Closure Plan Template for Dangerous Waste Recyclers and Used Oil Processors

Washington State Department of Ecology
Hazardous Waste and Toxics Reduction Program
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The Closure Plan Template is intended to help dangerous waste recyclers and used oil processors prepare closure plans as required by the *Dangerous Waste Regulations*, Chapter 173-303 WAC. It is intended to simplify and streamline the development and preparation of closure plans by providing an overarching outline and basis for closure plan development. **This is not an "off the shelf" closure plan. Recyclers and used oil processors will need to create a site-specific closure plan to meet their site-specific closure needs.**

Who should use this Template?

The Closure Plan Template applies to dangerous waste recyclers and used oil processors. The Template also may be helpful to owners and operators of dangerous waste treatment, storage, and disposal facilities, and dangerous waste generators and transfer facilities that are required to undergo closure because the "substantive requirements" for what must be accomplished during closure are the same for all dangerous waste units/facilities. "Substantive requirements" define what must be accomplished during closure. They include requirements related to:

- Closure performance and constituent concentrations that must be achieved for clean closure;
- Removal of wastes and waste residues;
- Inspecting units after removal of wastes and waste residues;
- Removal and decontamination of debris and contaminated environmental media managed during closure;
- Management of wastes, waste residues, debris, and contaminated environmental media during closure; and
- Sampling and analysis.

For more information on the substantive requirements for closure, other closure requirements, and the types of units and facilities that are required to undergo closure, you should consult the Department of Ecology's (hereinafter Ecology) guidance on the substantive and administrative requirements for closure, *Guidance for Clean Closure of Dangerous Waste Units and Facilities* (May 2005, Publication #94-111), referred to throughout the Template as the "Clean Closure Guidance." Ecology also has published checklists for closure, the *Checklists for Closure Plans, Closure Cost Estimates, and Financial Assurance* (May 2005, Publication #05-04-008), referred to throughout the Template as the "Closure Plan Checklists." The Clean Closure Guidance and the Closure Plan Checklists can be downloaded from Ecology's website at www.ecy.wa.gov/pubs.shtm.

How should this Template be used?

Dangerous waste recyclers and used oil processors should use the Closure Plan Template to help them prepare closure plans as required by WAC 173-303-610(2) and (12). **It is very important that dangerous waste recyclers and used oil processors modify and add to the Template as necessary to describe their unique, site-specific closure activities.** While the

sample text in the Template is designed to provide recyclers and used oil processors a good starting place for closure plan preparation, it is only that, a starting place.

Recyclers and used oil processors should use this guidance in conjunction with Ecology's Clean Closure Guidance and the Closure Plan Checklists. **This Template <u>does not</u> contain all the information you need to prepare an adequate closure plan submittal. It is important that you refer to the Clean Closure Guidance for additional information**.

How is the Closure Plan Template organized?

The Closure Plan Template lists common major sections and subsections of closure plans, such as, introduction, closure performance standard, and closure activities. Section and subsection headings are numbered sequentially and are in bold text. Your site-specific closure plan should also have section and subsection headings that are numbered sequentially like the Template. Under each section and subsection heading are instructions for the types of site-specific information that should be included in your site-specific closure plan. There also is sample text that you can use to help you develop your site-specific plan.

For simplicity, the Template addresses a single dangerous waste recycling unit and its associated waste staging area. Your facility likely has more than one unit used for recycling or used oil processing. It is important that your closure plan address all units at your facility subject to closure. For information on the types of dangerous waste recycling and used oil processing units that are subject to closure, and how units are defined, refer to Section 9.1 of the Clean Closure Guidance.

Even though the Closure Plan Template uses a hypothetical dangerous waste recycler in its specific examples of sample text, the outline of closure plan sections and instructions for creating closure plans apply equally to recyclers and used oil processors.

Closure Plan Template

1. Introduction

Instructions: Use this section to introduce Ecology to your facility, especially the dangerous waste recycling or used oil processing activities that are the subject of the closure plan. Be sure to cite the proper regulatory requirements, which will differ depending on what type of unit your closure plan addresses. For dangerous waste recycling units, cite WAC 173-303-120(3) and (4) and WAC 173-303-610(2) and (12). For used oil processing units, cite WAC 173-303-515(9) and WAC 173-303-610(2) and (12).

Sample Text: This Closure Plan is for clean closure of the 500 gallon dangerous waste recycling unit (including the secondary containment system, associated waste staging area, and solvent load and unload area) at XYZ facility, a wholly owned subsidiary of ABC Corporation. XYZ Company is located in Olympia, Washington. Closure of the unit is required under WAC 173-303-120 and WAC 173-303-610(2) and (12).

1.1 Facility Contact Information

Instructions: Identify a facility contact, their job title, and contact information. Be sure to include information on how to contact the person by email, if possible.

Sample Text: The facility contact is Sally Jones, who is the product/service manager at XYZ Company. Telephone: 360-555-1234. Mailing address: 555 North Lane, Olympia, WA, 98502. Email: Sally.Jones@xyzcompany.com.

1.2 Facility Description

Instructions: Use the facility description section to describe your facility in detail, emphasizing your dangerous waste recycling or used oil processing activities.

Sample Text: This section describes the facility and facility operations, including dangerous waste recycling activities. It also identifies and describes the dangerous waste recycling unit (including the secondary containment system and associated waste staging area) that is the subject of this closure plan and the maximum amount of waste inventory for the unit.

1.3 Facility History, Function, Location and Layout

Instructions: Briefly describe your facility, where it is located, what it looks like, and the main activities that you perform. Be sure to include a plan-view figure or diagram showing the layout of your facility, including the locations of all dangerous waste management units. Also describe your facility history, such as how long the facility has been in operation, how long you have been the owner or operator, and past operational activities to the extent you know about them.

Sample Text: The facility is located at 555 North Lane, Olympia, Washington, in Thurston County. It occupies approximately five acres of land zoned for industrial use. The dangerous waste identification number for the facility is WAD 123456789. The majority of the facility is paved or covered by buildings. Small strips of exposed soil are used for landscaping around buildings and in the parking area. The primary business at the facility is the recycling of spent solvents. Other activities carried-out at the facility include staging of spent solvents prior to recycling, accumulation of solid and dangerous wastes from the recycling unit, and storage of solvent products. The arrangement of the facility, including the locations of dangerous waste management units, is shown in Figure 1.

XYZ Company has owned and operated the facility since 1995. Prior to XYZ Company's ownership, the facility was used as a packaging and distribution warehouse for a local paper supplier. XYZ Company is the first owner/operator to require a dangerous waste identification number for the facility.

1.4 Products and Production Processes

Instructions: Describe the dangerous wastes you manage, your products, and your production processes. Pay special attention to describing your dangerous waste recycling or used oil processing activities. For example, describe how dangerous waste and used oil are received at your facility; where and how you stage, store, or accumulate dangerous waste and used oil; the recycling or processing activities that you perform, including all units used, unit capacity, piping, containment systems, and output; and the products and waste streams that result from recycling and used oil processing.

Sample Text: The facility recycles spent halogenated solvents used in degreasing (waste code F001) and non-halogenated solvents (waste codes F003 and F005). Some spent solvents also exhibit dangerous waste characteristics including: lead (D008), tetrachloroethylene (D039), trichloroethylene (D040), and vinyl chloride (D043). Spent solvents are collected by facility drivers or contract drivers and delivered to the facility at the solvent load and unload area. The solvent load and unload area is outside, immediately adjacent to the door to the building that houses the spent solvent staging area and recycling unit. Solvents are moved immediately from the load and unload area to the spent solvent staging area. The spent solvent staging area is indoors, adjacent to the solvent recycling unit. The spent solvent staging area has a maximum capacity of 3,300 gallons. The amount of waste being staged at any given time may be less, depending on the size of container in which the solvents are staged. From the spent solvent staging area, spent solvents are placed in the 500 gallon-capacity recycling unit. The facility recycles approximately two batches of spent solvents per day; each batch takes approximately four hours. Recycled solvents are placed in product containers and stored in the solvent storage area prior to sale. Residues (largely still bottoms) from the spent solvent recycling unit are removed approximately once per week and are accumulated in 55-gallon drums at the dangerous waste accumulation area prior to being shipped off-site for treatment and disposal. See Figure 1 for a map identifying the sizes and locations of all dangerous waste management units at the facility.

1.5 Dangerous Waste Management and Units

Instructions: List all the dangerous waste management activities and units at your facility. In this section, it is only necessary to identify and list all units and other areas where dangerous waste is managed. In the subsections below, you will describe in detail each unit and how it operates. Make sure you identify all waste management areas. For recyclers, this will include the recycling units and associated equipment, 72-hours staging areas, load and unload areas, secondary containment systems, and all other areas where dangerous wastes are managed. For used oil processors, this will include used oil processing units and associated equipment, used oil storage areas and tanks, load and unload areas, secondary containment systems, and all other areas where used oil is managed. Storage areas for oil that has already been processed and is ready for shipment offsite as a product do not have to be included.

Sample Text: Dangerous waste is managed at two locations at the facility: (1) 500 gallon spent solvent recycling unit, including the associated 72-hour dangerous waste staging area, the secondary containment system, and the solvent load and unload area; (2) the 1100 gallon capacity dangerous waste accumulation unit (where waste that is generated during the recycling process is stored in up to twenty 55 gallon drums). This closure plan covers the 500 gallon spent solvent recycling unit including the associated 72-hour staging area, secondary containment systems, and solvent load and unload area, which is described in detail below.

1.6 Unit Description

Instructions: Describe in detail the unit that is the subject of the closure plan, its design, and how it works. For example, explain what components make up the unit (tanks, containers, piping), the unit's secondary containment system, all inputs into the unit (materials and energy), and all outputs from the unit (including waste streams). Provide a physical description of the unit and describe the dangerous wastes (including waste codes) managed in the unit. Reference the facility layout diagram as necessary.

Sample Text: The 500 gallon spent solvent recycling unit is located near the southwest corner of the facility, in the processing building. The unit is comprised of tanks and associated piping that make up the recycling system, a 72-hour dangerous waste staging area, secondary containment systems, and the solvent load and unload area. The recycling unit and the 72-hour staging area have separate secondary containment systems to minimize contamination in the event of a release. Both containment systems consist of a concrete pad with a berm of 12 inches. The containment systems are completely sealed with a solvent resistant coating and are sized to contain the maximum inventory of dangerous waste that could be present in the recycling unit or in the staging area, plus 50 percent. The solvent load and unload area is outside, unpaved and located immediately adjacent to a door to the building that houses the spent solvent staging area and the recycling unit. Dangerous wastes recycled in the unit include spent halogenated solvents used in degreasing (waste code F001) and non-halogenated solvents (waste codes F003 and F005). Some spent solvents also exhibit dangerous waste characteristics including: lead (D008), tetrachloroethylene (D039), trichloroethylene (D040), and vinyl chloride (D043).

1.6.1 Maximum Waste Inventory

Instructions: Determine the maximum amount of waste that could be present in the unit at any one time. For recycling and processing units, be sure to consider any recycling or processing residues that may be present in the unit (for example, distillation or tank bottoms) along with dangerous waste or used oil that is undergoing recycling or processing.

Sample Text: The maximum amount of dangerous waste that could be present in the 500 gallon spent solvent recycling process at any one time is approximately 550 gallons; this includes 500 gallons of spent solvent undergoing processing and approximately 50 gallons of distillation residues. The maximum amount of dangerous waste that could be present in the 72-hour staging area is 3,300 gallons. Therefore, the total maximum inventory of dangerous waste associated with the recycling unit is 3,850 gallons, which is the maximum inventory of the recycling process plus maximum inventory of the associated 72-hour storage area. Wastes are not accumulated, staged, or stored in the solvent load and unload area.

2. Closure Performance Standard

Instructions: Use this subsection to describe your understanding of the closure performance standard. Be sure to directly cite the closure performance standard in the *Dangerous Waste Regulations*. It can be found in WAC 173-303-610(2)(a). Sometimes it is helpful to repeat the language of the standard in your closure plan.

After you have cited the closure performance standard, describe your objectives for closure. If you intend to clean close the unit, your closure objectives should address removal of waste, removal and/or decontamination of structures and equipment, and removal and/or decontamination of any contaminated soil or other contamination resulting from releases from the unit. Identify the standards that you plan to meet during closure. You probably will need a standard for decontamination activities and a standard for removal or decontamination of contaminated soil, ground water, or other environmental media (the standard for environmental media is often called the "clean closure level"). In the sample text below, the Alternative Treatment Standards for Hazardous Debris are cited as the standard for decontamination of equipment, tanks and structures. The Alternative Treatment Standards for Hazardous Debris are recommended by Ecology as decontamination standards in Section 5.3.1 of Ecology's Clean Closure Guidance. However, if you wish, you can propose site-specific decontamination standards. Site-specific decontamination standards are addressed in Section 5.3.2 of the Clean Closure Guidance. Similarly, in the sample text below, standard Model Toxics Control Act (MTCA) Method B unrestricted site use cleanup levels are cited as the clean closure levels for any contaminated soil. Be sure to clarify that you will be calculating MTCA cleanup levels using exposure assumptions for unrestricted site use (a requirement for clean closure), and reference the MTCA cleanup level methodology that you will use. Section 2.1 of the Clean Closure Guidance addresses use of MTCA cleanup levels as clean closure levels.

Sample Text: The spent solvent recycling unit will be closed in a manner that complies with the performance standard in WAC 173-303-610(2)(a) and, therefore, achieves clean closure. The objectives of closure activities at the solvent recycling unit are as follows:

» Minimize the need for further maintenance.
» Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of dangerous waste, dangerous constituents, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, ground water, or to the atmosphere.
» Remove all waste and waste residues and properly dispose of them off site.
» Remove the tanks, containers, piping, and other items that make up the spent solvent recycling unit and properly dispose of them off site.
» Decontaminate the concrete secondary containment systems to meet the Alternative Treatment Standards for Hazardous Debris, or remove any concrete that cannot be so decontaminated.
» Perform soil sampling and analysis to ensure soils in the solvent load and unload area meet standard MTCA Method B cleanup levels for unrestricted site use, and remove any soils contaminated above these levels.
» Return the land to the appearance and use of surrounding land areas to the degree possible, given the nature of the previous dangerous waste activity.

3. Closure Activities

Instructions: Use this section to describe in detail what you will do during closure. In the first part, identify and list all the activities you plan to carry out during closure. Use the list of activities as subsection headings to organize the rest of this section of your closure plan. It's important that the organization of your closure plan is clear, so Ecology can fully understand and evaluate the work you plan to carry out during closure.

Sample Text: This section addresses activities that will be completed during closure of the spent solvent recycling unit. The following activities are described:

» Removal of wastes and waste residues (Section 3.1)
» Removal of unit parts, equipment, and piping (Section 3.2)
» Inspecting the remaining containment structures prior to decontamination (Section 3.3)
» Decontamination of the containment structures (Section 3.4)
» Identifying and managing contaminated environmental media (Section 3.5)
» Confirming clean closure (Section 3.6)
» Sampling and analysis and constituents to be analyzed (Section 3.7)
» Role of the independent registered professional engineer (Section 3.8)
» Closure certification (Section 3.9)
» Conditions that will be achieved when closure is complete (Section 3.10)

3.1 Removal of Wastes and Waste Residues

Instructions: Describe in detail how you will remove wastes and waste residues from the closing unit. In general, the first step in removing wastes and waste residues from

dangerous waste recycling units and used oil processing units is to fully process as much of the waste as possible to generate usable products. After waste has been processed through the unit, address how remaining wastes and waste residues will be removed. In addition to the residues normally managed from waste recycling or used oil processing (such as tank or distillation unit bottoms), address removal of wastes and waste residues that may remain in piping and the recycling or used oil processing equipment.

You should describe in detail the procedures and equipment you will use to remove as much waste and waste residue as possible from the closing unit. This might include pouring, pumping or vacuuming, scraping, and shoveling. Address how you will manage waste and waste residue removed from the closing unit, including plans to put wastes in containers, label and manage containers, and provide for proper disposal.

Address the waste management requirements that you believe will apply and your plans for compliance. For example, wastes removed from closing units generally must be managed as dangerous waste and must be treated to meet dangerous waste land disposal restriction treatment standards before being placed in a land disposal unit. Your plan should address compliance with waste identification, labeling, and accumulation requirements (see WAC 173-303-070 and WAC 173-303-230), manifesting (see WAC 173-303-180), preparing waste for transport (see WAC 173-303-190), transportation (see WAC 173-303-240 and WAC 173-303-250), and disposal (see WAC 173-303-141). Assume that you will have to manage the maximum inventory of waste identified in the closure plan.

Section 3.0 of Ecology's Clean Closure Guidance addresses removal of wastes and waste residues in detail.

Sample Text: XYZ Company will remove all dangerous waste and waste residue from the spent solvent recycling unit and associated 72-hour staging area in a sequenced approach. First, all dangerous waste in the 72-hour staging area will be processed. Second, distillation residues will be removed and placed in 55-gallon drums and moved to the dangerous waste accumulation area for subsequent treatment and disposal at an appropriate off site dangerous waste facility.

3.2 Removal of the Unit, Parts, Equipment, Piping, the Containment Structure, and other Ancillary Equipment

Instructions: After you remove all waste, you have the option of also removing the unit and associated equipment and piping and the unit containment structure. If you choose to remove all or part of the unit, associated equipment and piping, or the containment structure, use this section to give a detailed description of how you will accomplish the removal, management, and disposal of such items. In general, unit parts, associated equipment and piping, and parts of the containment structure that have come into contact with dangerous waste must be managed as dangerous waste unless they are decontaminated.

It is important to recognize that you can choose any combination of removal and decontamination that meet the closure performance standard. Sections 5.0 (debris) and 6.0

(environmental media) of Ecology's Clean Closure Guidance provide additional information on options for removal and decontamination. It is important for you to consider this guidance as you develop your site-specific removal and decontamination strategy for closure.

Sample Text: The spent solvent recycling unit is comprised predominantly of metal tanks, containers, and associated piping. XYZ Company plans to decontaminate these materials to meet the appropriate standards from the Alternative Treatment Standards for Hazardous Debris. When Ecology confirms that the tanks are decontaminated, XYZ Company will consider the tanks to no longer contain dangerous waste and will sell them for reuse or recycling or will dispose of them at an appropriate off-site disposal facility.

3.3 Unit Inspection Prior to Decontamination

Instructions: Describe how you will inspect the unit and the area surrounding the unit after removal of waste, waste residues, and any unit components, or other materials you choose to remove, but before beginning decontamination activities. Describe how you will look for cracks or other openings in the unit containment structure, as these cracks and other openings may indicate the potential for releases from the containment structure. Finally, describe how you will keep a record of any indication of potential spills or releases at or from the containment structure, and how this information will be used when determining soil and other sampling needs. Section 4.0 of Ecology's Clean Closure Guidance includes detailed instructions for inspecting units prior to decontamination.

Sample Text: After removing all wastes and waste residues, but prior to beginning decontamination activities, XYZ Company will visually inspect the solvent recycling unit containment system to identify all cracks and other openings through which waste, debris, or decontamination media such as rinsate or wash water could be released to the environment. If cracks or other openings are found, the XYZ Company will investigate and evaluate all cracks and openings to determine if releases of dangerous waste or dangerous waste constituents have occurred at or from the closing unit. XYZ Company also will inspect the area around the solvent recycling unit containment system to look for staining or other indication of spills or releases at or from the unit. When this investigation and evaluation are complete, XYZ Company will seal or repair all cracks or other openings in the containment system to prevent releases prior to and during decontamination.

XYZ Company will maintain a record of the location and dimensions of all cracks or other openings identified during this evaluation, as well as any other indication of the potential for spills or releases at or from the unit, and will use this information to determine whether there is any need to recommend focused soil sampling and analysis during closure for Ecology review. The records will be kept in XYZ Company's operating record or in the field notebook(s) used by the independent qualified registered professional engineer overseeing closure.

3.4 Decontamination

Instructions: Describe in detail how you will decontaminate the inside and outside of the closing unit, all associated equipment and piping, and the unit containment structure. You

should describe the types of materials you will decontaminate, such as metal in tanks or containers or concrete in the unit containment structure. Describe the procedures, methods, and equipment you will use during decontamination.

Describe how you will evaluate decontaminated areas to determine if they meet the decontamination standard for clean closure (remember, you identified the decontamination standard you plan to use earlier in the closure plan). In Section 5.3.1 of the Clean Closure Guidance, Ecology recommends use of the Alternative Treatment Standards for Hazardous Debris as closure decontamination standards. If you choose to use these standards, provide a detailed description of the standard that applies to the types of debris you will decontaminate.

Ecology recognizes that the Alternative Treatment Standards for Hazardous Debris will not be the best closure decontamination standard in all cases. For example, the Alternative Treatment Standards for Hazardous Debris for concrete debris is removal of the top 0.6 cm of concrete and treatment to a clean debris surface. If concrete is in good condition and unstained or has a history of a well maintained coating, removal of the top 0.6 cm of concrete may not be the best environmental approach, considering the amount of dust typically created during this type of decontamination. Also, if high-density silica concrete has been used, it may not be practical to remove the top 0.6 cm of concrete. In these types of situations, you may wish to propose a site-specific closure decontamination standard. If you choose to propose a site-specific closure decontamination method, describe the standard that you will use, why that standard is appropriate, and how you will evaluate whether the decontamination works to adequately decontaminate the debris you plan to manage during closure. Section 5.3.2 of the Clean Closure Guidance describes use of site-specific decontamination methods in detail.

Because different decontamination techniques and standards will apply to different materials, it is necessary to describe decontamination efforts material-by-material and create subsections for each material. For example, you might have separate subsections for metal (in tanks, containers, and piping) and concrete. Because you may need to adjust your plans to respond to unforeseen circumstances as decontamination activities unfold, you should describe any adjustments you anticipate may be necessary. For example, a decontamination method might not initially achieve the decontamination standard, and you may have to adjust or reapply the method to achieve clean closure.

Describe how you will decontaminate any equipment that you use during decontamination. For example, if a piece of earth-moving equipment comes into contact with contaminated soil or dangerous waste, it will require decontamination.

Describe how you will manage all decontamination residuals, such as rinse or waste water and concrete dust. Address the waste management requirements that you believe will apply to decontamination residuals. Generally, decontamination residuals from items that have been in contact with dangerous waste must be managed as dangerous waste.

Section 5.0 of Ecology's Clean Closure Guidance provides detailed information on developing decontamination strategies for debris, including specific information on decontamination of concrete and metal tanks and containers.

Sample Text: XYZ will decontaminate metal tanks containers and piping and concrete containment surfaces during closure.

Metal tanks, containers, and piping
Interior and exterior metal surfaces of the tank systems, including piping, will be decontaminated using water washing and spraying until they meet the clean debris surface standard. Wash water will be collected in the concrete containment structure (provided no cracks or other openings are identified that might allow wash water to be released) and re-circulated. When decontamination is complete, wash water used in this process will be placed in containers and moved to the dangerous waste accumulation area; it will be sampled, analyzed, and evaluated for dangerous waste designation purposes, and appropriately treated or disposed of off site. (Because the tanks are used to manage listed waste, XYZ Company will manage the decontamination residuals as listed waste; sampling and analysis will be conducted to determine if additional characteristic or criteria waste codes apply.) When Ecology confirms that the tanks are decontaminated to meet the clean debris surface standard, XYZ Company will consider the tanks to no longer contain dangerous waste and will sell them for reuse or recycling or will dispose of them at an appropriate off-site disposal facility.

Concrete containment surfaces
XYZ Company intends to leave the concrete containment structure in place after decontamination. Concrete containment surfaces, including the sumps, will be decontaminated with physical extraction technology to meet the clean debris surface standard, that is, removal of at least 0.6 cm (0.24 inch) of concrete using abrasive blasting, scarification, grinding and planing, or vibratory finishing. Appropriate safeguards will be used to minimize the release of particulate matter to the ambient air. The removed material will be placed into containers, sampled for waste characterization, and disposed at a permitted off-site dangerous waste treatment, storage, and disposal facility. Scrapers, chippers, or grinders may be used in physical extraction decontamination activities.

Concrete containment surfaces will be considered decontaminated when at least 0.6 centimeter of the surface layer has been removed and when they have met the clean debris surface standard.

After removal of at least 0.6 centimeter of the surface layer, if the clean debris surface standard is not met, abrasive blasting, scarification, grinding and planning, or vibratory finishing will be continued until the standard is met. XYZ Company will persist in efforts to meet the clean debris surface standard using physical extraction until it becomes economically infeasible to continue. At that point XYZ will propose a different decontamination method for Ecology review and approval or choose to dispose of the concrete containment as hazardous debris. For purposes of the closure cost estimate, XYZ has assumed that the concrete containment structure can be successfully decontaminated.

The residuals from the physical extraction process will be placed in containers and moved to the dangerous waste accumulation area. Residuals will be sampled, analyzed, and evaluated for dangerous waste designation purposes, and appropriately treated or disposed of off site. (Because the tanks are used to manage listed waste, XYZ Company

will manage the decontamination residuals as listed waste; sampling and analysis will be to determine if additional characteristic or criteria waste codes apply.)

The independent qualified registered professional engineer retained to assist with XYZ Company's closure certification will be present during decontamination activities and to confirm visual inspection of decontaminated surfaces.

3.5 Identifying and Managing Contaminated Environmental Media

Instructions: Describe how you will determine if soil, ground water, and other environmental media have been contaminated by releases at or from the closing unit. If your closing unit is completely located within a containment structure (such as a bermed concrete containment pad), describe how you will determine if releases from the containment structure may have contaminated soil or ground water. This likely will require biased soil sampling, focused at areas where releases are likely. If your closing unit is not located within a containment structure, describe how you will evaluate underlying soil and ground water for contamination. In both cases, you also should describe what you will do if contaminated soil or ground water is discovered. This will include descriptions of how you will evaluate the nature and extent of contamination, how you will remove or decontaminate contaminated environmental media, and how you will properly manage any contaminated environmental media that must be removed. If you plan to collect soil samples at depth, you also should plan to describe the subsurface geology in accordance with the Unified Soil Classification System (USCS) so Ecology can better evaluate your sampling strategy and results, and can consider the potential for any soil contamination to contaminate ground water.

Section 6.0 of Ecology's Clean Closure Guidance provides detailed information on managing contaminated environmental media during closure. Typically, sampling and analysis are needed to evaluate environmental media (soils, ground water, surface water, and sediments) during closure. Section 7.0 of the Clean Closure Guidance provides detailed information on development of sampling and analysis plans and strategies.

Sample Text: The solvent recycling unit and the associated 72-hour staging area have always been located indoors and completely within a well maintained, bermed, sealed concrete containment structure; therefore, XYZ Company does not anticipate contamination of soil, ground water, or other environmental media from the recycling unit itself. Unless stained concrete, or cracks or other openings in the containment system are identified during closure, XYZ Company does not plan to carry out soil sampling associated with the solvent recycling unit and the associated 72-hour staging area.

The solvent load and unload area is out of doors in a location where soil is believed to be contaminated. XYZ Company will determine whether soil has been contaminated by releases at or from the solvent load and unload area by collecting discrete soil samples and analyzing the samples for constituents present in dangerous wastes managed at the facility. Soil sampling locations will be biased towards areas where contamination is most likely. At a minimum, this will include areas of obvious staining, areas where solvent containers may have come into contact with soil, and areas where it appears from other evidence that releases or runoff from the load and unload area may have occurred. If soil samples are

collected at depth, the subsurface geology will be described in accordance with the Unified Soil Classification System (USCS).

If the result of a soil sample analysis is above the clean closure level for any constituent, the area represented by the sample will be considered to be outside the standard for clean closure and XYZ Company will propose additional actions, such as soil removal, to meet clean closure levels.

For purposes of the closure cost estimate, XYZ Company has assumed that 24 soil samples will be needed to investigate contaminated environmental media during closure, and that samples will be analyzed using methods 8260 for volatiles, 8270 for semivolatiles, and 6010 for metals. Figure 2 is a map that shows anticipated sampling locations and depths for investigation of soil. Table 1 shows the number and type of samples anticipated at each location, and the analytical methods to be used.

3.6 Confirming Clean Closure

Instructions: There may be different methods for confirmation of clean closure for different materials. For example, you might confirm clean closure of a decontaminated concrete containment system by verifying that the Alternative Treatment Standards for Hazardous Debris are achieved throughout the system. If environmental media are affected by releases at or from the closing unit, you will confirm clean closure by carrying out sampling and analysis to document that all affected media have been removed or decontaminated so that MTCA unrestricted site use cleanup levels are achieved. Describe each material that you anticipate addressing during confirmation of clean closure, restate the clean closure standard that will apply (remember, you identified clean closure standards in Section 2.0 of your closure plan), and describe the procedures you will follow to confirm that clean closure standards are achieved. Also describe the records and other materials that you will retain so that Ecology can verify your confirmation that clean closure standards are achieved.

Sample Text: When closure activities are complete, XYZ Company anticipates that all wastes and waste residues will be removed, the unit components and equipment will be decontaminated and removed, the concrete containment system will be decontaminated and any affected environmental media will be removed or decontaminated so that MTCA unrestricted site use cleanup levels are achieved.

XYZ Company will confirm that the concrete containment system is decontaminated and meets the clean closure standard by visually inspecting all parts of the unit to confirm that the upper 0.6 centimeter of the surface layer of the concrete has been removed and to confirm that there is a "clean debris surface" as defined in the Alternative Treatment Standards for Hazardous Debris. Photos and field notes will be used to confirm that these standards are achieved. XYZ Company anticipates that contamination to environmental media will be limited to soil. XYZ Company will confirm that all contaminated soil has been removed from the affected area by performing area-wide sampling of the affected area. A sampling grid will be imposed over the area to be sampled. The area to be sampled will encompass the full extent of any affected or potential affected soil. If the analytical result from a sample collected during closure confirmation exceeds MTCA unrestricted site use cleanup levels,

the area represented by the sample will be considered contaminated and additional removal will be carried out, followed by additional confirmational sampling.

XYZ Company's Sampling and Analysis Plan is described in Section 3.7 of this Closure Plan, and included as Appendix A. For purposes of the closure cost estimate, XYZ Company has assumed that 32 soil samples will be required to confirm clean closure, and that samples will be analyzed using methods 8260 for volatiles, 8270 for semivolatiles, and 6010 for metals. Figure 3 is a map that shows anticipated soil sampling locations and depths for confirmation of clean closure. Table 1 shows the number and type of samples anticipated at each location, and the analytical methods to be used.

3.7 Sampling and Analysis Plan and Constituents to be Analyzed

3.7.1 Sampling and Analysis Plan

Instructions: A sampling and analysis plan describes the procedures and methods you will use to identify sample locations, collect environmental samples, properly transport samples to a qualified laboratory, identify analyses to be conducted, and ensure the quality of analytic results. During closure, sampling and analysis might be needed to identify whether environmental media (such as soil) are affected by releases from the closing unit and to confirm decontamination of debris when site-specific decontamination methods are used and that affected environmental media has been completely removed. Most closure plans will need to be accompanied by a sampling and analysis plan – the only circumstances in which a sampling and analysis plan might not be needed is if all waste handling has always occurred indoors within a completely sealed containment system that has no cracks or other openings, so there is very limited possibility that waste would come into contact with soil. Even then, if inspection of the containment system during closure reveals staining, cracks, openings, or other indications that waste may have migrated into or through the containment system, a sampling and analysis plan will then be required to govern investigation of the potential for contaminated soil. If you handle dangerous waste or used oil in tanks, containers, or other management areas that are located outside, you should include a sampling and analysis plan with your closure plan.

Section 7.0 of the Clean Closure Guidance includes detailed information on sampling and analysis plans.

Sample Text: XYZ Company has prepared a detailed sampling and analysis plan for closure. The sampling and analysis plan is included with this closure plan as Appendix A. The sampling and analysis plan describes all sampling anticipated during closure, including sampling of potentially affected soils (see Section 3.5 of this Closure Plan) and sampling to confirm clean closure (see Section 3.6 of this Closure Plan). The detailed sampling and analysis plan include the following:

» Statement of purpose and objectives
» Organization and responsibility for sampling and analysis activities
» Project schedule
» Detailed procedures for sample collection and handling

» Identity of chemical constituents that will be analyzed (see Section 3.7.2 of this closure plan)
» Analytical techniques and procedures consistent with this closure plan and Chapter 173-303 WAC, modified, if necessary, to meet data quality objectives
» Specific sampling location and a unique identification number for all random and bias soil samples that were selected in accordance with this closure plan
» Procedures for decontamination of sampling equipment
» Procedures for management of waste materials generated by sampling activities
» Protocols for sample labeling and chain of custody
» Practical quantification limits (PQLs) sufficiently low to determine compliance with clean closure standards
» Description and number of quality assurance and quality control samples including blanks, matrix spikes, surrogate samples, laboratory control samples, and duplicates, as appropriate
» Provisions for splitting samples with Ecology, when appropriate
» Procedures for reporting results

3.7.2 Constituents to be Analyzed

Instructions: Constituents to be analyzed include the specific constituents that you plan to look for and evaluate in sampling and analysis. During closure, sampling and analysis may be carried out relatively early in the process to determine if there have been any releases from the closing unit that have caused soil or other environmental contamination and to assess the nature and extent of such contamination. If contamination is found, it must be addressed. Sampling would then be used to demonstrate that contaminated soil, ground water, and other environmental media have been removed or decontaminated to meet clean closure levels. To identify constituents to be analyzed you will consider the types of constituents present during current and historic operations at the facility and the closing unit, and how these constituents might break down, or decompose, in the environment. Often it will be useful to plan to use "indicator constituents" instead of sampling and analysis for every dangerous constituent ever managed at the facility and all their decomposition products. Indicator constituents are constituents that Ecology agrees are representative of the wastes managed and their decomposition products. Sections 2.7 and 7.7 of Ecology's Clean Closure Guidance describe the identification of constituents to be analyzed and indicator constituents, in detail.

Sample Text: To identify constituents to be analyzed, XYZ Company reviewed information about current and historical waste management at the facility, including Part A of the XYZ Company permit application, waste receipts, and waste characterization information on the specific types of spent solvents managed at the facility. Constituents to be analyzed are identified in XYZ Company's sampling and analysis plan, which is included as Appendix A. Constituents are listed in a table, which includes the common name of each constituent proposed, Chemical Abstracts Service number, and proposed test method.

3.7.3 Revisions to the Sampling and Analysis Plan and Constituents to be Analyzed

Instructions: Because you are required to have a closure plan and cost estimate in place during the full operating life of your dangerous waste recycling or used oil processing unit, in most cases, you will submit your closure plan to Ecology for review long before you plan to begin closure activities. Therefore, it may be necessary to update your sampling and analysis plan or the constituents that you plan to analyze immediately before closure begins to account for new information. Describe how you will determine if revisions to your sampling and analysis plan or constituents to be analyzed are necessary and, if necessary, how you will submit a revised plan to Ecology for review and approval. If a revised plan is anticipated, it should be submitted to Ecology with your notification of intent to begin closure activities.

Sample Text: XYZ Company will submit a revised sampling and analysis plan, including a revised list of constituents to be analyzed, to Ecology with the Company's notification of intent to begin closure. In preparing the revised sampling and analysis plan, XYX Company will consider the facility operating history and other information to determine if revisions to sample numbers, locations, analysis, or constituents to be analyzed should be made. XYZ Company will not begin sampling and analysis until the revised sampling and analysis plan is reviewed and approved by Ecology.

3.8 Role of the Independent Qualified Registered Professional Engineer

Instructions: Describe how an independent qualified registered professional engineer will become familiar with your closure activities.

Sample Text: An independent qualified registered professional engineer will become familiar with XYZ Company's closure activities by observing field activities and reviewing records. At a minimum, this will include field observation and a review of records of the following activities:

» Removal of waste (and removal of any unit components or other materials) and disposition of waste (and other materials removed) to ensure the removal was complete and materials were properly disposed.
» Decontamination procedures and results to ensure that the closure plan for decontamination was followed and the clean closure standard for decontamination was achieved - this will include inspecting metal tanks and the concrete containment system after decontamination to confirm that a "clean debris surface" and other decontamination performance standards are achieved.
» Management of decontamination residuals to ensure management was properly carried-out.
» Sampling procedures and results.
» Locations of sampling to ensure locations were as specified in the sampling and analysis plan.
» Sample labeling and handling, including chain-of-custody procedures.

When closure is complete, the independent qualified registered professional engineer will sign and stamp XYZ Company's certification of clean closure.

3.9 Certification of Clean Closure

Instructions: Describe both how you will comply with the requirement to certify completion of clean closure to Ecology and the information that you will submit to support your clean closure certification. Clean closure certifications must follow a certain format, be signed by the facility owner, and be signed and stamped by an independent qualified registered professional engineer who is familiar with closure activities. Use the sample text below or consult Section 9.4 of Ecology's Clean Closure Guidance to ensure that you follow the certification requirements closely.

Sample Text: Within 60 days of closure of the solvent recycling unit, XYZ Company will submit to Ecology, by registered mail, certification that the unit has been closed in accordance with this closure plan. The certification will be signed by XYZ Company's owner. XYZ Company's owner will make the following certification:

I certify under penalty of the law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing of violations.

The closure certification also will be signed and stamped by an independent qualified registered professional engineer who is familiar with XYZ Company's closure activities.

XYZ Company will submit the following information to support its closure certification:

» All field notes and photographs related to closure activities, including the results of the inspection of the unit and containment system for cracks and other openings prior to decontamination.
» A description of any minor deviations from the approved closure plan and justification for these deviations.
» Documentation of the final disposition of all dangerous wastes and dangerous waste residues, including contaminated media, debris, and all treatment residuals.
» All laboratory and/or field data, including sampling procedures, sampling locations, quality assurance/quality control samples, and chain of custody procedures for all samples and measurements, including samples and measurements taken to determine background conditions and/or determine or confirm clean closure.
» A summary report which identifies and describes the data reviewed by the independent registered professional engineer and tabulates the analytical results of samples taken to determine and confirm clean closure.
» A description of what the unit area looks like at completion of closure, including a description of what parts of the former unit, if any, will remain after closure.

3.10 Conditions That Will Be Achieved When Closure Is Complete

Instructions: Describe what the unit area will look like and what conditions will be

achieved when closure is complete. This should include a description of what parts of the former unit, if any, will remain after closure.

Sample Text: XYZ Company plans to completely remove the spent solvent recycling unit and to decontaminate the unit's concrete containment structure. When closure is complete, all waste and all unit parts, associated equipment and piping, will be removed and properly disposed of off site. The concrete containment structure will be completely decontaminated, but will remain on site for potential future use for other activities.

4. Closure Schedule and Timeframe

4.1 Closure Schedule

Instructions: Describe the schedule for closure of each dangerous waste management unit and for final closure of the facility. The schedule should anticipate that closure will be complete within the total of 180 days allowed for closure, or you should request an extension to the closure period. Information on time allowed for closure activities can be found in WAC 173-303-610(3) and (4) and Section 9.3 of Ecology's Clean Closure Guidance.

Sample Text: Notification of intent to close will be sent to Ecology at least 45 days before beginning final closure of the spent solvent recycling unit. XYZ Company will complete closure activities in accordance with the approved closure plan within 180 days. XYZ Company will submit closure certification to Ecology within 60 days following completion of closure activities at each closing unit and/or completion of final facility closure.

5. Cost of Closure

5.1 Closure Cost Estimate

Instructions: Explain in detail how the company prepared the estimated cost of closing the dangerous waste management unit(s) or facility in accordance with the requirements in WAC 173-303-610(2) through (6) and applicable closure requirements such as WAC 173-303-630(10) and 173-303-640(8). Cost for closure activities should account for: waste and waste residual removal, including transportation costs; decontamination of unit tanks, containers, and all associated equipment and piping; disposal of unit tanks, containers, and all associated equipment and piping; sampling and analysis; and inspection and certification of closure by an independent registered professional engineer. In addition, explain the basis for costs (for example, current contract prices, invoices, etc.) and other assumptions used in your calculations. WAC 173-303-620(3) offers more information on closure cost estimate requirements, and Section 12.0 of Ecology's Clean Closure Guidance provides detailed information on how to develop a closure cost estimate. In addition, Ecology has prepared an Excel spreadsheet tool ("Closure Cost Estimating Tool") and a User Guide to help dangerous waste recyclers and used oil processors estimate closure costs; the spreadsheets and user guide are Ecology Publication #05-04-009 and are available on the Ecology website at www.ecy.wa.gov/pubs.shtm. Dangerous waste recyclers and used oil processors are allowed to exclude the salvage value of certain recyclable materials from their closure costs. Salvage value may be excluded from the closure cost estimate for recyclable materials that are handled

in dedicated tanks or containers and where only minimal processing of the recyclable materials is needed to produce a product that can be sold to the general public.

Sample Text: The information presented in this section for implementing the Closure Plan has been prepared in accordance with WAC 173-303-620(3). The following assumptions were used in developing the cost estimate:

» A third party will be used to conduct closure activities.
» The maximum dangerous waste volume will be present on site and managed during closure.
» Salvage value of recyclable solvents is not included in the closure cost estimate. The salvage value for recyclable solvents was determined based on the average value of recycled solvents in the past calendar year.
» Costs will be incurred for management of wastes handled during closure.
» Closure certification activities will be conducted by an independent qualified registered professional engineer registered in Washington State and a certification that closure has been done in accordance with the approved closure plan will be submitted to Ecology as required in WAC 173-303-610(6).

The closure cost estimate will be adjusted annually for inflation as specified in WAC 173-303-620(3)(c)(i) and (ii). Costs for closure labor, equipment, and analytical services are based on currently available rates. At the time of implementation of this Closure Plan, XYZ Company reserves the option to use any other appropriately-permitted facility for disposal or recycling of wastes.

The cost estimate for closure of the recycling unit at XYZ Company is presented in Appendix B, along with a more detailed breakdown of the cost estimates.

5.2 Financial Assurance for Closure

Instruction: Describe how your company will meet financial assurance requirements for closure by specifying what financial mechanism, outlined in WAC 173-303-620(4), your company will use to assure closure activities. The financial assurance mechanism must cover the cost of closure identified in the closure cost estimate. If the closure cost estimate is revised and is more expensive, the financial assurance mechanism will need to be augmented to cover the revised closure cost estimate. Remember to provide a copy of your financial assurance instrument(s) with your closure plan and make sure the copy is notarized or certified as required. Depending on the financial mechanism you choose, you also may need to provide an original financial instrument to Ecology. Section 13.0 of Ecology's Clean Closure Guidance has detailed information on financial assurance for closure, including how to properly submit a copy of your financial assurance instrument(s) to Ecology. If you have questions about this requirement, contact Kimberly Goetz, Ecology's Financial Assurance Officer at (360) 407-6754, or kgoe461@ecy.wa.gov.

Sample Text: XYZ Company will meet the financial assurance requirements specified under WAC 173-303-620(4) through continual maintenance of a financial assurance mechanism for closure with the Department of Ecology. The amount of the mechanism will be no less than the closure cost estimate provided in Appendix B of this Closure Plan. XYZ Company will provide

documentation of financial assurance in at least the amount of the current cost estimate, as required by WAC 173-303-620(4) and (10). XYZ Company has chosen to use insurance as its financial assurance mechanism for closure. Ecology is named as a secondary beneficiary on the insurance policy. Details of the financial assurance insurance policy for closure are provided in Appendix C.

5.3 Financial Assurance for Liability

Instruction: Describe how your company will meet financial assurance requirements for liability by specifying what financial mechanism outlined in WAC 173-303-620(8) your company will use. You must provide coverage of at least $1 million per occurrence and at least $2 million annual aggregate (exclusive of legal defense costs) for sudden accidental occurrences. Remember to provide a copy of your financial assurance instrument(s) with your closure plan and make sure the copy is notarized or certified as required. Depending on the financial mechanism you choose, you also may need to provide an original financial instrument to Ecology. Section 13.0 of Ecology's Clean Closure Guidance has detailed information on financial assurance for liability, including how to properly submit a copy of your financial assurance instrument(s) to Ecology. If you have questions about this requirement, contact Kimberly Goetz, Ecology's Financial Assurance Officer at (360) 407-6754, or kgoe461@ecy.wa.gov.

Sample Text: XYZ Company will meet the financial assurance requirements for specified under WAC 173-303-620(8) through a corporate guarantee issued by ABC Corporation, XYX Company's parent company. ABC Corporation has tangible net worth of over $35 million dollars and U.S. assets of over $25 million. Details of the corporate guarantee are provided in Appendix D.

6. Figures and Tables

Figure 1: Plan view of facility showing all locations where dangerous waste is managed.

Figure 2: Plan view of facility showing anticipated soil sampling locations for characterization of contaminated environmental media.

Figure 3: Plan view of facility showing anticipated soil sampling locations for certification of clean closure.

Table 1: Anticipated sample types, numbers, and analyses to be performed

Table 2: Constituents to be analyzed

7. Appendices

Appendix A: Sampling and Analysis Plan

Appendix B: Closure Cost Estimate

Appendix C: Financial Assurance for Closure

Appendix D: Financial Assurance for Liability