



ATTACHMENT 4

Waste Analysis Plan

SUMMARY OF WASTE ANALYSIS PLAN

The Waste Analysis Plan describes the procedures that are used to obtain chemical and physical data for wastes that are received into the TRADEBE East Chicago, Indiana and the TRADEBE Millington, TN facility. This plan was implemented to insure proper waste classification and to establish general procedures to be followed in evaluating all waste shipments. The evaluation of potential wastes managed by TRADEBE is conducted as follows:

1. The generator will complete a Waste Profile on each waste stream that is intended to be shipped to the TRADEBE facility.
2. The generator will supply a representative sample of the proposed waste stream(s) for evaluation by TRADEBE. This is done in accordance with applicable requirements of 40 CFR 264.13 and IAC 329-3-41-4.
3. Based upon the available data and professional judgment, TRADEBE will make an acceptance/rejection decision concerning the waste stream.

I. PARAMETERS AND RATIONALE

Per 40 CFR 246.13 and 329 IAC 3-41-4 regarding General Waste Analysis, before TRADEBE recycles, treats or stores any material, the facility will obtain a chemical and physical analysis of a representative sample. The analysis is repeated as necessary to ensure accuracy and each stream is evaluated annually.

The parameters for which materials may be analyzed and the rationale for selection are:

Flash Point - to determine ignitability for proper handling of the waste. This is also to confirm if a waste is a RCRA ignitable waste D001.

Heat of Combustion - to determine fuel value, rate of processing, and check for variation in the waste stream.

Solids Percentage - to determine method of processing.

PCBs - to insure that no material contains greater than 30 ppm.

pH - to check corrosive qualities, to protect employees and processing mechanisms, and to determine method of processing.

Metals - to determine how material should be treated and/or disposed of.

Total Halogens - primarily to determine chlorine content, which will affect the rate of processing.

Elemental Analysis - (total sulfur and total nitrogen) to provide material balance information and to determine potential acid gas generation.

Hazardous Organic Constituents - to determine if significant concentrations of organic components are present.

Specific Gravity - to determine variability of waste stream.

Compatibility/Reactivity - to determine if the material is blendable and non-reactive. A composite of daily waste receipts is maintained in the laboratory. To this composite a weighted portion of the incoming waste will be added. A temperature rise of over approximately 10 degrees Celsius signifies an incompatible waste for TRADEBE's blending tanks.

TRADEBE periodically reviews the parameters and rationale for waste stream evaluations to determine if additional parameters should be added to evaluation procedures.

II. WASTE SAMPLING METHODS

WASTE SAMPLING METHODS			
WASTE TYPE	CONTAINER	EQUIPMENT	GENERAL PROCEDURE
Liquid	Drum	Coliwasa or equivalent	Composite sample from representative sample of drums
Liquid	Bulk Tank	Coliwasa or equivalent	Composite from 1 to 5 grabs
Liquid	Tank	Weighted Bottle	Composite from 1 to 5 grabs
Solid	Drum	Scoop/Trowel/Auger/ Thief	Composite from 1 to 5 grabs
Solid	Bulk	Scoop/Auger	Composite from 5 or more grabs; well distributed to obtain representative samples
Sludges or Slurries	Various	Various	Judgment required, use most appropriate method specified above

A laboratory form containing the Chain of Custody is used to document information. The sample containers and corresponding data sheets reference the unique sample number to maintain pertinent information in an orderly manner. Each sample is labeled as follows:

Sample No:
 Company Name:
 Waste Common Name:
 Sampled By:
 Date Collected:

Each waste movement is checked to determine if the shipment is consistent with the waste stream. Generators are required to notify TRADEBE of any process changes. Each waste stream is evaluated annually. Generators are required to submit a new profile sheet if a process change occurs or if a significant change is detected by TRADEBE based on fingerprint analysis.

III. ACCEPTANCE CRITERIA

A. WASTE FUEL/TREATMENT

Waste material accepted into the fuel blending program are: Characteristic Waste, Toxicity Characteristic, Hazardous Waste from Nonspecific Sources, Hazardous Waste from Specific Sources, Discarded Commercial Chemical Products, Off-specification Species, Container Residues, Spill Residues and Non-Hazardous Wastes. These materials are stored on-site in tanks or containers.

1.

TESTING PARAMETERS	RATIONALE	ACCEPTANCE RANGES
BTU	To approve for hazardous waste fuel	Ranges will be the allowable limits specified for a fuel marketer and certified kilns burning for energy recovery.
TCLP	Proper Characterization	None (*)
Flash Point	Proper Storage	None (*)
Total Halogen	Identify total chlorine content	10% (**)
PCBs	Identified range is less than regulated limits	Less than 30ppm
Metals, Pb, Cr, Cd, As, Hg	Identify total metals	None (*)
Compatibility	To identify compatibility with other fuel blending material	Non-reactive with material to be bulked in tanks
Color/Appearance	Reference for Fingerprinting	Visual inspection

2.

FINGERPRINT ANALYSIS FOR HAZARDOUS WASTE	
PARAMETERS	RANGES
BTUs	Ranges specified for fuel blending
Color, Appearance	Reference for fingerprinting
PCBs	<30ppm
Total Halogen	10% (**)
Flash Point	None (*)
Compatibility	Will not react with material in storage/treatment tanks (**)

(*) Acceptable limits are not required.

Analytical results of Halogens and Metals are reviewed for Storage/Treatment Tank determination.

**Materials that are outside the acceptable ranges can be accepted but must be brought to Plant Management's attention, to assure proper treatment and storage methods are prescribed. If the material is not compatible with bulk material, it can still be used as a Hazardous Waste Fuel, but packaged independently for supplement fuel.

Due to Pollution Control Industries' handling capabilities, and various Hazardous Waste Treatment Processes, material is received in aerosol cans, liquid, solid, sludge and semi solid states.

B. SOLIDIFICATION

Waste materials that are accepted for Hazardous Waste Solidification are Characteristic Waste, Toxicity Characteristic and Hazardous Waste From Specific Sources, Discarded Commercial Chemical Products, Off-Specifications Species, Container Residue, Spill Residue and Non-Hazardous Waste.

1.

TESTING PARAMETERS	RATIONALE	ACCEPTANCE RANGES
Flash Point	Proper Storage	Actual
pH	Proper Storage	None (*)
Metals, As, Ba, Cd, Cr, Pb, Hg, Se, Ag	Identify total metals	None (*)
PCBs	To identify range if less than regulated limits	<30ppm
TCLP	Proper	None (*)
Compatibility	To identify compatibility with solidification media	Material is physically immobilized
Color/Appearance	Reference for fingerprinting	Visual inspection

(*) Acceptable limits are not required

2.

FINGERPRINT ANALYSIS FOR SOLIDIFICATION	
PARAMETERS	RANGES
pH	Proper storage
Color/Appearance	N/A
PCBs	<30ppm

C. CHEMICAL FIXATION

Waste materials that are accepted for "Chemical Fixation" are Characteristic Waste, Toxicity Characteristic, Hazardous Waste From Specific Sources, Discard Commercial Chemical Products, Off-Specification Species, Container Residues, Spill Residues and Non-Hazardous Waste.

1.

TESTING PARAMETERS	RATIONALE	ACCEPTABLE RANGES
Flash Point	Proper Storage	None (*)
pH	Proper Storage	None (*)
Metals, Pb, Cr, Ba	Identify total metals (**)	None (*)
Compatibility	Identify media necessary for fixation	To reduce solubility and/or chemical reactivity in waste (*)
PCBs	Less than regulated limits	<30ppm
TCLP	Proper Characterization	None (*)

Analytical will be performed in accordance with 329 IAC 3-41-4, 40 CFR 264.13 and 40 CFR 268.7.

(*) Acceptable limits are not required.

(**) Based on processes generating waste, additional metals required for determination of treatability will be sent to an outside-approved lab.

2.

FINGERPRINT ANALYSIS FOR CHEMICAL FIXATION	
PARAMETERS	RANGES
pH	Proper Storage
Color/Appearance	N/A
PCBs	<30ppm

Material that is destined for a landfill, regulated by the "Land Disposal Restriction," will be subject to required analytical for disposal and annually updated for re-qualification by an outside approved lab, if required, using TCLP Method SW846-1311 or EP TOX SW846-1310.

D. CORROSIVE MATERIAL

Corrosive Waste Streams, Waste Code D002 Materials, corrosive, acidic and basic wastes, are accepted for the fuels program dependent upon the composition (primarily BTU value) or they may be shipped off site for disposal. This determination is made prior to acceptance of the material.

Waste, which could potentially be accepted for the fuels program, is profiled and tested according to the QA/QC for the fuels program. Wastes that are not acceptable for the fuel program will be evaluated for an approved alternate disposal facility.

1.

TEST PARAMETERS	RATIONALE	ACCEPTABLE RANGE
pH	Classify as acid base	Between 2.5 & 12.5
Color/Appearance	Reference for fingerprinting	Record visual inspection
PCBs	Identify range if less than regulated limits	<30ppm

Additional tests may be performed as necessary for off-site disposal.

2.

FINGERPRINT ANALYSIS FOR CORROSIVE MATERIAL	
PARAMETER	RANGES
PH	Proper Storage
Color/Appearance	N/A
PCBs	<30ppm

E. AQUEOUS WASTES ACCEPTANCE CRITERIA

1.

TEST PARAMETERS	RATIONALE	ACCEPTANCE RANGE
pH	Determine proper storage and disposal	Actual value (*)
Flash Point	Determine proper storage and disposal	Actual value (*)
Solids	Approve for off-site disposal	Off-site disposal criteria
Specific gravity	Approve for off-site	Actual value disposal
Appearance	Reference for fingerprinting	Visual inspection

Materials are accepted or rejected based upon off-site disposal capabilities.

*Actual value represents the actual value recorded at time of analysis.

2.

FINGERPRINT ANALYSIS FOR OFF-LOADING	
PARAMETER	RANGE
pH	Actual value of acceptance criteria sample
Flash point	Actual value of acceptance criteria sample
Solids	Actual value of acceptance criteria sample
Appearance	Actual value of acceptance criteria sample

LAB PACK TEST PARAMETERS AND REQUIREMENTS

I. PRE-APPROVAL REQUIREMENTS

All lab packs to be shipped to TRADEBE must be pre-approved by the Lab Pack/DePack Department. In order to obtain an approval for a lab pack, the following items must be submitted to the Lab Pack Department:

A. TRADEBE Lab Pack Profile

The following generator information must be included on the TRADEBE lab pack profile before an acceptance will be issued.

1. Generator name (as it will appear on the manifest).
2. Generator address (the actual site the material was generated and packed)
3. The EPA identification number (if applicable per 40 CFR 261.5).
4. A state ID number if applicable
5. Origin of the lab pack (example: cleaning of warehouse).

B. Drum Inventory List

Each drum inventory list will be reviewed. The following generator information must be included:

1. Generator name (as it will appear on the manifest).
2. TRADEBE profile.
3. The EPA identification number.

The following content information must be included on each drum inventory sheet.

Requirements for the inner containers:

1. Chemical name (EPA code if applicable or "NR" for nonregulated) for each container.
2. Physical state of material ((l) liquid or (s) solid)
3. Quantity (solids by weight, liquids by volume or both for each)
4. Container type (g - glass bottle, m - metal can, p - plastic, f - fiber box)
5. Any chemical in a shipping container that meets or exceeds the reportable quantity (RQ) must be identified on the inventory by the letters RQ.

Requirements for outer containers:

1. Drum number
2. Proper DOT shipping name
3. UN/NA number
4. Hazard class
5. Name and signature of person packing the drum
6. Outer container description (Container type and size) example:
55-gallon, 17 E, or 20-gallon fiber.

The Technical Services Department will review each section to see that all the information is complete and consistent.

Each material is reviewed to see that the material is either acceptable to TRADEBE's secondary fuel program or that an outlet is available for the material. A material cannot be accepted if there is not an outlet available to further treat, store or dispose of the material.

Any materials that are identified by a commercial trade name or a generic name are investigated to determine what the constituents are. The constituents must be known so it can be demonstrated that the material can be treated successfully at TRADEBE or at an alternate RCRA approved disposal facility (329 IAC 3-41-4).

After the drum inventory list is reviewed and no discrepancies have been found, the Technical Services Department can approve the lab pack(s). If there are discrepancies, the generator is contacted. When the discrepancies have been resolved, the Technical Services Department can approve the lab pack(s).

II. MANIFEST REQUIREMENTS

After pre-approval by the TRADEBE Technical Services Department (see pre-approval process), material can be scheduled into TRADEBE. All scheduling must be done with the Technical Services Department. When a lab pack shipment arrives at TRADEBE, the following procedure applies. A hazardous waste shipment must be on an Indiana manifest and must be accompanied by a land ban notification. If there are any discrepancies with respect to the paper work, the generator is contacted and the discrepancies are resolved. Once the discrepancies are resolved, QA/QC is performed on the load.

III. QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

"A ten percent (10%) QA/QC is performed on each shipment prior to acceptance of material at TRADEBE. Ten percent (10%) of the lab pack drums are moved to the QA/QC area in the Area 6 expansion. Technical Services personnel will check the top layer of each drum against the drum inventory list. The top layer is inspected to see that:

- A. The chemical or compound name is on each inner container.

- B. Each container has maintained its integrity.
- C. The material is inspected to see that the color and appearance match the documented physical properties from a Material Safety Data Sheet, Merck Index, CRC Handbook of Industrial Materials, Condensed Chemical Dictionary or Chemical Catalog.
- D. The container must be on the pre-approved drum inventory list.
- E. The packing material is checked to make sure that there are no signs of waste leakage.

If any discrepancies are found, the generator is contacted. If information can be obtained to resolve the discrepancy, the material is accepted. If information cannot be obtained to resolve the discrepancy, the lab pack is rejected.

Justification for the type of QA/QC procedure as opposed to sampling one (1) container from each drum is that on an average a greater number of containers will be inspected on each load."

IV. COMPATIBILITY ANALYSIS

Any material that is to be bulked, entering either the waste fuel program or the tank farm, or any material that is to be bulked and sent for outside disposal, must undergo a compatibility analysis. These analyses are done in the same booth, under the hood, that the material is to be processed in.

A. Compatibility Analysis for Aqueous Waste Streams

The pH of each individual container is checked to make sure that the pH is consistent with the material type. If the pH is inconsistent with the material type the material is set aside to await determination of alternate disposal possibilities. If the pH is consistent with the material, the compatibility analysis continues. A graduated sample is taken from each individual container. This graduated sample is added to an aliquot of water contained in a beaker. The sample, or combination of samples, is not to exceed sixty percent (60%) of the aliquot. At this time, the material is stirred and the temperature of the material is monitored. Since an exothermic reaction is to be expected when adding certain acids or bases to water, an increase of up to forty (40) degrees is acceptable in a time frame of thirty (30) to sixty- (60) seconds. If an increase in temperature of greater than forty (40) degrees occurs, the material is re-sampled to determine if a slower rate of addition will decrease the rise in temperature. If the increase in temperature falls within the acceptable limits, the material is then added into a receiving composite drum holding thirty (30%) to fifty (50%) percent water. This aqueous solution is being stirred and the temperature and pH is being constantly monitored during this addition process. If the increase in temperature continues to exceed acceptable limits, the material is set aside to await determination of alternate disposal possibilities. When the receiving composite drum is full or all material has been processed, the compatibility sample is added to the composite drum. The receiving composite drum is not to be closed or moved until the temperature of the contents is within five (5) degrees of the ambient temperature. The compatibility analysis results are entered on the compatibility analysis log for aqueous waste streams. Each material that is bulked into the receiving composite drum is entered on the Lab Pack Composite log for aqueous waste streams. Any aqueous waste stream that is to be pumped to the tank farm located in Area 5 will undergo a compatibility analysis prior to being pumped.

A representative percentage ratio sample will be taken from the receiving tank. A representative percentage ratio sample will be taken from the drum to be pumped. The drum sample is added to the tank sample. As the sample is being added, the material is being stirred to simulate the stirring that will occur in the tank as the drum is being pumped. The temperature and pH is being monitored. An increase of up to forty (40) degrees is acceptable in a thirty (30) to sixty (60) second time frame. If an increase in temperature of greater than forty (40) degrees occurs, the drum material is re-sampled to determine if a slower rate of addition will decrease the rise in temperature. If the increase in temperature falls within the acceptable limits, the material is then pumped to the tank. During this pumping process the lab pack technician can monitor the temperature and pH of the material in the tank. If the increase in temperature continues to exceed acceptable limits, the material is set aside to await determination of alternate disposal possibilities.

B. Compatibility Analysis for Fuel Material

Any material destined for the waste fuel program will undergo two (2) compatibility analyses.

1. A compatibility analysis with typical fuel blend stock.
2. A compatibility analysis with material currently being bulked together in the booth.

This compatibility analysis is done in the same booth in which the material will be composited.

C. Compatibility Analysis with Typical Fuel Blend Stock

Each individual container is checked to determine the pH. An acceptable pH is one that is greater than two (2) and less than twelve and one half (12.5). If the pH is within acceptable limits, the compatibility analysis continues. If the pH is not within acceptable limits, the material is set aside, to await determination of alternate disposal possibilities. For every individual inner container, a representative ten- (10) ml sample is taken and added to a two hundred (200) ml aliquot of typical fuel blend stock. This aliquot of typical fuel blend stock is taken from one of the stationary tanks located in Area 2, currently holding fuel material. Individual container samples are not to exceed twenty-five percent (25%) of the fuel material. Each sample is monitored for two (2) minutes for signs of incompatibility. Signs of incompatibility are any physical changes indicating polymerization, emission of gases, or an excessive exothermic reaction. An excessive exothermic reaction is defined as a change in temperature of greater than five (5) degrees in a thirty (30) to sixty- (60) second time frame. A thermometer monitors the temperature change. If there are any signs of incompatibility, the individual container is set aside to await determination of alternate disposal possibilities. If the material passes both compatibility analysis, the material is then bulked into a receiving composite drum within the booth. When the two hundred- (200) ml aliquot contains twenty-five percent (25%) of the samples from the individual containers, it is then bulked into the receiving composite drum within the booth.

The compatibility analysis results are entered on the compatibility analysis log for secondary fuel material. Each material that is bulked into the receiving composite drum is entered on the Lab Pack composite log for fuel material.

D. Compatibility Analysis with Materials Being Bulked Together

A compatibility analysis is run between each individual inner container within a lab pack drum if the material is to be bulked into the same receiving container. A graduated sample is taken and added to a beaker.

Each sample is monitored for two (2) minutes for signs of incompatibility. Signs of incompatibility are: any physical changes indicating polymerization, emission of gases, or an excessive exothermic reaction. An extreme exothermic reaction is defined as a temperature change of greater than five (5) degrees in a thirty (30) to sixty (60) second time frame. If there are any signs of incompatibility, the individual container is set aside to await determination of alternate disposal possibilities. If the material passes both compatibility analysis, the material is then bulked into the receiving composite drum within the booth. At the time when the receiving composite drum is determined to be full, the composite sample is then added to the drum. The compatibility analysis results are entered on the compatibility analysis log for waste fuel material. Each material that is bulked into the receiving composite drum is entered on the lab pack/depac composite log for fuel material.

Any material that is bulked together for waste fuels will undergo the same analytical screening process as fuel material shipped to TRADEBE. Once the receiving container has been filled, the full drum is removed from the booth and returned to the lab pack storage area in Area 6. A sample is taken from every drum and every ten (10) drum samples are composited. This composite sample undergoes testing in accordance with fingerprint testing for hazardous waste fuels. Waste types that are not amenable to TRADEBE's waste fuel program will be shipped to a RCRA approved disposal facility for treatment and/or disposal. Wastes being sent for outside disposal may be depacked and repacked to meet the guidelines of the receiving facility.

Some waste streams going to an outside disposer may be bulked together for more cost-effective disposal. An example of this would be aqueous waste streams (i.e. acids, bases, or water-soluble oxidizers). If an amount is received in sufficient quantity to bulk, the aqueous waste will undergo compatibility testing. Compatible material will be bulked into a receiving container. The container size will be determined by the quantity of material. The container type will in accordance with 49 CFR Section 173. The material will be either (1) shipped to an offsite facility for treatment or disposal or (2) managed onsite. Some waste streams require fixation/solidification treatment prior to shipment for off-site disposal.

TRADEBE will also use the lab depacking areas for bulking of drum quantities of aqueous waste streams into the tank farm located in Area 5. These aqueous waste streams would be waste streams that are identical to the waste streams already being stored in the tank farm. These materials will be subject to all acceptance and approval parameters of TRADEBE. This material will also undergo compatibility testing.

V. OVERVIEW OF LAB DEPACK MATERIAL FLOW

Pre-approved lab pack wastes arrive at the facility in containers, which are subjected to the QA/QC program prior to acceptance. Once the material is accepted, the wastes are stored in a designated lab pack storage area within Area 3. As per production scheduling, the drums are delivered to the DePack facility and placed in one of the four staging areas to await processing. The drums are moved into the appropriate booth for compatibility testing and processing in accordance with a schedule prepared by the lab pack coordinator and/or director of operations. After processing, the empty drum is removed and crushed. At this point, the chemicals formerly

in the inner containers have been removed from the drum; all containers have been rinsed in accordance with 40 CFR 261.7 and crushed and stored to await testing and ultimately disposal or recycling and the packing material has been removed via a vacuum system and stored to await testing and ultimately disposal.

Any potential peroxide formers, i.e., Tetrahydrofuran must be checked for peroxides prior to shipping to TRADEBE, or the generator must provide an MSDS to show that the material is inhibited, to prevent the formation of peroxides.

VI. NON-PERMITTED MATERIALS:

These materials are not accepted at TRADEBE Lab DePack Program.

- A. Pathogenic waste (infectious waste).
- B. Materials exhibiting radioactivity.
- C. Explosives.
- D. TSCA and RCRA controlled substances identified by EPA Hazard Codes F020, F021, F022, F023, F026, and F028.
- E. PCB's at a concentration greater than 49 ppm or material derived from a source greater than 50 ppm as defined in 40 CFR Part 761.

Organic Perchlorates.