

ATTACHMENT C
WASTE ANALYSIS PLAN

1.0 INTRODUCTION

1.1 Objective of the Waste Analysis Plan

This Waste Analysis Plan (WAP) describes waste analysis operations at Veolia ES Technical Solutions, L.L.C. (VES) waste mercury containing manufactured articles storage and recycling facility. This WAP has the following objectives:

1. Establish a reliable and consistent internal management mechanism for properly identifying and accepting mercury waste brought to VES for recycling.
2. Describe key waste analysis procedures that will be followed to illustrate that VES's Storage and Processing/Recycling facility will be operated in accordance with the requirements of Title 40 of the Code of Federal Regulations (CFR) and Arizona Administrative Code (A.A.C.) R18-8-264.
3. Facilitate compliance with documentation requirements under RCRA and Arizona environmental regulations.
4. Reduce VES's possible future liability by preventing improper handling or unsound management of wastes, which may cause an environmental incident or violation of applicable regulations.

This WAP has been prepared in accordance with the EPA guidance document *Waste Analysis at Facilities that Generate, Treat, Store, and Dispose of Hazardous Waste*, April 1994 (EPA 530-R-94-024).

1.2 FACILITY IDENTIFICATION

Company Name:	Veolia ES Technical Solutions, L.L.C.
Facility Location:	5736 West Jefferson Street Phoenix, Arizona 85043
Telephone Number:	(602) 233-2955
Facsimile Number:	(602) 233-6883
EPA Identification Number:	AZ0 000 337 360

2.0 Acceptance/Rejection Criteria

2.1 Waste Acceptance Procedures

All lamps and mercury-containing devices are received through a transporter with an EPA identification number, as required by R18-8-263(A) through (C) (40 CFR 263), unless:

- The wastes are shipped directly from a generator classified as a conditionally exempt small quantity generator [R18-8-261.A, E, F, and G (40 CFR 261.5)];
- The wastes are subject to the household waste exclusion in accordance with R18-8-261.A (40 CFR 261.4(b)(1)). This exclusion includes those household-generated lamps collected by municipalities pursuant to household hazardous waste collection programs;
- The generator is classified as a small quantity generator and complies with R18-8-261.A (40 CFR 262.20(e));
- The mercury containing manufactured articles meet the definition of Universal Waste and are handled by the generator as universal waste pursuant to 40 CFR 273;
- The generator has submitted a completed material profile sheet certifying the waste as non-RCRA regulated waste.

Prior to shipping waste to VES, generators and/or handlers provide VES with the specification of the shipment. VES then completes the appropriate manifest or Bill of Lading and returns it to the generator and/or handler of the waste to be included with the shipment.

VES uses a tiered process to evaluate and sort waste into three different categories of approvals:

- Standard Approvals, this category applies to universal wastes. Standard material profiles have been developed for these wastes and are maintained on file at the facility.
- Generic Approvals, this category applies to materials that are not federal universal wastes, will vary between generators and are subject to varying degrees of regulation, requiring additional review and evaluation.
- Case-by-case Approvals, this category applies to waste that may vary between generators and is subject to a detailed review of the physical and chemical properties of the material prior to approval.

2.1.a. Standard Approvals

Generators with waste subject to standard approvals are not required to submit a site specific waste material profile sheet. Once VES has been notified by a generator that they wish to ship materials subject to the standard approvals process, the generator's information will be recorded and the generator will be notified in writing that VES has the appropriate licenses and processing

capabilities to accept their material for recycling.

2.1.b. Generic Approvals

Generators shipping materials in the generic approvals category are required to submit a site specific waste material profile sheet. The waste material profile sheet must provide specific information regarding the identity, physical and chemical properties, and the regulatory status of the waste. This information is reviewed by the facility manager or his designee to ensure that the material can be recycled at the facility. Once the material has been approved the generator will be notified in writing that the facility has the appropriate licenses and the processing capabilities to accept the waste.

2.1.c. Case-by-case Approvals

Generators shipping waste in the case-by-case approvals category will be required to submit a site specific waste material profile sheet. The waste material profile sheet must contain specific information regarding the, physical and chemical properties, and the regulatory status of the waste. This information will then be reviewed by the facility manager or his designee and by corporate approvals staff to ensure that the material can be recycled at the facility. Once the material has been approved the generator will be notified in writing that the facility has the appropriate licenses and the processing capabilities to accept the waste.

The written generator notification as required under A.A.C.R18-8-264.A(40 CFR 264.12(b)) may vary from generator to generator depending on the type of material that the generator is shipping to VES and the type of contract/arrangements that the generator has in place. This notification may take the form of an Approval Letter, be contained in a Quotation, printed directly on packaging materials provided to generators by VES, or some other form of written communication as deemed appropriate at the discretion of the facility.

Since the facility only accepts mercury containing manufactured articles, clean up articles and PPE from handling of manufactured articles, generator knowledge will typically be sufficient to properly characterize the waste. If at any point during the approvals process, analytical testing is needed to provide additional information, generators will be required to submit analytical data obtained using methods specified by the U.S. EPA or ADEQ as applicable. A list of the waste category and its applicable approval method is provided below:

Table C.1- VES Classification Code and Waste Classification Description and Approval Type

CLASS LAMPS	Waste Category	Acceptance Category
LP-F	Fluorescent Lamps	Standard
LP-FCIRC	Circular Fluorescent Lamps	Standard
LP-FCMP	Compact Fluorescent Lamps	Standard
LP-FDM	Crushed Lamps	Generic
LP-FSS	Shielded Fluorescent Lamps	Standard
LP-FUT	U-Tube Lamps	Standard
LP-FUV	UV Fluorescent Lamps	Standard
LP-H	HID Lamps	Standard
LP-MH01	Metal Halide Lamps	Standard
LP-MISC	Miscellaneous Specialty Lamps	Case-by-case

CLASS LAMPS	Waste Category	Acceptance Category
LP-MV01	Mercury Vapor Lamps	Standard
LP-NEON	Neon Lamps	Standard
LP-SHP	High Pressure Sodium Lamps	Standard
MCMA		
MC-BATT	Mercury Batteries	Standard
MC-COMP	Inorganic Mercury Compounds	Case by Case
MC-AMALG	Dental Amalgam	Generic
MC-DE-RE	Mercury Contaminated Clean Up Articles and PPE	Case by Case
MC-HG	Mercury	Generic
MC-HGREG	Mercury Containing Gas Regulators	Generic
MC-LABPACK	Mercury Containing Labpacks, used for packages contained mixed types of acceptable waste	Case by case
MC-MA	Mercury Containing Articles	Generic
MC-PD	Phosphor Powder	Case by Case

Upon arrival of a shipment at the VES facility, the following sequence of events occurs:

- a. The truck is directed to the receiving dock where all containers are visually inspected to ensure the contents match the profile and shipping paperwork. The shipping documents may consist of a Bill of Lading or a hazardous waste manifest and Land Disposal Restriction (LDR) form.
- b. If the shipment conforms to the material profile, the shipping document is signed and the truck off-loaded using forklifts and staged in the receiving area inside the building for verification. Accepted waste may also be placed at or near loading docks prior to storage inside the buildings or set at the staging area at the north side of the lamp processing building. At the end of each process day, lamps are stored within the permitted storage areas.
- c. All containers are visually inspected to ensure the contents match the profile and shipping paperwork.
- d. A receiving report is generated by personnel working in the receiving area. The receiving report includes the following information:
 - i. Generator's name
 - ii. Profile number
 - iii. Description of the material
 - iv. Piece count, type and total quantity
- e. The receiving reports are submitted to the receiving clerk who inputs the information into the waste tracking system.
- f. Labels for each container are generated and the material officially received into the inventory.
- g. Labels are manually affixed to each container and the material moved to its appropriate

storage location within the facility.

- h. Copies of the shipping document/hazardous waste manifest are then forwarded to the generator (and customer if they are not the same) within 14 calendar days. Normal turn around time for material to be received into the facility is twenty four (24) hours but can be delayed by discrepancies in paperwork, missing information, or the need to conduct testing to verify that the material matches the profile. Material that is profiled and shipped into the facility correctly will normally be received and moved to storage area within 72 hours of the receipt.

2.2 Waste Rejection

If, at any stage in the receiving process, the material is found to be non-conforming the transporter is held at the facility while the generator is contacted to try to resolve the discrepancy. If the material appears to be something the facility can accept, a profile and supporting documentation, such as analytical reports, are requested from the generator and the approval process is started. If the material is something the facility can not accept, the generator is contacted to determine if the generator would like the material forwarded to an alternate facility or if they would like to have the material rejected back to them.

Based on the instructions from the generator the status of the material is noted in section 19 of the Uniform Hazardous Waste manifest or on the bill of Lading, and the transporter is notified that the material will be loaded back into the transport vehicle for delivery to an alternate facility or for return to the generator. VES can assist the generators in finding a proper outlet for their material and will assist them in doing so if the generator does not want the material shipped back to their facility.

If the transporter has already left the facility, the generator will be contacted and informed of the discrepancy. The generator will then have the option of arranging for the pick up of the material or have VES transport the material to the alternate facility or back to them. The rejected material is segregated from other wastes scheduled to be processed on site by placing it into the rejected material pod. Materials that fall into this category are usually shipped off-site within 7-14 days. In accordance with A.A.C.R18-8-264.A (40 CFR 264.72), the facility has 15 days to resolve any discrepancies. If at the end of the 15 day period the discrepancy remains unresolved, the material is rejected and transported back to the generator. Wastes will be rejected for the following reasons:

- Waste does not conform to the information provided in material profile or the waste contains materials that the facility is not permitted to accept.
- Other wastes that cannot be accepted by VES are included in the shipment.
- The waste is classified as ignitable waste (D001) in accordance with 40 CFR 261.21(a)(1) through (3). However, waste classified as D001 in accordance with 40 CFR 261.21(a)(4) will be accepted by the facility (the material is an *oxidizer* as defined in 49 CFR 173.151). Please refer to Attachment J for a copy of 49 CFR 173.151.

2.3 Procedures for Ignitable, Reactive, and Incompatible Wastes

VES will not accept ignitable (D001) wastes, although the facility may accept oxidizers carrying the same waste code. Incompatible waste will be stored in separate containers.

3.0 Sampling Procedures

It is necessary in any recycling and recovery process to determine if the process has been successful and the materials to be shipped off-site meet the criteria set for the future use or destination.

The major concern in the recycling process is contamination of the reclaimed material by mercury. For proper process control and to ensure compliance with applicable regulations, products are sampled and analyzed. All analyses are conducted by laboratories, licensed by State of Arizona, and qualified to conduct mercury test procedures.

Data received from the analytical laboratory are reviewed by management personnel responsible for the operation of the recycling process. The results are used to ensure processes are functioning adequately or if a need exists for modifications. Results indicating mercury levels above the allowable will be investigated, and shipments involved in the results will be held.

3.1 Sampling Strategies

After the spent fluorescent and HID tubes are crushed and processed through the air stripping and sieving phases the materials are separated into three components: 1) crushed glass, 2) aluminum and other metals, and 3) mercury containing phosphor powder. At this point the glass and the metal have been cleaned of the phosphor powder. All glass, phosphor, and metals are sampled *quarterly* to verify that the operation is not producing mercury contaminated materials. Phosphor powder is analyzed for mercury, antimony and cadmium using TCLP analysis. In agreement with ADEQ, if the first two years of the analysis for antimony and cadmium produces non-detect results, the testing for these contaminants will be discontinued and the phosphor powder will only be analyzed for mercury.

Glass and metal are analyzed for mercury using the same analysis method. Since mercury is a volatile metal, all mercury sampling is performed in a manner to minimize loss. All glass and metal residue sampling is done at the time it exits the crusher or retort process. Chain of custody is maintained on all samples. Field logs are kept indicating all data concerning the sampling process, including dates and times, responsible individuals, locations, sample identification, and special notes. Sampling procedures are described below.

3.2 Sampling Equipment and Procedures

All samples are collected according to the requirements of ASTM Standards and SW-846. Since samples are collected from bulk materials in an unconsolidated state, a stainless steel scoop or a grain thief is used. The collecting devices are decontaminated after each use. After collection the samples are sealed and a strict chain of custody is in effect.

- a. Using a stainless steel scoop or grain thief, at least 200 grams is removed from a container holding processed materials. The materials will be selected from a number of points throughout the container.
- b. The sample is placed into the clean glass sample jar provided by the analytical laboratory. Any material remaining in the sampler is returned to the container

from which it was taken.

- c. Sample labels are completely filled out, including the identification of the sampled material, the point in the process stream from which the sample was obtained, the container number from which the sample was taken (if appropriate), the date, time, and the collector's name.
- d. The sample label is placed securely on the jar if the jar has not been previously labeled, and the chain of custody form completed. All data must be recorded on the chain of custody.
- e. The sample jar is prepared for shipment and submitted to the laboratory.

3.3 Sample Containers, Preservation, and Storage

The crushed glass is tested after going through a separation phase which, for the lamp line, coordinates a sieving process with air stripping. A minimum of 200 grams is collected from the containers in which the glass is stored; sampling is random but is representative of the entire container. Samples are collected according to the requirements of ASTM Standards and SW-846.

The aluminum/other metals (uncontaminated with mercury) are also tested after going through the separation phase. A minimum of 200 grams is collected from the containers in which the metals are stored; sampling will be random but is representative of the entire container. Samples are collected according to the requirements of ASTM Standards and SW-846.

Phosphor powder is sampled after going through the Retort process. A minimum of 200 grams is collected from the containers in which the phosphor powder is stored; sampling is random and is to be representative of the entire container. Samples are collected according to the requirements of ASTM Standards and SW-846.

Phosphor powder that is sent off-site for retort processing will be assumed to contain mercury in excess of the TCLP limit and will be managed as a hazardous waste. As such, no analytical testing will be performed on phosphor powder unless the powder is retorted on-site. If no phosphor powder is retorted on-site a notation will be made in the operating record of the facility.

Samples extracted from the retort ovens will be consistent with the type of product to be recovered and any wastes generated. A minimum of 200 grams will be collected from the containers. Sampling will be random, but will be representative of the entire container.

Sample containers consist of clean glass sample jars furnished by the analytical laboratory. Sample jars used are wide-mouth jars with Teflon™/polyethylene-lined lids. Samples are preserved by storing with wet ice and maintained at 4 degrees Celsius at all times.

3.4 Sample Shipment

Samples are packaged in coolers to maintain a temperature of 4 degrees Celsius. The method of shipment of the samples will be dependent upon the analytical laboratory selected.

3.5 Equipment Decontamination

All non-disposable equipment used for collection of samples will be decontaminated and cleaned as indicated in SW-846 and in the appropriate ASTM Standards.

3.6 Field Documentation

The container labels provided must be completely filled out since this data is necessary to the proper identification of the sample. In conjunction with the labeling requirements, all samples must be sealed at the time of sampling.

Field records will be kept by VES to indicate conformity with all requirements of SW-846. The following information will be available for all testing:

- a. Date, place, and time of sampling: name of person who collected the sample.
- b. Identification of sample as to material and location in process stream.
- c. Identification as to duplicate, split, trip blank, field blank.
- d. Analysis required.
- e. Sample identification by chain of custody forms.

3.7 Chain of Custody Procedure

The purpose of a documented chain of custody is to create an accurate written record that can be used to trace the possession of the sample from the time of its collection through the final disposition of any remaining aliquot.

Chain of custody must be used for any samples sent to a laboratory for analysis. All personnel involved in the collection of samples will be trained in sample collection and in the documentation needed to enforce a valid chain of custody.

3.8 Sampling Quality Assurance/Quality Control Procedures

All samples tested for mercury during the course of this program will be analyzed in a laboratory licensed by the State of Arizona Environmental Laboratory Licensing Program for the analysis of solid waste.

Quality assurance is the overall program used to ensure the validity of the results produced by a laboratory and consists of the mechanisms used within individual activities, such as sampling, and procedures to monitor data accuracy. All personnel involved with sampling any material will complete training in the techniques required for obtaining a valid sample.

4.0 LABORATORY TESTING AND ANALYTICAL METHODS

4.1 Laboratory Selection

All analytical testing of samples collected by VES will be performed by laboratories licensed by the Arizona Department of Health Services Environmental Laboratory Licensure program.

4.2 Testing and Analytical Methods

All analyses will adhere to SW-846 methods and procedures. The analytical laboratory must show a current license indicating approval by the Arizona Department of Health Services Environmental Laboratory Licensure Program for those specific procedures. The analytical methods will be determined by the analytical laboratory according to the analyte to be tested and the sample matrix.

4.3 Waste Re-Evaluation Frequencies

The last step in a sampling and analysis program is the review of the data that is generated. The Operations Manager will be the individual responsible for the review of results submitted by the analytical laboratory, including the quality control data. Any results, which indicate potential problems with the recycling process, will be presented to management immediately, and corrective actions will be taken.

EXHIBIT C
WASTE MATERIAL PROFILE SHEET

Mercury Waste Profile Sheet

Profile # _____

Generator Representative: _____

Designated Facility: _____

A. Generator Information

Name _____
Site Address _____
City, State, Zip _____
Contact _____
Phone _____
EPA ID# _____ State ID # _____

B. Billing Information

Name _____
Site Address _____
City, State, Zip _____
Contact _____
Phone _____
SIC Code _____

C. General Information

Name of Waste _____
Estimated Volume _____
Frequency _____Process Generating Waste _____

_____Method of Shipment: Drum Type/Size _____ Other packaging description _____

DOT Proper Shipping Name: _____

Hazard Class: _____ UN/NA ID#: _____ Packing Group: _____

US EPA and State Waste Codes: _____

D. Chemical Composition and Characteristics

Chemical Composition	Percent Range
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(Total must be greater than or equal to 100%)

Color _____
Physical State _____
Odor Strong Mild None
BTU/lb. _____
Flash Point _____
pH _____
Free Liquids _____
Form Code: _____ Source Code: _____

E. Sample Information/Attachments

Check all that apply:

 Laboratory Analysis submitted Material Safety Data Sheet Submitted Manufactured article, MSDS not available

Laboratory Name _____ Sample Date _____ Sample I.D. _____

F. Generator Certifications

1. This waste does not contain polychlorinated biphenyls (PCBs).
2. This waste does not contain the organic compounds listed in 40 CFR 261 Appendix VIII at a total concentration of greater than or equal to 500 ppm.
3. This waste does not contain radioactive materials.
4. This waste does not contain infectious wastes/regulated medical wastes.
5. All information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix 1 and was obtained by using this or an equivalent sampling method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.

Generator's Signature _____ Title _____

Print Name _____ Date _____

Mercury Waste Profile Sheet Instructions

Below is a section by section list of instructions for completing a Superior Special Services, Inc. Mercury Waste Profile Sheet.

Profile Header Information

Profile #: To be assigned by Superior, please leave blank.

Sales Representative: If not already completed, fill in the name of your Superior Sales Representative.

A. Generator Information

Enter the generator information in this section as it should appear on the manifest or bill-of-lading. The uniform hazardous waste manifest must contain the generator's mailing address. Many states also require the entry of the pick-up address, if different from the mailing address. If the pick-up address is different than mailing address, please attach an additional sheet listing the pick up address. All manifest copies and certifications will be mailed to the generator address listed on the profile unless Superior is notified otherwise. If an alternate address is to be used for the mailing of manifest copies or certificates of recycling please attach an additional sheet noting this address.

B. Billing Information

Enter the information for the party to be billed.

C. General Information

Name of Waste: Enter the common description for the waste being profiled. Examples of common names: Mercury thermostats, Mercury contaminated debris, Mercury manometers, Mercury Devices. Please note that if the generic description Mercury Devices is used, the types of devices must be listed in the chemical composition section.

Process Generating Waste: Enter a description of the process generating the waste. This information is critical to determining whether Superior Special Services can accept the material for recycling and determining what analysis is required for the material. This information must clearly describe the process. An example of an acceptable description would be: "Clean up of broken mercury thermometer using mercury spill kit." An example of an unacceptable description would be: "Spill clean up." Providing insufficient information in this section may cause unnecessary delays in approving the waste.

Estimated Volume and Frequency: Enter the estimated volume and frequency for waste stream shipments.

Method of Shipment: Enter the type of packaging to be used for the shipment. Other packagings include cardboard boxes, supersacks, cube boxes.

DOT Proper Shipping Name: Enter the DOT Proper shipping to be used to describe the waste on the manifest or bill-of-lading.

Hazard Class, UN/NA ID#, Packing Group: Enter the appropriate hazard class, ID#, and packing group for the material.

Below is a list of commonly used DOT Proper Shipping Names with the hazard class, UN/NA ID#, Packing Group, and additional descriptions as they would appear on a shipping paper. This list is not an all-inclusive list. There may be another more appropriate shipping name for the material being profiled. If you need assistance in selecting a proper shipping name please contact your Customer Service Representative

Waste Name	Type of Shipping Paper	Proper Shipping Name	Hazard Class	UN/NA ID#	Packing Group
Liquid Mercury	Bill of Lading	RQ Mercury	8	UN2809	III
	Haz. Waste Manifest	RQ Waste Mercury	8	UN2809	III
Intact Mercury Devices	Bill of Lading	RQ Mercury contained in manufactured articles	8	UN2809	III
	Haz. Waste Manifest	RQ Waste Mercury contained in manufactured articles	8	UN2809	III
Mercury Debris and Other Solids	Bill of Lading	RQ Environmentally Hazardous substance solid, n.o.s. (Mercury)	9	UN3077	III
	Haz. Waste Manifest	RQ Hazardous Waste solid, n.o.s. (D009)	9	NA3077	III

US EPA and State Waste Codes: Enter the applicable US EPA and/or State Waste Codes

D. Chemical Composition and Characteristics

Chemical Composition: Enter a description of the constituents that make up the waste stream. This section should be completed with as much detail as possible. An example of an acceptable list of components:

Broken Mercury Thermometer	1-10%
Cardboard	10-30%
Mercsorb Powder	25-50%
PPE (tyvek suit and gloves)	25-40%

An example of an unacceptable list of components:

Debris	95-99%
Mercury	1-5%

An example of an acceptable of an acceptable list of components where Mercury Devices is used as the common name for the waste:

Thermometers	10-30%
Thermostats	20-40%
Ampoules from Thermostats	20-40%
Mercury Switches	20-40%

Characteristics: Enter a description or analytical results for the parameters listed in this section. If analytical data is not available, this information may be obtained from an MSDS. If the characteristic is not applicable, such as pH for a solid, enter "N/A." Do not leave any spaces blank.

E. Sample Information/Attachments

If the results listed for the characteristics listed in Section D are based on laboratory analysis, include a copy of the laboratory analytical and check the box for laboratory analysis submitted. The Laboratory name, Sample date and Sample ID must also be entered in this section of the profile. If there is any other analysis that was performed on the waste stream, please include a copy of that analysis as well.

If a Material Safety Data Sheet is submitted with the profile, check the box for Material Safety Data Sheet Submitted.

If the waste stream is solely comprised of intact/unbroken manufactured articles (thermometers, thermostats, switches...) and an MSDS is not available, check the box for Manufactured article MSDS not available.

F. Generator Certification

The generator or an agent of the generator must sign this section certifying that the waste does not contain PCBs, Appendix VIII organics, radioactive materials, or infectious waste. The generator is also certifying that all information of the profile is true and accurate and that no information is being withheld from Superior.