

ATTACHMENT II-1-3

WASTE STABILIZATION PLAN

I. PURPOSE AND SCOPE

1. This plan shall apply to treatment of waste at the Permittee's Mixed Waste Treatment Facility using stabilization treatment technologies.
2. Treatment areas at the Mixed Waste Facility consist of the:
 - a. Mixed Waste Treatment Building,
 - b. Mixed Waste Operations Building,
 - c. Mixed Waste Storage Building, and
 - d. Mixed Waste Storage Areas.
3. The treatment technology referred to as stabilization in this plan involves chemical treatment and stabilization treatment, to decrease the waste's concentration of hazardous constituents through chemical reaction, to reduce the leachability of hazardous constituents in the waste, or both. Depending on the waste treatment utilized, the following technology codes may apply to stabilization treatment technologies: AMLGM, STABL, CHOXD, CHRED, DEACT, and NEUTR.
4. The following definitions are used in this attachment:
 - a. Cleaned shall be defined as normal housekeeping operations that entails the removal of residual material by sweeping, wiping, washing, or other similar operations.
 - b. Decontaminated shall be defined as a hazardous waste clean decontamination, i.e. triple rinse.

II. TREATMENT SYSTEM DESCRIPTION AND REQUIREMENTS

1. Tank System Description and Requirements.
 - a. Tank System Identification.

i. Mixed Waste Treatment Building

- A. Waste Receiver Tank
- B. Liquid Waste Storage Tanks (2)
- C. Sizing Screen Tank
- D. Primary Shredder Tank
- E. Secondary/Tertiary Shredder Tank
- F. Mixer Tank No.1

ii. Portable Tank Systems

A. Small-Scale Mixer

- b. A general description of each of these tanks is provided below. (See also the tank system requirements in Attachment IV-1, *Tank Management Plan*, and in Module IV, *Storage and Treatment in Tanks and Surface Impoundments*.)
- c. Waste Receiver Tank. This tank system shall be designed to receive waste into the Mixed Waste Treatment Building.
- d. Liquid Waste Storage Tanks (2). These tanks shall be designed to store liquid wastes. Ancillary equipment enables bulk liquid delivery as well as transfer from the tanks to Mixer No. 1.
- e. Sizing Screen Tank. This tank is used for secondary containment of waste in the Mixed Waste Treatment Building.
- f. Primary Shredder Tank. This tank system shall be designed with a shredder. Shredded wastes fall into the Primary Shredder Tank.
- g. Secondary/Tertiary Shredder Tank. This tank is used for secondary containment of waste in the Mixed Waste Treatment Building.
- h. Mixer Tank No. 1. This tank is used as secondary containment for Mixer

No. 1 in the Mixed Waste Treatment Building.

- i. Small-Scale Mixer. This mixer shall be designed to mix small quantities of waste for stabilization and solidification treatment.
2. Portable Treatment Systems.
 - a. Commercial Cement Mixer. This mixer shall be an off-the-shelf commercial mixer and shall be utilized to mix small quantities of waste for stabilization and solidification treatment. This mixer shall require secondary containment.
 - b. Can Tumbler Mixer. This mixer shall consist of a commercially available can tumbler with variable-size container holders. The can tumbler shall be applicable for containers from 4.5-inches to 16.5-inches tall. This mixer shall require secondary containment.
 - c. Drum Rotator Mixer. This mixer shall be a commercially available drum rotator mixer that can hold up to two 55-gallon drums. This mixer shall require secondary containment.

III. GENERAL REQUIREMENTS

1. Hazardous waste activities for stabilization such as waste receipt and waste transfers may be conducted in the Mixed Waste Treatment Building, Mixed Waste Operations Building, and Mixed Waste Storage Building. Treatment and storage shall be conducted in containers and tank systems in accordance with applicable provisions of this Permit.
2. Within the Mixed Waste Treatment Building, Mixed Waste Operations Building, and Mixed Waste Storage Building, waste transfer into or between permitted units may occur in accordance with the applicable provisions of this Permit by one or more of the following methods:
 - a. use of a loader,
 - b. pouring,
 - c. use of the Facility liquid piping system,
 - d. use of pumps,

- e. use of hoses,
 - f. use of augers, or
 - g. use of other appropriate transfer equipment.
3. Within the Mixed Waste Treatment Building, Mixed Waste Operations Building, and Mixed Waste Storage Building, reagent transfer into or between permitted units may occur in accordance with the applicable provisions of this Permit by one or more of the following methods:
- a. use of a loader,
 - b. pouring,
 - c. use of the liquid reagent piping system,
 - d. use of the Facility liquid piping system,
 - e. use of pumps,
 - f. use of hoses,
 - g. use of augers, or
 - h. use of other appropriate transfer equipment.
4. Treatment Run.
- a. A treatment run shall be defined as all residues of one waste stream that are treated using the same treatment unit during one calendar day of operation.
 - b. Whenever a different treatment system is used for treatment of a waste stream, the initial and subsequent sampling and analytical frequencies shall re-start for that waste stream.
 - c. Except as designated in III.4.d., different waste streams shall not be processed together in the same treatment run.
 - d. Different elemental mercury waste streams may be combined for amalgamation treatment as long as treatment is only necessary for metals.

5. The volatile organic content of waste for treatment shall be limited to concentrations that maintain the cancer risk and non-cancer Hazard Index requirements of Condition II.T.4. of Module II, *General Facility Conditions*.
6. Target Treatment Standards.
 - a. The Permittee may receive wastes that are certified to meet some of their applicable treatment standards and that do not meet other applicable treatment standards.
 - b. The generator of such waste, or the treatment facility sending such waste, may certify that a portion of the applicable treatment standards are met. For purposes of this Permit, such treatment standards are referred to as certified standards.
 - c. For off-site wastes that are sent to the Permittee for treatment and that are accompanied by a certification from the generator, or a treatment facility, that some of the applicable treatment standards are met, the Permittee shall not be required to test for those certified treatment standards, provided that:
 - i. The Permittee has confirmed through sampling and analysis that the waste meets the LDR Treatment Standards certified by the generator,
 - ii. The Permittee has confirmed that any additional treatment that is to be performed shall not cause previously certified constituents to mobilize, and
 - iii. The waste meets the Permittee's incoming waste acceptance criteria.
7. Corrective Actions in Treatment. During treatment operations, the Permittee shall use corrective actions to rectify variances from the treatment formula. Corrective actions shall be noted in the Operating Record. If corrective actions do not bring the treatment process to within the requirements of this plan, the Permittee shall provide a remedial plan to the Director.
8. With the exception of elemental mercury as described in Condition III.4.d., only

one waste stream at a time shall be open for stabilization within each processing unit in the Mixed Waste Treatment Building or the Mixed Waste Operations Building.

9. All hazardous waste tanks shall be tested for tightness at installation, in accordance with Condition IV.D. of Module IV, *Storage and Treatment in Tanks and Surface Impoundments*, and Condition 3 of Attachment IV-1, *Tank Management Plan*; and annually, in accordance with Condition 4.n. of Attachment II-3, *Site Inspection Plan*.
10. The Commercial Cement Mixer, Drum Rotator Mixer, and Can Tumbler Mixer shall be portable units; however, these mixers shall be located in clearly designated areas, within secondary containment, during waste processing operations.
11. Stabilization formulas developed using Attachment II-1-1, *Waste Analysis Plan and Formula Development for Treatment Wastes* and solidification formulas developed using Attachment II-1-4-1, *Analytical Procedures for Formula Development for Liquid Waste Solidification* may be combined into one process provided that the objectives of each formula are met and they have been shown to work together.
12. Recordkeeping.
 - a. The Permittee shall maintain documentation in the Operating Record of stabilization treatment operations and of other requirements in this plan for a period of three years.
 - b. Treatment operation documentation shall include:
 - i. treatment formula,
 - ii. amount of waste treated,
 - iii. amount of reagents added,
 - iv. dates of treatment (or treatment run number),
 - v. operators names (or initials corresponding to names),
 - vi. tanks used during treatment,

- vii. analytical results, and
- viii. a certification of treatment based analytical results.
- c. Treatment certifications shall be kept for a period of five years.

IV. TREATMENT FORMULA DEVELOPMENT REQUIREMENTS

1. Formula Development and Analytical Verification.
 - a. Treatment formulas shall be developed in accordance with Attachment II-1-1, *Waste Analysis Plan and Formula Development for Treatment Wastes*. Full-scale and other treatability studies shall be conducted in accordance with the applicable provisions of this Permit. The results of other such treatability studies may be used in conjunction with formula development.
 - b. For treatment involving the Small-Scale Mixer, Commercial Cement Mixer, Drum Rotator Mixer, or Can Tumbler Mixer; a size requirement for the waste material shall be established within the formula.
 - c. For each formula developed, analytical verification of the applicable treatment standards shall be performed prior to actual waste treatment and kept in the Operating Record.
 - d. Wastes with similar contaminants and concentrations may use a previously developed treatment formula from another waste stream as long as the post-treatment verification procedures of Condition VI.3. are followed. The basis for the formula selected shall be documented in the Operating Record.
2. Adjustments to established formulas may be made using Attachment II-1-1, *Waste Analysis Plan and Formula Development for Treatment Wastes* or additional post-treatment analytical results from the established formula.
 - a. Adjustments shall be submitted to the Director as a new formula if exceedance of the weight ratio for dilution monitoring occurs.
 - b. The sampling scheme for analytical treatment verification, as detailed in Condition VI.3., shall be restarted each time a new formula is submitted.

3. Treatment Reagents. The Permittee shall use the approved reagents for treatment listed in Attachment II-1-2, *Approved Treatment Reagents*. Should a treatment formula require the addition of any other reagent, the Permittee shall modify this Permit to add reagents to the list in Attachment II-1-2, *Approved Treatment Reagents*. The Permittee may use mixtures of approved reagents in treatment.
4. Use in treatment formulas of non-waste materials listed in Attachment II-1-4-1, *Analytical Procedures for Formula Development for Liquid Waste Solidification*, shall be limited to 30 percent by volume in the aggregate of the final composition of the treated waste unless prior approval is received from the Director.
 - a. Analytical samples shall be taken before addition of the non-waste materials.
 - b. The Permittee shall limit use of these materials to situations where the addition of these materials shall be necessary to affect or adjust the consistency of the treated waste unless prior approval is received from the Director.
5. Dilution Monitoring. To monitor the effect of dilution inherent in appropriate treatment, the weight ratio of additives to waste should not exceed two using the following calculation unless prior approval is received from the Director:

$$\frac{W_b + W_a}{W_b}$$

where W_b : Weight of waste material to be treated

W_a : Weight of water and reagents added to waste material during treatment

6. Notice of Formula Development. Prior to treatment using a newly developed formula, the Permittee shall submit the formula to the Director as a notification.
 - a. Unless the weight ratio, as defined in Condition IV.5., exceeds two, Director approval of the formula shall not be required.
7. The use of a previously developed treatment formula shall be documented in the

Operating Record. Submittal to the Director is not required.

V. TREATMENT OPERATION REQUIREMENTS

1. **Communication Requirement.** In order to ensure that treatment facility personnel who shall be involved in the treatment operation have a general understanding of the treatment parameters, operational requirements and precautions, the treatment system foreman or supervisor shall review the treatment formula, confer with those responsible for formula development or the choosing of a previously developed formula, and brief the facility operators prior to treating each waste stream. This pre-operational briefing shall be documented in the Operating Record.
2. **Prevention and Control.**
 - a. The treatment process shall be run in accordance with manufacturer's specifications to prevent the generation of fire, explosions, toxic gases, or excess heat.
 - b. Activities within the Mixed Waste Treatment Building shall be performed in accordance with Attachment II-1-11, *Mixed Waste Treatment Building Operating Plan*. Mists, fumes, and dust from the waste process shall be controlled using the HEPA filtration system and the suppression water spray systems. Water sprays may be mixed with surfactants for this purpose. The roll-up doors and the containment and dust collection system at the Waste Receiver Tank shall also be used in a manner to control mists, fumes, and dust.
 - c. The Permittee may use additional portable systems and may install additional systems as necessary to control mists, fumes and dusts that may be generated as part of the treatment process.
3. **Freeboard.** The Permittee shall maintain six inches of freeboard in the tanks listed in Condition II.1.a.
4. **Size Control.**
 - a. Waste material in the Mixer No. 1 shall not exceed an eight-inch particle size (volume equivalent to that of an eight-inch diameter sphere) unless prior written approval is received from the Director.

- b. The volume percentage of objects in the Mixer No. 1 that have a particle size greater than four inches (volume equivalent to that of a four-inch diameter sphere) shall not exceed ten percent based on visual inspection.
 - c. Waste material in the Small-Scale Mixer shall not exceed a two-inch particle size. Prior written approval from the Director shall be required for a particle size larger than two inches.
 - d. Waste material in the Commercial Cement Mixer shall not exceed a two-inch particle size. Prior written approval from the Director shall be required for a particle size larger than two inches.
 - e. Waste material processed in the Can Tumbler Mixer shall not exceed a two-inch particle size. Prior written approval from the Director shall be required for a particle size larger than two inches.
 - f. Waste material processed in the Drum Rotator Mixer shall not exceed a two-inch particle size. Prior written approval from the Director shall be required for a particle size larger than two inches.
5. **Scaling Factors and Error Range for Treatment.** The Permittee shall use direct proportions for scaling up from the verified formula. The Permittee shall operate within an error range of 10% of the direct-proportion treatment process ingredients for stabilization.
6. **Order and Manner of Additions in the Mixers.** During treatment, wastes, water, stabilization agents, other treatment materials and reagents shall be added in the order and manner as outlined in the treatment formula.
7. **Treatment Operation Description and Requirements.**
- a. **Waste Receiving.** Waste shall be placed into permitted units in the Mixed Waste Treatment Building and Mixed Waste Operations Building.
 - b. **Waste Management.** Waste may be transferred between permitted units in order to accomplish size separation, size reduction, and stabilization treatment. Following management, waste shall be managed in accordance with the applicable provisions of this Permit.

- c. Stabilization Treatment. Wastes shall be treated as specified in treatment formulas. In general, a formula involves mixing water and reagents with waste in a Mixer. These ingredients shall be measured by weight or volume, as specified by the formula.
 - d. Waste Solidification. Wastes shall be solidified in accordance with Attachment II-1-4, *Liquid Waste Management Plan*.
 - e. Ensuring a Solid-Phase Treatment Residue.
 - i. Following treatment, the wastes shall be visually inspected for free liquid content. If the visual inspection indicates the presence of free liquids, a Paint Filter Liquids Test (PFLT) shall be performed. This test shall be performed before the treated wastes are disposed or placed into solid-phase storage.
 - ii. Wastes with a liquid component shall be stored in accordance with liquid storage requirements prior to solidification or re-processing. Such wastes shall be solidified in accordance with provisions of this Permit or replaced in the treatment mixer used for solidification in accordance with the provisions of the treatment formula or solidification formula.
 - iii. Following any such re-processing or solidification efforts, the waste shall be visually inspected for free liquids. If this visual inspection indicates the presence of free liquids, a PFLT shall be performed to assure that no free liquids are present.
8. Liquid Waste Management. Liquids from water washing, spraying, rinsing, decontamination, wash-down, or cleanup shall be collected and placed in containers and/or tanks and managed in accordance with the applicable provisions of this Permit including the requirements of Attachment II-1-6, *Leachate, Evaporation, and Decontamination Waste Management Plan*, and Attachment II-1-4, *Liquid Waste Management Plan*, as appropriate.
9. Make-Up Water in Stabilization.
- a. Decanted liquids from a waste may be used as make-up water in stabilization treatment, provided that such liquids contain only wastes and waters associated with the waste stream being treated.

- b. The following may also be used as make-up water for stabilization, provided that the treatment formula was developed using the source of water and that post-treatment analytical performed includes analytical for constituents identified in the water used:
 - i. water from the Mixed Waste Area run-off pond;
 - ii. water from the LLRW Area run-off ponds;
 - iii. water from the evaporation tanks; or
 - iv. water from surface impoundments.
 - A. If the evaporation tank or surface impoundment water is potentially contaminated with PCBs, it shall be analyzed for PCBs and shall not be used for stabilization activities if PCB concentrations are greater than three (3) $\mu\text{g/l}$ (3 ppb).
 - c. Otherwise, well-produced or commercial water shall be used in stabilization or as a substitute for the make-up water described above.
10. LEL Detector.
- a. The Permittee shall operate and maintain an electronic LEL (Lower Explosive Limit) detector/alarm or monitor in the area of the receiver tank.
 - b. When the LEL indicates that the air is below appropriate safety levels, the process shall be adjusted so that operations are such that appropriate LEL levels are maintained.
 - c. If such adjustments cannot be made or if the LEL malfunctions, the operation shall be shut down until a safety evaluation is completed that prescribes the personal protective equipment required for operation at those levels.
11. When treatment operations are being conducted at the Mixed Waste Treatment Building or Mixed Waste Operations Building, at least two operators shall be present at each operating treatment unit.
- a. Operators are not required to be present throughout Can Tumbler Mixer or

Drum Rotator Mixer operation.

12. Wastes shall remain in the Mixed Waste Treatment Building and Mixed Waste Operations Building tank systems as long as is necessary to complete treatment or as long as other permit conditions allow. Wastes may be removed and placed into container storage prior to completion of the treatment process in accordance with the applicable provisions of this Permit.
13. Forming or containment devices may be placed in containers in order to facilitate removal of treatment residues from the containers, to provide structural support, or to prevent the solidified and stabilized waste from lodging in the container.
14. The Can Tumbler Mixer shall be operated with at least a 20% headspace void within the container to ensure proper mixing.
15. The Drum Rotator Mixer shall be operated with at least a 33% headspace void within the drum to ensure proper mixing.

VI. POST-TREATMENT REQUIREMENTS

1. A curing time shall be designated in the treatment formula. The curing time for treated wastes shall be defined as the amount of time that a waste shall remain in storage, following treatment, prior to disposal or additional treatment.
2. Waste Segregation and Treatment Equipment Decontamination.
 - a. At the end of each treatment run, the treatment area floors shall be cleaned. Wastes, residues and materials from this cleaning activity shall be removed or placed in containers or tanks and labeled appropriately.
 - b. After a waste stream has been treated and before another waste stream shall be put into the mixer, the treatment tanks or other waste management equipment and the affected area of the building shall be inspected.
 - i. Residual waste material shall be collected, placed into containers, and managed in accordance with the applicable provisions of this Permit.
 - ii. If the subsequent waste is incompatible with the previous waste handled in the tank, it shall also be triple rinsed prior to

management of the subsequent incompatible waste in that tank.

iii. Emptying and triple rinsing of tanks shall be documented in the Operating Record.

c. Waste collected from the Mixed Waste Treatment Building or the Mixed Waste Operations Building following treatment operations shall be managed as an untreated waste. This waste shall either be treated using the same formula as the parent waste stream, or treated as the Permittee's generated waste.

d. Clean-up wastes removed from process equipment following successful treatment shall be managed as treated waste.

3. Analytical Treatment Verification.

a. Verification samples shall be taken using a scoop, shovel, or other sampling device. Since the material has been thoroughly mixed by this point in the process, no compositing of samples shall be necessary.

b. The treatment residues shall not be disposed in the Mixed Waste Landfill Cell until analytical verification is completed.

c. The Permittee shall verify treatment by sampling and analyzing stabilization treatment residues, in accordance with the minimum frequency outlined below using EPA-approved analytical methods performed by a laboratory meeting the requirements in Attachment II-1, *Waste Analysis Plan*:

i. One sample from each of the initial three treatment runs for each formula used on each waste stream,

THEREAFTER,

ii. One sample from ten percent of the treatment runs until 15 treatment runs have been tested,

THEREAFTER,

iii. One sample from five percent of the treatment runs

4. Disposal Following Verification. Wastes for which verification has been completed, and treatment standards met, shall be disposed in accordance with the applicable provisions of this Permit.
5. Retreatment.
 - a. Should the results from treatment verification of the waste indicate that the standards or treatment objectives have not been reached; the waste shall be retreated or re-tested until proper treatment is verified or another method for management is identified.
 - i. Other methods of management may include manifesting the waste to another permitted facility, storing the waste for future management, re-profiling the waste for other treatment, or returning the waste to the generator.
 - b. Retreatment may use the formula previously used to treat the waste, or a new formula may be developed as outlined in Attachment II-1-1, *Waste Analysis Plan and Formula Development for Treatment Wastes*.
 - c. If the previously used formula is used to retreat the waste, the waste-to-additives weight ratio for the combined treatment shall not exceed the requirements of Condition IV.5. unless prior approval is received from the Director; and
 - d. The retreated waste residue shall be analyzed for the contaminants that previously did not meet treatment standards.
 - e. If the waste does not meet the treatment standards after four process verification attempts, the Permittee shall notify and inform the Director of any subsequent management plans for the waste.

END OF ATTACHMENT II-1-3