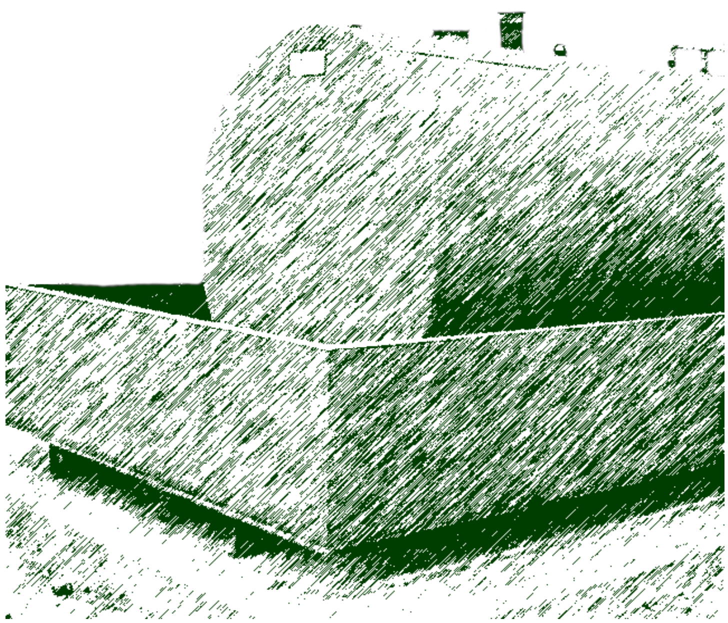
WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Used Oil Guidance

Tank and Secondary Containment Requirements For Used Oil Processors



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The Washington State Department of Ecology's Hazardous Waste and Toxics Reduction Program is responsible for the management and reduction of hazardous wastes and toxic substances in Washington State. Contact a regional office near you and ask for a Toxics Reduction Specialist for information on reducing or recycling hazardous waste. If you are a hazardous waste generator and you are uncertain about your responsibilities, ask for a Hazardous Waste Specialist.

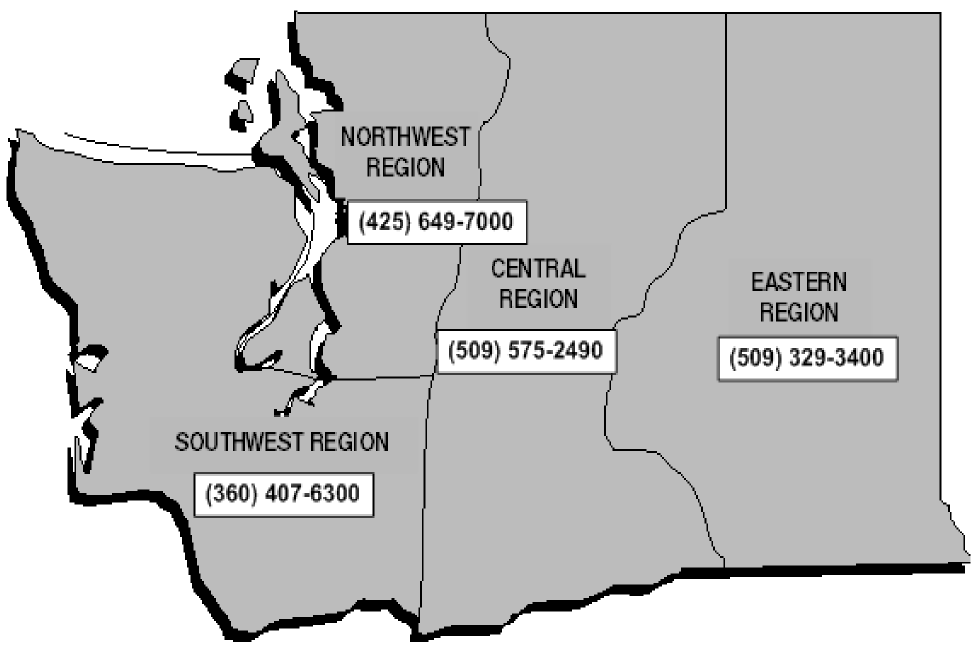

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Table of Contents

Acronyms Used in this Publication

ACI	American Concrete Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
MRW	Moderate Risk Waste
NFPA	National Fire Protection Association
PE	Professional Engineer
PSIG	Pounds Per Square Inch Gauge
SPCC	Spill Prevention, Control, and Countermeasure
STI	Steel Tank Institute
TSD	Treatment, Storage and Disposal facilities
UBC	Uniform Building Code
UL	Underwriters' Laboratory
UST	Underground Storage Tank
WAC	Washington Administrative Code

Introduction

This guidance addresses performance standards for aboveground tanks and *secondary containment** at *used oil processors* (processors). It provides regulatory structure and detailed technical requirements for the following people:

- Owners and operators.
- Ecology inspectors and engineers.
- *Qualified, independent professional engineers*.

It does not address requirements for training, record keeping, labeling, *used oil* analysis, tracking, or spill response.

Purpose

The used oil regulations rely on performance standards to protect human health and the environment. Questions may arise whether a used oil processor meets the required performance standards. This guidance intends to facilitate evaluations and discussions between the groups identified above of satisfactory conditions for tanks, containers, and secondary containment.

This publication presents and discusses established industry standards for tanks and secondary containment appropriate for determining compliance with the required performance standards. The used oil regulations, *Washington Administrative Code* (WAC) 173-303-515, do not require a used oil processor to meet every aspect of a specific industry standard for a tank or concrete construction. However, the used oil processor's burden to ensure compliance with the used oil performance standards increases if an operation does not meet an established and accepted industry standard. Other authorities, such as the local fire department, the health department, or the Department of Labor and Industries, may require a specific industry standard for equipment or structures under regulations they implement at a used oil facility.

This guidance has two major headings:

- Part I: Applicable Regulations.
- Part II: Tank and Secondary Containment - Guidance on Technical Requirements.

Part I focuses on three state and federal regulations. It discusses how these rules apply and interrelate at used oil processors. Part II includes references and detailed technical information on how used oil processors can meet general performance requirements.

**Definitions of italicized terms can be found in the glossary at the end of this publication.*

PART I: Applicable Regulations

Regulations reviewed in this guidance that apply to used oil processors in Washington include the following:

- WAC 173-303-515 - state regulation for used oil management and operations.
- 40 CFR (*Code of Federal Regulations*) Part 279 - federal regulation for used oil management and operations.
- 40 CFR Part 112 - federal regulations for *Spill Prevention, Control and Countermeasure (SPCC) Plans.*

Fire codes, building codes, and other safety codes have additional requirements important to used oil processors referenced in Part II. Contact the appropriate authority for detailed information.

Used oil processors in Washington are subject to regulatory requirements in WAC 173-303-515 and federal used oil regulations at 40 CFR Part 279. WAC 173-303-515 incorporates 40 CFR Part 279 by reference, which means used oil processors in Washington are fully subject to 40 CFR Part 279 and Ecology has authority to enforce those federal regulations. WAC 173-303-515 has additional requirements for used oil processors not in 40 CFR Part 279. Ecology can require *integrity assessments* of tanks and secondary containment systems at used oil processors (WAC 173-303-515(9)(b)(i)). Both the WAC and the CFR are referred to in this guidance.

40 CFR Part 279 states used oil processors are subject to all applicable spill prevention, control, and countermeasures in 40 CFR Part 112. This means many used oil processors must have a Spill Prevention, Control, and Countermeasure (SPCC) Plan. Some operations are exempt from the SPCC Plan (See Part II Section 2).

Ecology is not authorized to enforce 40 CFR Part 112 (SPCC planning). However, many requirements of used oil regulations overlap with requirements of SPCC planning. Used oil processors may use information in the SPCC Plan to demonstrate they meet certain requirements in used oil regulations. Ecology inspectors may request to review the SPCC Plan to determine whether the operation is in compliance with used oil regulations. If the processor does not have a SPCC Plan or the inspector believes the SPCC Plan is inadequate, the inspector should refer that potential violation to the U.S. Environmental Protection Agency (EPA). The inspector should use existing authority under the used oil regulations, independent of EPA's action on the SPCC Plan, to ensure environmental protection at the processor. For example, if an inspector believes a tank or secondary containment system is not adequate they should require an integrity assessment by a qualified, independent professional engineer. Ecology inspectors should also require any necessary repairs to tanks or secondary containment systems. See Part II for detailed information.

Moderate Risk Waste (MRW)

WAC 173-350-360 (regulations for MRW handling) apply to used oil processors that receive used oil classified as MRW. Used oil from households, classified as *household hazardous waste*, or conditionally exempt *small quantity generators* is subject to MRW requirements. Washington counties have primary authority to implement and enforce the solid waste regulations, including requirements for MRW. Processors subject to solid waste regulations may be required to obtain a county permit or meet other county requirements.

Note: A detailed discussion of MRW requirements is beyond the scope of this guidance and is not included in this publication.

Underground Storage Tank (UST)

Special comprehensive regulations in Chapter 173-360 WAC (UST regulations) apply to processors that have a UST system that holds more than 110 gallons. Requirements in the UST regulations go beyond regulatory requirements in WAC 173-303-515. They include comprehensive requirements for notification, performance, corrosion protection, release detection, reporting, *liability coverage*, *closure*, and annual administrative fees. The UST must be licensed and have a visible tag that confirms compliance with regulatory requirements. If the used oil processor has a UST, refer to the UST regulations and guidance, and consult personnel in Ecology's Toxics Cleanup Program which administers the UST program. This link provides access to the UST regulations, guidance, and Ecology contacts: http://www.ecy.wa.gov/programs/tcp/ust-lust/tanks.html.

Note: A detailed discussion of UST requirements is beyond the scope of this guidance and is not included in this publication.

Quick Scan

PART II: Tank and Secondary Containment - Guidance on Technical Requirements

The shaded column in this part contains a brief summary of requirements the reader can scan to locate a certain topic. Read the shaded column for general information on a topic. Read the unshaded column for detailed technical discussions and references.

Section 1: Tank Systems

Summary of Regulatory Requirements

Tank systems for used oil management must be in good condition with no visible leaks.

"Tank system" refers to the tank itself, *ancillary equipment* such as piping and vents associated with the tanks, and the secondary containment around the tanks.

Tank systems used for the management of used oil (i.e., storage or processing) must be in good condition and have no visible leaks (40 CFR 279.54(b) as referenced by WAC 173-303-515(9)).

Ecology may require independent integrity assessment of tank systems.

Ecology has authority to require integrity assessments of tank systems by a qualified, independent professional engineer if substandard conditions pose a threat to human health or the environment, (WAC 173-303-515(9)(b)(i)). Determining whether to require this independent assessment is an important decision by Ecology compliance inspectors and engineers. Current condition and design standards of the tank system should be evaluated in any assessment required.

Ecology may require repairs and improvements based on results of the integrity assessment.

Ecology can require repair or replacement of a tank system based on results of the integrity assessment (WAC 173-303-515(9)(b)(ii)). Ecology personnel should carefully review and evaluate the independent assessment after it is completed to determine whether this action is needed.

This section focuses on aboveground steel tanks typical at used oil facilities.

This section focuses on aboveground tank systems constructed of steel. Combustible construction materials, such as many types of plastics, cannot be used for aboveground tanks used to manage *flammable liquids* or *Class II* and *IIIA combustible liquids* (see WAC 296-24-33005 and National Fire Protection Association (NFPA) 30, Section 2.2). Most used oil is a Class IIIA combustible liquid.

Some used oil is *Class IIIB combustible liquids.* Combustible construction materials can be used to store this class of liquid if the storage area cannot be exposed to leaks or spills of a Class I or II liquid. Combustible construction materials can also be used for underground tanks.

In all cases, properties of the liquids managed in a tank system must be compatible with the tank. Used oil must not cause excessive corrosion, dissolution, or other damaging physical or chemical changes to the tank's construction material.

The type of used oil managed must be compatible with the tank's construction materials.

Despite the focus on the steel tanks, the guidance references industry standards that can be used to evaluate other types of systems.

1.1 Tank System Design Standards

State and federal used oil regulations do not specify design standards required for used oil tanks. Instead, there are general performance requirements (WAC 173-303-515(9)(b) and 40 CFR 279.54). There is also reference to "applicable industry standards" in the SPCC regulations (40 CFR 112.3(d)(1)(iii)).

The used oil regulations have performance requirements for tanks, but do not require specific tank design standards.

Different categories of tanks may be employed for used oil management. These are listed and briefly described below. In addition, prominent examples of the "applicable industry standard" for each category of tank are identified. The standards listed are often referred to as "consensus design standards" because they have received wide acceptance by regulating agencies and industries.

There are established industry standards for tanks called "consensus standards." This section identifies these standards for different categories of tank systems.

- **Atmospheric tanks** are tanks designed to operate at pressures from *atmospheric pressure* through 0.5 to 1.0 psig (pounds per square inch gauge). The following are common industry tank design standards suitable for aboveground used oil management:
  - American Petroleum Institute (API) Number 650—Welded Steel Tanks for Oil Storage.
  - American Petroleum Institute (API) Number 12A—Specifications for Oil Storage Tanks with Riveted Shells.
  - Underwriters Laboratory (UL) Number 142—Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids.

  "Atmospheric tanks" must not be used for management of a flammable or combustible liquid at a temperature above its boiling point.

- **Low-pressure tanks** are designed to operate at pressures above 0.5 psig, but not more than 15 psig. Common industry tank design standards suitable for aboveground used oil storage include:
  - American Petroleum Institute (API) Number 620—Recommended Rules for the Design and Construction of Large, Welded Low-Pressure Storage Tanks.
  - American Society of Mechanical Engineers (ASME)—Boiler and Pressure Vessel Code Section VIII, Division 1 - Code for Unfired Pressure Vessels.

- **Pressurized tanks** can be designed for pressures greater than 15 psig. The following are common industry standards:
  - American Society of Mechanical Engineers (ASME)—Boiler and Pressure Vessel Code Section VIII, Division 1 or 2 - Code for Unfired Pressure Vessels.
  - American Society of Mechanical Engineers (ASME)—Boiler and Pressure Vessel Code Section I or Section VIII, Division 1 or 2 - Code for Fired Pressure Vessels.

- **Underground tanks** are subject to the Underground Storage Tank (UST) Regulations in WAC 173-360 if the tank holds more than 110 gallons. If an underground tank exists, consult with personnel in Ecology's Toxics Cleanup Program for assistance and technical guidance.

- **Double walled tanks** provide their own secondary containment when the outer shell completely contains any releases from the inner tank. They can be used as above or underground tanks. Underwriters' Laboratory (UL) Number 142 Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids is a common standard for aboveground double walled tanks. If an underground tank exists, consult with personnel in Ecology's Toxics Cleanup Program for the acceptable design standard and other technical and regulatory assistance.

Other design standards for tanks may be acceptable. If a different standard is used, it should be identified.

There are design standards that may be acceptable in addition to the "consensus design standards" listed above. During an integrity assessment by a qualified independent professional engineer, the design, condition and use of a tank should be evaluated against that standard. The integrity assessment will likely be more straightforward if a "consensus design standard" is used.

1.2 Anchoring a Tank

The Uniform Building Code and individual tank standards provide standards for safely anchoring tanks. Wind storms and earthquakes are the forces that determine design requirements.

Safely anchoring tanks considering potential forces by wind storms and earthquakes is important for used oil facilities. The Uniform Building Code (UBC) provides minimum design standards. The qualified, independent professional engineer certifying a tank integrity assessment should confirm adequate design of a tank's anchoring system to at least the UBC standards.

Depending on the specific location, design wind speeds in Washington vary between 70 and 100 mph (although local codes may by higher than the UBC based on storm records at that location). Most of Western Washington is in seismic zone 3 and much of Eastern Washington is in zone 2B.

Some individual tank design standards have additional requirements for anchoring. For example, Appendix E of API 650 addresses seismic design of storage tanks. These should also be considered during a tank system integrity assessment.

Leak detection is another consideration when designing the tank anchoring system. For example, radial grooves in the foundation facilitate flow of a release to the tank perimeter where it is rapidly detected (see API 650, Appendix I). This type of design is not as important for rounded or cone-bottom tanks that are supported above the ground, as for flat-bottomed tanks placed directly on a secondary containment surface. Reliable and rapid leak detection helps avoid soil and ground water contamination and costly cleanup requirements.

Major modifications to add rapid leak detection to existing tank systems may not be justified unless there are concerns about the integrity of the underlying secondary containment. Conversely, rapid leak detection under a flat-bottomed tank may be essential if a major crack in concrete secondary containment extends beneath the tank. Ecology encourages designing for rapid leak detection from the bottom of tanks at new tank installations or for existing tanks that are moved.

Ecology encourages designing for effective leak detection.

1.3 Tank Venting

Tank venting is an important safety issue and warrants special considerations during tank design, inspections, and assessment.

Venting tanks for both normal operating and emergency situations is critical. Tank vents need to be carefully designed and evaluated. Both design standards and safety standards address tank venting.

NFPA 30 is a good general source of requirements for venting of tanks containing flammable and combustible liquids. It addresses venting of atmospheric and pressurized tanks, both for normal operating and emergency situations. API 2000 is a specific standard for tank vent design. Additional information on venting is included in WAC 296-24-33005(2)(d) and (e), API 650, and UL 142.

The information in the following paragraph is a summary of the standards most relevant to small to medium-sized aboveground used oil storage tanks.

Atmospheric storage tanks must be adequately vented to prevent the development of vacuum or pressure that exceeds the design pressure (e.g., 0.5 to 1 psig) during normal operations, such as filling or emptying the tank or due to atmospheric temperature changes. Normal operating vents should be sized in accordance with either API 2000 (Venting Atmospheric and Low-Pressure Storage Tanks) or other standards acceptable to the certifying engineer. In general, the inside diameter of

To protect the tank's integrity, normal venting controls pressure changes due to temperature changes and during filling or emptying operations.

the vent will not be smaller than 1.25 inches for tanks under 2,500 gallons to 3 inches or more for tanks larger than 20,000 gallons.

Without specific documentation regarding the design standard or an engineer's certification, the compliance inspector should ensure the vent is at least as large as the largest filling or withdrawal connection. Also, be aware that if there is more than one filling or withdrawal connection, a larger vent is needed due to the potential for simultaneous flow into or out of the tank from several ports.

Emergency venting releases pressure from a tank before it explodes. The method of venting should also prevent release of used oil from the tank.

A tank must have emergency relief venting in addition to venting for normal operations. Emergency venting avoids dangerous pressure buildup potentially followed by a catastrophic failure (e.g., explosion). In general, emergency venting for atmospheric tanks should protect against pressure buildup greater than 2.5 psig.

Emergency venting may be a design feature of the tank itself such as a weak seam that will preferentially fail to allow relief of excessive internal pressure (Note: this type of emergency venting design should not be used for tanks inside buildings pursuant to NFPA 30). Emergency vents can also be self-closing covers or valves; these must be vapor tight during normal tank operations. The emergency vent should be designed to prevent rupture of the shell or bottom of the tank. In other words, the emergency vent should protect the tank from a failure that would cause release of its liquid contents.

Common atmospheric tank design standards, such as API 650 and UL 142, address emergency venting. NFPA 30, Chapter 2, includes specifications for the flow capacity of the emergency vent. If the tank is not designed to a common standard, the certifying engineer should specifically evaluate emergency venting of the tank.

Because of the potential for greater pressure buildup, venting of low pressure and pressurized vessels require even closer scrutiny than the venting design of atmospheric tanks.

The above paragraphs focus on atmospheric tanks because they are most commonly found at used oil facilities. Greater scrutiny is justified for venting design of low pressure tanks and pressurized vessels. Because of the intended design and operation of these tanks, greater pressures can build up and cause a more extreme failure if the venting system is not properly designed and maintained. These tanks are typically not used for storage, but may be used for oil processing.

1.4 Ancillary Equipment for Tanks

Piping used to convey used oil must be liquid tight (e.g., see NFPA 30, Chapter 3). This broad performance requirement is not satisfied if liquid is leaking at pipe joints or from equipment such as valves or flanges. Also, each connection used to add or withdraw liquids to or from an aboveground tank should have a valve located as close as practical to the tank itself.

Piping and equipment for tanks must be liquid-tight.

The American Society of Mechanical Engineers (ASME) B31 Pressure Piping Code, is a primary source for acceptable standards for liquid tight piping systems. NFPA 30, Section 3.2.1, indicates that compliance with ASME B31 constitutes compliance with performance standards in the fire code. API 570 Piping Inspection Code is also a primary reference for acceptable piping for combustible and flammable liquids, and it also references ASME B31 for detailed requirements and procedures. These standards should be considered during the integrity assessment conducted by a qualified, independent, professional engineer for tank system certifications.

As for tanks, there are common industry standards to design and evaluate piping. Evaluation of piping and equipment should be part of routine facility inspections, and detailed integrity assessments.

Significant problems can be directly observed in aboveground piping even during routine inspections. Ensuring liquid-tight aboveground piping is easier and more certain than ensuring the integrity of underground piping.

If underground piping exists, special regulatory requirements in WAC 173-360 (UST regulations) may apply. These regulations apply if 10% or more of the volume of the tank's system, including its piping, is underground. As one example, WAC 173-360-350 (methods of release detection for piping) includes schedules and procedures, including testing sensitivity, for required leak testing of underground piping. If underground piping subject to UST requirements exists consult with personnel in Ecology's Toxics Cleanup Program who implement the UST regulations.

If underground piping exists, requirements in WAC 173-360 **Underground Storage Tank Regulations,** ***may apply. Consult with personnel in Ecology's Toxics Cleanup Program who implements these important regulations.***

Piping must be adequately supported to protect against physical damage. Piping should also be protected against and inspected for excessive corrosion. Obvious and dramatic problems can be identified during routine inspections. However, a more detailed evaluation should be made by a professional engineer during an assessment for tank system certification.

Routine inspections and a professional engineer's certification should ensure piping is physically supported and free of excessive corrosion.

1.5 Bonding and Grounding

Tanks and ancillary equipment must be designed and operated to prevent a spark over an "ignitable mixture." Bonding and grounding of tanks and equipment is needed if a static charge can be generated in the tank system and a flammable or combustible liquid is managed above its flashpoint.

Bonding and grounding of tanks and equipment is needed if flammable or combustible liquid can create a static charge and the liquids are managed above their *flashpoint*. The flashpoint of a liquid is the lowest temperature at which it gives off sufficient vapor to ignite at the liquid's surface. Sparks can be caused by static charges created by transferring some organic liquids into, out of, or between tanks.

Not all organic liquids generate static charges when they flow; *non-polar liquids* represent the greatest threat. Whether or not used oil generates a static charge depends on factors such as its composition and water content. If these factors are not well understood and controlled at the facility, bonding and grounding of tanks and equipment is prudent.

If the tanks and piping are not bonded and grounded, a spark generated by static charges can ignite vapor above the liquid resulting in a fire or explosion. Bonding makes an electrical connection from one tank to the next, and grounding drains the static charge off of the tank system. Proper bonding and grounding may also afford protection against lightning strikes.

NFPA 30 requires that all equipment be designed and operated to prevent "*electrostatic ignitions*." This means that metallic tanks and piping where an "ignitable mixture" could be present and a static charge could be generated must be bonded or grounded, or both. Nonmetallic equipment must be designed for equivalent safeguards against *static electricity*.

The key question for used oil tanks and piping is whether the used oil in the tank or piping will create an "ignitable mixture." Used oils are generally classified as Class IIIA combustible liquids. This indicates they have a flashpoint between 140°F and 200°F. If the oil's storage or processing temperature ever gets above 140°F, it is possible that there would be an "ignitable mixture" in the tank. Also, pursuant to WAC 296-24-33001(19)(c), if a combustible liquid is heated to within 30°F of its flashpoint it must be handled according to the requirements of the next lower class of liquid (i.e., a Class II combustible liquid in this case).

If the facility accepts a range of used oil mixtures, some might have a lower flashpoint than usual, and an ignitable mixture could be created at a lower temperature than expected. This is a consideration that facility owners/operators, certifying engineers, and Ecology inspectors should address when assessing the bonding and grounding required of used oil tanks.

NFPA 77, *Recommended Practices on Static Electricity,* provides guidance on prevention of electrostatic ignition in equipment. API 2003, *Protection Against Ignition Arising Out of Static, Lightning, and Stray Currents,* can also be used as a reference for protection against static ignition.

1.6 Tank Level Control

A tank must have some form of high liquid level indicator or high liquid level pump cutoff device to prevent overfilling. The indicator may be audible or visual. The liquid level sensing device must be regularly tested to ensure proper operation (for example, see the SPCC requirements at 40 CFR 112.8(c)(8)). If the tank is not equipped to avoid overfilling and the facility owner or operator is not willing to address that problem, the Ecology inspector may refer this to EPA as a violation of a significant SPCC Plan requirement.

Tanks must have a* high-level alarm *or cutoff system to prevent overfilling.

1.7 Tank Integrity Inspection Standards

The following are common standards used by professional engineers to inspect and certify the integrity of aboveground tanks:

- American Petroleum Institute (API) Number 653 Tank Inspection, Repair, and Reconstruction.
- Steel Tank Institute (STI) SP001-00 Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids.

There are also common tank integrity inspection standards. When a professional engineer assesses a tank, they should identify the inspection standard used as part of the assessment certification.

A typical engineer's certification will identify the design and inspection standard used to evaluate the used oil tank. If the design standard of the tank is unknown or if a specified standard was not used to build the tank, the certifying engineer should make adequate observations and measurements so they can independently evaluate the tank against an applicable standard. For example, even if a tank was not strictly designed to API 650 standards, the engineer can take shell thickness measurements, evaluate welds, and conduct other critical analyses to assess whether the tank is designed to equivalent standards.

The certifying engineer should comprehensively apply inspection standards (such as those in API 653 or STI SP001-00) to help ensure the tank system meets industry standards. Examples of key requirements under API 653 include measuring and assessing tank shell thickness, weld inspections, internal inspection particularly of the floor area, corrosion assessment, foundation evaluation, and evaluating the condition and operation of ancillary equipment. These are just prominent examples; the actual standard is much more comprehensive.

In API 653, the frequency of a comprehensive internal integrity assessment is determined by the condition and age of the tank, but should not exceed 20 years. Under API 653, an external integrity inspection should occur every 5 years. STI SP001-01 specifies an integrity inspection every 10 years.

1.8. Other Issues

There are significant safety issues for tank systems that are beyond the scope of this guidance. Experts at the local fire departments and state department of Labor and Industries are good sources for concerns and questions.

There are significant fire protection and worker safety requirements for the management of flammable and combustible liquids. This guidance is focused on environmental protection, and many fire protection and worker safety requirements are beyond its scope. Examples include ventilation inside buildings and design of electrical systems. If the inspector or facility owner/operator has questions or concerns on such issues, they should consult the local fire department or the Washington Department Labor and Industries. Primary codes that apply are NFPA 30 for fire protection and Chapter 296-24 WAC, Part E for worker safety.

Section 2: Secondary Containment

Processors must have impervious secondary containment for their operations.

Summary of Regulatory Requirements

Processors must provide secondary containment for storage, processing, and transfer operations. The secondary containment must be sufficiently *impervious* to prevent migration of spilled used oil to the surrounding soil, ground water, or surface water (WAC 173-303-515(8), WAC 173-303-515(9), 40 CFR 279.45, and 40 CFR 279.54).

Ecology can require an assessment of the secondary containment system by a qualified, independent professional engineer. Ecology can require improvements or removal of used oil if the secondary containment system is not adequate.

Ecology can require an assessment of the secondary containment system by a qualified, independent professional engineer (PE) registered in Washington (WAC 173-303-515(8)(a) and WAC 173-303-515(9)(b)(i)). Ecology can also require repairs or improvements of the secondary containment systems if, based on evaluation of the assessment, it determines such improvements are necessary to eliminate threats (WAC 173-303-515(8)(b) and WAC 173-303-515(9)(b)(ii)). If necessary, Ecology can use this authority to require the facility to remove used oil from the operating area until the improvements are made.

Most operations that store or process used oil must have a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

In addition to the requirements cited above, used oil processors are subject to applicable Spill Prevention, Control, and Countermeasure (SPCC) requirements in 40 CFR Part 112. This means that these operations must have a SPCC Plan unless they meet conditions for an exemption in 40 CFR 112.1(d). Major conditions for an exemption are:

- The operation cannot reasonably be expected to discharge oil to navigable waters of the United States because of its location.

- Aggregate aboveground storage of used oil is 1,320 gallons or less (used oil in containers less than or equal to 55 gallons do not have to be counted).
- Aggregate below ground storage of used oil is 42,000 gallons or less.

The definition of "navigable waters of the United States" is very broad. For example, it includes small tributaries and seasonal wetlands. Refer to 40 CFR 112.1(d) to make a final determination on whether an operation meets the requirements for an exemption.

The SPCC Plan provides detailed information on equipment, workforce, and procedures to prevent, control, and provide adequate countermeasures to a discharge of used oil (40 CFR 112.2). The requirement to develop and implement an SPCC Plan is outlined in 40 CFR 112.3. The Plan must be reviewed and certified by a licensed professional engineer. The professional engineer must attest to their familiarity with regulatory requirements and they must examine how the facility meets the relevant requirements. The PE must certify that the SPCC Plan was prepared in accordance with good engineering practices, including consideration of applicable industry standards.

The SPCC Plan provides details on how the used oil processor will prevent and control discharges of used oil. The plan must be certified by a professional engineer.

Requirements in the SPCC regulations are performance-based. They rely on state-of-the-art practices and equipment as determined and assessed by qualified professional engineers and other professionals in the field. 40 CFR 112.7 outlines the general requirements for an SPCC Plan which include: identification of all tanks that manage used oil, a description of containment and diversionary structures that prevent discharge of oil to surface water, and requirements for routine inspections and periodic assessments of tanks and equipment as well as personnel training, security, and record keeping. 40 CFR 112.8 includes more detailed discharge prevention and containment procedures. For example, 40 CFR 112.8(c)(2) requires secondary containment to have a volume equal to the largest tank with sufficient *freeboard* to contain precipitation, and 40 CFR 112.8(c)(8) requires high-level alarms to prevent overflow from tanks.

Ecology is not directly authorized to implement the SPCC requirements in 40 CFR 112. However, 40 CFR Part 279 (which is incorporated into WAC 173-303-515) requires that non-exempt used oil processors have an SPCC Plan that meets the requirements in 40 CFR Part 112. If the facility does not have an SPCC Plan certified by a professional engineer, the Ecology inspector should refer this potential violation to EPA Region 10. Also, if the SPCC Plan seems incomplete or inadequate, this also should be referred to EPA. In these situations, Ecology should use all existing and necessary authority in WAC 173-303-515 to ensure adequate secondary containment. Lack of a certified SPCC Plan may indicate seriously substandard conditions at the facility, and it puts an added burden on Ecology and the facility to ensure environmental protection.

Ecology is not authorized to require an SPCC Plan. If the used oil processor does not have an SPCC Plan, or if the Plan seems inadequate, the Ecology inspector should report the potential violation to EPA. Ecology should then rely on state regulations (WAC 173-303-515) to ensure environmental protection.

2.1 Performance Requirements for Secondary Containment

Secondary containment must be "sufficiently impervious" to prevent used oil from reaching the soil, groundwater, or surface water.

Tank systems and containers must have secondary containment including *dikes*, *berms*, or *retaining walls*, and a floor. These barriers "must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, ground water, or surface water" (see 40 CFR 279.54(c) and (d)).

"Sufficiently impervious" is not defined in the regulation. However, examples of construction materials that can be designed and maintained to meet this performance requirement are given in the preamble of the federal register for the final regulation (see 57 FR 41596), and they include concrete, clay, asphalt, plastic, and steel. Other sections of the *Dangerous Waste Regulations* require *hydraulic conductivity* of $1x10^{-7}$ cm/sec. If secondary containment at the used oil facility meets this performance standard, it should be considered "sufficiently impervious." If the secondary containment is more permeable than this, the burden should be placed on the owner/operator of the facility to otherwise demonstrate that it meets the performance requirement.

Although not strictly required by the used oil regulations, the capacity of secondary containment should be sufficient for ten percent of the used oil in the area or the volume of the largest tank, plus water from a 24-hour 25 year storm. This capacity is a common requirement for secondary containment of hazardous materials.

The used oil regulations at WAC 173-303-515 do not specifically state the required secondary containment capacity. However, if the secondary containment at a used oil processor does not meet capacity requirements generally considered adequate for management of hazardous materials, or specifically required by other relevant regulations, the owner/operator or Ecology inspector should take appropriate steps to ensure protection against a release to the environment from secondary containment.

The capacity for secondary containment of dangerous wastes must be sufficient to contain the contents of the largest tank plus storm water from a 24-hour, 25 year storm event (see WAC 173-303-640(4)(e)). Used oil processors subject to Chapter 173-350 (i.e., facilities managing MRW) must have secondary containment sufficient to contain ten percent of the volume of all containers and tanks holding liquids or the contents of the largest tank, whichever is greater, plus storm water from a 24-hour 25 year storm event (WAC 173-350-360(5)(iii)(A)). Most used oil processors must have an SPCC Plan, and the required capacity for secondary containment in those plans is "for the entire capacity of the largest container (i.e., tank) and sufficient freeboard to contain precipitation" (40 CFR 112.7(c)(2)).

2.2 Materials for Secondary Containment

Tank systems and container storage areas at used oil processors usually have concrete secondary containment. Design and maintenance of impervious concrete will be the focus of this section. However, other materials including clay, amended asphalt, plastic, and steel may be used and are briefly discussed.

__Most secondary containment at used oil facilities is made of concrete and that is the focus in this guidance. However, other materials, including clay, amended asphalt, plastic, and steel may meet the performance requirements.__

- **Clay.** To be sufficiently impervious, a clay liner requires careful design, material specification, installation, and testing. With these steps, constructing a clay liner to achieve a hydraulic conductivity of $1x10^{-7}$ cm/sec or less is feasible. Use of native soil without careful engineering design and construction will rarely meet the required performance standards.

  If a clay liner is used, the Ecology inspector should request documentation to ensure it was carefully designed and built. The inspector should ask an Ecology engineer to help with this evaluation. Requiring an integrity assessment by an independent, qualified, professional engineer pursuant to WAC 173-303-515(8)(a) or (9)(b) will often be prudent.

- **Amended asphalt**. Special mixes of asphalt with fine aggregate can be manufactured to achieve low hydraulic conductivity. Also, high quality, low permeability sealants can be applied to asphalt to reduce its overall hydraulic conductivity. If asphalt is used as a secondary containment material, these types of special measures are needed to ensure adequate performance. Used oil may degrade asphalt, especially if it is allowed to penetrate through the asphalt's surface.

  Common asphalt generally has hydraulic conductivity that is several orders of magnitude greater than needed for adequate secondary containment. Therefore, common asphalt should not be used for secondary containment.

- **Plastic**. Plastic secondary containment may be used for small operations or areas. Issues to consider are: compatibility of the plastic with the used oil being managed, whether the plastic has developed cracks or is otherwise damaged through use, and whether the plastic meets fire code requirements for its use. In general, combustible construction materials should not be used to manage flammable, or Class II or IIIA combustible materials. The local fire department should be consulted regarding fire code compliance.

- **Steel**. Steel can be a good construction material for low hydraulic conductivity secondary containment. Welded joints are more reliable than bolted joints. If bolted joints are used, all joints should include a low permeability gasket that is compatible with used oil. Most steel is susceptible to rust and corrosion and its condition should be evaluated as part of the routine facility inspection, Ecology compliance inspection, and any independent PE assessment and certification.

Double walled tanks may also be used for secondary containment. However, a dike to contain spills may also be needed to meet all requirements of a SPCC Plan.

- **Double walled tank**. A double walled tank with adequate monitoring of the interstitial space meets used oil requirements for secondary containment. There are numerous types of *interstitial monitoring* for double walled tanks, including electrical resistivity, pressure sensing, fluid sensing, and manual detection (e.g., with a dip stick). The most reliable methods provide continuous leak detection with alarms. At a minimum, the integrity of the system should be ensured on a monthly basis.

  Despite compliance with secondary containment requirements in the used oil regulations, SPCC regulations may require a dike. This is to prevent spills that could occur during tank filling operations from reaching a waterway.

2.3 Concrete Secondary Containment

Concrete is generally an acceptable materials for secondary containment if care is taken for its design, construction, and maintenance.

Depending on how well it is designed, constructed, and finished, solid concrete used for secondary containment will usually be sufficiently impervious to protect soil and ground water at used oil facilities. However, gaps and cracks in concrete are permeable, and if these are significant, the concrete is not adequate to contain spilled oil. In this context, gaps are separations at joints in the concrete slab, (such as at expansion joints), where concrete poured at different times meet, or where a slab meets a vertical wall. Cracks are separations that develop after the concrete is placed; they usually follow an irregular course through the concrete. In dangerous waste permits, Ecology has specified that cracks penetrating the concrete (i.e., not simply surface drying cracks) greater than 0.08 inches in width must be repaired. That is an appropriate guideline for crack repair at used oil facilities.

Ongoing inspection and maintenance is required to ensure concrete remains sufficiently impervious.

Careful preparation of the soil foundation and adherence to industry design standards for concrete will help keep open gaps and cracks to a minimum. Also, care with finishing and curing of concrete reduces its permeability and potential for cracking. For example, finishing the concrete using steel troweling methods reduces its surface permeability. Curing the concrete at greater than 80% humidity for at least three to seven days after it is placed maximizes strength and reduces subsequent cracking. A comprehensive inspection and maintenance program is then needed to maintain the concrete for adequate secondary containment.

2.4 Concrete and System Design

The best established industry standard for the design of concrete secondary containment is the American Concrete Institute Standard 350.2 Concrete Structures for Containment of Hazardous Materials (ACI 350.2R-97). This standard was developed specifically to protect underlying soil and ground water from contamination by hazardous chemicals. ACI 350.2 focuses on sealing all *concrete joints* and the control of concrete cracking. It specifies *waterstops* to be placed in all joints for construction, contraction, and expansion. This use of waterstops is one significant example of how ACI 350.2 goes beyond other concrete design standards to help ensure impervious secondary containment.

ACI 350.2 is a concrete standard specifically written for secondary containment of hazardous materials, and it is recommended for new construction.

Special design measures in ACI 350.2 are required for tank secondary containment at dangerous waste treatment, storage and disposal facilities (dangerous waste TSDs). Ecology recommends use of ACI 350.2 for new construction at used oil facilities. However, few existing used oil facilities in Washington are built to this standard.

However, most existing used oil facilities will not be designed and built to this standard.

ACI 318 is a prominent industry standard for concrete construction. Most existing used oil facilities are probably built to a current or older edition of this standard. More recent editions of ACI 318 address concrete strength by specifying minimum amounts of steel reinforcement for a given slab or wall thickness. Concrete durability is addressed by requiring a minimum amount of concrete over steel reinforcing, requiring a minimum amount of cement per yard of concrete, and limiting the maximum weight of water per yard of concrete.

Secondary containment at existing used oil facilities is probably designed and built to a current or older edition of ACI 318.

ACI 318 also specifies placement and design of concrete joints to control cracking. If concrete secondary containment at a used oil facility was designed and built for the load it is subject to and it has been well maintained, it can often be upgraded to be sufficiently impervious for secondary containment of used oil.

Concrete containment built to the ACI 318 design standard can frequently be upgraded and maintained, using well established techniques and materials, to meet the required performance standards.

Improving secondary containment built to ACI 318 specifications generally involves filling and sealing joints and other gaps in the containment slab, the containment wall, and between the slab and wall. Preparation of the joints, specifications of repair materials, and application of the materials should all be developed and overseen by a qualified professional engineer. Joint areas to be sealed must be carefully prepared so they are clean and sufficiently rough to ensure good adhesion of the repair materials. The materials must be chosen for the type of repair and the expected service use of the area. There are usually several different types of materials required to seal a single gap (e.g., filler, caulk, and elastomeric coating). Good products are readily available on the market for repair of cracks and gaps in concrete.

The condition of sumps is particularly important because spills accumulate there. In addition to being free of cracks and gaps, sumps should be coated.

Sump design and maintenance is critical for reliable secondary containment because potentially contaminated storm water and releases accumulate there. Also, sumps are often under a hydraulic head which can force liquids through any imperfections. The ideal situation is a blind sump free of cracks and gaps and covered with a high quality, low permeability *concrete coating*.

If there are joints (i.e., potential gaps) in the sump, ideally they would include a water stop. If there are joints without water stops, they must be carefully sealed as described above. Any cracks must also be sealed. The sump, free of cracks and gaps, should be coated to further restrict leakage of fluids. It is more important to coat the sump than other parts of the secondary containment. As indicated above, this is because sumps contain fluids under a hydraulic head more often than other areas of a secondary containment (especially for outdoor systems).

Ecology discourages use of subsurface piping at used oil facilities.

Sumps connected to subsurface piping are not as reliable as blind sumps for ensuring an adequate secondary containment system. Some facilities may have subsurface piping connecting sumps to oil/water separators or some other treatment device. Ecology discourages subsurface piping if there are viable alternatives.

Compared to above ground piping, subsurface piping is harder to inspect and potentially subject to more damaging conditions.

Subsurface piping is harder to inspect and maintain than above ground piping or blind sumps. Furthermore, subsurface piping is subject to more damaging conditions than most above ground piping. For example, subsurface metal piping can be damaged by corrosion, whose severity depends on soil resistivity and other chemical characteristics of the soil. Subsurface piping can also be damaged by soil consolidation. As a result, it is less certain that the system is maintained to ensure "sufficiently impervious" secondary containment.

If subsurface piping is in use, and its condition is not known, then it should be tested to ensure the integrity of the secondary containment system.

A leak in the subsurface piping that is undetected and/or not repaired becomes a continuing source of release to the soil and potentially to the ground water. At a minimum, subsurface piping should be inspected to determine if repair is needed during the independent integrity assessment. If the condition of the subsurface piping is not known, this is a good justification for Ecology to require an independent assessment under WAC 173-303-515(8)(a) and WAC 173-303-515(9)(b)(i).

If subsurface piping does exist, inspection methods can be used if its integrity is not known or suspect. Inspection methods range from uncovering the piping, using video cameras for internal observation, and pressure testing (see API 570, Section 9).

There are acceptable methods to test subsurface piping, but they must be designed and carried out with care.

Pressure testing of piping may use air, hydrostatic, or pneumatic pressure. Each of these methods has its own set of limitations and cautions. For example, testing should not be done by air pressure if there is a chance that a Class I, Class II, or Class IIIA liquid or vapor is in the pipe. Pressure testing requires careful consideration for safety and the sensitivity of the test. The pressure should not be so high as to damage the piping, but high enough to detect a leak that may exist. NFPA 30, section 3.6 provides general guidelines on minimum pressures for testing. A certified UST supervisor or qualified, independent professional engineer familiar with the design and materials of the piping system and piping codes should be consulted to plan a pressure test.

The discussion in this subsection is intended for subsurface piping that is not subject to the UST regulations. If the piping is subject to UST requirements, consult the UST regulation, guidance, and Ecology's Toxics Cleanup Program personnel who implement those requirements.

2.5 Soil Foundation

Concrete secondary containment must be placed on a stable, well-compacted foundation with adequate strength to help ensure long-term support of structures and equipment. If this is not done, the weight of the secondary containment, tanks, trucks, and heavy equipment can cause uneven settlement and cracking of the concrete. Prior to construction for new facilities, the soil subgrade must be prepared and tested to ensure it is acceptable for the design loads. For some types of soils, an extended period of consolidation through preloading will be required prior to other construction activities. All soils should be compacted and tested before building begins to ensure they meet engineering specifications for construction. Foundation soil investigation and testing should be performed by a qualified geotechnical engineer.

Design and preparation of a stable foundation is needed to support tanks and their secondary containment.

In the event that problems in the secondary containment system develop after construction (e.g., excessive cracks or gaps), a qualified professional engineer should be consulted to evaluate the problem. If the facility owner/operator does not take the initiative, Ecology can require this action pursuant to WAC 173-303-515(8)(a) or WAC 173-303-515(9)(b)(i).

Unacceptable cracking of the concrete is likely if foundation soils are not sufficiently prepared for construction or if the concrete and foundation are overloaded.

2.6 Inspection and Repair of Concrete Secondary Containment

Generally, concrete secondary containment is subject to three levels of inspection. These range from daily inspections to a detailed assessment by a qualified independent professional engineer.

Concrete secondary containment is subject to three levels of inspection. These include:

- Routine facility inspection
- Detailed facility inspection
- Independent integrity assessment

Routine inspections (i.e., daily or weekly) of secondary containment are needed to ensure proper storm water management for outdoor facilities and check that new cracks, gaps, or other imperfections (e.g., damaged coating in sumps, or exposed aggregate or rebar) have not developed.

Periodic (e.g., semiannual) detailed inspections by trained facility personnel are warranted to ensure that adequate conditions are maintained over the longer term.

If there are questions or concerns about the integrity of the secondary containment systems, or whether the containment meets performance requirements in the used oil regulations, then it should be assessed by a qualified, independent professional engineer (PE). In addition to a detailed field inspection of the secondary containment, the PE should use existing design and as-built documentation to evaluate the concrete construction against established design standards such as ACI 318 or 350.2. If the containments subgrade is in question, it may be necessary to conduct soil testing to ensure adequate strength and stability. The PE assessment will often include repair and maintenance requirements to support their certification that the secondary containment system is adequate.

Concrete secondary containment requires ongoing maintenance to ensure it remains "sufficiently impervious."

To remain impervious, concrete secondary containment requires ongoing maintenance. Inevitably, cracks develop in concrete. Unless they are shallow surface drying or shrinkage cracks, they must be repaired as described for gaps, above. It is often difficult to distinguish between small cracks that require repair and shallow shrinkage cracks. Crack repair is not prohibitively expensive, and Ecology recommends that if there is doubt about the depth of the crack, it should be repaired. Also, coatings may degrade over time (e.g., delaminate or become excessively chipped) and need to be patched or replaced. Maintenance in sumps is particularly important.

For More Information

If, after reading this guidance, your questions on requirements for containers, aboveground tanks, and secondary containment for used oil processors have not been addressed or you need clarification, please call a representative at one of Ecology's regional offices:

Northwest Regional Office	(425) 649-7000
Southwest Regional Office	(360) 407-6300
Central Regional Office	(509) 525-2490
Eastern Regional Office	(509) 329-3400

Used Oil Tanks and Secondary Containment Integrity Assessment Checklist

This checklist is a companion to Ecology's Used Oil Guidance for Tanks and Secondary Containment, publication number 05-04-016. Inspectors and facilities should familiarize themselves with its contents. This checklist was developed to assist regional inspectors in determining whether or not a Used Oil Processor or Storage Facility needs to conduct a tank or secondary containment integrity assessment under WAC 173-30-515(8)(b) and (9)(b). However, facilities may also use the checklist to assess if they need to conduct an integrity assessment. Key factors that will influence the need for an integrity assessment include significant cracks and gaps in the concrete and severe pitting and rusting of a tank's exterior. In addition, the age of the tank farm and other factors may influence the need to conduct an integrity assessment.

Facility Name: ______________________________

Facility Address: ______________________________

RCRA ID Number: ______________________________

Phone Number: ____________________ Fax: ____________________

Number of tanks: __________ Total Capacity (of all tanks) ____________________

Type of tank:

❐ Vertical ❐ Horizontal ❐ Steel

❐ Cone Bottom ❐ Flat Bottom ❐ Double walled[1]

	Yes	No	Comments
Does the facility have an SPCC Plan?			
Does the facility have as-built plans?			
Does the facility have design specifications for tanks?			
Has the facility developed an inspection schedule for the tanks?			
Has the facility ever conducted a tank integrity assessment?			
If so, did an independent, licensed professional engineer perform the assessment?			

[1] *Refer to page 10 of the this guidance manual.*

Part 2: Technical Requirements

Section 1: Tank Systems		Yes	No	Comments
1.1	**Tank Design Standards**			
1.1a	Are the tanks riveted?			
1.1b	Are the tanks welded?			
1.2	**Tank Anchoring**			
1.2a	Are all tanks anchored?			
1.2b	Are tanks sitting directly on the containment floor?			
1.2c	If sitting directly on the containment floor, is the base of the tank free of corrosion?			
1.2d	Are the tanks on a concrete pad?			
1.2e	Is the pad sloped to provide drainage?			
1.2f	Are there radial grooves in the pad to facilitate drainage?			
1.3	**Venting**			
1.3a	Do the tanks have emergency release vents?			
1.3b	Are the normal and emergency release vents in good operating condition?			
1.3c	Does the facility have an inspection, maintenance, and/or testing program to ensure the vents are in working order?			
1.3d	Are vents kept closed except when needed to equalize pressure?			
1.3e	Are process tanks designed to withstand elevated pressures?			
1.4	**Ancillary Equipment**			
1.4a	Is all of the piping and equipment contained within the secondary containment?			
1.4b	Is the piping supported?			
1.4c	Are pumps and other equipment located within the secondary containment?			
	If not, is there evidence of spills outside of the secondary containment?			
1.4d	Is there evidence of spills around the pump?			
1.4e	Are the flanges welded?			
1.4f	If so, are they inspected and how often?			
1.4g	Are the flanges bolted?			
1.4h	Are the process tanks equipped with temperature gauges?			
1.4i	Are the tanks equipped with a measurement device such as a level gauge or spyglass?			
1.5	**Grounding and Bonding**			
1.5a	Are the tanks grounded?			
1.5b	Are the tanks bonded?			
1.6	**Tank Integrity Inspection Standards**			
1.6a	Are there any signs of leakage?			
1.6b	Do the tanks' exteriors have any pitting or rusting?			
1.6c	Are there any other signs of compromised integrity?			
1.6d	Are there any tank inspection records? If so, how often did the facility conduct inspections (daily, weekly, monthly)?			

Section 2: Secondary Containment		Yes	No	Comments
2.1	**Performance Requirements for Secondary Containment**			
2.1a	Do the tanks have secondary containment?			
2.1b	Is there a sealant or coating on the containment floor?			
2.1c	Is the sealant or coating in good condition, particularly in trenches and sumps?			
2.1d	Are there any rips, tears, or evidence of bubbling or de-lamination?			
2.1e	Are there any cracks or gaps in the concrete?			
2.1f	Are the cracks significant in length, depth, and width?			
2.1g	Is there a pattern of cracking around the loading dock or where the facility uses heavy equipment or other areas of high traffic and stress?			
2.1h	Is there any vegetation growth in the cracks or gaps?			
2.1i	Is there any exposed aggregate?			
2.1j	What is the capacity of the secondary containment?			
2.2	**Materials for Secondary Containment**			
2.2a	Does the secondary containment consist of non-earthen material?			
2.2b	If not, please note the material used.			
2.3	**Concrete Secondary Containment**			
2.3a	Are all joints sealed to prevent liquid infiltration?			
2.3b	Do the joints include water stops?			
2.4	**Concrete Design**			
2.4a	Was the concrete designed for a specific standard, such as ACI 350, ACI 318, or a local standard?			
2.5	**Soil Foundation**			
2.5a	Are there any records of a geo-technical evaluation?			
2.6	**Inspection and Repair of Concrete Secondary Containment**			
2.6a	Are there any inspection records, and if so at what frequency did the facility conduct inspections (daily, weekly, monthly).			

Glossary of Terms Used in this Publication

Ancillary equipment: any device including, but not limited to piping, fittings, flanges, valves, and pumps, that is used to distribute, meter, or control the flow of used oil from its point of generation or from a transportation vessel to a storage or treatment tank(s), between used oil storage and treatment tanks, or from a used oil storage and treatment tank to a transportation vessel.

Atmospheric pressure: the force per unit area exerted against a surface by the weight of the atmospheric air above that surface; standard atmospheric pressure at sea level is 14.7 pounds per square inch.

Berm: an elevated narrow shelf or ledge, such as the concrete outer edge of a concrete secondary containment area or the shoulder of a dike, used to contain liquids, sludges, solids, or other substances.

Bonding: making a continuous electrical connection from one tank or piece of equipment to others.

Class II combustible liquid: liquids with flash points at or above 100° Fahrenheit (37.8° Celsius) and below 200°F (93.3°C).

Class IIIA combustible liquid: liquids with flash points at or above 140° Fahrenheit (60° Celsius) and below 140°F (60°C).

Class IIIB combustible liquid: liquids with flash points at or above 200° Fahrenheit (93.3° Celsius).

Closure: regulatory requirements to ensure used oil processing and refining operations are cleaned up in an acceptable manner after they cease operations.

Code of Federal Regulations (CFR): federal regulations

Concrete coating: an external surface covering used to protect concrete and make it more impervious.

Concrete joints: purposeful design features in concrete to control and minimize cracks. There are several types of joints used for different purposes, including construction joints, expansion joints, and isolation joints. Water stops help to ensure the integrity of a concrete joint for secondary containment.

Dangerous waste: solid wastes that designate in WAC 173-303-070 through 173-303-100 as dangerous, or extremely hazardous or mixed waste.

Dike: an embankment or ridge of natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other substances.

Electrostatic ignition: fire or explosion in a gas mixture caused by sparks from static charges.

Flammable liquid: any liquid having a flash point below 100°F (37.8°C).

Flashpoint: lowest temperature at which the vapor of a liquid can be made to ignite momentarily in air.

Freeboard: the vertical distance between the top of a tank, berm, or dike and the surface of the liquid contained by that structure.

Grounding: draining static charges and other sources of electricity form a tank system or piece of equipment to the ground.

High level alarm: an automatic signal to indicate when a liquid level rises above acceptable levels in a tank or in other equipment.

Household hazardous waste (HHW): any waste derived from households which exhibits any of the properties of a dangerous waste.

Hydraulic conductivity: the measure of the capacity of a material, like soil, to transmit water.

Impervious: not capable of being permeated or penetrated.

Integrity assessment: detailed inspection and technical evaluation of secondary containment, a tank system, or equipment to ensure it is adequate to ensure environmental protection.

Interstitial monitoring: inspecting for leaks between the walls of a double-walled tank.

Liability coverage: insurance or other financial assurance meeting the requirements of WAC 173-303-620(8) and 40 CFR 264.147(a).

Moderate risk waste: solid waste that is small quantity generator (SQG) waste and household hazardous waste (HHW).

Non-polar liquid: a liquid that does not have concentrations of positive or negative electrical charge. Many oils are non-polar; however, used oil may not be non-polar depending on other materials in the used oil solution.

Permeable: capable of being permeated or penetrated.

Qualified, independent professional engineer: a person who is licensed by the state of Washington, or a state which has reciprocity with the state of Washington as defined in RCW 18.43.100, and who is not an employee of the owner or operator of the used oil operation. A qualified professional engineer is an engineer with expertise in the specific area for which a certification is given.

Retaining wall: A wall to support or prevent the advance of a mass of earth, water, or other material.

Secondary containment: a barrier system surrounding primary containment (such as processing equipment, tanks or containers) capable of detecting and collecting releases and accumulated materials to prevent their release from the system to the soil, ground water, or surface water.

Small quantity generators (SQG): a dangerous waste generator who meets the conditions in WAC 173-303-070 (8).

Spill Prevention, Control, and Countermeasure (SPCC) Plan: the document required by 40 CFR 112.3 that provides details on equipment, workforce, procedures, and steps to prevent, control, and provide adequate countermeasures to a release or discharge.

Static electricity: accumulation and discharge of an electric charge from an insulated body.

Tank venting: releasing excess pressure from a tank through an engineered structure.

Used oil: 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.

Used oil processor: a facility that processes used oil.

Washington Administrative Code (WAC): Washington State regulations.

Waterstop: a physical barrier to fluids embedded in the joints of concrete secondary containment to ensure the integrity of those structures.