ATTACHMENT 11

CLOSURE PLAN

11. CLOSURE PLAN

This Closure Plan is a plan for final closure of the World Resources Company (WRC) facility and is prepared in accordance with the requirements of Code of Federal Regulations (CFR) Title 40, 264 Subpart G. WRC operates four miscellaneous units and a hazardous debris treatment system to process recyclable materials to produce metal concentrates for manufacturers of precious and non-ferrous metals. The four miscellaneous units are:

- The hazardous waste management unit (HWMU);
- The thermal concentrating unit (TCU);
- The primary mechanical shredding/size reducer unit manufactured by WEIMA America, Inc. (WEIMA), and the standby Proveda shredder; and
- The mechanical blender.

In addition to the miscellaneous units and debris treatment system components described above, this Closure Plan also applies to other equipment components and to ancillary equipment as defined at R18-8-260.10 (all collectively referred to as "equipment").

Recyclable materials that WRC receives are managed exclusively within the boundaries of the HWMU. There is no disposal of hazardous waste at WRC.

The objective of this Closure Plan is to describe the procedures to be used to close the WRC facility in a manner that complies with the closure performance standard of 40 CFR 264 Subpart G. To achieve that objective, the Closure Plan and the Equipment Decontamination and Removal Plan (EDRP) (Attachment 11-A) collectively provide the following information:

- An estimate of the maximum inventory of recyclable materials that would ever be stored on site at any one time over the active life of the facility;
- The methods to be used for removing, transporting, and disposing of wastes stored at the facility, including an identification of the types of off-site waste management units to be used;
- The steps needed to remove or decontaminate waste residues and contaminated containment system components, equipment, sub-soils, and structures during closure of the units;
- The methods to be used to sample and test containment system components, equipment, and structures, and the criteria for determining the extent of decontamination required to satisfy the closure performance standard;
- Other activities necessary during the closure period to ensure that closure of the facility satisfies the closure performance standard; and
- A schedule for closure of the facility.

The WRC facility will be closed in a manner that (1) minimizes the need for further maintenance; (2) controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere; and (3) complies with applicable closure requirements listed in 40 CFR §§ 264.111 through 115.

11.1 Cause for Implementation of the Closure Plan

WRC will implement this Closure Plan upon receipt of the final volume of recyclable materials at the facility, in accordance with the schedule provided in Section 11.11 of this Plan. There is no scheduled or anticipated date for closure of the facility, as ongoing activities are dependent upon market conditions and the need for the service provided by WRC. WRC will notify the Arizona Department of Environmental Quality (ADEQ) in writing at least 30 days prior to the date on which WRC expects to begin closure of the units. WRC will begin closure no later than 30 days after the date on which the facility receives the final volume of recyclable materials, or if there is a reasonable possibility that the facility will receive additional recyclable materials, no later than one year after the date on which the facility received the most recent volume of recyclable materials.

WRC may remove equipment listed in Section 11.4.2 from the WRC facility prior to final closure when the equipment is no longer needed or will be replaced. WRC will notify ADEQ 30 days prior to the proposed date for commencing the decontamination and removal of the equipment. All equipment listed in Section 11.4.2 that is to be decontaminated and removed from the WRC facility, whether as part of final closure or in advance of final closure, will be subject to the requirements of this Closure Plan and the EDRP.

11.2 Amendment of the Closure Plan

Based on the design, construction, operation, and maintenance of the facility, WRC believes that there is minimal possibility that the soils underlying the HWMU will be contaminated with hazardous waste or hazardous waste residues. As such, the procedures described in this Closure Plan will adequately remove all hazardous waste residues from the Facility. If contamination of soils beneath the HWMU is discovered during implementation of closure activities to the extent necessitating removal and/or other active remediation, WRC will request a permit modification in accordance with 40 CFR § 270.42(a) or (b) and 40 CFR § 264.112(c)(2)(iii), to modify this Closure Plan to address this unexpected event.

Additionally, whenever changes in facility design or operation affect the Closure Plan, unexpected events during the closure activities require a modification of the approved Closure Plan, or ADEQ requests a modification of the Closure Plan, WRC will submit a revised Closure Plan with a written request for a permit modification to ADEQ at least 60 days prior to the proposed change in facility design or operation or no later than 60 days after an unexpected event has occurred that affects the Closure Plan in accordance with 40 CFR § 270.42(a) or (b) and 40 CFR § 264.112(c)(3). A revised Closure Plan also will be submitted to ADEQ no later than 120 days prior to the anticipated closure of the facility if any revisions are necessary.

11.3 Maximum Inventory of Recyclable Materials

WRC is authorized to accept hazardous wastes that have Resource Conservation and Recovery Act (RCRA) codes F006, F019, D004, D005, D006, D007, D008, D009, D010, and D011, as well as non-hazardous recyclable materials. The maximum permitted inventory of recyclable materials on the HWMU is 3,800 tons (4,685 cubic yards). This maximum inventory is equivalent to the design capacity limit that incorporates access and segregation constraints for individual lots of incoming materials. This maximum inventory includes recyclable materials that would currently be in process within the HWMU, including the TCU, shredder, mechanical blender, and debris treatment processes.

11.4 Closure Performance Standard

The closure performance standard found in 40 CFR § 264.111 requires WRC to close the four miscellaneous units and the standby shredder in a manner that:

- Minimizes the need for further maintenance;
- Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and
- Complies with the closure requirements of 40 CFR Part 264 Subpart G.

WRC intends to close the facility in a manner that will preclude the necessity for post-closure care or maintenance. If an unexpected event occurs that may require additional actions such as engineering controls (e.g., landfill cap or similar) to achieve the closure performance standard, WRC will submit 180 days prior to scheduled closure, or as required, an application for a Class 2 or Class 3 permit modification pursuant to Arizona Administrative Code (ACC) R18-8-270.A (40 Code of Federal Regulations[CFR] 270.42, Appendix I). Post-closure monitoring and maintenance will be conducted in accordance with ACC R18-8-264.A (40 CFR 264) and ACC R18-8-270 (40 CFR 270).

The following subsections describe the manner in which the closure performance standard applies to the concrete and masonry components of the HWMU, the various processing equipment, other HWMU component surfaces, the wastewater treatment unit (WWTU), and soils that underlie or are adjacent to the HWMU.

11.4.1 Concrete and Masonry Components of the HWMU

The closure performance standard for concrete and masonry components of the HWMU is achieved when hazardous waste residuals are demonstrated to not be "contained" within the concrete, based on sampling and analytical procedures described in this Closure Plan. Hazardous waste residues are not contained in concrete or masonry components if analytical results indicate that constituents are not detected at concentrations exceeding their respective non-residential soil remediation levels (SRLs) (pre-determined or site-specific). Development of site-specific SRLs for concrete and masonry surfaces may consider the relative immobility of such materials, compared to soil, which thereby lessens the potential for human exposure. Metal concentrations in concrete samples will also be compared to minimum groundwater protection levels (GPLs). If this comparison indicates that groundwater quality could be adversely impacted, the need to employ additional remediation measures or to develop alternative GPLs will be evaluated. Intact portions of the pad or berm may be shown to not "contain" hazardous waste, irrespective of the presence of staining or soiling. The upper portions of concrete may be removed using technologies described in R18-8-268.45, Table 1, Part A.1.a or the entire thickness of a portion of concrete may be removed. Any concrete removed and sent off site for disposal will be subject to the Toxicity Characteristics (TC) and Universal Treatment Standards (UTS) for the Resource Conservation and Recovery Act (RCRA) "Eight" metals, the Underlying Hazardous Constituents for the D004 through D011 Waste Codes and the Treatment Standards for Hazardous Waste (TSHW) criteria for F006 and F019 waste as described in Section 11.4.5 below.

11.4.2 Process Equipment and Other HWMU Component Surfaces

The closure performance standard applies to the surfaces of the process equipment, HMWU components, and ancillary equipment (collectively, "equipment") including all of the following:

- TCU, including its support structure;
- Mechanical shredding unit, and one standby unit;
- Mechanical blender;
- The two agglomerating tanks except that their interior surfaces need not be decontaminated if the tanks did not store hazardous waste;
- Hazardous debris treatment process equipment;
- Fabric mesh canopy, including its support structure;
- Baghouse, including its support structure, but excluding porous filter media;
- Secondary filtration unit, excluding porous filter media;
- Surfaces of exterior walls of the TCU control room, surfaces of the exterior walls of the maintenace shop that face the HWMU, and the surfaces of walls and floors of the agglomerating tank containment area, and outer surfacesWRC's Wastewater Treatment Unit (WWTU);
- Ancillary equipment as defined at R18-8-260.10;
- Outer surfaces and accessible inner surfaces of mobile equipment used on the HWMU; and
- Dust control/containment equipment used at the sweeper unloading area, as follows:
  - Aluminum support structure.
  - Three-sided canopy cover.
  - Vertical slats at canopy entry.

The closure performance standard requires all equipment to be removed from the HWMU and shipped to a hazardous waste management facility for disposal unless the equipment is decontaminated on site using debris treatment processes listed in Table 1 of R18-8-268.45. Parts A.1 and A.2.a of Table 1 include the debris treatment processes applicable to the equipment listed above and, if needed, to the upper surfaces of the HWMU's concrete floor and the surrounding berm and apron. The same parts and related footnotes describe the criteria used to determine adequacy of treatment. The treatment processes and related criteria, which are described in detail in the EDRP (Attachment 11-A), are based on the following requirements.

11.4.2.1 Criteria for Equipment Qualified for Disposal in Non-Hazardous Landfills

Non-porous (metal) components of equipment primarily will be decontaminated using one or more of five physical extraction technologies listed in Part A.1 of the aforementioned Table 1. The principal technology to be employed for metal components involves the use of "High Pressure Steam and Water Sprays" (collectively referred to as "high pressure spray"), which is described in Part A.1.e as the "Application of water or steam sprays of sufficient temperature, pressure, residence time, agitation, surfactants and detergents to remove hazardous contaminants from debris surfaces or to remove contaminated debris surface layers." Other listed physical extraction technologies, primarily "Abrasive Blasting" or "Scarification, Grinding, and Planing," or the chemical extraction technology described below may be used, as necessary, in the event that the high pressure spray is not universally sufficient for non-porous surfaces or if needed for the removal of top portions of concrete surfaces.

Process equipment will be disassembled as necessary to expose both sides of metal surfaces to high pressure spray. One hundred percent of both sides of the decontaminated metal surfaces will be inspected to verify compliance with the clean debris surface standard described in Footnote 3 of the aforementioned Table 1. If the surfaces are determined not to be in compliance with the clean debris surface standard, they may be subjected to additional high pressure spray until compliance is achieved or, alternatively, the metal may be shipped off site to a hazardous waste managent facility for disposal.

Part A.2.a of Table 1 describes the only chemical extraction technology authorized for this Closure Plan. The technology, Water Washing and Spraying, is described as the "Application of water sprays or water baths of sufficient temperature, pressure, residence time, agitation, surfactants, acids, bases, and detergents to remove hazardous contaminants from debris surfaces and surface pores or to remove contaminated debris surface layers." Surfactants and detergents will be used sparingly. Acidic solutions may be used in the event that the solid phase in which the contaminants are located is not sufficiently soluble in water to become dislodged from the debris surface. Acidic solutions may not be used if the reactive cyanides are present. Note that R18-8-268.45(d)(3) requires any residue from the treatment of debris that is reactive because of cyanide must meet the R18-8-268.40 treatment standards for D003. It is highly improbable that any residue from the treatment of the HWMU debris would be reactive due to cyanide because D003 wastes are not accepted at the WRC facility.

Small items such as nuts, bolts and clamps may be decontaminated to the clean debris surface standard in accordance with the extraction procedures described in Part A. 2 .a of Table 1 or may be disposed as hazardous waste. Decontamination using Part A.2.a procedures will be accomplished in open tanks or containers (collectively, "tanks") or decontamination pads, as described in the EDRP. Any material decontaminated using the Part A.2.a procedures will be in contact with the water solution not less than 15 minutes before it is visually inspected. If the inspection indicates the metal does not comply with the clean debris surface standard, the metal may be washed and rinsed until it complies with the standard or, alternatively, it may shipped to a hazardous waste landfill. Pipes will be shipped to a hazardous waste landfill if they have processed hazardous waste and cannot be reasonably disassembled for decontamination using high pressure spray waste and for 100% inspection of the inner and outer surfaces of the pipes.

Additional requirements are specified for the canopy fabric. The canopy will be cut into manageable pieces and decontaminated using the process described in Part A.2.a for not less than 15 minutes. The decontaminated portion of the canopy will then be visually inspected to verify that it is reasonably free of particles characteristic of the material processed in the HWMU. If the canopy does not meet that requirement, it will then subjected to further decontamination until it does comply with that requirement. After the fabric has been sufficiently decontaminated, one-foot by one-foot samples of the fabric will be collected in accordance with methods described in Section 5.6 of the EDRP. The samples will be analyzed methods described in the table included in Section 11.4.5 for and tested in accordance with the Toxicity Characteristics (TC) and Universal Treatment Standards (UTS) for the Resource Conservation and Recovery Act (RCRA) "Eight" metals, the Underlying Hazardous Constituents for the D004 through D011 Waste Codes, and the Treatment Standards for Hazardous Waste (TSHW) criteria for F006 and F019 waste as described in Section 11.4.5 below. If the concentration of any metal exceeds the above criteria, the canopy fabric may be further decontaminated until the analysis of rinsate samples indicates compliance with the criteria or, alternatively, the fabric may be shipped to a hazardous waste management facility for disposal.

Split duplicate samples of the decontaminated canopy fabric will be collected and sent to two different laboratories in accordance the ADEQ alternative data validation procedures that are applicable for a small number of samples. It is anticipated that there will be less than 40 samples. Therefore, the number of split samples will be 10 and will be spread more or less evenly across all samples.

11.4.2.2 Criteria for Equipment Qualified for Salvage

Metal equipment components eligible for further decontamination and testing to demonstrate compliance with the salvage clearance criteria are limited to metal pieces that have been decontaminated in accordance with Part A.1.a or Part A.2.a and, following 100 percent visual inspection, determined to comply with the clean debris surface standard. Eligible pieces of equipment will be grouped into lots and numbered, using an organic marker, by piece and lot number. The metal will be transferred to the equipment processing station by lots for further decontamination. Before any metal is placed in a decontamination tank or on a decontamination pad, the tank or

pad will be thoroughly rinsed by high pressure spray and then drained. (Samples of the drained water may be collected and the analytical results compared with analytical results of the rinsate subsequently created by the washing of the metal.) Individual pieces of each lot will be sequentially placed into an open decontamination tank or on a decontamination pad and all surfaces of the metal will be rinsed by a high pressure spray. The rinsed metal will then be removed from the tank and temporarily placed to the side until all pieces of the lot have been rinsed.

After all pieces in a numbered lot have been washed, the entire lot will be transferred to the salvage staging area described in Section 5.1 of the EDRP, and samples of the final rinsate will be collected for analysis. The remaining rinsate will be drained from the tank or decontamination pad and conveyed to the WWTU for treatment. The tank or pad will then be rinsed using a high pressure spray and the rinse water will be conveyed to the WWTU for treatment. If the final rinsate does not comply with the salvage clearance criteria listed in Table 1 of Section 2.3.4 of the EDRP, the metal may be rinsed further and the rinsate tested as described below, or the metal may be placed in the staging area designated for shipments to a non-hazardous landfill. No metal may be cleared for salvage unless samples of the associated rinsate are collected and analyzed in accordance with procedures in Section 2.3 of the EDRP and the concentrations of metals in the sample are determined to be less than or equal to the maximum contaminant levels (MCLs) or regional screening levels (RSLs) listed in Table 1 of Section 2.3.4. Metal pieces may not be released until the final rinsate from that lot is tested and determined to comply with the salvage clearance criteria included in Table 1 of Section 2.3.4 of the EDRP. Metal pieces failing to comply with the salvage clearance criteria may be shipped to a non-hazardous landfill or subjected to further decontamination until the metal concentrations in the associated rinsate are less than or equal to the MCLs and RSLs listed in Table 1.

Split duplicate samples will be collected and sent to two different laboratories in accordance with the ADEQ alternative data validation procedures that are applicable for a small number of samples. It is anticipated that there will be less than 20 lots and, hence, less than 20 samples. Therefore, the number of split samples will be 10 and will be spread more or less evenly across all samples.

11.4.2.3 Criteria for Equipment and Structures Qualified for Non-destructive Decontamination

Equipment and structural components that are not intended to be disposed or salvaged during closure may be decontaminated in a non-destructive manner provided that the equipment and structural components do not have closed interior surfaces in contact with recyclable material. The decontamination procedures will be limited to exterior surfaces and must meet the same requirements described in Section 11.4.2.2 for metal surfaces except that the requirement for demonstrating compliance with the clean debris surface standard will not apply to the walls with porous surfaces. All equipment and structural components subject to non-destructive decontamination procedures must be decontaminated such that the concentrations of metals in rinsate samples are determined to be less than or equal to the MCLs and RSLs listed in Table 1 of Section 2.3.4 of the EDRP.

11.4.3 Wastewater Treatment Unit

The closure performance standard for the Wastewater Treatment Unit (WWTU) is achieved by documentation of the performance of the stated decontamination procedures. It is acknowledged that minor amounts of hazardous waste residues may remain in cracks, crevices, or pits following implementation of the stated decontamination procedures. No portion of the WWTU will be disassembled during closure.

11.4.4 Soils Underlying and Surrounding the HWMU

The facility will be closed in a manner that complies with the Soil Remediation Rule (Arizona Administrative Code

[A.A.C.] R18-7-201 *et seq.*), or successor regulations. The referenced regulations require that soils comply with any one of the following standards:

- The background remediation standards prescribed in R18-7-204.
- The pre-determined remediation standards prescribed in R18-7-205.
- The site-specific remediation standards prescribed in R18-7-206.

Any combination of the above-listed standards may be considered during implementation of this Closure Plan to address the various potential soil contaminants (Section 11.7.6). Additionally, the Soil Remediation Rule requires that remaining soil contamination, if any, cannot adversely impact groundwater quality. Groundwater quality will be protected by ensuring that soil concentrations meet the minimum groundwater protection levels (GPLs) or other levels developed in accordance with ADEQ's "A Screening Method to Determine Soil Concentrations Protective of Groundwater Quality" and approved by ADEQ.

Considering the current industrial use of the property, as well as the current use of much of the nearby surrounding properties, closure that complies with non-residential soil remediation standards is appropriate. However, this scenario would require the owner to file a Declaration of Environmental Use Restriction (DEUR) because R18-7-208 requires that an owner who elects to leave contamination on a property that exceeds the applicable residential standard for the property under R18-7-205 or R18-7-206, or elects to use an institutional control or an engineering control to meet the requirements of R18-7-205, R18-7-206, or R18-7-207 shall record a DEUR pursuant to A.R. S. § 49-152 and comply with the related provisions of that statute and applicable rules. Existing data indicate that the soil conditions might qualify the HWMU for clean closure, a condition that is used in this RCRA application to mean that, at closure, hazardous constituents (primarily metals) meet minimum GPLs, or other GPLs approved by ADEQ, and residential soil remediation standards. Because the metal concentrations in the HWMU's concrete floor, the soil layer between the floor and the underlying membrane liner, and the soil below the liner appear to currently meet the clean closure requirements, WRC has established a Concrete Management Program (see various sections of the RCRA permit application) that is designed to increase the likelihood that the HWMU may be closed in a manner that will achieve clean closure and will minimize the need for removal to achieve clean closure.

If a risk assessment is determined to be necessary, a work plan for conducting the risk assessment, and for conducting additional sampling that may be required to support the risk assessment, must be submitted to ADEQ for approval prior to conducting the risk assessment. Risk assessment evaluations will be conducted in accordance with applicable guidance published by the Arizona Department of Health Services (ADHS)[1] (1999) and U.S. Environmental Protection Agency (USEPA)[2] (2002). If necessary, an exposure assessment will be conducted, with consideration of the intended future use of the property, to identify receptors that potentially will be present, along with the types of activities that could cause their contact with the soil (i.e., exposure scenarios). This information would be used to establish one or more "exposure units" at the location of the HWMU, each of which may present a given degree of potential exposures to constituents remaining in soil. The exposure assessment also would consider whether the types of exposure at the Site will be consistent with that used by ADHS to establish the non-residential SRLs. For each exposure unit, if any, estimates of the concentrations of soil contaminants that receptors could be exposed to via contact with soil will be made (i.e. exposure concentration).

The USEPA[3] recommends using the average concentration to represent a reasonable estimate of the exposure concentration (USEPA, 1989). However, because of the uncertainty associated with estimating the true average

[1] Arizona Department of Health Services (ADHS), March 15, 1999. *Deterministic Risk Assessment Guidance.*
[2] USEPA, December 2002. *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites.* Publication No. 285.6-10, Office of Emergency and Remedial Response.
[3] USEPA, 1989. *Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Model (Part A), Interim Final.* Publication No. EPA/540/1-89/002, Office of Emergency and Remedial Response.

concentration at a site, USEPA[4] states that the 95 percent upper confidence limit (95% UCL) of the arithmetic mean should be used for this variable (USEPA, 1992).

ProUCL is a software package available from USEPA that automatically converts and presents input data as a variety of mathematical distributions and calculates, among other things, the 95% UCL for each distribution. It also notes which of the distributions (and which of the 95% UCLs) are more appropriate than others. ProUCL 4.1.00.02 or a more recent version of ProUCL may be used.

For each exposure unit, if any, soil data from land surface to an appropriate depth below land surface would be considered. Typically, for non-volatile constituents, a depth limitation of not more than 10 feet is used because there is no potential for exposure to non-volatile constituents that are present below this depth. As such, data for soil at greater depths would not be considered in the calculations.

Exposure concentrations of analytes would be compared to their non-residential SRLs. Exposure units, if any, for which exposure concentrations are less than the non-residential SRLs would be considered compliant with the closure performance standard. If the exposure concentration of any analyte is found to exceed its non-residential SRL in an exposure unit, the need to employ additional remediation measures or to develop site-specific remediation standards would be evaluated. If necessary, additional risk assessment methodologies would be utilized to incorporate procedures necessary to develop site-specific remediation standards, including evaluation of exposure pathways, body weight, exposure duration and frequency, soil intake rates, bioavailability, and toxicity. In accordance with Arizona Revised Statutes (A.R.S.) § 49-175(B)(2), site-specific remediation standards would be developed to achieve a cumulative excess lifetime cancer risk between 1×10^{-4} to 1×10^{-6}, and a hazard index of less than one.

Evaluation of the potential for adverse effects on groundwater quality would be accomplished by comparing soil analytical data to minimum groundwater protection levels (GPLs) that have been developed by ADEQ[5] (1996). If this comparison indicates that groundwater quality could be adversely impacted, the need to employ additional remediation measures or to develop alternative minimum GPLs would be evaluated. If necessary, this Closure Plan would be modified to incorporate procedures necessary to conduct vadose-zone modeling procedures that may be necessary.

11.4.5 Required Analyses

The following identifies the analyses required to support closure activities:

- For characterization of waste for shipment to off-site hazardous waste disposal facilities – Sampling and analysis for metals as described in this section.
- For confirmation of decontamination of materials for shipment to non-hazardous landfill – Visual inspection to determine clean debris surface for metals and analysis as described in this section for canopy fabric.
- For confirmation of decontamination required of materials to be salvaged or non-destructively decontaminated – analyses described in Section 2.3.4 of the EDRP.
- For post-decontamination analysis – Total arsenic, barium, cadmium, chromium, lead, nickel, selenium, silver, copper, aluminum, manganese, beryllium, antimony, zinc, cobalt, tin, thallium and vanadium using

[4] USEPA, 1992. *A Supplemental Guidance to RAGS: Calculating the Concentration Trim.* Publication No. 9285.7-081, Office of Solid Waste and Emergency Response.

[5] ADEQ, September 1996. *A Screening Method to Determine Soil Concentrations Protective of Groundwater Quality, prepared by the Leachability Working Group of the Cleanup Standards/Policy Task Force.*

USEPA Test Methods 3050 (sample preparation) and 6010B (sample analysis); total mercury using USEPA Test Methods 3050 (sample preparation) and 7471 (sample analysis), or equivalent; volatile organic compounds (VOCs) using USEPA Method TO-15 (applicable only to Section 11.7.2); and total hexavalent chromium using USEPA Test Methods 3060 (sample preparation) and 7196 (sample analysis) if total (trivalent chromium) exceeds 30 mg/kg (samples will be extracted and held for possible hexavalent chromium analysis, pending the results of total chromium analysis).

The above-mentioned USEPA Test Methods will be used, unless superseded. If superseded, the applicable test method at the time of closure will be used.

The following table describes analyses that may be required for purposes of characterization of waste for shipment to off-site disposal facilities. It includes the Toxicity Characteristics (TC) and Universal Treatment Standards (UTS) for the Resource Conservation and Recovery Act (RCRA) "Eight" metals, and the Underlying Hazardous Constituents for the D004 through D011 Waste Codes. It also includes the Treatment Standards for Hazardous Waste (TSHW) criteria for F006 and F019 waste. The criteria are presented in two forms. The first is based on the Toxicity Characteristic Leaching Procedure (TCLP) and the values are presented in milligrams per liter (mg/l). The second form is based on total metals (TM) analysis and the "20 times" rule and the values are presented in mg/kg. If the TM analyses specified in the following table yield concentrations less than the concentrations presented as mg/kg, analyses based on the TCLP will not be required.

Applicable Toxicity Characteristic (TC) Criteria, Treatment Standards for Hazardous Wastes Criteria and Universal Treatment Standards (UTS) Criteria[1]

Metals	TC Criteria[2]	UTS Criteria[3]	TSHW Criteria[5]
RCRA Eight Metals			
D004, Arsenic	5.0 mg/l, 100 mg/kg	5.0 mg/l, 100 mg/kg	
D005, Barium	100.0 mg/l, 2,000 mg/kg	21 mg/l, 420 mg/kg	
D006, Cadmium	1.0 mg/l, 20 mg/kg	0.11 mg/l, 2.2 mg/kg	
D007, Chromium (total)	5.0 mg/l, 100 mg/kg	0.6 mg/l, 12 mg/kg	
D008, Lead	5.0 mg/l, 100 mg/kg	0.75 mg/l, 15 mg/kg	
D009, Mercury	0.2 mg/l,4.0 mg/kg	0.025 mg/l, 0.5 mg/kg	
D010, Selenium	1.0 mg/l, 20 mg/kg	5.7 mg/l, 114 mg/kg[6]	
D011, Silver	5.0 mg/l, 100 mg/kg	0.14 mg/l, 2.8 mg/kg	
F006 and F019 Waste			
F006, Cadmium			0.11 mg/l, 2.2 mg/kg
F006, Chromium (total)			0.6 mg/l, 12 mg/kg
F006, Nickel			11 mg/l, 220 mg/kg
F019, Chromium (total)			0.6 mg/l, 12 mg/kg
F006 and F019, Total Cyanide			590 mg/kg[4]
F006 and F019, Free Cyanide			30 mg/kg[4]
Applicable Underlying Hazardous Constituent Criteria for D004 through D011 Waste Codes			
Antimony		1.5 mg/l, 30 mg/kg	
Beryllium		1.22 mg/l, 24.4 mg/kg	
Thallium		0.2 mg/l, 4 mg/kg	

[1] USEPA Test Methods 1311 (TCLP) followed by Method 6010B (sample analysis for all metals except mercury), and 7471 (for mercury analysis) or, for total metals (Method 3050 (sample preparation) followed by Method 6010B (sample analysis for all metals except mercury), and Method 7471 (for mercury analysis).

[2] Value from R18-8-261.24, Table 1: first value based on TCLP analysis; second value based on TM analysis and 20 times rule.

[3] Value from R18-8-268-48, Universal Treatment Standards Table, Nonwastewater Standard: first value based on TCLP analysis; second value based on TM analysis and 20 times rule.

[4] Both Total Cyanides and Amenable Cyanides are to be analyzed using USEPA Test Method 9010C and Method 9012B, respectively, with a sample size of 10 grams and a distillation time of one hour and 15 minutes.

[5] Treatment Standards for Hazardous Wastes Table, Nonwastewater Standard: first value based on TCLP analysis; second value based on TM analysis and 20 times rule.

[6] This constituent is not an underlying hazardous constituent as defined at § 268.2(i) of this part because its UTS level is greater than its TC level, thus a treated selenium waste would always be characteristically hazardous, unless treated to below its characteristic level (R18-8-268.48, Footnote 7).

mg/l = milligrams per liter
mg/kg = milligram per kilogram

Section 2.3 of the EDRP includes procedures and criteria that must be met for the decontamination of equipment and structures before the equipment and structures may be removed prior to or during closure.

11.5 Management of Remaining Inventory of Recyclable Materials and Hazardous Debris

Any recyclable materials in process at closure will have been qualified and accepted at the facility, thereby precluding the need to perform any additional sampling or analysis to characterize the recyclable materials. Remaining recyclable materials will be processed by WRC in the typical manner described in Section 3.1 to produce metal concentrates, prior to being shipped to customers. In the event of a sudden or unexpected closure, recyclable materials may be transported to disposal facilities or to recovery facilities in accordance with R18-8-264.A (40 CFR 264). However, the closure cost estimate required by R18-8-264.142 includes the transportation and disposal costs associated with disposal of all recyclable materials on site at the time of facility closure. That cost is shown in Appendix J, Closure Cost Estimate.

Filter media and others materials that are typically recycled by WRC will be processed by shredding and blended with other recyclable materials that are shipped to buyers. Any such materials that will not be recycled will be containerized in drums, totes, or other suitable containers and shipped as hazardous waste to a permitted hazardous waste facility.

Hazardous debris that is typically processed to remove hazardous constituents will be removed using the hazardous debris treatment process (Section 3.1.7), sampled as described in the WAP to verify that it is non-hazardous, and discarded at a local non-hazardous solid waste disposal facility. Any such hazardous debris that is not processed in the hazardous debris treatment process will be containerized in drums, totes, or other suitable containers and shipped as hazardous waste to a permitted hazardous waste facility.

11.6 Decontamination Procedures

WRC will decontaminate structures and equipment at the facility or remove the structures and equipment and dispose of it as hazardous waste if necessary. If the decontamination process is followed, the HWMU, including the concrete pad, concrete and masonry berms, process equipment, and fabric mesh canopy, will be decontaminated using physical extraction or water extraction techniques. The remainder of any recyclable material or product will be collected by sweeping or dry-vacuuming techniques prior to decontamination. The extraction techniques are described in further detail in the EDRP.

The HWMU, TCU, shredders, mechanical blender, debris treatment process equipment, and various components of these permitted units, including ancillary equipment as defined at R18-8-260.10 will be decontaminated to the relevant closure performance standards listed in Section 11.4, and in the manner that minimizes the release of hazardous constituents (e.g., fugitive dust, contaminated rinsate, etc.). WRC will continue air monitoring procedures during closure as required by conditions of its Maricopa County Air Quality Department Permit. As a secondary consideration, decontamination activities will also be conducted in a manner that minimizes the potential for re-contamination of equipment that has been previously decontaminated. The following is an example sequencing of decontamination activities that may be used to achieve these two objectives:

- Following removal of recyclable materials, the HWMU pad will be water-rinsed to remove residues that are judged to be susceptible to becoming airborne (i.e. small particulate matter). The HWMU surface and berms may then be used as the location for storing and decontaminating each of the various pieces of equipment that require decontamination.
- The TCU and control room, shredders, blender and debris treatment equipment will be decontaminated for final disposition (salvage or disposal).
- Other contaminated equipment such as agglomerating tanks, ancillary equipment, and mobile equipment will be decontaminated for final disposition (salvage or disposal).

- The fabric mesh canopy will be removed in sections, with each section being decontaminated for disposal using a soak-and-rinse technique. Decontamination will be conducted within the HWMU.
- Vertical support structures for the fabric mesh canopy will be decontaminated and may be left in place or subject to disposition (salvage or disposal).
- The HWMU surface and berms will be decontaminated, in preparation for decontamination verification procedures.

11.6.1 Concrete and Masonry Components of the HWMU

Decontamination of the HWMU concrete pad and berm surfaces will be performed utilizing the "High Pressure Water Spray" physical extraction technique of applying high pressure water to remove any hazardous contaminants from the concrete surfaces. Sufficient pressure, volume, and temperature will be used to achieve the closure performance standard (Section 11.4). Decontamination of the HWMU surfaces will be conducted in a systematic and documented manner to ensure that the entire surface is decontaminated, while minimizing the risk of cross-contamination from the generated rinsate. Decontamination of the HWMU surface will generally occur from north to south, to take advantage of the north-to-south slope of the HWMU surface. Wash water and rinsate solutions generated during the high-pressure steam and water spray decontamination will be controlled and collected as outlined in Section 11.6.4.

Areas of the concrete or masonry that do not comply with the closure performance standard will be subject to additional decontamination, as described above, or may be saw-cut from the rest of the concrete. Alternatively, the top portion of the concrete surface may be physically removed. Concrete debris generated during these operations will be sampled, analyzed, and characterized to determine whether they are hazardous waste. The debris will be temporarily stockpiled within the HWMU or placed on plastic sheeting outside of the HWMU. It will then be containerized (e.g., roll-off bins or haul trucks) and disposed at an appropriately permitted disposal facility. Care will be taken during concrete demolition, saw cutting, and removal to minimize dust and potential migration of contaminants. The location of concrete removal will be documented in the independent registered engineer's field observation reports. Any holes produced from removal of concrete sections will be backfilled to prevent run-on (ADEQ letter, September 15, 1998).

11.6.2 Process Equipment and Other HWMU Component Surfaces

A designated portion of the HWMU will be set aside for decontamination of the various pieces of readily movable equipment. Designation of this area may be a function of several factors, including proximity to equipment and structures that need decontamination, overall closure schedule, and ease of rinsate management. Large, non-portable equipment or facility structures (i.e., support structures) may be decontaminated, in whole or in part, where they are located at the time of facility closure, rather than at the designated decontamination area. Areas where decontamination is to occur will first be prepared using a high-pressure water spray that is intended to remove residues that are judged to be susceptible to becoming airborne (i.e., small particulate matter). Application of the high-pressure water spray technique in this situation is not necessarily intended to thoroughly decontaminate to achieve the closure performance standard for the concrete surface. Full decontamination of the entire HWMU surface and berms would be conducted after all other process equipment and HWMU component surfaces are decontaminated.

The following equipment will be decontaminated utilizing the techniques described in the EDRP to achieve the closure performance standard (Section 11.4):

- TCU, including its support structure.
- Mechanical shredding/size reducer units.

- Mechanical blender.
- Hazardous debris treatment process equipment.
- Fabric mesh canopy, including its support structures.
- Baghouse, including its support structure, but excluding porous filter media.
- Secondary filtration unit, excluding porous filter media.
- Control room exterior and support structure.
- Ancillary equipment and agglomerating tanks.
- Earthmoving equipment used on the HWMU.
- Dust control/containment equipment used at the sweeper unloading area.

To the extent practicable, each of these pieces of equipment will be disassembled to facilitate decontamination. Surfaces to be decontaminated include exterior surfaces of equipment or structures that are used or located on the HWMU, and internal surfaces of process equipment that could reasonably have come into contact with recyclable materials. Surfaces of equipment that cannot contain water will be subject to high- pressure water spray until the closure performance standard is achieved. Wash water and rinsate solutions generated during the high-pressure steam and water spray decontamination will be controlled and collected as outlined in Section 11.6.4. Decontaminated equipment will be sold for reuse or scrap metal content, or disposed as non-hazardous solid waste. A detailed Equipment Decontamination and Removal Plan is provided as Attachment 11-A. The plan includes steps to disassemble and decontaminate the equipment, to dispose of equipment that cannot be salvaged, and verify decontamination of equipment to be salvaged.

11.6.3 Wastewater Treatment Unit

Solid and semi-solid treatment residues that are generated by the WWTU as a result of processing of storm water and decontamination rinsates generated during closure will be containerized. Pending the results of waste characterization, these containers will be temporarily stored within the WWTU secondary containment until they are removed from the property for appropriate disposal. A composite sample will be prepared using material obtained from each container, and analyzed by an ADHS-certified laboratory for the following constituents:

- Leachable arsenic, barium, cadmium, chromium, lead, selenium and silver using USEPA Test Methods 1311 (sample preparation) and 6010 (sample analysis).
- Leachable mercury using USEPA Test Methods 1311 (sample preparation) and 7470 (sample analysis).

Decontamination of the WWTU equipment interior surfaces should be conducted prior to equipment exterior surfaces, unless provisions are made for a follow-up round of decontamination (i.e. in the event that decontamination rinsates from a tank interior are inadvertently released to equipment exterior surfaces, thereby recontaminating equipment exterior surfaces). Decontamination of the WWTU secondary containment will be done following decontamination of WWTU exterior surfaces.

High-pressure water spray will be used to decontaminate WWTU interior and exterior surfaces, as well as the WWTU secondary containment. In general, rinsing of interior surfaces of WWTU equipment should be conducted in the same sequence in which wastewater typically flows through the WWTU. Using this strategy, the discharge piping leading from the HWMU to the WWTU would be decontaminated first, following by the various holding tanks that are used to temporarily accumulate wastewater, following by tanks used for treatment, followed by solids handling equipment. Triple rinsing will be used to facilitate removal of rinsate and solid residues from each tank and piping section.

Verification of decontamination will be based on documented completion of the above-described decontamination procedures. Sampling of the concrete secondary containment will not be performed. The WWTU will be visually examined after decontamination to verify the effectiveness of the decontamination procedure.

No portion of the WWTU will be disassembled to facilitate the decontamination or verification processes. Following decontamination, the WWTU may be left in place, and may continue to be used by WRC or another, future owner of the property, pending acquisition or transfer of appropriate permits (i.e., City of Phoenix). Should the WWTU be decommissioned and dismantled following decontamination, the decommissioning and dismantling process and the final disposition of equipment are not subject to any requirements under this Closure Plan.

Decontamination rinsate will be stored in temporary tanks (e.g., Frac Tanks), pending sampling and analysis for waste characterization. Samples will be analyzed by an ADHS-certified laboratory for the same constituents identified above. Following receipt of analytical results, the WWTU decontamination rinsate will be transported for treatment and disposal at an appropriate off-site facility. Alternatively, if the rinsate complies with applicable standards set forth in WRC's pretreatment permit, it may be discharged to the publicly owned treatment works (POTW).

11.6.4 Management of Decontamination Rinsate

Wash water and rinsate solutions generated during the high pressure steam and water spray operation will be controlled and care will be taken to avoid generating unnecessary quantities of rinse water. The solutions generated from decontamination procedures will be collected with a potential combination of hand tools (squeegees), portable berms (booms), and a portable wet vacuum unit or similar collection device and containerized in a timely manner.

Collected water will be managed in one of two ways. The water will be treated on site in the WWTU and the effluents discharged to the POTW and any residuals from the treatment of the collected waters would be managed as waste using the same procedures detailed in Section 11.5. Alternatively, the collected waters would be sampled and analyzed according to the characterization requirements of an off-site disposal or recycling facility selected by WRC.

11.7 Post-Decontamination Sampling and Analysis

After surface decontamination of the HWMU is complete, closure sampling and analysis will be performed. Prior to sampling for closure, the HWMU will be inspected for locations of any residual staining, topographic features which may have caused liquids to accumulate, or significant cracks, which will be documented in the independent registered professional engineer's field observation report. Locations of these features will be determined and recorded using a geographic positioning system (GPS) having approximately one-meter accuracy or better. This information will be used to plan the locations of biased samples discussed in the concrete and soil sampling locations described below.

Post-decontamination sampling consists of collecting several types of samples, which are detailed in the following subsections. Concrete and masonry samples will be collected to determine whether decontamination procedures were adequate. Following completion of this verification sampling, a soil vapor survey will be conducted to verify that no VOCs contamination exists beneath the HWMU surface. Subsurface construction materials and soils will be sampled to evaluate the potential presence of hazardous waste constituents; this sampling may be conducted at any time following completion of the concrete and masonry sampling. Locations for all samples will be determined and recorded using a GPS having approximately one-meter accuracy or better, or a sampling grid that is based on a referenced data point that is located using GPS where grid-based sampling is appropriate (i.e., the soil vapor survey).

Because of the presence of a storm water conveyance beneath the HWMU (refer to Site Plan SP-MW01, in Section 4), care should be taken whenever selected sample locations overlie or are near the location of this conveyance. Sample locations should either be relocated away from the storm water conveyance or care must be taken to not damage the storm water conveyance during sampling activities.

Samples of concrete, masonry, and subsurface construction materials and soils will be collected from a combination of random and biased locations. In general, locations that are selected for concrete sampling will also be subsequently used for collection of samples of subsurface construction materials and soils. Soil vapor sample locations are discussed in Section 11.7.2 and do not necessarily correspond to the sample locations for any other media. A total of 22 random locations will be selected for concrete sampling throughout the HWMU surface. A random number-generating computer program will be used to generate 22 locations on a grid map of the HWMU. The 22 random samples will be supplemented by 30 biased samples. Biased samples mostly will be collected from portions of the concrete liner and underlying materials, including below the membrane liner, where contamination is considered most likely due to the conditions of the concrete or past uses (e.g., areas of standing water). Some biased samples will be collected from portions of the concrete liner and underlying material, including soil below the membrane liner, where contamination is considered less likely to exist for comparison purposes. If any of the concrete or underlying materials, including soil below the membrane liner, contains metals in excess of the pre-determined non-residential SRLs, additional sampling will be conducted to characterize the horizontal and vertical extent of the contamination exceeding the pre-determined non-residential SRLs.

Biased location sampling will be collected as follows:

- Sumps or low areas where standing water may typically accumulate (representative selection);
- Seams and construction joints, with preference given to relatively low-lying portions of the HWMU, heavily used portions of the HWMU, and highly stained portions of the HWMU (representative selection);
- Interior surfaces of the concrete and masonry berms;
- All locations where previous releases to soil have been identified, if any; and
- Other locations that are authoritatively selected by ADEQ prior to or during closure activities.

A total of 30 biased sample locations (at least 18 samples from the eastern one-half of the HWMU) will be used, including 4 samples from the interior surfaces of the berms. If the results of laboratory of samples collected at the random and biased locations indicate that results are not conclusive for comparison against the closure performance standards for any of the sampled media (i.e., concrete, subsurface construction materials, or soil), then additional random and/or biased sampling will be performed as necessary for the affected media. The membrane liner will not be sampled.

11.7.1 Concrete and Masonry Surfaces

Samples will be collected from the concrete floor and the concrete and masonry berms, to determine whether these materials contain any hazardous waste constituents in excess of the closure performance standards. Surface samples of the floor and berms may be collected to determine worst-case conditions or core samples may be collected to obtain more representative results. Samples will be analyzed for total metals in accordance with methods listed below for surface samples. Constituent concentrations in surface samples will be compared to their non-residential SRL and, if established, to their minimum GPL and to their threshold TCLP (based on the "20 times" rule). If any constituent exceeds any of the criteria just mentioned, a core sample will be collected at the same location where the surface sample exceedance was detected for analysis of total metals in accordance with methods listed below to determine concentrations for use other than the worst-case surface concentrations.

Samples of the concrete surface and the concrete and masonry berms will be collected using a hammer and decontaminated steel chisel. The steel chisel will be decontaminated between collection of each sample. Alternatively, concrete core samples will be obtained using standard concrete coring equipment, to produce concrete cores that are approximately 2 inches in diameter, having a length equivalent to the thickness of the concrete or concrete block being sampled. The coring bit will be decontaminated prior to collection of each concrete core sample.

Analyses selected for concrete and masonry samples collected during closure are based on possible constituents that may be present in recyclable materials managed by WRC. These samples will be analyzed by an ADHS-certified laboratory for the following constituents:

- Total arsenic, barium, cadmium, chromium, lead, nickel, selenium, silver, copper, aluminum, manganese, beryllium, antimony, zinc, cobalt, tin, thallium, and vanadium using USEPA Test Methods 3050 (sample preparation) and 6010B(sample analysis).
- Total mercury using USEPA Test Methods 3050 (sample preparation) and 7471 or equivalent (sample analysis).
- Total and amenable cyanide using USEPA Methods 9010C or 9012B.
- Total hexavalent chromium using USEPA Test Methods 3060 (sample preparation) and 7196 (sample analysis) if total (trivalent chromium) exceeds 30 mg/kg.

Samples will be extracted and held for possible hexavalent chromium analysis, pending the results of total chromium analysis. Hexavalent chromium analysis will be necessary in the event that laboratory results for total chromium analysis exceed relevant standards for hexavalent chromium. The abovementioned USEPA Test Methods will be used unless superseded. If superseded, the applicable test method at the time of closure will be used.

11.7.2 Soil Vapor Screening for VOCs

A shallow-soil vapor survey will be performed by a qualified contractor as a wide-area screening tool to confirm that subsurface VOC contamination does not exist. A total of 18 locations on approximately 100-foot centers will be evaluated during the shallow-soil vapor survey (i.e., three rows of five sample locations per row, generally centered across the 300-foot by 560-foot HWMU surface as shown on Figure 11-1). Two-inch concrete cores will be removed at each marked location to facilitate the soil vapor survey.

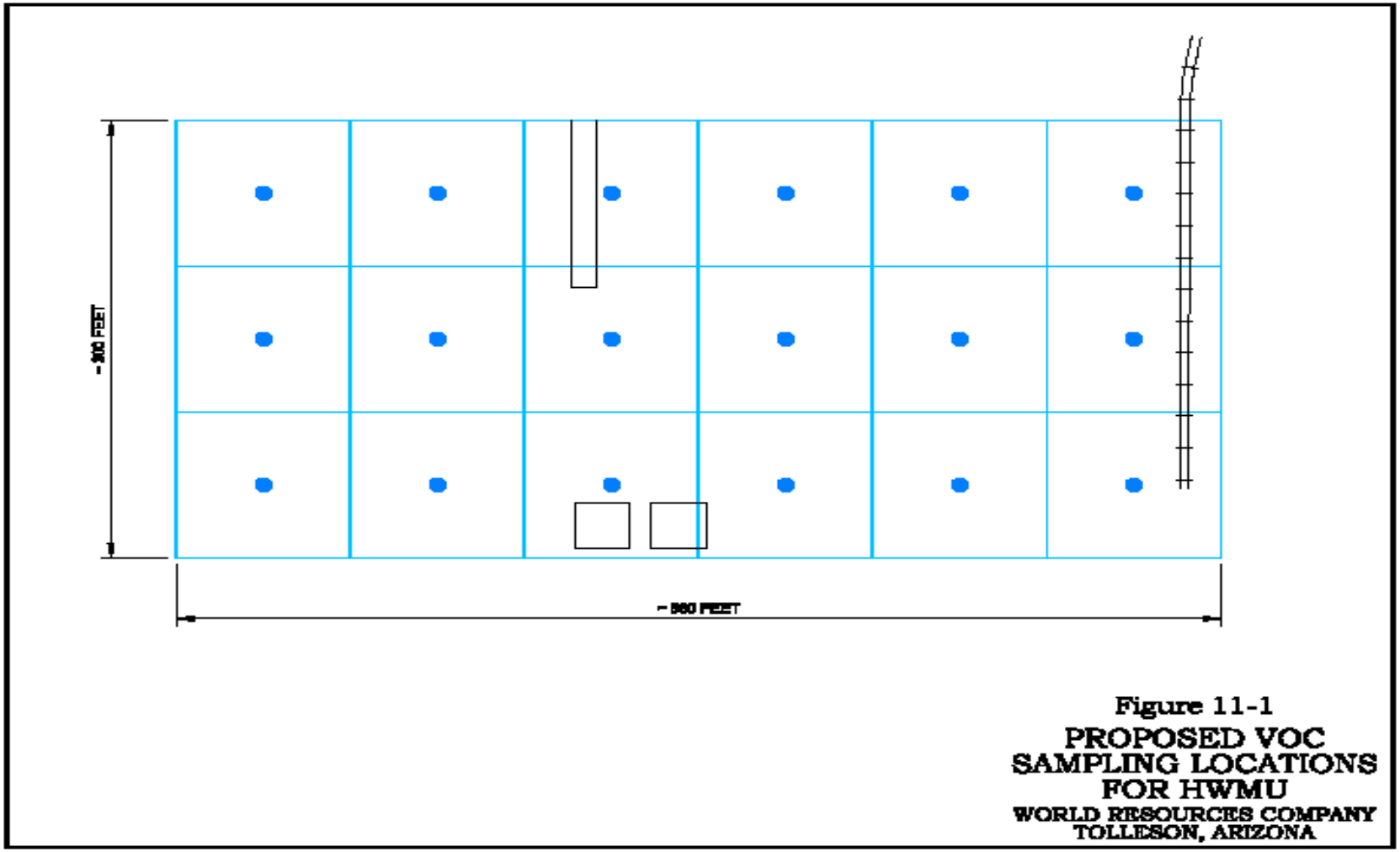

Figure 11-1
PROPOSED VOC SAMPLING LOCATIONS FOR HWMU
WORLD RESOURCES COMPANY
TOLLESON, ARIZONA

A direct-push rig will be used to drive a 1.5- inch outer diameter stainless-steel probe to a depth of 10 feet into the soil. The soil vapor probe consists of a $^{5}/_{8}$-inch diameter hollow steel rod connected to a stainless steel soil gas collection chamber with a detachable tip. Sampling and analysis will be conducted in accordance with the Arizona Department of Environmental Quality Soil Vapor Sampling Guidance (rev. May 19, 2011) or later Arizona Department of Environmental Quality guidance in effect at the time of closure.

No further investigation for VOCs will be necessary if VOCs are not detected in any of the soil vapor samples. In the event that VOCs are detected, a comparison of the analytical results to applicable remediation standards will be conducted. This may be performed either in accordance with applicable soil vapor remediation rules or guidance that exists at the time of closure, or using a comparison of soil vapor concentrations to predicted, equilibrium soil-phase concentrations that are based on a methodology to be proposed by WRC. In the event that VOCs are detected in soil vapor samples at concentrations above the applicable remediation standards, a work plan detailing subsequent characterization activities will be prepared and submitted to ADEQ for review and approval.

11.7.3 Subgrade Materials and Soils Underlying the HWMU

Once samples of the HWMU concrete pad and berms have been collected, samples of underlying materials (e.g., ABC material and sand) and soil will be collected generally at the same 22 random and 30 biased sample locations used for the sampling of concrete described in Section 11.7.1. At each sample location, three samples will be collected - by the Geoprobe or similar sample collection method - from the non-concrete portion of the liner systems (i.e., below the concretebut above the lowermost liner) and two samples will be collected from soil below the lowermost liners. Samples will be collected to obtain representative samples of material above each liner. However, samples will not be collected less than two inches above the lowermost liners in order to minimize the potential damage to those liners. Sample depths of the liner system described below are based on Figure F-H02.1 (Section 4 of the RCRA permit application).

Samples from the liner system below the Railroad Spur Pad will include six inches of the ABC material above the upper compacted soil layer, the bottom six inches of the upper compacted soil layer, and the compacted soil between two to eight inches above the lowermost liner. Samples from the liner system below the West Area Pad, will include six inches of ABC material above the sand, not more than six inches of sand above the upper membrane liner, and compacted soil between two to eight inches above the lowermost liner. Samples from the liner system below the East Area Pad will include the middle six inches of any asphalt layer that might be present, the lower six inches of ABC material, and sand and/or soil not lower than two inches above the membrane liner. Samples collected from soil below the liner systems will be collected at depths of 4.5 to 5.0 feet, and 9.5 to 10.0 feet below the lowermost liner.

The procedures and associated equipment to be used to collect soil samples with a Geoprobe sample rig are as follows:

- A probe will be hammered or pushed to the desired sample depth, the sampler piston released, and the probe driven through the sample interval. The probe will then be returned to the surface.
- The Geoprobe sampler uses a 22-inch long, 1.06-inch diameter stainless-steel tube. Samples will be collected in a decontaminated, 22-inch long, 1-inch diameter clear polyvinyl chloride (PVC) liner inserted into a decontaminated sampler. Additional lengths of clear PVC liner will be used on successive penetrations into the same boring to collect samples from greater depths.
- The sampler is then attached to the Geoprobe push rod and lowered into the borehole. No lubricants will be applied to either the end cap or drive shoe.
- The sampler is then driven through the sample interval using the Geoprobe sample rig's hydraulic hammer.

- The sampler and drive rod will be removed from the borehole and verification of sample collection will be performed by looking into the sampler drive shoe. If no sample has been retrieved, one additional attempt will be made to retrieve a sample from that depth interval.

When a sample has been collected, the sample liner will be removed from the sampler. The two endsof the sample liner will be covered with Teflon® sheeting and plastic end caps. Using a decontaminated stainless-steel knife, a minimum of 6 inches of the sample liner will be cut off, and the cut end will be covered with Teflon® sheeting and a plastic end cap. Soil samples will not be composited with samples containing ABC material and sand.
Vertical characterization will be considered complete when two consecutive soil samples collected at each boring contain constituent concentrations less than or equal to the closure criteria, *i.e.,* less than or equal to their respective pre-determined or site-specific non-residential SRLs and less than or equal to their respective minimum GPLs or other GPLs approved by ADEQ in accordance with ADEQ's "A Screening Method to Determine Soil Concentrations Protective of Groundwater Quality." Additional borings will be necessary to determine horizontal extent if the results of analysis of samples collected from the primary boring indicate that soil contaminants are present at concentrations that exceed their respective non-residential SRLs. In the event that WRC chooses to not apply a DEUR across the HWMU, lateral extent characterization will be conducted with the objective of delineating those areas underlying the HWMU that exceed residential SRLs.

A brief report describing the results of sample collection, and subsequent proposed activities will be submitted to ADEQ for review and approval.

11.7.4 Soils Adjacent to the HWMU

Soil samples will be collected from a maximum of six locations located within 10 feet of the outside perimeter of the HWMU berm. Excluding areas that are paved with asphalt or concrete, two samples will be collected along each long side of the HWMU and one sample collected along each short side, all in exposed soil. Should exposed soil be greater than 10 feet from the outside perimeter, exposed soil at the nearest location to 10 feet from the perimeter will be sampled. Overlying gravel, if any, will be removed from the designated locations prior to collection of the samples. Soil samples will be collected from a depth of 0 to 3 inches using a decontaminated stainless steel spoon or disposable sampling trowel. Criteria for selection of sampling locations will be biased towards the following:

- Areas where the surface is observed to be stained;
- Low areas where liquids may have accumulated;
- Locations where previous releases to soil have been identified; and
- Other locations that are authoritatively selected by ADEQ prior to or during closure activities.

A brief report describing the results of sample collection and analysis will be submitted to ADEQ for review and approval.

11.7.5 Background Soils

An assessment of soil background concentrations may be performed for metals detected in soil during sampling described in Section 11.5 and 11.7.4 at concentrations exceeding the closure performance standards. In that event, background samples will be randomly collected from contiguous land areas around the facility and the area of the property not used by WRC for processing of recyclable materials.

Background sampling locations will be generated by assigning a grid to a map showing the area including the facility. Soil samples collected to assess background will not be from any area of the HWMU and the area will not have been influenced by any known facility operations. All processing areas and past processing areas will be excluded from any grid devised for random sampling. Ten sampling locations will be selected using a random

number generator, resulting in 10 general areas on the grid map. Within each randomly-selected general area, the specific sampling location will be biased away from low areas that may have accumulated non-indigenous constituents from the surrounding area, if needed. At least one sample each from the 10 sampling locations will be collected at the same approximate depths where concentrations above the pre-determined SRLs were observed in soil samples collected beneath or adjacent to the HWMU. Proposed locations and depths of background samples will be submitted to ADEQ for approval before the samples are collected.

The results of the 10 samples, a statistically significant number of samples for valid ProUCL results, will be evaluated at the 95th percentile upper confidence level using ProUCL with the distribution indicated by ProUCL as the preferred distribution. A brief report describing the results of sample collection and analysis will be submitted to ADEQ for review and approval.

11.7.6 Laboratory Analysis

Analyses selected for samples of soil and other materials collected during closure will be used to determine compliance with clean closure criteria and to identify hazardous constituents that may be present in recyclable materials managed by WRC. These are equivalent to the analyses that are referenced in the WAP (Section 5) for annual recertification samples. These samples will be analyzed by an ADHS-certified laboratory for the following constituents:

- Total arsenic, barium, cadmium, chromium, lead, nickel, selenium, silver, copper, aluminum, manganese, beryllium, antimony, zinc, cobalt, tin, thallium, and vanadium using U.S. Environmental Protection Agency (USEPA) Test Methods 3050 (sample preparation) and 6010B(sample analysis).
- Total mercury using USEPA Test Methods 3050 (sample preparation) and 7471 or equivalent (sample analysis).
- Total and amenable cyanide using USEPA Methods 9010C or 9012B.
- Total hexavalent chromium using USEPA Test Methods 3060 (sample preparation) and 7196 (sample analysis) if total (trivalent chromium) exceeds 30 mg/kg.

Samples will be extracted and held for possible hexavalent chromium analysis, pending the results of total chromium analysis. Hexavalent chromium analysis will be necessary in the event that laboratory results for total chromium analysis exceed relevant standards for hexavalent chromium. The abovementioned USEPA Test Methods will be used unless superseded. If superseded, the applicable test method at the time of closure will be used.

11.7.7 Sampling Equipment Decontamination

Sampling equipment will be decontaminated using a three-bucket wash and rinse methodology by the following procedures:

- Wash equipment using a solution of Alconox® or equivalent detergent and potable water contained in one 5-gallon bucket.
- Rinsing with potable water only in one 5-gallon bucket.
- Rinsing with distilled water contained in one 5-gallon bucket.
- Air-dry the equipment.

Waste decontamination rinsate will be managed as indicated in Section 11.6.4.

11.7.8 Field Quality Control Samples

One field duplicate soil sample will be collected for every 20 primary soil and concrete samples. The

primary/duplicate pair will be prepared by first homogenizing the soil extracted from the subsurface in a dedicated disposable container and then dividing the mixed soil into two sets of sample containers. The duplicates will be submitted to the laboratory as "blind" samples with a fictitious sample identification number and sampling time. In addition, one out of every five primary/duplicate pairs will be split such that one aliquot can be sent to a different Arizona-certified laboratory (in addition to the blind duplicate) for Quality Assurance/Quality Control (QA/QC) purposes.

One field equipment blank will be collected for each type of sampling apparatus on each day of sampling. The field equipment blank is prepared by collecting analyte-free water in appropriate containers after the water is poured over the decontaminated sampling tools used that day.

11.7.9 Sample Management

11.7.9.1 Sample Containers, Preservation, and Holding Times

Table 11-1 lists the required sample containers, preservatives, and recommended maximum holding times for each analyte and method. Sample containers provided by the analytical laboratory will be clean virgin bottleware. Stick-on labels will be affixed to containers. These labels will indicate any preservative added to the containers by the laboratory.

Table 11-1. Summary of Sample Containers, Preservation, Volumes and Holding Times

Analyte(s)	Analytical Method	Container	Preservation	Minimum Sample Weight	Holding Time
Silver, Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Copper, Nickel, Aluminum, Manganese, Beryllium, Antimony, Zinc, Cobalt, Tin, Thallium, and Vanadium	USEPA Test Methods 6010B	9-ounce glass with Teflon- lined cap (soil or concrete chips); re-sealable plastic bags (concrete cores)	Approximately 4°C	100 grams	180 days until extraction; 28 days after extraction
Mercury	USEPA Test Method 7471	9-ounce glass with Teflon- lined cap (soil or concrete chips); re-sealable plastic bags (concrete cores)	Chill to 4°C	10 grams	28 days
Hexavalent Chromium	USEPA Test Method 7196	9-ounce glass with Teflon- lined cap (soil or concrete chips); re-sealable plastic bags (concrete cores)	Chill to 4°C	50 grams	24 hours
Cyanide, Total and Cyanide, Amenable	USEPA Test Method 9010C/9014	4-ounce glass jar with Teflon lid	Chill to 4°C	10/20 grams	14 days

** The abovementioned USEPA Test Methods will be used unless superseded. If superseded, the applicable test method at the time of closure will be used.*
°C = degrees Celsius
USEPA = United States Environmental Protection Agency

11.7.9.2 Sample Handling and Storage

Each sample container will be marked with the sampling location number, sampling depth, date, and time of sample collection. Sample containers containing samples will be wiped with paper towels to remove extraneous materials and placed in a cooler on ice in preparation for delivery to the laboratory. Glass containers will be securely packed in plastic bubble bags and re-sealable plastic bags. In addition to the chain- of-custody

documents, samples taken and delivered to the laboratory will be recorded in a log with the time, date, and other pertinent information.

Upon laboratory receipt of the samples, the laboratory will immediately notify WRC if conditions or problems regarding the samples are identified that require immediate resolution. Such conditions may include container breakage, leakage, missing or improper chain-of-custody documents, sample holding time exceedances, missing or improper sample labeling, or frozen water samples. Such problems will be recorded by WRC in the sample log.

11.7.9.3 Chain of Custody

For each sample to be submitted to the laboratory for analysis, an entry will be made on a chain-of-custody form supplied by the laboratory. The information to be recorded includes the sampling date and time, sample identification number, matrix sampled, requested analytes and methods, preservatives, and sampler's name. Sampling team members will maintain custody of the samples until they are relinquished to laboratory personnel or a sample courier. The chain-of-custody form will accompany the samples from the time of collection until they are received by the laboratory. Each party in possession of the samples (except the professional courier service) will sign the chain-of-custody form signifying receipt. A copy of the original completed form will be provided by the laboratory along with the report of results. The chain-of-custody form will be placed in a plastic bag and shipped with samples inside the cooler. After the samples, ice, and chain-of-custody forms are packed in the coolers, custody seals will be placed on the lid of each cooler before the cooler is relinquished to the professional courier service. Custody seals provide assurance that the samples are not tampered with during transportation to the laboratory. Upon receipt, the laboratory will inspect the condition of the custody seals and report the information on the chain-of-custody form. Provisions of 40 CFR § 261.4(d) apply to samples collected at closure.

11.7.9.4 Sample Documentation

Information will be recorded on chain-of-custody forms, sampling log sheets, and a field notebook. The field notebook is used to keep a diary of field activities and to record pertinent data that are not included on the chain-of-custody form or the sampling log sheet. The information recorded on the sampling log sheets includes the following:

- Sample identification number recorded on the container label;
- Sampling location number;
- Random or biased sampling location coordinates;
- Sampling equipment used;
- Sampling depth (depth in feet);
- Moisture observations;
- Visual observations;
- Sampling time; and
- Identification of blind duplicate samples and fictitious sampling times.

11.8 Revision of Cost Estimates

On an annual basis, WRC will continue to update its cost estimates for closure to account for inflation and other changes that may have an impact on these costs. These annual updates will also consider any revisions to these costs that may be necessary due to analytical results of samples collected during concrete replacement activities regarding impacted soils that are left in place at the time of concrete replacement.

In the event that impacted subsurface construction materials or soil is identified that is not feasible to remediate while concrete replacement activities are being conducted, WRC will evaluate whether to remediate impacted materials at the time of closure to achieve the closure performance standard, or to close the HWMU with some or all of the impacted materials being left in place using an engineering control. This evaluation may be based primarily or solely on economic considerations. The Closure Plan and closure cost estimate will be revised to provide for removal of impacted soil and other materials at the time of closure or revised for leaving the materials in place, consistent with the permit modifications approved by the Director.

WRC will maintain the level of financial assurance that is necessary to fund the closure cost estimate, which as stated above, will be revised annually based on inflation and other considerations. Other considerations include whether or not it is necessary to remediate any impacted soils and materials that are identified during concrete replacement activities, but left in place until closure.

11.9 Closure Certification

11.9.1 Oversight of Closure Activities

An independent Arizona-registered engineer will inspect a number of typical examples of each of the types of procedures performed during closure of the facility to ensure that the requirements of this Closure Plan are met. Applicable procedures to be inspected include, but are not limited to, removal of recyclable materials inventory; decontamination of process equipment and HWMU components; sampling for decontamination verification; chain-of-custody procedures; and removal of contaminated materials. Some inspections will be unannounced to personnel conducting and supervising closure activities, except when coordination is needed to inspect an activity of relatively short duration (e.g., sampling). The engineer will prepare field notes to document observations made during the inspections.

If deviations from the procedures specified in this Closure Plan are required, those deviations will be documented within the closure certification report prepared by the engineer. A description of the corrective actions taken to remedy the deviations, and a discussion of the effectiveness of those corrective actions, will be included in the closure certification report.

The engineer will review analytical data received from the laboratory, including the results of quality control samples and procedures, to determine whether or not decontamination has been conducted in a manner than complies with the closure performance standard. Laboratory analytical reports will be included in the closure certification report.

11.9.2 Closure Certification Report

Following completion of closure activities, an independent Arizona-registered professional engineer and WRC will certify that closure has been conducted in accordance with the specifications of this Closure Plan. The closure certification report will include the following:

- Certification of closure by an independent registered professional engineer in the State of Arizona;
- Summary of closure activities;
- Observation reports including deviations from the approved Closure Plan;
- Laboratory analytical reports, including QA/QC information;
- Discussion of analytical results with regard to demonstration of the closure performance standard;
- Any modifications or amendments to the Closure Plan; and
- List of records (e.g., manifests, shipping documents, sampling data, laboratory results, contractor logs describing activities performed) that were renewed by the certifying engineer.

This report will include sufficient detail to substantiate the professional engineer's certification of closure activities, including deviations from the approved closure plan, detailed analytical results from sampling activities, and final disposition of wastes and other materials.

The closure certification report, prepared by the independent engineer, will be submitted to ADEQ within 60 days following completion of closure.

11.10 Declaration of Environmental Use Restriction (DEUR)

Pursuant to A.A.C. R18-7-208, a DEUR must be recorded in accordance with Arizona Revised Statutes (A.R.S.) § 49-152 if contamination is proposed to be left on the property at a concentration that exceeds the applicable residential standard for the property under R18-7-205 or R18-7-206, or the owner elects to use an institutional control or an engineering control to meet the requirements of R18-7-205, R18-7-206 and R18-7-207. Groundwater protection levels will also be considered pursuant to R18-7-203(B)(1) when evaluating requirements for a DEUR. If a DEUR is required, it will be prepared in accordance with A.R.S. §49-152 and submitted to ADEQ for review and approval. This DEUR may be established for WRC's property as a whole, or it may be limited to only those portions of the HWMU where soil constituents remain at concentrations requiring a DEUR.

The effect of the DEUR will be to restrict use of the property, or affected portions thereof, to non-residential uses. It will identify the soil constituents for which the DEUR is necessary and the range of concentrations for each constituent. A legal description of the restricted areas of the property will be attached to the DEUR. Should an engineering control be necessary, the DEUR will also provide a legal description of the portion of the property where the engineering control is to be maintained.

Following approval of the DEUR by ADEQ, WRC will record the document with the Maricopa County Recorder's Office. A certified copy of the recorded DEUR will be obtained by WRC from the Maricopa County Recorder's Office and submitted to ADEQ within 60 days of ADEQ's approval of the DEUR. Annual notices will be provided to ADEQ regarding the status of the restrictions and controls described in the DEUR, including a certification that such restrictions and controls are being maintained.

11.11 Closure Schedule

Closure of the HWMU, TCU, mechanical shredding/size reducer units, mechanical blender, and debris treatment process equipment are subject to the schedule outlined in the following table. The schedule includes "regulatory" deadlines that are specified by applicable regulations and "estimated" deadlines that are subject to change to the extent that concurrent or subsequent regulatory deadlines are not adversely impacted.

Table 11-2. Closure Schedule

Closure Milestone	Regulatory Schedule (cumulative days)	Estimated Schedule (cumulative days)
ADEQ Notification of Final Closure	(30 days)	(30 days)
Receipt of final volume of recyclable materials	0 days	0 days
Initiation of closure activities	30 days	30 days
Removal of remaining recyclable materials inventory	90 days	180 days
Decontamination (equipment and structures)	NA	90 to 135 days
Subsurface sampling	NA	135 to 180 days
Completion of closure activities	180 days	180 days
Submission of closure certification report	240 days	240 days

Attachment 11-A: EQUIPMENT DECONTAMINATION AND REMOVAL PLAN

1.0 INTRODUCTION

1.1 Scope

This Equipment Decontamination and Removal Plan (EDRP) describes the procedures that will be used to decontaminate and remove equipment from the World Resource Company (WRC) Hazardous Waste Management Unit (HWMU). The plan is designed to meet the requirements of Arizona Administrative Code (A.A.C.) R18-8 §§ 264.114 and 603 regarding the disposal or decontamination of four miscellaneous units subject to the requirements of R18-8-264, subpart X. The four operating miscellaneous units include the HWMU and three miscellaneous units located within the HWMU: a thermal concentrator unit (TCU), a shredder, and a blender. The decontamination will include the four miscellaneous units described above, a standby shredder, two agglomerating tanks, smaller pieces of equipment, and ancillary equipment as defined at R18-8-260.10 (all collectively referred to as "equipment" and/or "equipment components"). The process of disassembling and decontaminating the equipment will be in accordance with the procedures described in this plan and with the debris treatment requirements of R18-8-268.45.

The EDRP is also designed to prepare the HWMU floor and berms for the collection and analysis of samples in accordance with Sections 11.7.1 through 11.7.3 of the Closure Plan. The sampling will be conducted to determine waste constituent concentrations in the concrete floor, in the surrounding berms, and in the soil layer between the concrete floor and the underlying membrane liner. The preparation of the HWMU floor and berms for sampling required by Sections 11.7.1 through 11.7.3 will require the removal of all recyclable materials and products from the HWMU, the TCU, the shredder, the blender, and all ancillary equipment such as ducts, pipes, and pumps and emission control devices; the TCU control room; the fabric canopy covering the HWMU; and any residue remaining after all equipment and material have been decontaminated and removed.

All processing of recyclable materials occurs within the HWMU, an open work area of approximately 305 feet x 565 feet. The work area includes a sealed concrete floor, composed of sealed concrete pads with joints that are covered by sealants. The sealed concrete floor in the eastern half of the HWMU is underlain by an asphalt layer which is above a soil layer that covers a membrane liner. In the western half of the HWMU, the sealed concrete floor is underlain by a layer of soil, a membrane liner, another layer of soil, and another membrane liner. A short retaining wall constructed of concrete blocks surrounds the HWMU floor. The wall, also referred to as a "berm," is designed to prevent stormwater run-on from entering the HWMU and to contain all precipitation that falls into the HWMU. An inwardly sloping apron surrounds much of the berm and adds stormwater holding capacity. Counting the apron, the dimensions of the HWMU are approximately 312.6 feet wide and 582.6 feet long. Section 4 of the WRC permit application provides a detailed description of the HWMU, TCU, shredder, and blender and includes figures showing the dimensions and construction of the HWMU. The HWMU is covered by a fabric canopy at a height of approximately 22 feet above the floor. The canopy is shown on Site Plan SP-WWTU 01, which is included in the permit application. A copy of SP-WWTU 01 precedes the attached Figures 11-A.1 through 11-A.4.

The EDRP covers the following activities:

- Inspection of the HWMU floor and berms surrounding the HWMU after all recyclable materials, recyclable products, related supplies, and residues have been removed from the floor;
- Repair of any damage to the concrete pads or joints forming the HWMU floor or to the surrounding berms that would enable hazardous waste constituents to migrate to subsurface or adjacent soils;

- De-energizing and disconnecting all power lines to the TCU, shredder, and blender and ancillary equipment;
- Isolating, disconnecting, and capping of all lines (e.g., natural gas, water and agglomerating fluids) to the TCU, shredder and blender;
- Lowering the TCU, shredder, blender, and ancillary equipment to the HWMU floor;
- Disassembling the TCU, shredder, blender, and ancillary material into smaller components, as necessary for decontamination;
- Preparation of all equipment and equipment components not selected for decontamination in accordance with the debris treatment standards of R18-8-268.45 for shipment to a hazardous waste management facility;
- Treatment of the equipment and equipment components selected for decontamination in accordance with the debris treatment technologies of R18-8-268.45, Table1, A.1;
- Inspection of the decontaminated equipment and equipment components to verify that they meet the clean debris surface standard of R18-8-268.45, Table 1, Footnote 3;
- Preparation of all equipment and equipment components that fail to meet the clean debris surface standard for shipment to a hazardous waste management facility, unless the equipment and equipment components meet the standard after further treatment;
- Decontamination of the two agglomerating tanks except that their interior surfaces need not be decontaminated if the tanks did not store hazardous waste.
- Preparation of all equipment and equipment components that meet the clean debris surface standard for shipment to a non-hazardous waste landfill, unless the equipment and equipment components qualify as potential salvage items;
- Treatment and testing of potential salvage items to verify that the items meet the salvage clearance criteria described in Section 2.3 below;
- Preparation of all equipment and equipment components that fail to meet the salvage clearance criteria for shipment to a non-hazardous waste landfill , unless the equipment and equipment components meet the criteria after further treatment;
- Preparation of all equipment and equipment components that meet the salvage clearance criteria described in Section 2.3 below for shipment off site;
- Removal of equipment from the TCU control room, disassembly of control room, and decontamination of structural components of control room in accordance with procedures described above for equipment and equipment components;
- Disassembly of the HWMU's fabric canopy and supporting structure;
- Decontamination of the fabric canopy and supporting structure in accordance with the treatment technologies specified in R18-8-268.45, Table 1 (Section A.2.a for the fabric and primarily A.1.e for the support);
- Decontamination in accordance with R18-8-268.45, Table 1, A.1.e of the outer surfaces of the mobile equipment used to move recyclable material and residues within the HWMU and the mobile equipment used to lower and disassemble the TCU, shredder, blender and ancillary equipment;
- Use of portable equipment (e.g., squeegees, vacuum sweepers, booms) for the management of liquids and residues for the purpose of minimizing the potential for migration through the sealed concrete floor and to comply with applicable disposal regulations;
- Inspection and repair of any damage to the concrete pads or joints forming the HWMU floor or to the surrounding berms that would enable hazardous waste constituents to migrate to subsurface or adjacent soils;
- Decontamination, using high pressure water spray, of HWMU's sealed concrete floor and inwardly facing portions of the HWMU berms;
- Decontamination of WRC's wastewater treatment facility;

- Disposal as hazardous waste of all residues, filter media, and equipment components that are not successfully decontaminated in accordance with debris treatment requirements of R18-8-268.45;
- Disposal in non-hazardous landfills of equipment, non-porous equipment components, and ancillary material that are successfully decontaminated in accordance with debris treatment requirements of R18-8-268.45;
- Final inspection of the berms and floor to verify the absence of hazardous waste residues; and
- Preparation of a report documenting EDRP activities.

1.2 General EDRP Conditions and Objectives

All EDPR activities involving the disassembly, inspection, and sampling of equipment will be conducted inside the HWMU. The HWMU is easily accessible and its open arrangement provides ample space for disassembling and decontaminating the equipment during closure. Therefore, no demolition of the HWMU will be required to provide access for the decontamination and removal of the TCU, shredder, blender, or ancillary equipment. A telescoping crane will be used to lower heavy components of the miscellaneous units to the HWMU floor so they can be further disassembled and transferred by forklifts to designated decontamination areas on the HWMU floor. The crane will be located outside the HWMU to prevent the weight of the crane from damaging the HWMU floor and to prevent the crane from becoming contaminated. Special care will be exercised during the lowering of unit components to the floor and during the subsequent handling of those components to prevent damage to the floor surface

1.2.1 Regulatory Status of HWMU

The HWMU, TCU, shredder, and blender are subject to the subpart X requirements of R18-8-264 governing miscellaneous units. Features of the HWMU's location, design and operations that are described in Section 4 of the WRC permit application provide the foundation for compliance with R18-8-264.601, the environmental performance standards applicable to subpart X facilities. The groundwater-protection features required to demonstrate compliance with R18-8-264.601 also demonstrate compliance with the R18-8-264.251(b) standards applicable to waste piles. To the extent that ADEQ has indicated that contingent closure, contingent post-closure and the associated financial assurance may be required, it is important to note that compliance with the R18-8-264.251(b) standards qualifies the HWMU for an exemption from the contingent closure and contingent post-closure requirements of R18-8-264.258(c)(1). The avoidance of the contingent closure and contingent post-closure requirements is the primary reason that special care will be exercised throughout closure to protect the HWMU floor and to minimize liquid contact with the floor.

The requirements of R18-8-264.251(b) apply only to the HWMU whereas the requirements of R18-8-264.601 apply to the HWMU, the TCU, the shredder and the blender. Compliance with R18-8-264.251(b) requires that there be no migration of hazardous constituents into groundwater and surface water. Compliance with R18-8-264.601 requires the prevention of any release that would cause adverse effects on human health or the environment due to migration of waste constituents in groundwater, the subsurface environment, surface water, soil, wetlands, or air. The environmental quality required by R18-8-264.251(b) and R18-8-264.601 must be met during operations and closure and at any time in the future following closure.

Persons implementing this plan will need to take greater care to prevent damage to the HWMU floor and in managing liquids on the floor than may be typically required for decontamination and removal of equipment from waste piles that comply with R18-8-264.251(a). The liner system of the HWMU is fundamentally different than the liner systems authorized by R18-8-264.251(a). As described in Section 4 of the WRC permit application, the HWMU liner system is designed and operated to prevent waste from migrating into the liner system and, therefore, does not require an LCRS for groundwater protection. The HWMU's uppermost liner component is composed of concrete pads and connecting joints that are both covered with sealants to prevent material from migrating into the liner system. The system component below the concrete pads is a soil layer for absorbing small amount of liquids, if any, that could potentially migrate through unsealed cracks

in the concrete floor before the cracks are detected and corrected. The lowermost liner component is a low-permeability membrane liner for further retarding the migration of any liquid that might have migrated through the concrete.

Section 11.7 of the Closure Plan that is included in this permit application describes the procedures for collecting and analyzing samples to determine the adequacy of the HWMU closure. Sections 11.7.1 and 11.7.2 describe sampling and analysis procedures applicable to the concrete floor and the berms surrounding the HWMU floor. Section 11.7.3 describes sampling and analysis procedures applicable to materials (primarily soil between the concrete floor and the membrane liner) and soils underlying the membrane liner.

2.0 DECONTAMINATION AND DISPOSAL CRITERIA

2.1 Decontamination Criteria

Section 3 below describes steps for preparing the HWMU for the decontamination and removal of the TCU, shredder and blender. Before those steps are completed, the floor will be free from all recyclable materials, concentrate and residues. The decontamination process described in Sections 4 and 5 below will then commence and will initially involve the lowering of components of the TCU, shredder and blender to the floor so they can be safely disassembled and decontaminated. The decontamination will be conducted in accordance with the debris treatment standards (R18-8-268.45) for all material greater than 60 millimeters (approximately 2.4 inches in size), except for material that is shipped to hazardous waste management facilities for disposal. Material shipped to hazardous waste facilities will primarily include filters used in emission control devices, materials smaller than 60 millimeters, debris not amenable to treatment in accordance with R18-8-268.45, and solid and semisolid residues resulting from the treatment of the components of miscellaneous units and ancillary equipment.

R18-8-268.45, Table 1, Part A.1 describes five authorized physical extraction technologies with associated standards. The technology considered to be the overall best technology for the non-porous portions of the miscellaneous units involves the use of "High Pressure Steam and Water Sprays" (collectively referred to as "high pressure spray"), which is described as the "Application of water or steam sprays of sufficient temperature, pressure, residence time, agitation, surfactants and detergents to remove hazardous contaminants from debris surfaces or to remove contaminated debris surface layers." Due to cost considerations and potential complications with the treatment of wash-down water, surfactants and detergents will rarely be used, if at all. Other authorized physical extraction technologies, primarily "Abrasive Blasting" or "Scarification, Grinding, and Planing," or the chemical extraction technology described below may be used, as necessary, in the unlikely event that the high pressure spray is not universally sufficient for non-porous surfaces.

Part A.2 of Table 1 describes three chemical extraction technologies. The first listed technology, "Water Washing and Spraying," is the only chemical extraction technology considered for this plan. It is described as the "Application of water sprays or water baths of sufficient temperature, pressure, residence time, agitation, surfactants, acids, bases, and detergents to remove hazardous contaminants from debris surfaces and surface pores or to remove contaminated debris surface layers." As noted above, surfactants and detergents will be used sparingly, if at all. Acidic solutions may be used in the event that the solid phase in which the contaminants are located is not sufficiently soluble in water to become dislodged from the debris surface. Acidic solutions may not be used if the reactive cyanides are present. Note that R18-8-268.45(d)(3) requires any residue from the treatment of debris that is reactive because of cyanide must meet the R18-8-268.40 treatment standards for DOO3. It is highly improbable that any residue from the treatment of the HWMU debris would be reactive due to cyanide because DOO3 wastes are not accepted at the WRC facility.

The debris treatment processes listed in Table 1, Sections A.1 and A.2.a, R18-8-268.45, with related footnotes, will be used to determine adequacy of the debris treatment. The R18-8-268.45 standards apply to debris as defined at R18-8-268.2(g) that may be sent to a non-hazardous landfill after decontamination and after a determination that the decontaminated debris complies with the criteria of R18-8-268.45 and other applicable criteria described in Section 11.4 of the Closure Plan. For equipment with metal (non-porous) surfaces, the principal decontamination method is high pressure steam and water washing as described in Section A.1.e of Table 1. The adequacy of equipment decontamination for that treatment process will be determined by inspecting the entire impervious surface to determine whether the surface meets the clean debris surface standard as described in Footnote 3, Table 1 of R18-8-268.45. Footnote 3 reads as follows:

> Clean debris surface means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits that may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area.

If the surface does not comply with the clean debris surface standard, the surface may be decontaminated until it does comply with the standard or the equipment may be shipped to a hazardous waste landfill for disposal. If the surface complies with the clean debris surface standard, the equipment may be placed in a non-hazardous landfill for disposal or it may be treated and tested in accordance with the salvage clearance procedures and criteria described in Section 2.3 below to determine if it qualifies for salvage or reuse. If the equipment does not meet the salvage clearance criteria, the equipment may be decontaminated until it does qualify for salvage or reuse or it may be placed in a non-hazardous landfill for disposal.

The canopy fabric and other porous material may be decontaminated using a water washing and spraying process as described in Section A.2.a of Table 1, R18-8-268.45. The adequacy of decontamination will be determined, as described in Section 5.6 below, by collecting samples for the analyses described in Sections 11.4.2.1 and 11.4.5 of the Closure Plan, after inspecting the fabric and determining it to be reasonably free of particles. If the fabric meets both the visual and analytical tests, it may be sent to a non-hazardous landfill. Otherwise, it may be decontaminated until it passes both tests or it may be shipped to a hazardous waste landfill for disposal.

Treatment processes described in Sections A.1.a-e of Table 1, R18-8-268.45, may be used to remove the top portions of the HWMU's floor, berm, or apron if the need for removal is indicated by the results of post-decontamination sampling and analysis described in Sections 11.7 and 11.7.1 of the Closure Plan. The entire thickness of the concrete floor may also be removed where indicated by the results of the post-decontamination sampling and analysis. Residues from the surface removal operations and larger dislodged pieces of concrete will be shipped to hazardous waste management facilities for disposal. The adequacy of removal will be determined by comparing analytical results of samples collected from the concrete, masonry material or underlying soil with applicable closure criteria of Section 11.4 of the Closure Plan. Where post-decontamination sampling indicates the need for removal, WRC will submit a report and plan of action as required by Section 11.4, 11.7, and 11.8 of the Closure Plan, prior to commencing removal or prior to commencing the preparation of a risk assessment in accordance with R18-7-06.

2.2 Salvage and Disposal Considerations

Pursuant to R18-8-264.142(a)(3), the closure cost estimate required by R18-8-264.142(a) must not reflect estimated salvage values for wastes, equipment, structures, etc. Therefore, cost estimates for the removal of recyclable materials and the products of the recycling process (generally referred to as "concentrates") have been calculated assuming that all such materials and concentrates, equal to the maximum permitted operating capacity of 4,685 cubic yards, will be shipped to a hazardous waste disposal facility, even though WRC may ship most, if not all, of the materials and concentrates to facilities where the economic value of the material

and products can be recovered. Similarly, the cost estimates for decontaminating and removing equipment from the HWMU have been calculated assuming all equipment will be sent to disposal facilities, even though WRC plans to salvage as much of the equipment as is economically practicable. The requirement not to credit the salvage value of either the equipment or the recyclable materials and concentrates causes the estimated closure cost (and related financial assurance) to far exceed probable closure costs.

Equipment and equipment components subject to this plan that are not decontaminated on site will be shipped to a hazardous waste management facility for disposal. All equipment not shipped to a hazardous waste disposal facility will be subject to high pressure spray-washing or other procedures authorized in Table 1 of R18-8-268.45 until the equipment meets the clean debris surface criteria of Footnote 3 of the aforementioned Table 1.

Equipment meeting those criteria may be shipped to a non-hazardous landfill or may be further rinsed, with rinsate tested to verify that the salvage clearance criteria listed in Table 1 below have been met. Equipment meeting those criteria may be cleared for on- or off-site re-use, or for sale as scrap. Equipment failing to meet the salvage clearance criteria may be placed in a non-hazardous waste landfill for disposal or it may be repeatedly pressure washed, or subjected to other techniques authorized in Table 1 of R18-8-268.45, until it does meet the salvage clearance criteria described in Section 2.3 below.

2.3 Salvage Clearance Procedures

2.3.1 Purpose and Scope

The procedures included in this Section 2.3 will apply only in the event that equipment and equipment components subject to the debris standards (R18-8-268.45) are determined to have sufficient salvage value to justify the additional treatment and testing required to comply with the following salvage clearance procedures. Only equipment and equipment components that have been decontaminated in accordance with Section 5 of this EDRP and determined, upon visual inspection of 100 percent of the subject surface area, to meet the clean debris surface standard of R18-8-268.45, Table 1, Footnote 3, (see Section 2.1 above), may qualify for treatment and testing under the following salvage clearance procedures. Equipment and equipment components not complying with the clean debris surface standard must be shipped to a hazardous waste management facility for disposal. Equipment and equipment components that comply with the clean debris surface standard may be shipped to a non-hazardous landfill for disposal. Only equipment and equipment components that have been processed in accordance with the salvage clearance procedures, and found to comply with the salvage clearance standards, may be cleared for salvage.

2.3.2 Equipment Processing Station

The equipment processing station will be located in the western portion of the HWMU, south of the operational area of the TCU, Shredder and Blender. The station will include at least two open tanks or plastic-lined decontamination pads with berms. Each tank and decontamination pad will be sloped so that accumulated water may be removed after samples have been collected. After all equipment is removed from the HWMU, the tanks or decontamination pads may be used for decontaminating the canopy and/or construction equipment.

2.3.3 Treatment Process

Equipment and equipment components to be decontaminated will be disassembled and cut into smaller pieces necessary to facilitate the decontamination of the metal surfaces in accordance with the procedures of Section 5. After decontamination has been completed and both surfaces of the metal have been determined to comply with the clean debris surface standard, the metal will be grouped into lots and numbered, using an organic marker, by piece and lot number. The metal will be transferred to, and processed in, the equipment processing station by lots. Before any metal is placed in a tank, the tank will be thoroughly rinsed by high pressure spray and then drained. (As discussed below, samples of the tank or decontamination pad rinse water may be collected and the analytical results compared with analytical results of the rinsate created by the

washing of the metal.) Individual pieces of each lot will be sequentially placed into an open decontamination rinse tank or pad and both surfaces of the metal will be rinsed by a high pressure spray. The rinsed metal will then be removed from the tank and temporarily placed to the side until all pieces of the lot have been rinsed.

After all pieces in a numbered lot have been rinsed, the entire lot will be transferred to the salvage staging area described in Section 5.1. After all pieces of a numbered lot have been rinsed, a grab sample of the final rinsate will be collected for analysis. The remaining rinsate will be drained from the tank or decontamination pad and conveyed to the WWTU for treatment. The tank or pad will then be rinsed using a high pressure spray and the rinse water will be conveyed to the WWTU for treatment. If the final rinsate does not comply with the salvage clearance criteria listed in Table 1 below, the metal may be rinsed further and the rinsate tested as described below, or the metal may be placed in the staging area designated for shipments to a non-hazardous landfill. Note: Metal placed in the salvage staging area may not be released until the final rinsate from that lot is tested and determined to comply with the salvage clearance criteria described below.

2.3.4 Salvage Clearance Criteria

The salvage clearance criteria are listed in Table 1 below. A grab sample (or split grab samples if required for data validation) will be collected from the final rinsate accumulated in a rinse tank or decontamination pad after both surfaces of all metal in a numbered lot have been rinsed, as described above. The collected samples will be identified by lot number, labeled, and transferred to a laboratory licensed by ADHS to perform the indicated analyses. Sample preservation, preparation of chains of custody, and collection and analysis of quality control samples will be conducted in accordance with procedures described below. Results of the laboratory analyses will be compared to the criteria listed in Table 1. Samples of tap water and samples of water following the rinsing of a tank or pad (but prior to rinsing the next lot of metal) may be collected as additional quality control samples.

Table 1. Clearance Criteria

Analyte (Total Metals)	(µg/L)	Source	USEPA Analytical Method	Detection Limit (µg/L)*
Arsenic, Inorganic	1.0E+01	MCL	200.8	1.E+00*
Barium	2.0E+03	MCL	6010B	8.7E-01**
Cadmium	5.0E+00	MCL	6010B	2.3E+00**
Chromium (Total)***	1.0E+02	MCL	6010B	4.7E+00**
Lead	1.5E+01	MCL	200.8	1.E+00*
Nickel	1.7E+01	RSL	6010B	1.0E+01**
Selenium	5.0E+01	MCL	6010B	5.0E+01**
Silver	7.1E+00	RSL	6010B	4.7E+00**

Notes:
MCL = Maximum Contaminant Level - 40 CFR 141, subpart C
RSL = Regional Screening Level - United States Environmental Protection Agency (USEPA), Region 9
µg/L = micrograms per liter

* 40 CFR 141.23
** EPA SW-846 6010B

*** If the total chromium criterion is exceeded, hexavalent chromium may be analyzed and the concentration compared to the tap water RSL of 3.1E-02 µg/L to determine compliance for chromium provided that the analytical method used has a method detection limit less than 3.1E-02 µg/L.

Laboratory reports must indicate a specific estimate, rather than just "ND," for concentrations between the method detection limit and the laboratory detection limit.
The above-mentioned USEPA test methods will be used unless superseded. If superseded, the test methods applicable at the time of closure will be used.

Records for all metal shipped off site for salvage will be maintained and included in the Closure Certification Report required under Section 11.9.2 of the Closure Plan. The records will include copies of shipping papers that identify the source of the metal (e.g., TCU, WEIMA shredder) and the number and lot number assigned to the metal prior to the metal being transferred to the equipment processing station. Information on the shipping papers will enable shipments of metals for salvage to be linked to sampling and analytical data demonstrating that the metal's final rinsate complies with salvage clearance criteria listed in Table 1.

2.3.5 Sampling and Analytical Procedures

2.3.5.1 Field Quality Control Samples

Due to the relatively small number of rinsate samples that will be required to be analyzed, data validation will not be achieved via a formal quality assurance project plan. Rather WRC will use the split sampling procedures authorized by ADEQ for projects with small numbers of samples. The actual number of samples required to be split under ADEQ's program will depend on the number of samples collected. Conservative estimates of 20 samples with 50% splits for the canopy decontamination process and 20 samples with 50% splits for the salvage clearance processes have been included in the closure cost estimate.

One field equipment blank will be collected for each sampling day. The field equipment blank will be composed of tank rinse water, i.e., water resulting from rinsing an open tank after the tank has been used for rinsing metal.

2.3.5.2 Sampling Equipment Decontamination

Non-dedicated sampling equipment will be decontaminated using a three-bucket wash and rinse methodology as described below

- Wash equipment using a solution of Alconox® or equivalent detergent and potable water contained in one 5-gallon bucket;
- Rinsing with potable water only in one 5-gallon bucket;
- Rinsing with distilled water contained in one 5-gallon bucket; and
- Air-dry the equipment.

Waste decontamination rinsate will be conveyed to the WWTU for treatment.

2.3.5.3 Sample Containers, Preservation, and Holding Times

Table 2 lists the required sample containers, preservatives, and recommended maximum holding times for each analyte and method. Sample containers provided by the analytical laboratory will be clean virgin bottleware. Stick-on labels will be affixed to containers. These labels will indicate any preservative added to the containers by the laboratory.

Table 2. Required Sample Containers, Preservation, Volumes and Holding Times for Salvage Rinsate Samples

Analytes (Total Metals)	Analytical Method	Container	Preservation	Holding Time
Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium (Total), Lead, Nickel, Selenium, Silver and Thallium	USEPA Test Methods 6010B and 200.8	I liter polyethylene, fluoropolymer, or glass container	HNO_3 to pH<2 or at least 24 hours prior to analysis	6 months
Mercury	USEPA Test Method 245.1	I liter polyethylene, fluoropolymer, or glass container	HNO_3 to pH<2	28 days

Notes:
USEPA = United States Environmental Protection Agency
The above-mentioned USEPA test methods will be used unless superseded. If superseded, the test method applicable at the time of closure will be used.

2.3.5.4 Sample Handling and Storage

Each sample container will be marked with the sampling location number, date, and time of sample collection. Sample containers containing samples will be wiped with paper towels to remove extraneous materials and placed in a cooler on ice in preparation for delivery to the laboratory. Glass containers will be securely packed in plastic bubble bags and re-sealable plastic bags. In addition to the chain- of-custody documents, samples taken and delivered to the laboratory will be recorded in a log with the time, date, and other pertinent information.

Upon laboratory receipt of the samples, the laboratory will immediately notify WRC if conditions or problems regarding the samples are identified that require immediate resolution. Such conditions may include container breakage, leakage, missing or improper chain-of-custody documents, sample holding time exceedances, missing or improper sample labeling, or frozen water samples. Such problems will be recorded by WRC in the sample log.

2.3.5.5 Chain of Custody

For each sample to be submitted to the laboratory for analysis, an entry will be made on a chain-of-custody form supplied by the laboratory. The information to be recorded includes the sampling date and time, sample identification number, matrix sampled, requested analytes and methods, preservatives, and sampler's name. Sampling team members will maintain custody of the samples until they are relinquished to laboratory personnel or a sample courier. The chain-of-custody form will accompany the samples from the time of collection until they are received by the laboratory. Each party in possession of the samples (except the professional courier service) will sign the chain-of-custody form signifying receipt. A copy of the original completed form will be provided by the laboratory along with the report of results. The chain-of-custody form will be placed in a plastic bag and shipped with samples inside the cooler. After the samples, ice, and chain-of-custody forms are packed in the coolers, custody seals will be placed on the lid of each cooler before the cooler is relinquished to the professional courier service. Custody seals provide assurance that the samples are not tampered with during transportation to the laboratory. Upon receipt, the laboratory will inspect the condition of the custody seals and report the information on the chain-of-custody form. Provisions of 40 CFR § 261.4(d) apply to samples collected at closure.

2.3.5.6 Sample Documentation

Information will be recorded on chain-of-custody forms, sampling log sheets, and a field notebook. The field notebook is used to keep a diary of field activities and to record pertinent data that are not included on the chain-of-custody form or the sampling log sheet. The information recorded on the sampling log sheets includes the following:

- Sample identification number (including Lot Number) recorded on the container label;
- Tank or pad identification number;
- Sampling equipment used;
- Rinsate conditions (color, visible solids);
- Sampling time; and
- Identification of split duplicate samples, including identification of the laboratory receiving the split samples and the laboratory receiving the primary samples.

2.3.6 Recordkeeping

Records will be maintained and included in the Closure Certification Report required under Section 11.9.2 of the Closure Plan for all metal shipped off site for salvage. The records will include copies of shipping papers that identify the source of the metal (e.g., TCU, WEIMA shredder) and the number and lot number assigned to the metal prior to the metal being transferred to the equipment processing station. Information on the

shipping papers will enable shipments of metals for salvage to be linked to sampling and analytical data demonstrating that the metal's rinsate complies with salvage clearance criteria listed in Table 1.

3.0 PRE-DECONTAMINATION AND REMOVAL ACTIVITIES

This section describes, in a stepwise fashion, the activities that will be required to prepare the HWMU for the decontamination and removal of equipment and equipment components.

1. All 4,685 cubic yards of recyclable material and concentrate, and all materials collected in filters and discharge bins described in Step 2 below will be removed from the HWMU and transported to a hazardous waste management facility in accordance with United States Environmental Protection Agency (USEPA) and United States Department of Transportation (USDOT) regulations for disposal as hazardous waste.
2. The TCU, shredder, and blender will be operated "empty" momentarily to ensure that loose residues will be removed from the process equipment and either collected in discharge bins or captured in the appropriate emission control units.
3. All power lines to the shredder, blender, TCU, and any other equipment within the HWMU and TCU control room will be de-energized, disconnected, and physically removed from the process area in order to limit potential electrical hazards to the lighting and equipment being used to disassemble and decontaminate equipment and ancillary material.
4. All piping that supplies gas, agglomerating agents, water, or other material to the TCU, shredder, blender and ancillary equipment will be blocked, disconnected, and capped at the point of entry to the HWMU. Unless the piping conveyed hazardous waste, only the outer surfaces of the removed and drained piping will be required to be decontaminated.
5. Temporary power and water lines will be re-established as necessary for equipment disassembly and decontamination operations.
6. Residues remaining on the HWMU floor and the sides of the berms facing the HWMU will be removed by sweepers and/or high pressure spray. All solid and semi-solid residues will be containerized and transported to a hazardous waste management facility for disposal. All liquids produced by the spray will either be squeegeed to collection points where the liquid will be removed or will be vacuumed near the point of generation. All such liquids will be conveyed to the WRC wastewater treatment facility or to a commercial wastewater treatment facility.
7. After all residues have been removed from the HWMU floor and berms, the floor and berms will be inspected for damage that might allow the migration of waste constituents into the subsurface or adjacent soils.
8. Damage to berms or the sealed concrete floor that might allow the migration of waste constituents through the concrete floor or berms will be repaired.
9. An inspection and repair log will be maintained to identify locations where damage to the sealed concrete floor was observed and to record actions taken to repair the damage.

4.0 GENERAL DECONTAMINATION PROCEDURES

This section provides a general description of the procedures that will be used, after activities described in Section 3 have been completed, for lowering components of the TCU, shredder, and blender and related equipment components" and ancillary material to the HWMU floor and for decontaminating equipment and structural components. Section 5 provides unit-specific procedures for the decontamination and disposal of the TCU, shredder, standby shredder, blender, two agglomerating tanks, ancillary material, TCU control room, and the fabric canopy. Section 5 also describes the last steps in the decontamination and disposal process: decontaminating the HWMU's floor and berms, decontaminating the wastewater treatment facility;

and preparing a report documenting the decontamination of the HWMU, TCU, shredders, blender, agglomerating tanks, and ancillary equipment.

As explained in the Closure Plan, Section 11.4.2 has been divided into 3 subsections which describe in summary fashion the procedures and the criteria that must be used to determine whether decontaminated equipment and structural components meet applicable requirements of the Closure Performance Standards described in Section 11.4. Each subsection is briefly discussed below because the decontamination procedures described in this section and Section 5 below must meet the Closure Performance Standards.

Section 11.4.2.1 describes the decontamination procedures and criteria for qualifying equipment and structural components for disposal in a non-hazardous landfill. Equipment and structural components that do not qualify for disposal in a non-hazardous facility must be shipped to a hazardous waste management facility for disposal. Metal equipment and structural components must be decontaminated using procedures described in R18-8-268.45, Table 1, Parts A.1a and A.2.a and meet the clean debris surface standard (R18-8-268.45, Table 1, Footnote 3). High pressure spray, a technique specified in Part A.1.a of Table 1, will be the primary decontamination process for metal. A soak-and-rinse process specified in Part A.2.a, will be used to decontaminate canopy fabric. The criteria to be used to determine adequacy of decontamination is based on the analysis of rinsate as described in Section 5.6 below. The metal and canopy fabric may be repeatedly decontaminated until the criteria are met.

Section 11.4.2.2 describes decontamination procedures and criteria for qualifying equipment and structural components for salvage or reuse, collectively referred to as "salvage." Only metal, that has been determined to meet the clean debris surface standard, may be considered for the additional decontamination and testing required for the metal to qualify for salvage. To qualify for salvage, the metal must be pressure washed at least once after it has been determined to meet the clean debris surface standard. Samples of the resulting rinsate will then be analyzed and the results compared to the MCLs and RCLs listed in Table 1 of Section 2.3.4 above. If the concentrations are less than or equal to the specified criteria, the metal will be deemed qualified for salvage. The metal may be repeatedly decontaminated until it qualifies for salvage. Alternatively, it may be shipped to a non-hazardous landfill for disposal. Section 2.3 above provides details specifically for decontaminating and testing for salvage.

Section 11.4.2.3 describes non-destructive decontamination procedures and related criteria applicable to equipment and structural components that are not intended to be disposed or salvaged during closure. The principal difference between the non-destructive decontamination procedures and the salvage clearance procedures discussed above is that disassembly is not required for equipment eligible for non-destructive decontamination. Equipment eligible for the non-destructive procedures must not have closed interior surfaces in contact with recyclable material. The exterior surfaces of equipment and structures eligible for non-destructive decontamination must be decontaminated, determined to be a clean debris surface, and tested via rinsate procedures in the same manner and sequence as required for process equipment except that the clean debris surface standard does not apply to porous surfaces.

4.1 Lowering Equipment Components to the HWMU Floor

The procedures described in this section will be implemented after activities described in Section 3 have been completed. The procedures apply to lowering components of the TCU, shredder, standby shredder, blender, and ancillary equipment to the HWMU floor and decontaminating the equipment components and ancillary material. Section 5 provides unit-specific procedures for the decontamination and disposal of the TCU, shredders, blender, agglomerating tanks, ancillary material TCU control room, and the fabric canopy. Section 5 also describes procedures for decontaminating the wastewater treatment facility. It also includes non-destructive procedures for equipment such as mobile equipment and for exterior surfaces of walls.

1. Two man lifts will be used to provide access needed to disconnect the elevated wiring and piping that connect the components and ancillary material (ducts, fans, and emission control devices).
2. One telescoping crane will be located immediately outside the HWMU and will be used in conjunction with the man lifts to dismantle and lower to the floor all components and ancillary equipment. The crane will not be needed to lower the fabric canopy covering the HWMU. Pieces of wood may be used to protect the floor sealant from the sharp pieces of equipment. (Any wood used to protect the floor from equipment that has not been decontaminated will be subject to disposal as a porous material.)
3. The lowered equipment components and ancillary material will be placed on portions of the floor in the northwestern section of the HWMU, designated as decontamination areas, with sufficient space allowed for the components and ancillary material to be accessed by equipment needed to assist in exposing inner and outer surfaces of the components and ancillary material to high pressure spray for decontamination purposes.
4. After the equipment components have been removed from the process area, the equipment's supporting structures will be removed and transferred to the decontamination areas. The structures will be disconnected from floor plates by removing connecting bolts or pins. Care will be exercised during the lowering of the equipment components and the removal of supporting structures not to damage the HWMU floor and to promptly repair any damage that might occur.

4.2 Disassembly and Decontamination of Equipment Components and Ancillary Material

1. Traffic control signs, floor vacuums, booms, and squeegees will be used during decontamination operations to prevent spent wash water from spreading beyond the designated decontamination areas and across the HWMU floor in an uncontrolled manner.
2. Equipment components and, except as described below, each piece of ancillary material will be disassembled using cutting torches to expose the inner and outer surfaces of the components and ancillary material to high pressure spray.
3. All decontamination activities will be conducted in designated areas as described in Section 5 below. After the decontamination activities have been completed and the metal and canopy fabric have been inspected, they will be transferred to designated areas described in Section 5.1 below.
4. After all components and ancillary material described above have been removed from the HWMU, the fabric canopy will be removed and decontaminated using a soak-and-rinse technique described in Section 5.6 below.

5.0 DECONTAMINATION

This section provides unit-specific information regarding the lowering of components of the TCU, shredder, and blender to the HWMU floor. This section also includes procedures for the decontamination of all components, ancillary materials, the TCU control room, the fabric canopy, the HWMU floor and berms, and the wastewater treatment unit.

Note: This section describes procedures for decontamination required under Section 11.4.2.1 of the Closure Plan to qualify equipment and structural components for disposal in non-hazardous landfills. Equipment and structural components that fail to qualify for disposal in a non-hazardous landfill may be repeatedly decontaminated until qualified. Otherwise, the equipment and structural components must be shipped to a hazardous waste management facility for disposal. Consistent with Section 2.3 above, equipment and structural components qualified for disposal in a non-hazardous landfill may be decontaminated and tested in accordance with Section 11.4.2.2 to determine whether it qualifies for salvage. Non-destructive decontamination and testing procedures described in Section 11.4.2.3 may be used for structures and equipment that are intended to be used in their present form following the HWMU's closure.

Photographs of the HWMU, WEIMA shredder, blender, and TCU are attached to this plan, respectively, as Figures 11-A.1 through 11-A.4. Additional information regarding the design and operation of the HWMU, TCU, shredders and blender is provided in Section 4 of the WRC permit application, and in appendices to the application.

Unless site conditions dictate otherwise, the disassembly and decontamination of major pieces of equipment will be conducted in the following order: shredder, blender, TCU, TCU control room, and fabric canopy. Care will be exercised when the equipment components and supporting structures are being disconnected from the floor to minimize damage to the concrete and to ensure that voids in, or damage to, the concrete caused by the removal of the supports will be promptly sealed.

5.1 Designated Decontamination and Staging Areas

1. Decontamination areas – Decontamination areas will be designated in the northwestern portion of the HWMU and will be used for the disassembly and decontamination of equipment components. The areas will be south of the process area in which the TCU, shredder and blender are located so that contamination resulting from equipment removal, disassembly, and decontamination can be confined to the process area and downslope areas in the western portion of the HWMU.

2. Decontamination processes – Decontamination will primarily involve high pressure spray for large equipment components and soak and rinse for porous components and smaller components that are unable to withstand high pressure spray. Plastic curtains strung on frames with rollers may be used as backdrops to control spray drifts. Spent water (rinsate) from spraying operations and from soak-and-rinse operations will be controlled to minimize the rinsate's contact with the HWMU floor. Rinsate from spraying operations will be contained by booms. Spray drift outside the boomed areas and rinsate in the boomed areas will be removed by vacuum sweepers or directed to collection points by squeegees where the rinsate will be removed by vacuum sweepers or by pumps.

Unless it would be useful in washing down decontamination areas, rinsate from soak-and-rinse operations will not be released to the floor but will be conveyed via hoses or in containers to collection points where the rinsate will be removed by vacuum sweepers or by pumps. All rinsate from vacuum sweepers and from collection points will be transferred to the on-site wastewater treatment facility for treatment. In the event that the rinsate cannot be adequately managed at the treatment facility, the rinsate will be sampled and analyzed according to the characterization requirements of an off-site disposal or recycling facility selected by WRC, and the rinsate will be transferred to the selected facility in accordance with rules governing that facility's operations.

3. Staging areas - Three staging areas will be designated in the central and eastern portions of the HWMU. One of the staging areas will be used to temporarily store materials prior to shipment to hazardous waste management facilities. Such material may be transferred directly from the HWMU process area, or it may be transferred from a decontamination area with or without decontamination and inspection. Decontaminated equipment components and ancillary materials may be transferred to the two remaining staging areas after the components and materials have been inspected and found to be free of hazardous waste residues. If the equipment components and ancillary materials are found not to be free from hazardous waste residues, they may be subjected to additional decontamination until they are found to be free from hazardous waste residues, or they may be transferred to the designated hazardous waste staging area.

One of the two designated staging areas for non-hazardous waste will be used exclusively for equipment components and ancillary materials proposed for salvage. The other staging area will be used exclusively for equipment components and ancillary materials scheduled for disposal in a non-hazardous landfill. Before the following procedures may be implemented, the shredder, blender, TCU, TCU control room and ancillary material must be inspected to confirm that all power lines and piping have been disconnected as described in Section 3.

5.2 Shredder

The following describes the principal steps that will be used for lowering and decontaminating the WEIMA ZMK-40 series shredder that is shown on Figure 11-A.2. The following also applies to the standby shredder except that Step 1 will not be required for the standby shredder if it is not in service at time of closure.

1. All ancillary material such as wiring, conduits and the duct (4) leading from the hood enclosure to the emission control unit on the blender (not shown on Figure 11-A.2) will be removed and lowered to the floor.
2. The hopper (2) and hood enclosure (1) will be removed from the base of the shredder unit (3) and lowered to the floor.
3. All electric motors will be removed from the shredder unit (3).
4. The shredder (3), collection bin (6) and metal guard (5) or will be removed from the base unit.
5. Bolts/pins connecting the base unit to the floor will be removed, and the concrete will be sealed if the need is indicated.
6. All disassembled components, including the base unit, will be moved to a decontamination area and disassembled further as needed for successful decontamination.
7. High pressure spray will be used to decontaminate inner and outer surfaces of larger pieces of equipment components and ancillary material and the soak-and-rinse process will be used to decontaminate smaller pieces.
8. All decontaminated metal will be subject to a 100 percent visual inspection to determine if the decontamination resulted in a clean debris surface as defined at R18-8-268.45, Table 1, Footnote 3.
9. In the event that the standby shredder is removed from the WRC facility before final closure, a closure report must be submitted to ADEQ within 45 days following the removal. The report must include data showing that the shredder was decontaminated and inspected in accordance with R18-8-268.45 and treated and tested in accordance with procedures described in Section 2.3 above. The report must also include shipping papers identifying the receiving facility.

5.3 Blender

The following outlines the principal steps for lowering and decontaminating the blender that is shown on Figure 11-A.3. The blender, manufactured by the Scott Equipment Company, is a horizontal paddle mixer.

1. The duct (3) connecting the shredder shown in Figure A-11.2 to the blender hood enclosure (2) will be disconnected and lowered to the floor along with associated wiring and conduits.
2. The hood enclosure (2) and Arrestall dust collector (4) will be disconnected from the blender and lowered to the floor.
3. The filter media will be removed from the hood enclosure (2) and the Arrestall dust collector (4) and placed in containers for transfer to the hazardous waste staging area and shipment to a hazardous waste management facility for disposal.
4. The duct (3), hood enclosure (2), and Arrestall dust collector (4) will then be transferred to a decontamination area where cutting torches will be used to expose the inner and outer surfaces to high pressure spray.
5. The blender drive unit (1) will be disconnected and lowered to the floor.
6. The blender, the unit between the drive unit (1) and the hood enclosure (2) will be disconnected and lowered to the floor.
7. The paddles and paddle shaft will be removed from the blender, the housing will be dismantled and the dismantled pieces will be cut into smaller pieces, as needed, to facilitate transfer to a decontamination area.
8. High pressure spray will be used to decontaminate inner and outer surfaces of larger pieces of equipment components and ancillary material, and the soak-and-rinse process will be used to decontaminate smaller pieces.

9. All decontaminated metal will be subject to a 100 percent visual inspection to determine if the decontamination resulted in a clean debris surface as defined at R18-8-268.45, Table 1, Footnote 3.

5.4 TCU

The following describes the principal steps for lowering the TCU (shown on Figure 11-A.4) to the HWMU floor and for moving the TCU components to a decontamination area where they will be decontaminated.

1. Ducts 7, 8, 9 and the duct (not numbered) leading from the blower to the top of the burner chamber (4) will be disconnected and moved to a decontamination area where the burner chamber and ducts will be disassembled and decontaminated using high pressure spray on the inner and outer surfaces of all components, except that only the outer surface of the gas burner and associated piping will be subject to decontamination.
2. The duct (not shown) leading from the MAC baghouse (5) to the stack fan will be disconnected and lowered to the HWMU floor. The fan, the fan's electric motor, the fan housing, and the duct leading from the fan to the secondary air filter unit will be disconnected and lowered to the floor. The disconnected components will be moved to a designated decontamination area, where inner and outer surfaces will be exposed to high pressure spray.
3. Filter media will be removed from the secondary filter unit at the base of the stack and placed in containers for shipment to a hazardous waste management facility.
4. The stack will be lowered to the floor and moved to a designated decontamination area where a cutting torch will be used to cut the stack lengthwise into two approximately equal parts to expose both the inner and outer surfaces to high pressure spray.
5. The housing for the secondary filter unit (located at the base of the stack) will be lowered to the floor and moved to a decontamination area for disassembly and decontamination.
6. The feed vat (2), extrusion screw, and extrusion screw housing will be removed from the drying chamber and moved to a decontamination area for disassembly and decontamination.
7. The duct (9) leading from the drying chamber to the MAC baghouse will be disconnected, lowered to the floor, and moved to a decontamination area for disassembly and decontamination.
8. The drying chamber (3) will be lowered to the floor and moved to a decontamination area for disassembly and decontamination.
9. Filters will be removed from MAC baghouse (5) and placed into containers for shipment to a hazardous waste management facility.
10. The granulator conveyor will be disconnected from the baghouse hopper, lowered to the floor, and moved to a decontamination area for disassembly and decontamination.
11. The baghouse will be disconnected from the hopper, lowered to the floor, and then moved to a decontamination area for disassembly and decontamination.
12. The baghouse hopper will be disconnected from the supporting structure, lowered to the floor and moved to a decontamination area for disassembly and decontamination.
13 All structures supporting TCU components will be disconnected from the floor and transferred to a decontamination area.
14. Remaining components will be moved to a decontamination area and disassembled further, as needed for successful decontamination.
15. The floor in the process area will be checked for damage and repaired, as needed.
16. High pressure spray will be used to decontaminate inner and outer surfaces of larger pieces of equipment components and ancillary material and the soak-and-rinse process will be used to decontaminate smaller pieces.
17. All decontaminated metal will be subject to a 100 percent visual inspection to determine if the decontamination resulted in a clean debris surface as defined at R18-8-268.45, Table 1, Footnote 3.

5.5 TCU Control Room

1. All equipment will be removed from the control room and moved to a decontamination area for disassembly and decontamination.
2. Floor covers, walls and ceiling/roof will be dismantled and moved to a decontamination area for decontamination.
3. High pressure spray will be used to decontaminate inner and outer surfaces of larger pieces of walls, ceiling and other components of the control room and the soak-and-rinse process will be used to decontaminate smaller pieces.
4. All decontaminated metal will be subject to a 100 percent visual inspection to determine if the decontamination resulted in a clean debris surface as defined at R18-8-268.45, Table 1, Footnote 3.

5.6 Canopy

The HWMU canopy includes fabric panels covering the entire floor area and all four sides of the HWMU. The portion of the canopy that covers the floor area is formed by 91 panels approximately 22 feet above the floor, with each panel being approximately 43.6 feet by 43.6 feet. The panels weigh approximately 65 to 100 pounds, with heavier weights associated with the panels that include side panels. The panels will be removed and cut into pieces of a size that can be effectively accommodated in the one soak and two rinse containers (tanks). Consistent with the requirements of Table 1, Section 1.A.2, of R18-8-268.45, the total time that the fabric will be in contact with water in the soak and rinse tanks will be no less than 15 minutes.

After removal from the second rinse tank, the decontaminated portion of the canopy panel will be inspected to determine the adequacy of the decontamination process. If the panel's fabric does not visually appear to be reasonably free from the type of particles typically observed on the canopy prior to decontamination, it will be returned to the decontamination process as many times as necessary to become reasonably free of the particles. Once a sufficient amount of the canopy has been determined to be visually free of particles, a one-square foot sample of the canopy fabric will be collected from each 5,500 square feet of fabric and transferred to a laboratory licensed by the ADHS for analysis of metals using the methods specified in Section 11.4.5 of the Closure Plan. The sample will be collected from a portion of the fabric that appears to include the heaviest concentration of particles most likely to contribute to elevated metal concentrations. USEPA Method 3050 may be used for metal extraction instead of Method 1311 provided the concentrations do not exceed values allowed under the "20 times" rule, as explained in Section 11.4.5 of the Closure Plan.

Sampling at a rate of one sample per 5,500 square feet of fabric is expected to yield three samples per 15-cubic yard load. If the average concentration of any metal in the three samples in each load exceeds the applicable Section 11.4.5 criteria, the entire load will be returned to the decontamination process as many times as necessary to the criteria. Alternatively, the fabric may be shipped to a hazardous waste management facility for disposal. Exceedances of the Section 11.4.5 criteria are not considered likely because the generally impervious nature of the canopy fabric will reduce the potential for metals in the dust particles from migrating into the fibers.

After a portion of the canopy has been sampled, it will be allowed to drain and dry by placing the fabric on temporary racks constructed of equipment supports removed from the process area or constructed of similar material. Once reasonably dry, the fabric may be placed on a rinsed portion of the concrete floor until laboratory results are obtained. If the results indicate the concentrations of TCLP metals in the sample of fabric are less than or equal to the applicable Section 11.4.5 criteria, the fabric may be transported to either a hazardous waste or a non-hazardous waste landfill for disposal. If the concentrations exceed the criteria just described, the fabric may either be returned to the decontamination process for further decontamination and testing or it may be shipped to a hazardous waste facility. Rinsate from the decontamination process will be transferred to the WWTU for treatment and solid residues will be shipped to a hazardous waste management facility as described in Section 5.8 below.

The canopy's metal supports will be subject to the same procedures as other metal equipment components for qualifying for disposal in a non-hazardous landfill and for qualifying for salvage.

5.7 Decontamination and Removal of Remaining Containers and Equipment

The non-destructive decontamination procedures described in this section apply to equipment and structural components that are intended to be used in their present form after closure. Examples of items to be decontaminated include outer surfaces of the two agglomerating tanks, earthmoving equipment and exterior surfaces of walls designated by ADEQ. Equipment eligible for the non-destructive procedures must not have closed interior surfaces in contact with recyclable material. The exterior surfaces of equipment eligible for non-destructive decontamination are required to be decontaminated, determined to be a clean debris surface, and tested via rinsate procedures in the same manner and sequence as required to qualify metal equipment components for salvage.

Implementation of the procedures in this section will require careful placement of plastic liners to capture and dispose of rinsate generated during the initial decontamination process. Before the spraying to demonstrate compliance with the rinsate criteria can begin, the liners will need to be replaced or thoroughly cleaned so that the quality of the rinsate will not be affected by a contaminated liner.

The following applies to all material treated in accordance with this section, including exterior surfaces of walls. After, the material has been decontaminated by the spraying operation, the entire exterior surface will be visually inspected. If the inspection indicates that the surface does not meet the clean debris surface standard (R18-8-268.45, Table 1, Part A.1, Footnote 3), additional high pressure spray or other techniques authorized under Part A.1 of Table 1 will be used until the standard is met, or the material must be shipped to a hazardous waste management facility for disposal. If the clean debris surface standard is met, the surface will be rinsed again and then the plastic liner will be replaced or thoroughly washed to provide a clean rinsate collection device. The material will again be subjected to high pressure wash and samples of the rinsate will be collected for analysis. The analytical results will be compared to the criteria listed in Table 1 of the EDRP's Section 2.3.4 to determine compliance with the criteria. If the rinsate does not meet all criteria, the material will be further decontaminated until all of the criteria are met or, alternatively, the material may be removed and placed in a non-hazardous waste landfill.

5.8 Residue Removal

After all equipment components and material transferred to the staging areas have been shipped off site in accordance with this plan, all remaining residues on the HWMU floor, including any residue remaining in the sump used to collect water from the washing of truck tires, and residues on the berm walls facing the floor will be removed with sweepers, vacuum sweepers, and high pressure spray. Solid residues will be collected and shipped to a hazardous waste management facility. Rinsate will be removed by vacuum sweepers and transferred to the WRC wastewater treatment facility or directed to collection points where it will be transferred to the wastewater treatment facility.

5.9 Inspection and Repair of HWMU Floor

The HWMU floor and the surrounding berm and apron will be inspected for damage to the concrete or seals. Each location where damage is noted will be marked and the nature of the damage will be recorded. Damaged concrete and seals will be repaired and the nature and the date of the repairs will be recorded.

5.10 Residue Removal from the WRC Wastewater Treatment Facility

Solid and semi-solid treatment residues that are generated by the WWTU as a result of processing of stormwater and decontamination rinsate generated during closure will be containerized. Pending the results of waste characterization, these containers will be temporarily stored in a 90-day accumulation area until they are removed from the property for appropriate disposal. A composite sample will be prepared using material obtained from each container, and analyzed by an ADHS- certified laboratory for the following constituents:

- Leachable arsenic, barium, cadmium, chromium, lead, selenium, and silver using USEPA Test Methods 1311 (sample preparation) and 6010 (sample analysis).
- Leachable mercury using USEPA Test Methods 1311 (sample preparation) and 7470 (sample analysis).

Decontamination of the WWTU equipment interior surfaces should be conducted prior to equipment exterior surfaces, unless provisions are made for a follow-up round of decontamination (e.g., in the event that decontamination rinsates from a tank interior are inadvertently released to equipment exterior surfaces, thereby re-contaminating equipment exterior surfaces).

Decontamination of the WWTU secondary containment will be done following decontamination of WWTU exterior surfaces.

High pressure water spray will be used to decontaminate WWTU interior and exterior surfaces, as well as the WWTU secondary containment. In general, rinsing of interior surfaces of WWTU equipment should be conducted in the same sequence in which wastewater typically flows through the WWTU. Using this strategy, the discharge piping leading from the HWMU to the WWTU would be decontaminated first, following by the various holding tanks that are used to temporarily accumulate wastewater, following by tanks used for treatment, followed by solids handling equipment. Triple-rinsing will be used to facilitate removal of rinsate and solid residues from each tank and piping section.

Verification of decontamination will be based on documented completion of the above-described decontamination procedures. Sampling of the concrete secondary containment will not be performed. No portion of the WWTU will be disassembled to facilitate the decontamination or verification processes. Following decontamination, the WWTU may be left in place, and may continue to be used by WRC or another, future owner of the property, pending acquisition or transfer of appropriate permits. Should the WWTU be decommissioned and dismantled following decontamination, the decommissioning and dismantling process and the final disposition of equipment are not subject to any requirements under this Closure Plan.

Decontamination rinsate will be stored in temporary tanks (e.g., Baker Tanks), pending sampling and analysis for waste characterization. Samples will be analyzed by an ADHS-certified laboratory for the same constituents identified above, and any other constituents required by the current Waste Water Discharge Permit. Following receipt of analytical results, the WWTU decontamination rinsate will be transported for treatment and disposal at an appropriate off-site facility. Alternatively, the rinsate may be discharged to the publicly owned treatment works if it complies with applicable standards set forth in WRC's pretreatment permit.