C4: TREATMENT

(Volume 1)

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C4.A LAB PACKING

DLD receives wastes in lab pack quantities from a variety of sources. A large portion of the wastes are expired chemicals still in the manufacturer's original container with the manufacturer's label identifying the container contents. A significant portion of this waste is non-hazardous by legal definition and still more of this waste is from non-regulated sources such as households. Because these wastes represent a wide variety of chemical properties, they must be sorted and lab packed according to compatibility guidelines established by other treatment facilities receiving the waste from DLD. For treatment of lab pack waste, Drug & Laboratory Disposal uses several different treatment facilities that each have their own compatibility and acceptability guidelines.

The vast majority of waste received by DLD is disposed of using high temperature hazardous waste incinerators, resulting in complete destruction of the original compound. Organic chemicals are broken down into environmentally inert compounds or elements such as carbon dioxide, water, and nitrogen. Organically bound metals are also incinerated with the metals being captured by the exhaust stack scrubbing units (required on all licensed hazardous waste incinerators) or in the ash. In most cases incineration is the most appropriate method of disposal. This is true for even difficult to destroy organic compounds such as polychlorinated biphenyls (PCBs) and dioxins.

Because of DLD's emphasis on incineration, the lab packing of chemicals is a major part of the facility's activities. All lab packing is done by degreed Hazardous Waste Chemists who make packing lists of the chemicals in each drum. These packing lists are sent to the incineration facility for approval prior to shipment of the lab packs. During the time between packing at DLD and transport to the destination facility, lab packs are placed in secondary containment areas for storage.

DLD’s general lab pack guidelines are presented in the following pages. They have been developed with the consideration of 40 CFR 264 Appendix V, DOT guidelines, the guidelines of all of the lab pack receiving facilities that DLD utilizes, and the cumulative knowledge and experience of the Drug & Laboratory Disposal staff. It is important to understand that the following guidelines are appropriate as of the date of this writing, but they change as receiving facilities revise their guidelines and as DLD protocol changes with experience. It is also important to remember that these guidelines do not serve as a compendium of all of the chemicals that DLD may receive, but do represent the majority of hazard classes encountered by our chemists.

C4.A.1 General Lab Packing Guidelines

a. *Cyanides and Sulfides.* Cyanides that are selected to go on for incineration are lab packed with vermiculite as the packing material. Cyanides and sulfides may be packaged together.

b. *Corrosive Liquids.* There are some corrosives where handling and neutralizing the liquid is not the most economically feasible choice for disposal. Corrosive liquids are packaged in plastic drums with vermiculite as the packing material.

c. *Flammable Liquids.* There are some flammable liquids that are unsuitable for commingling. These are packaged in plastic or fiber (with a plastic liner) drums with vermiculite as the packing material.

d. *Poison Inhalation Hazard - Zone A (PIH-A).* These compounds are packaged according to current applicable DOT regulations.

e. *Pyrophorics and Grignards.* These materials are packaged in plastic drums with vermiculite as the packing material. Pyrophoric compounds or Grignard reagents that are also Poison Inhalation Hazard – Zone A materials are packaged according to PIH-A standards.

f. *Flammable Solids.* These compounds are typically lab packed using sawdust or vermiculite in easy burn containers such as plastic or cardboard fiber drums. However, Raney nickel is a flammable solid and needs to be packed under water with vermiculite in plastic drums. Metal dusts must be packaged under oil with vermiculite in plastic drums.

g. *Red Phosphorus.* Red phosphorus must be packaged under oil in plastic or cardboard fiber drums with vermiculite as the packing material.

h. *Yellow/White Phosphorus.* Yellow or white phosphorus must be stored under water and packaged in plastic drums with vermiculite as the packing material.

i. *Inorganic Mercury Compounds.* Inorganic mercury compounds are usually packaged in vermiculite.

j. *Organic Mercury Compounds.* Organically bound mercury compounds may be packaged using sawdust or vermiculite as packing material.

k. *Iron Pentacarbonyl.* Iron pentacarbonyl is packaged according to current applicable DOT regulations. Other permissible carbonyls can also be packaged in the same lab pack.

l. *Isocyanates*. Isocyanates (that are not also Zone A - Poison Inhalation Hazards) are packaged in plastic drums or cardboard fiber drums with a plastic liner utilizing sawdust or vermiculite as the packing material. Those isocyanates that are Zone A – Poison Inhalation Hazards are packaged according to the Poison Inhalation Hazard standards.

m. *Non-RCRA Organic Materials*. Non-RCRA organic wastes that DLD believes should be incinerated rather than land-filled are grouped into this particular category. Lab packs of these compounds are typically packaged in plastic or cardboard fiber with sawdust as the packing material.

n. *Corrosive Solids*. DOT corrosive solids are packaged in plastic drums with sawdust or vermiculite as the packing material.

o. *Oxidizing Solids.* Oxidizing solids are packaged in plastic containers with vermiculite or oil dry as the packing material.

p. *Organic Peroxides.* Both solid and liquid forms of organic peroxides are lab packed for incineration, but must be packaged separately from inorganic oxidizers. Organic peroxides are packaged in plastic containers and packed with vermiculite or oil dry as the packing material.

q. *Toxic Liquids.* These materials are packaged in plastic containers with vermiculite as the packing material.

r. *Toxic solids.* These materials are packaged in plastic containers with vermiculite as the packing material.

s. *Water Reactive.* Water reactive compounds are packaged in plastic drums with vermiculite as the packing material. (Sawdust is not an acceptable packing material for water reactive compounds because its moisture content may initiate reactions.) Additionally, all alkali metals must be packaged under oil.

t. *Organic "Class 9" Hazardous Wastes.* DLD believes that organic "Class 9" hazardous wastes should be incinerated rather than land-filled. These lab packs are packaged in plastic or cardboard fiber drum with sawdust or vermiculite as the packing material.

u. *Radioactive Wastes.* DLD accepts very limited quantities and types of radioactive materials. Radioactive compounds are lab packed in metal or plastic containers with vermiculite as the packing material.

v. *Unknown Materials.* All outgoing unknown compounds must be lab packed on a repack profile with a fingerprint included. For the fingerprint, the following parameters must be recorded:

- physical description
- water miscibility/reactivity
- pH screen
- cyanide screen
- sulfide screen
- ignitability screen
- oxidizer screen
- peroxide screen

w. *Aerosols*. Aerosol cans are accepted for incineration, but the following guidelines must be followed in order for the incinerator to meet process and permit requirements.

i. A separate profile sheet must be submitted when profiling large amounts of aerosol cans. Exceptions are for less than five 55-gallon quantities. These small quantities may be added on to lab pack profiles using drum inventory sheets.

ii. If quantities of aerosol cans exceed five 55-gallon drums, no drum inventories are required. However, each package must be labeled "Inside Containers Comply with Prescribed Regulations" (per 49 CFR §173.304) and use an appropriate DOT proper shipping name (i.e. "UN1954, Waste compressed gas, flammable, n.o.s., 2.1" for flammable gases, "UN1956, Waste compressed gas, non-flammable, n.o.s." for non-flammable gases, etc.).

iii. Some aerosols may be California list waste.

C4.A.2 Packing (Absorbent) Material

There are many absorbent materials, also referred to as packing materials, that may be used when lab packing. Bentonite, cellulose, oil dry, kitty litter, vermiculite, ground corn cob, "Greenstuff" (a phenolic absorbent material), and sawdust are some examples of packing materials that may be utilized as absorbent materials in lab packs. The choice of absorbent material used is dependent on the chemical properties of the material being lab packed.

a. Chemicals of a reactive nature, such as oxidizer and pyrophoric compounds, are typically packed using an inert, non-combustible absorbent material such as bentonite, kitty litter, or vermiculite.

b. Chemicals of a non-reactive nature are typically packed using light weight absorbents like sawdust, vermiculite, and Greenstuff

c. Sawdust and ground corncob contain too much moisture to be used with moisture reactive or moisture sensitive materials (e.g. pyrophoric compounds, alkali metals, etc.).

d. The phenolic absorbent material known as "Greenstuff" is slightly acidic and is not used with acid reactive compounds.

C4.A.3 Development of Lab Pack Guidelines

Lab pack and sorting guidelines are not a set of static rules. They have been set up based on DOT regulations, regulations and suggested guidelines from the EPA, receiving facilities' requirements, and the experience and knowledge of the Drug & Laboratory Disposal staff. As new regulations, requirements, and first-hand experiences warrant, these guidelines are updated.

C4.B COMMINGLING

A significant portion of wastes generated by clients of DLD Environmental Services, Inc is collected, stored, and transported in containers that are segregated and commingled (for purposes enumerated in R 299.9504 (5)) with compatible wastes into larger containers prior to shipment offsite for treatment at a licensed disposal facility.

C4.B.1 Practices Common to DLD Commingling Processes

Containers transported and/or received at DLD are required to be labeled by the generator with the constituents they contain. As the primary means of identification, the generator's label is assumed to be correct; however, because errors in labeling can occur, it is expedient for a trained chemist to inspect containers during sorting and commingling. This inspection and evaluation of the physical and chemical properties of container contents, called the "fingerprint", will be documented for each shipment and is an invaluable safeguard against the contamination of waste streams and possible reaction of incompatible wastes. Inconsistency in the phase, color, density, viscosity, odor, homogeneity, or fingerprint analysis of the waste and the listed constituent(s) on the generator label can quickly be detected by the technical personnel employed at DLD.

After sorting and documenting that the fingerprint of the waste is comparable with the information received from the generator or, if warranted, laboratory analysis, compatible wastes are commingled as a method of reducing the volume of the original waste and making it more conducive to storage and transportation. Waste is stored in containers, lined containers, or IBC's compatible with the waste or, if the waste is a liquid, it may be stored in one of DLD's 5,000-gallon stainless steel storage tanks. Once sorting and fingerprinting is finished, the commingling of compatible waste will be carried out in one of the licensed containment areas under the supervision of a trained DLD chemist using generator (or manufacturer) information and knowledge gained from training and prior bench tests.

Waste or waste mixtures that have not been tested for compatibility before or are significantly different from those wastes that have been previously tested will be checked for compatibility. Compatibility will be determined by using an aliquot system or ASTM:D5058, Standard Test Methods for Compatibility of Screening Analysis of Waste. Wastes determined to be incompatible will not be commingled.

Wastes to be commingled may also contain compounds that have EPA listed waste codes associated with them. (see Volume 1, Part A, pages 4-18) All listed waste codes are retained by the commingled mixture and become part of the generator information provided to the licensed treatment facility to which the waste is shipped.

Because the composition of the waste mixture can be significantly different from the wastes commingled to generate it, a representative sample is taken and laboratory analysis performed (as described in Section A3.B.2), so that the licensed destination facility will have adequate information describing the waste, as per 40 CFR 268 – Land Disposal Restrictions. Prior to shipment off site for treatment/disposal, the sample's various constituents and properties as determined by laboratory analysis and generator information must conform to the criteria set by the destination facility in order for the waste to be approved for receipt.

C4.B.2 Commingling Categories

Each incoming shipment is inspected and containers with wastes eligible for commingling are sorted into the following groups:

C4.B.2(a) Refrigerants for Recovery

DLD engages in the commingling of refrigerants from containerized waste and small appliances for the purpose of reclamation. Refrigerants eligible for recovery are stored in their original containers or commingled into regulatory compliant recovery cylinders. The commingling of these refrigerants are carried out by a Certified Type I technician or his/her apprentice (40 CFR §82.161(a)) using recovery equipment compliant with 40 CFR §82.158, with the recovered refrigerants being shipped off site to an EPA certified refrigerant reclamation facility.

Unlike most other wastes that are commingled, refrigerants do not require analytical testing for acceptability at a reclamation facility. Each refrigerant has a unique pressure-temperature relationship that identifies it. The purity and type of refrigerant is assessed by the Certified Type I Technician or apprentice using the pressure-temperature relationship prior to commingling into a recovery cylinder.

The containers and small appliances that have undergone refrigerant recovery and/or verification that the refrigerant has been evacuated (40 CFR §82.156(f)) are sent for recycling as scrap.

C4.B.2(b) Aqueous Acids and Heavy Metals Solutions

Aqueous acids are water solutions of inorganic compounds of varying concentrations and pH that may contain one or more of the EPA toxic characteristic metals (D004 through D011). In general, the water content is such that the flash point is above 140^{o}F and BTU content is less than 1,000 BTU per pound.

Heavy metal solutions are water solutions of compounds that contain one or more of the EPA toxic characteristic metals (D004 through D011) of varying concentrations and pH. In general, the water content is such that the flash point is above 140^{o}F and BTU content is less than 1,000 BTU per pound.

Armed with generator information, knowledge gained from training, and prior experience, and following the guidelines presented in C4.B.1 above, the majority of these wastes are carefully commingled underneath a fume hood within a suitable DLD containment area. The liquid present in the commingling vessel is used as a heat sink to prevent violent reactions from occurring during the addition of the comparatively smaller volumes of these wastes. This commingling is done in a fume hood as a precautionary measure to capture fugitive corrosive and toxic fumes and vapors that may be released during the commingling process.

Wastes in this category either go through on site neutralization/precipitation or are shipped off site to a licensed treatment facility.

C4.B.2(c) Liquid Pesticides and Herbicides

Wastes in this group are pest and vegetation killers/inhibitors of varying concentrations that may contain one or more of the EPA toxic characteristics designated as D004 through D043. These formulations are generally heavily halogenated compounds with a BTU content of less than 4,000 BTU per pound and low volatility, but may also contain solvents as a carrier for the active ingredients.

Liquid pesticides and herbicides that are eligible to be commingled are processed in one of DLD's licensed hazardous waste containment areas. These wastes are carefully commingled using generator information, knowledge gained from training and prior experience, and following the guidelines presented in C4.B.1 above.

Wastes in this category are shipped off site to a licensed treatment facility for disposal via incineration.

C4.B.2(d) Solvents and Solutions

Of all the commingling processes undertaken at DLD, this process represents the largest volume handled. These wastes are divided into three groups for separate commingling: halogenated solvents, high BTU solvents, and low BTU solvents/solutions. Each of these categories may be contaminated with constituents that display the EPA characteristic waste codes D004 through D043.

Halogenated solvents are carbon-containing liquids with one or more halogen atoms incorporated into the organic molecule, e.g., trifluoroethane, dichloromethane, and bromobenzene. High BTU solvents are primarily carbon-containing liquids that are not water miscible. Low BTU solvents/solutions are water-miscible liquids and solutions.

Halogenated solvents, high BTU solvents, and low BTU solvents/solutions are carefully commingled separately under a fume hood areas using generator information, knowledge gained from training and prior experience, and following the guidelines presented in section C4.B.1 above.

Storage and shipment of commingled organic solvents and solutions in drums, IBC's, or bulk tank is based on three factors: (1) the final composition of the commingled waste; (2) the acceptance criteria of the licensed disposal facility; and (3) economic considerations. The decision to ship these wastes off site for incineration, fuel recovery, waste water treatment, or some other appropriate disposal methodology, is determined based on these factors.

C4.B.2(e) Mercury for Recovery

Elemental mercury and mercury contaminated materials are segregated and carefully commingled for the purpose of volume reduction, rendering the waste more amenable to recovery, and making it more amenable to storage and shipment.

Using generator information, knowledge gained from training, and prior experience, and following the guidelines presented in C4.B.1 above, this process employs a tertiary containment tray to prevent the spread of mercury contamination. To control the emission of mercury vapor, DLD employs a mercury vacuum to thoroughly clean the containment tray after use. If the mercury contaminated materials are required to be left in the tray overnight, the mercury vacuum is used to clean as much of the visible elemental mercury as possible and the tray is covered.

Verification of the control of mercury vapor emission is conducted using a portable electronic mercury sensing device. The mercury "sniffer" is used to verify: (1) that the tertiary containment tray does not need to be covered; (2) that the containers used to transport the mercury contaminated material is mercury-free and may be re-used; (3) that the area in which the mercury commingling takes place is free of elemental mercury contamination; and (4) that other materials have been thoroughly decontaminated for recycle or disposal in another waste stream.

Recovered elemental mercury is stored in mercury flasks and shipped off site for reclamation or permanent storage at a licensed treatment facility. Other mercury contaminated materials are shipped off site to a licensed treatment facility for mercury recovery via retort.

C4.B.2(f) Solid Pesticides and Herbicides

Solid pesticides and herbicides are pest and vegetation killers and inhibitors of varying concentrations that may contain one or more of the EPA toxic characteristics designated as D004 through D043.

Solid pesticides and herbicides that are eligible to be commingled are processed with great care to minimize the generation of airborne dusts. These wastes are commingled using generator information, knowledge gained from training and prior experience, and following the guidelines presented in C4.B.1 above.

Wastes in this category are shipped off site to a licensed treatment facility for incineration.

C4.B.2(g) Inorganic Solids

Inorganic solids are stable, non-reactive compounds that are typically ionically bonded and usually originate from a mineral or metal source. They may contain one or more of the EPA toxic characteristics designated as D004 through D011. Some examples of inorganic solids for purposes of this classification are barium chloride, sodium sulfate, calcium carbonate, and potassium phosphate.

These materials are carefully commingled using generator information, knowledge gained from training, and prior experience, and following the guidelines presented in C4.B.1 above. As with the solid pesticides and herbicides, great care is taken to minimize the generation of airborne dusts.

Wastes in this category are either solidified on site or shipped off site to a licensed disposal facility for solidification. The purpose of the solidification is to chemically immobilize the heavy metal containing solids into a medium which will pass the TCLP (Toxic Characteristic Leaching Procedure) test.

C4.B.2(h) Organic Solids

Organic solids are stable, non-reactive organic compounds that may contain one or more of the EPA toxic characteristics designated as D004 through D043. Many of the compounds that are commingled in this category are not RCRA hazardous, but are DOT hazardous materials and DLD does not believe that it is proper to dispose of them in a landfill. In addition, these wastes tend to have a significant thermal value.

These organic solids are carefully commingled with high BTU using generator information, knowledge gained from training, and prior experience, and following the guidelines presented in C4.B.1 above. The resultant mixture is then blended to create a BTU rich slurry.

The disposal method of this waste is contingent on the final composition of the blended waste and the acceptance criteria of the licensed disposal facility. The decision to ship these wastes off site for incineration or fuel recovery is determined based on these two factors.

C4.B.2(i) Miscellaneous Burnable Materials

Absorbent materials used in spill clean-ups, used paint filters, plastic pipettes, and filter papers are just a few of the materials received by DLD that fit into this category. It consists of small debris contaminated with hazardous waste or that is declared a waste because it was “derived from” another waste that was hazardous and is required to be disposed of as a RCRA waste.

Sawdust used at DLD to clean metal and plastic drums for recycling that previously held EPA "listed" waste is an example of "derived from" waste that is placed in this waste stream. This waste stream will also frequently contain materials with EPA toxic characteristics designated as D004 through D011 and D012 through D043.

These materials are carefully commingled in using generator information, knowledge gained from training and prior experience, and following the guidelines presented in C4.B.1 above.

Wastes in this category are shipped off site to a licensed treatment facility for incineration.

C4.B.2(j) Distillation Candidates

Used paint thinners, spent solvents, spent solvent mixtures, and used chiller solutions are all candidates for distillation. Distillation candidates represent the opportunity to recycle or reuse waste materials that would normally be disposed of as hazardous waste.

Materials determined to be eligible for distillation are carefully commingled for volume reduction. These wastes are then stored to await processing in a distillation unit. Once processed, the effluent(s) are repackaged/relabeled for use as a product. The still bottoms are packaged for disposal and labeled with all appropriate waste codes, including any applicable codes that were associated with the waste(s) prior to processing.

Wastes in this category are shipped off site to a licensed treatment facility for incineration or stabilization.

C4.B.2(k) Explosive Materials

The concentration of an explosive compound has a direct bearing on whether or not it is capable of detonation. Dissolution (see Volume 1, Section C4.C7(b)(ii)) of an explosive compound in an appropriate solvent will render it incapable of explosive decomposition. The resultant non-reactive solvent containing the formerly reactive compound may now be commingled with other compatible solvents and stored in one of DLD's 5,000-gallon stainless steel tanks until it is shipped off site to a licensed treatment facility.

The addition of waste generated by this method of disposal of compounds that were previously reactive (readily capable of detonation and forbidden explosives) to the waste streams generated in C4.B.2(b) and C4.B.2(d) does not alter the treatment parameters of these wastes. No additional analytical parameters are required to accommodate the addition of the dissolute compounds.

Only compounds amenable to safe commingling with an appropriate solvent and complete dissolution therein will be treated via commingling at the DLD facility. Compounds that are not able to be treated using the commingling method must be treated using one of the other methods discussed in Volume 1, Section C4 of this license. *Note that the commingling of solvents/solutions containing explosive materials occurs only after the dissolution process (see Volume 1, Section C4.C7(b)(ii)).*

C4.B.3 Container Disposal

All emptied waste containers, whether they are made from glass, metal or plastic, are assessed for recycling. Each container found suitable for recycling is cleaned using an appropriate method (e.g., washed and rinsed, cleansed using sawdust, etc.) to assure environmental safety and volume reduced for ease of storage and transport. Containers which have contained an acute hazardous waste are triple rinsed as required by R299.92075(a) of Michigan Act 451, Part 111, prior to being volume reduced.

C4.C REACTIVES

DLD routinely handles reactive waste meeting the criteria listed in paragraphs one through six of 40 CFR 261.23 (a). DLD proposes to also receive and handle materials meeting the criteria of paragraphs seven and eight of 40 CFR 261.23 (a). The definition and common examples of chemicals meeting these listed properties are as follows:

C4.C.1 Waste that is normally unstable and readily undergoes violent change without detonating.

Chemicals meeting this definition would include pyrophorics (air-reactives) such as white phosphorus, lithium hydride, and butyllithium. These chemicals are protected from air and/or moisture by being stored in an inert atmosphere or under water-free kerosene, solvent, or oil.

These chemicals are typically lab packed, stored, and shipped off site for incineration in the manufacturer's original container. DLD trains its Hazardous Waste Chemists to fingerprint these materials at the time of receipt of the waste, but not to perform bench tests or sample them for laboratory analysis because of the likelihood of combustion of these materials during sampling and/or analysis.

Some of the chemicals that fit this category are segregated for processing. Since the reactivity of some of these chemicals is related to their concentration, quenching them in an appropriate media will make them safer for transport and storage by reducing reactivity. Other chemicals in this category can be safely reacted. The quenching of pyrophoric chemicals takes place under an inert atmosphere by a trained DLD chemist.

C4.C.2 Waste that reacts violently with water.

Examples of water reactive chemicals meeting this definition include alkali metals (sodium, potassium, lithium, and rubidium), alkaline earth metals (calcium, magnesium, and strontium), anhydrous aluminum chloride, and phosphorus pentoxide. These chemicals are either treated with water to make them no longer reactive, or are lab packed for shipment and treatment at a licensed treatment facility. The descriptions that follow are the treatment processes used for water reactive chemicals that are not lab packed.

C4.C.2(a) Alkali Metals

C4.C.2(a)(1) Alkali Metals

Alkali metals can be dissolved in an appropriate alkyl alcohol (R-OH) under controlled conditions represented by the following equation:

$$2Na + R\text{-}OH \text{ (excess)} \rightarrow NaO\text{-}R + H_2$$

The alkali metal reacts to form a metal alkoxide that remains dissolved in the excess alcohol throughout the reaction. When the reaction is complete, the waste solution is non-reactive and is commingled with high BTU organic solvents or low BTU solutions.

The commingled waste is then shipped off site for treatment at a licensed treatment facility.

C4.C.2(a)(2) Alkali Metals

Alkali metals can be treated slowly with humid air and/or water vapor under controlled conditions represented by the following equation:

$$2Na + 2H_20 \rightarrow 2NaOH + H_2$$

The alkali metal reacts to form solid sodium hydroxide. When the reaction is complete, the remaining sodium hydroxide is a DOT corrosive hazardous material and a RCRA nonhazardous waste. The sodium hydroxide is then either neutralized at DLD, or shipped off site to an appropriate disposal facility.

C4.C.2(b) Alkaline Earth Metals

Alkaline earth metals can be treated slowly with water or dilute acid under controlled conditions represented by the following equation:

$$Ca + 2H_2 \rightarrow Ca(OH)_2 + H_2$$

The resulting hydroxide solution is neutralized and subsequently commingled with low BTU solutions. The commingled waste is then shipped off site for treatment at a licensed treatment facility.

C4.C.2(c) Anhydrous Aluminum Chloride

Anhydrous aluminum chloride can be treated slowly with water and neutralized with base (ammonium hydroxide, sodium hydroxide, calcium hydroxide, etc.) and is represented by the following equations:

$$AlCl_3 + 3H_2O \rightarrow Al(OH)_3 + 3HCl$$

$$2HCl + Ca(OH)_2 \rightarrow CaCl_2 + H_2O$$

The resulting solution is commingled with other low BTU solutions and shipped off site for treatment at a licensed treatment facility.

C4.C.2(d) Phosphorus Pentoxide

Phosphorus pentoxide can also be treated slowly with water and neutralized with base and is represented by the following equation:

$$P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$$

$$H_3PO_4 + 2NaOH \rightarrow Na_2HPO_4 + 2H_2O$$

The resulting solution is commingled with other low BTU solutions and shipped off site for treatment at a licensed treatment facility.

C4.C.3 Waste that forms potentially explosive mixtures with water

Calcium carbide mixed with water is an example of this type of waste. It is either treated so it no longer forms explosive mixtures with water or it is lab packed for shipment and treatment at a licensed treatment facility. The calcium carbide reacts with the water to form acetylene (gas) and calcium hydroxide and is represented by the following equation:

$$CaC_2 + 2H_2O \rightarrow C_2H_2 + Ca(OH)_2$$

The acetylene is captured in a charcoal bed, while the calcium hydroxide solution is neutralized, commingled with low BTU solutions, and shipped off site for treatment at a licensed treatment facility.

C4.C.4 Waste that generates toxic gases when mixed with water.

Chemicals under this category, such as alkaline earth metals, are covered under C4.C.2 above. Other chemicals which could fall under this category are also covered in C4.C.6, below.

C4.C.5 Cyanide or sulfide bearing waste.

Cyanide- and sulfide-bearing waste is either treated to render these wastes incapable of generating toxic gases or lab packed for shipment to an off site licensed treatment facility. The descriptions that follow are the treatment processes used for cyanide or sulfide bearing wastes that are not lab packed.

C4.C.5(a) Cyanides

Cyanide-bearing waste received at DLD, whether liquid or solid, is stored away from mineral acids to avoid the possibility of a release of toxic gas in the event of a spill. Liquid cyanide wastes selected for treatment are first checked to ensure the pH is above seven (7) to guarantee that a release of hydrogen cyanide gas does not occur. DLD currently employs two methods of deactivation of cyanides: alkaline oxidation and alkaline chlorination.

i. **Alkaline Oxidation Method:** This method utilizes oxidizers (such as calcium hypochlorite, potassium nitrate, and hydrogen peroxide) in alkaline solution of pH greater than 10 to convert the cyanide anion to the cyanate anion. This reaction is represented by the following equation:

$$2CN + Ca(OCl)_2 \rightarrow 2NaOCN + CaCl_2$$

The resulting waste cyanate solution is no longer a cyanide bearing waste and is, therefore, no longer reactive. The solution is subsequently commingled with other compatible liquids and shipped off site for treatment at a licensed treatment facility.

ii. **Alkaline Chlorination Method:** In the alkaline chlorination method, a two step addition of chlorine using a closed system gas chlorinator renders the cyanide waste totally inert by oxidation. This method employs lecture cylinders of chlorine gas as the closed system gas injector. Closed system gas injection is a process whereby the chlorine gas is bubbled directly into the cyanide solution and does not release chlorine gas into the atmosphere. The reaction is represented by the following two equations:

(at pH of 11.5)

$$NaCN + Cl_2 + 2NaOH \rightarrow NaOCN + 2NaCl + H_2O$$

(at pH of 7.5 to 9)

$$2Na_2OC_2N + 3Cl_2 + 4NaOH \rightarrow 6NaCl + 2H_2O + N_2(gas) + 2CO_2(gas)$$

The resulting waste solution is no longer a cyanide bearing waste and is, therefore, no longer reactive. The solution is subsequently commingled with other liquids for shipment off site for treatment at a licensed treatment facility.

C4.C.5(b) Sulfides

Sulfide-bearing waste received at DLD, whether liquid or solid, is stored away from mineral acids to avoid the possibility of release of toxic gas in the event of a spill. Liquid sulfide wastes selected for treatment are first checked to ensure the pH is above seven (7) to guarantee that a release of hydrogen sulfide gas does not occur. Oxidizing compounds, such as calcium hypochlorite, potassium nitrate, and hydrogen peroxide, are employed to convert sulfides to sulfates and is represented by the following equation:

$$Na_2S + 2Ca(OCl)_2 \rightarrow Na_2SO4 + 2CaCl_2$$

The resulting waste solution is no longer a sulfide bearing waste and is, therefore, no longer reactive. The solution is subsequently commingled with other compatible liquids and shipped off site for treatment at a licensed treatment facility.

C4.C.6 Waste that is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement.

These compounds are either treated to render these compounds incapable of detonation or lab packed for incineration. Examples of this reactive waste type would include organic peroxides, some mono- and dinitro-ring compounds, some alkylhydrazine salts, and picric acid. DLD employs two methods of deactivation of these compounds: conversion to non-reactive compounds and dissolution.

i. **Conversion Method:** Conversion of reactive to non-reactive compounds by chemical reaction is primarily used for, but not limited to, deactivation of organic peroxides. Organic peroxides are slowly hydrolyzed over time in the presence of water. The hydrolysis of an organic peroxide compound is represented by the following equation:

$$2R\text{-}O\text{-}O\text{-}R' + 2H_2O \rightarrow 2R\text{-}OH + 2R'\text{-}OH + O_2$$

The resulting waste solution no longer contains organic peroxides and is, therefore, no longer reactive. The solution is subsequently commingled with other compatible liquids and shipped off site for treatment at a licensed treatment facility.

ii. **Dissolution Method:** Since the concentration of these compounds have a direct bearing on whether or not they are capable of detonation, dissolution in an appropriate solvent will render them incapable of explosive decomposition. Upon complete dissolution of this type of waste, the resultant non-reactive solvent waste containing the formerly reactive compounds is commingled with other compatible solvents and stored in one of DLD's 5,000-gallon stainless steel tanks until it is shipped off site for treatment at a licensed treatment facility.

C4.C.7 Waste that is readily capable of detonation or explosive decomposition at standard temperature and pressure (40 CFR 261.23(a)(7)).

C4.C.7(a) Fingerprinting/Screening

The identification and fingerprinting of these wastes are the responsibility of the trained DLD chemists. Because of the potentially violent reactive nature of wastes in this category, laboratory analyses are seldom attempted and proper identification is of utmost importance.

Primary to the fingerprinting process is comparative identification with the information on the waste profile and manifest documents. Many of the compounds fitting this category must be wetted prior to transport and inspection should verify the visible presence of liquid in containers of these materials. Positive fingerprinting of the incoming wastes must be established prior to receiving these wastes at our facility.

The chemists' use of generator knowledge, manufacturer knowledge, and knowledge gained from on-the-job training and first-hand experience is critical to the successful completion of these operations. As such, identification and fingerprinting of wastes fitting this category will be accomplished under the direct supervision and involvement of a Hazardous Waste Chemist.

C4.C.7(b) Handling

Review of the profile, manifest document, and available material safety data sheets (MSDS) is essential before handling wastes fitting the description of this category. These compounds may be detonated by being subjected to shock, heat, friction, or catalyst and the modes of detonation need to be identified prior to working with each compound.

Shock sensitive materials must be handled to avoid all mechanical means of trauma. Removal of these materials from containers must be accomplished gently and without scraping or chiseling with a spatula. Lumps of shock sensitive materials should not be ground with a mortar and pestle.

Heat sensitive materials need to be isolated from open flames and heat sources, including extremely exothermic reactions.

Friction and static electricity must be carefully avoided. For all materials identified as friction sensitive, the threads of the containers must be soaked in water or lubricated with a surfactant prior to opening (friction caused by the action of the threads of a cap on residual explosive material between the threads and container has been known to detonate contents). For safety purposes, a remote opening device is available to unscrew threaded container caps.

C4.C.7(c) Processing

Compounds fitting this description are treated to render them incapable of detonation or, if unable to render them incapable of detonation, prepared for transport off-site for detonation. Examples of this reactive waste type would include wetted HMX, wetted RDX, dry ammonium picrate, and some organic peroxides.

(i) **Conversion Method:** This method employs chemical reactions to convert reactive compounds into non-reactive compounds. Conversion by chemical reaction will be frequently used for, but not limited to, deactivation of organic peroxides. Organic peroxides are hydrolyzed over time in the presence of water using ammonia as a catalyst. The hydrolysis of an organic peroxide compound is represented by the following equation:

$$2R\text{-}O\text{-}O\text{-}R' + 2H_2O \rightarrow 2R\text{-}OH + 2R'\text{-}OH + O_2$$

The resulting wastes no longer contain organic peroxides and are, therefore, no longer reactive. These wastes are subsequently commingled with other compatible wastes and shipped off site for treatment at a licensed treatment facility.

Waste treated using this method is limited to a maximum of one (1) pound at a time.

(ii) **Dissolution Method:** Since the concentration of these compounds have a direct bearing on whether or not they are capable of detonation, dissolution in an appropriate solvent or solution will render them incapable of explosive decomposition. Upon complete dissolution the resultant non-reactive solvent/solution waste containing the formerly reactive compounds is commingled with other compatible solvents or solutions and stored until it is shipped off site for treatment at a licensed treatment facility.

Uninhibited waste treated using this method is limited to a maximum of one (1) pound at a time. Inhibited or quenched waste treated using this method is limited to a maximum of five (5) pounds at a time.

(iii) **Stabilization Method:** Compounds in this category that prove incapable of dissolution in a solvent or solution may still be able to be rendered non-reactive using the Stabilization Method. This method relies on the ability to sufficiently quench these inorganic reactive compounds to prevent detonation during the stabilization process. Once quenched, they may be safely dispersed and encapsulated in cement leaving them incapable of detonation. Once solidified, these wastes no longer exhibit the EPA characteristic of reactivity and are no longer considered reactive.

Uninhibited waste treated using this method is limited to a maximum of one (1) pound at a time. Inhibited or quenched waste treated using this method is limited to a maximum of five (5) pounds at a time.

(iv) **Detonation Method:** Wastes that prove to be unsuitable for the aforementioned methods will be stored for transport off-site for disposal via detonation. Detonation will be overseen by DLD personnel after contacting the proper authorities and obtaining all required permits.

The maximum quantity of waste treated using this method will be determined using information about the detonation site and its distance from inhabited buildings and public thoroughfares. 27 CFR 555.218 will serve as a guideline in determining the maximum quantity detonated and safe detonation distance.

C4.C.8 Waste that is a forbidden explosive as defined in 49 CFR §173.51, or a Class A explosive as defined in 49 CFR §173.53, or a Class B explosive as defined in 49 CFR §173.88 (40 CFR 261.23(a)(8)).

C4.C.8(a) Fingerprinting/Screening

See Section C4.C.7(a), above.

C4.C.8(b) Handling

See Section C4.C.8(b), above

C4.C.8(c) Processing

Compounds fitting this description are treated to render them incapable of detonation or, if unable to render them incapable of detonation, prepared for transport off-site for detonation. Examples of this reactive waste type would include wetted lead azide, ammonium bromate, mercury fulminate, and some organic peroxides.

(i) **Conversion Method:** This method employs chemical reactions to convert reactive compounds into non-reactive compounds. Conversion by chemical reaction will be frequently used for, but not limited to, deactivation of organic peroxides. Organic peroxides are hydrolyzed over time in the presence of water. The hydrolysis of an organic peroxide compound is represented by the following equation:

$$2R\text{-}O\text{-}O\text{-}R' + 2H_2O \rightarrow 2R\text{-}OH + 2R'\text{-}OH + O_2$$

Other examples of chemical conversion methods include the controlled oxidation of azide compounds, represented by the equation:

$$MnO_4^- + 2N_3^- + 8H^+ \rightarrow Mn^{2+} + 3N_2 + 4H_2O$$

and the reduction of azide compounds, represented by the equation:

$$8Zn + 2N_3- + 24H^+ \rightarrow 8Zn^{2+} + 6NH_4^+$$

In each case the reactive compound undergoes a chemical reaction after which it is no longer reactive. The resultant wastes are subsequently commingled with other compatible wastes and shipped off site for treatment at a licensed treatment facility.

Waste treated using this method is limited to a maximum of one (1) pound at a time.

(ii) **Dissolution Method:** Since the concentration of these compounds have a direct bearing on whether or not they are capable of detonation, dissolution in an appropriate solvent or solution will render them incapable of explosive decomposition. Upon complete dissolution of this type of waste, the resultant non-reactive solvent waste containing the formerly reactive compounds is commingled with other compatible solvents and stored until it is shipped off site for treatment at a licensed treatment facility.

Uninhibited waste treated using this method is limited to a maximum of one (1) pound at a time. Inhibited or quenched waste treated using this method is limited to a maximum of five (5) pounds at a time.

(iii) **Stabilization Method:** Compounds in this category that prove incapable of dissolution in a solvent or solution may still be able to be rendered non-reactive using the Stabilization Method. This method relies on the ability to sufficiently quench these inorganic reactive compounds to prevent detonation during the stabilization process. Once quenched, they may be safely dispersed and encapsulated in cement leaving them incapable of detonation. Once solidified, these wastes no longer exhibit the EPA characteristic of reactivity and are no longer considered reactive.

Uninhibited waste treated using this method is limited to a maximum of one (1) pound at a time. Inhibited or quenched waste treated using this method is limited to a maximum of five (5) pounds at a time.

(iv) **Detonation Method:** Wastes that prove to be unsuitable for the aforementioned methods will be stored for transport off-site for disposal via detonation. Detonation will be overseen by DLD personnel after contacting the proper authorities and obtaining all required permits.

The maximum quantity of waste treated using this method will be determined using information about the detonation site and its distance from inhabited buildings and public thoroughfares. 27 CFR 555.218 will serve as a guideline in determining the maximum quantity detonated and safe detonation distance.

C4.C.9 Summary

The identification and fingerprinting of the above wastes are the responsibility of the trained DLD chemists. Because of the nature of reactive wastes, laboratory analyses are seldom attempted and proper identification is of utmost importance. The chemists' use of generator knowledge, manufacturer knowledge, and knowledge gained from on-the-job training and first-hand experience is critical to the successful completion of these operations. As such, all operations concerning the handling and deactivation of reactives are accomplished under the direct supervision and involvement of a Hazardous Waste Chemist.

Treatment of reactive materials capable of evolving RCRA hazardous substances or volatile emissions will be performed under a fume hood.

C4.D HEXAVALENT CHROMIUM TREATMENT

The determination is made by the Hazardous Waste Chemist if wastes containing hexavalent chromium will be commingled for shipment off site to a licensed treatment facility or reacted at DLD. This decision is based on economic factors and the availability of reagents for treatment. Treatment at DLD is conducted under a fume hood under the supervision of a trained DLD chemist. In the treatment process, the hexavalent chromium waste is reduced to its trivalent form using a reducing agent in basic media ranging in pH from 8 to 10. The reduction process is carried out using a reducing agent, such as sodium bisulfite, stannous chloride, or sodium borohydride, and is represented by the following equation:

$$12H^{+} + Cr_2O_7^{-2} + Na_2S_2O_5 + 2CrO_4^{-2} \rightarrow 2\ Cr_2O_3 + Na_2SO4 + 6H_2O$$

Neutralization of the resultant solution, which becomes acidic during the reaction, with alkaline hydroxide solution results in the precipitation of insoluble trivalent chromium salts.

Representative samples are taken during the reducing process to ensure complete reduction of all hexavalent chromium. These samples undergo a photometric test for Cr^{+6} using ASTM Test Number D-1687-86A.

The basic chromium salts which precipitate are encapsulated as part of the solidification process conducted at DLD and subsequent shipment to a Type I (chemically secure) landfill. The supernatant liquid generated from the process is commingled with other low BTU solvent/solutions and pumped into a 5,000-gallon stainless steel storage tank to await shipment off site to a licensed treatment facility for incineration or waste water treatment.

C4.E STABILIZATION

Drug & Laboratory Disposal receives heavy metal wastes from both regulated generators and non-regulated generators. The containers are required to be labeled as to their constituents. Metal salts of arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), silver (D011), copper (001D), and zinc (003D) are examples of the metals found in solutions received.

The stabilization process at DLD is designed to chemically convert these metals into insoluble heavy metal salts which can then be encapsulated (stabilized) in concrete and transported to a secure chemical landfill. This restricted waste (land ban waste) must meet the treatment standards specified in 40 CFR 268.41, and these treatment standards must be verified by a Toxicity Characteristic Leaching Procedure (TCLP) test.

The current process will be continued for all heavy metals wastes (D004 through D011) for which stabilization is determined to be the appropriate disposal method. It is important to note that the process used by DLD meets the treatment standards for all heavy metals, including mercury (D009) and arsenic (D004). Wastes classified as hazardous due to EPA characteristic hazards that is treated such that it no longer displays those characteristic, is no longer hazardous and, therefore, no longer needs to be stored, transported, and disposed of as hazardous waste. Because of this, solidified heavy metal solids passing these tests can be transported for disposal to a Type II landfill; however, DLD currently ships this waste to a Type I secure chemical landfill as a precaution.

Stabilization of waste will be carried out under the supervision of a trained DLD chemist using generator (or manufacturer) information and knowledge gained from training and prior experience performing stabilization. In the stabilization process, the solids are mechanically mixed with Portland cement powder and aggregate and poured into a 1A2 drum where stabilization takes place.

During this stabilization/treatment process, a representative sample of each batch is collected using the ASTM Standard D140-70 method for extremely viscous liquids (as listed in Appendix I of 40 CFR Part 261) before it has hardened and allowed to solidify in the sample container. TCLP tests are then performed on this composite sample. Since this is a nearly continuous process, the sampling is used to verify and document that the waste stream produced has not changed. Analysis for metals utilizing EPA TCLP test method 1311 is conducted at least once each year that the stabilization processed is performed.

The sampling and analysis of solidified waste is performed whenever the stabilization process procedures are changed, any time the Hazardous Waste Chemist has reason to suspect that the solidified waste may have changed, or whenever the stabilization is not completed within 24 hours after placement of the waste into the shipment drum.

Stabilization of radioactive materials will be performed under the supervision of a trained DLD chemist using generator (or manufacturer) information and knowledge gained from training and prior experience performing stabilization. In the stabilization process, the radioactive materials are mechanically mixed with Portland cement and aggregate within the container that it will ultimately be shipped in for off site disposal at a licensed radioactive materials facility. Equipment used in the stabilization process (including personal protective equipment) is either decontaminated for re-use or is encapsulated for disposal as a radioactive material.

All waste is disposed of in accordance to State and Federal regulations with full consideration given to land disposal restriction.

C4.F NEUTRALIZATION

C4.F.1 Practices Common to DLD Neutralization Processes

As the primary means of identification, the generator's label is assumed to be correct; however, because errors in labeling can occur, it is expedient for a trained chemist to inspect containers during sorting and commingling. This inspection and evaluation of the physical and chemical properties of container contents, called the "fingerprint", will be documented for each shipment and is an invaluable safeguard against the contamination of waste streams and possible reaction of incompatible wastes. Inconsistency in the phase, color, density, viscosity, odor, homogeneity, or fingerprint analysis of the waste and the listed constituent(s) on the generator label can quickly be detected by the technical personnel employed at DLD.

After sorting and documenting that the fingerprint of the waste is comparable with the information received from the generator or, if warranted, laboratory analysis, these wastes are carefully neutralized to change their treatability group and to make the resultant waste more conducive to storage and transportation. Neutralization will be carried out in a licensed containment area under the supervision of a trained DLD chemist using generator (or manufacturer) information and knowledge gained from training and prior bench tests. Since the neutralization process uses the heat sink method to prevent violent reactions from occurring and the wastes are likely to react with one another, testing for incompatibility is not a part of the process.

Neutralized waste is then stored in containers, lined containers, or IBC's compatible with the waste or, if the waste is a liquid, it may be commingled with other low BTU solutions and stored in one of DLD's 5,000-gallon stainless steel storage tanks.

Prior to shipment off site a representative sample of the storage tank is collected and analyzed so that the licensed destination facility will have adequate information describing the waste, as per 40 CFR 268 – Land Disposal Restrictions. The sample's various constituents and properties as determined by laboratory analysis and generator information must conform to the criteria set by the destination facility in order for the waste to be approved for receipt.

C4.F.2 Neutralization Categories

C4.F.2(a) Aqueous Acids and Aqueous Bases

Aqueous acids and bases are water solutions of inorganic compounds of varying concentrations and pH that may contain one or more of the EPA toxic characteristic metals (D004 through D011).

These liquid wastes are safely stored to prevent potentially incompatible acids and bases from reacting with each other until the liquids are commingled from their containers into a neutralization vessel. The safe commingling of these potentially incompatible liquids is carried out under the supervision of a trained DLD Hazardous Waste Chemist. Using generator information, knowledge gained from training and prior experience, and following the guidelines presented in Section C4.F.1 above, these wastes are carefully neutralized underneath a fume hood in any of the previously

mentioned containment areas. Great emphasis is placed on maintaining near neutrality in the vessel used for commingling since the mass of the neutralized liquid already present in the vessel acts as a heat sink to prevent violent reactions from occurring during the addition of smaller volumes. For this reason, an aliquot method of commingling is not used when processing aqueous acids and bases.

Both acids and bases are neutralized; however, acids predominate necessitating the use of basic solutions (ammonium hydroxide, sodium hydroxide, magnesium hydroxide, etc.) to maintain a relatively neutral pH in the neutralization vessel. The pH is checked via a universal pH indicator strip which can indicate a solution's pH at whole number intervals. When the neutralization vessel is full and a pH of 7 to 9 has been verified, the liquid has then been neutralized. The liquid from the neutralization vessel is then transferred to one of DLD's 5,000-gallon tanks for storage with other low BTU solutions.

Wastes in this category will be shipped off site for treatment at a licensed treatment facility.

C4.F.2(b) Heavy Metal Solutions

Heavy metal solutions are water solutions of compounds that contain one or more of the EPA toxic characteristic metals (D004 through D011) of varying concentrations and pH.

The safe commingling of these potentially incompatible liquids is carried out under the supervision of a trained DLD Hazardous Waste Chemist. Using generator information, knowledge gained from training and prior experience, and following the guidelines presented in Section C4.F.1, these wastes are carefully neutralized underneath a fume hood in any of the previously mentioned containment areas with the liquid present in the neutralization vessel used as a heat sink to prevent violent reactions from occurring during the addition of the comparatively smaller volumes of these wastes.

Both acidic and basic heavy metals solutions are treated in this process; however, acidic solutions are usually received in higher volumes than basic solutions. These liquid wastes are commingled using the heat sink method and a minimum pH of 10 is maintained using

hydroxide solutions (ammonium hydroxide, sodium hydroxide, magnesium hydroxide, etc.). This results in a solution of heavy metal hydroxides which precipitate leaving supernatant liquids which no longer contain heavy metal concentrations above levels acceptable at the final disposal facility. The liquids and solids are separated to capture the solids and liberate the supernatant liquid.

In many instances the heavy metals content of the supernatant liquid is below RCRA limits. Even so, the supernatant liquids are transferred to one of DLD's 5,000-gallon tanks for storage with other low BTU solutions and are shipped off site for treatment at a licensed treatment facility.

The solids captured during the separation process contain the heavy metal wastes (D004 through D011) that were previously in solution and are collected and stored in containers. These solids may be stabilized on site or shipped off site for treatment at a licensed treatment facility. Solids with high mercury content are shipped off site for retort at a licensed treatment facility.

C4.F.3 Land Disposal Restriction Requirements

All waste is disposed of in accordance with State and Federal regulations with full consideration given to land disposal restriction requirements. DLD does not currently have a permit to discharge or a connection to a POTW.

C4.F.4 Neutralization/Precipitation Units

A by-product of the neutralization process can be the precipitation of solids. While the neutralized liquid waste may be stored in containers, or commingled with other low BTU solutions and stored in one of DLD's 5,000-gallon stainless steel storage tanks, excess solid waste in the storage tanks leads to corrosion. To minimize the amount of solids transferred to the storage tanks, neutralized waste is decanted so that the supernatant liquid may be placed in the storage tanks. The remaining mixture undergoes further processing prior to disposal.

To increase efficiency and reduce waste volumes, DLD proposes to use a series of portable tanks and a filter press for the neutralization, precipitation, and separation steps involved in this process (see Volume 1, Attachment C4-30). Trained DLD Hazardous Waste Chemists will identify and segregate wastes suitable for processing in the Neutralization/Precipitation Unit.

The first stage requires that all eligible liquids for neutralization/precipitation be fed into a large volume pH Neutralization Tank. The tank's pH is maintained close to neutral and takes advantage of the comparatively large mass of the neutralization tank which acts as a heat sink that prevents excessively violent reactions from occurring during the careful addition of waste.

The second stage is adjustment of the pH to maximize the precipitation of heavy metals. Maintaining the pH of this tank slightly above 10.5 optimizes the removal of RCRA metals from solution.

The next step in the process is the addition of a coagulant to tie up the solid fines and prevent them from exiting the process with the supernatant or effluent of the system. Flocculating agents are added in appropriate proportions to the precipitated solids and moved on to the Settling Tank.

The Settling Tank lets the bound solids settle to the bottom providing the opportunity for the supernatant liquid to be drawn off. The concentration of RCRA metals will be sufficiently low in the supernatant to allow it to be transferred to one of DLD's 5,000-gallon storage tanks.

Solids at the bottom of the Settling Tank will be transferred into the Solids Accumulation Tank and, once sufficient volume is accumulated, the solids are then fed into a filter press for liquid-solid separation.

In many instances the heavy metals content of the effluent from the filter press is below RCRA limits and can be managed for nonhazardous waste water treatment. If the effluent meets the definition of a hazardous waste, they are transferred to one of DLD's 5,000-gallon tanks for storage with other low BTU solutions and are shipped off site for treatment at a licensed treatment facility.

The solids captured during the separation process contain the heavy metal wastes (D004 through D011) that were previously in solution and are collected and stored in containers. These solids may be stabilized on site or shipped off site for treatment at a licensed treatment facility. Solids with high mercury content are shipped off site for retort at a licensed treatment facility.

DLD proposes to operate up to three (3) Neutralization/Precipitation Units, but no more than one unit in each Hazardous waste containment area.

C4.G STORAGE

C4.G.1 General Storage

For long term storage of reactive materials meeting the definition of Volume 1, Sections C4.C.7 and C4.C.8. For all other materials, see Volume 1, Attachment C1, Containers, for storage information.

All areas that are not allocated for treatment and areas allocated for treatment that are inactive (see section C4.K, Process Area Allocation), will be used for storage subject to the provisions in Volume 1, Attachment C1, Containers. Storage of waste in active treatment areas will be subject to the provisions in Volume 1, Attachment C1, Containers, and the additional constraints presented in C4.K.2, Storage Within Pods. Storage areas will be managed to maintain aisle space adequate for the entrance and egress of personnel and equipment.

C4.G.1 Radioactive storage

DLD Environmental Services, Inc manages radioactive materials in accordance with the MDEQ Ionizing Radiation Rules and Code of Federal Regulations, Title 10.

Storage and handling of radioactive materials (consisting largely of natural thorium and natural uranium compounds) is a periodic function at DLD. As such, all employee exposure is characterized as Non-Occupational exposure (R325.5205). Access to radioactive materials is limited through the use of locked storage units. Posting of these areas will be in accordance with the rules for Area and Room signs (R325.5229 and R325.5271) and Radiation Area Signs (R325.5225).

A storage units for these radioactive materials will be placed in a low traffic areas within DLS-1 where no employee is likely to receive a dose equivalent of more than 300 µRem per quarter (R325.5222). (See Volume 1, Attachment C4-Rad-1)

C4.H TREATMENT CAPACITIES

C4.H.1 Wastes Listed in Part A (DLS-1, DLS-2, DLS-3, DLS-5 & HWLB-1)

DLD shall treat no more than a total volume of 8,635 gallons (one hundred fifty-seven (157) 55-gallon drums at a time of hazardous wastes listed in Volume 1, Part A, pages 4-18 of this license) in the containment areas designated as DLS-1, DLS-2, DLS-3, DLS-5, and HWLB-1, excluding the treatment capacity of the Neutralization/Precipitation Unit in Section C4.H.7 below.

C4.H.2 Solidification (DLS-2)

DLD shall treat no more than a maximum of 165 gallons (three (3), 55-gallon drums) in the area during treatment at a time of hazardous waste in DLS-2 using the solidification treatment method specified in Volume 1, Section C4.E.

C4.H.3 Solidification (DLS-5)

DLD shall treat no more than a maximum of 165 gallons (three, 55-gallon drums) in the area during treatment at a time of hazardous waste in DLS-5 using the solidification treatment method specified in Volume 1, C4.E.

C4.H.4 Inorganic Fume Hoods (DLS-3, DLS-5)

DLD shall store or treat no more than 550 gallons (ten (10), 55-gallon drums) at a time under each of the inorganics fume hoods in the containment areas designated as DLS-3 & DLS-5.

C4.H.5 Organic Fume Hoods (DLS-3, DLS-5)

DLD shall store or treat no more than 550 gallons (ten (10), 55-gallon drums) at a time under each of the organics fume hoods in the containment areas designated as DLS-3 & DLS-5.

C4.H.6 Shredders (DLS-2, DLS-5)

DLD shall treat no more than a maximum throughput capacity of 4,125 gallons (seventy-five (75), 55-gallon drums) per day in a shredder (see Volume 1, Section C9 for information concerning shredders). DLD proposes to operate a maximum of five (5) shredders, fitted with pollution control devices, in the containment areas designated as DLS-2 and DLS-5.

C4.H.7 Distillation (DLS-3, DLS-5)

DLD shall treat no more than a maximum throughput capacity of 330 gallons (six (6), 55-gallon drums) per day in each distillation unit in the containment area designated as DLS-3. DLD proposes to operate a maximum of five (5) distillation units in the containment areas designated as DLS-3 and DLS-5.

C4.H.8 Neutralization/Precipitation Unit (DLS-3, DLS-5)

DLD proposes a maximum throughput capacity of 1,540 gallons (twenty-eight (28), 55-gallon drums) per day in the Neutralization/Precipitation Unit in the containment areas designated as DLS-3 & DLS-5. Each Neutralization/Precipitation Unit may store and treat no more than 3,000 gallons at a time. DLD proposes to operate two (2) Neutralization/Precipitation Units in the containment areas designated as DLS-3 and DLS-5.

C4.H.9 Fume Hood (DLS-1, DLS-2, DLS-3, DLS-5, HWLB-1)

DLD proposes to operate a maximum of 20 fume hoods in the containment areas designated as DLS-1, DLS-2, DLS-3, DLS-5, and HWLB-1, excluding pollution control devices fitted to hammer mills or shredders. DLD proposes to store or treat no more than 550 gallons (ten (10), 55-gallon drums) at a time under any single fume hood.

C4.H.10 Shredder Units (DLS-2, DLS-3, DLS-5, HWLB-1)

DLD proposes to operate a maximum of seven (7) shredders, each fitted with pollution control devices, in the containment areas designated as DLS-2, DLS-3, DLS-5, and HWLB-1.

C4.H.11 Hammer Mill (DLS-2)

DLD proposes a maximum throughput capacity of 7,920 gallons (one hundred forty-four (144), 55-gallon drums) per day in the hammer mill. The hammer mill may store and treat no more than165 gallons at a time. DLD proposes to operate a single (1) hammer mill in DLS-2.

C4.H.12 Metals Reclamation (DLS-3, DLS-5, HWLB-1)

DLD proposes a maximum throughput capacity of 330 gallons (six (6), 55-gallon drums) per day per Metals Reclamation (Electrolysis) Unit. DLD proposes to operate one unit in DLS-3, one unit in DLS-5, and one in HWLB-1.

C4.H. 13 Filter Press Units (DLS-1, DLS-2, DLS-3, DLS-5, HWLB-1)

DLD proposes to operate a maximum of five (5) 15 cubic foot Filter Presses, each with a max throughput capacity of 1,540 gallons (28, 55-gallon drums) per unit. These Filter Press Units will operate in DLS-1, DLS-2, DLS-3, DLS-5 and HWLB-1.

C4.H.14 Aerosol Recovery/Recycling (DLS-2, DLS-3. DLS-5)

DLD proposes a maximum throughput capacity of 330 gallons (six (6), 55-gallon drums) per day in each Aerosol Recovery/Recycling unit. DLD proposes to operate a maximum of ten (10) Aerosol Recovery/Recycling units. These units may be operated in DLS-2, DLS-3, and DLS-5.

C4.H.15 Conversion Method (DLS-3, DLS-5)

DLD proposes to treat no more than one (1) pound at a time of waste fitting the descriptions presented in Sections C4.C.7 and C4.C.8 (above) using the Conversion Method (presented in Sections C4.C.7(c)(i) and C4.C.8(c)(i) above).

C4.H.16 Dissolution Method (DLS-3, DLS-5)

DLD proposes to treat no more than one (1) pound of uninhibited waste or five (5) pounds of inhibited or quenched waste at a time fitting the descriptions presented in Sections C4.C.7 and C4.C.8 (above) using the Dissolution Method (presented in Sections C4.C.7(c)(ii) and C4.C.8(c)(ii) above).

C4.H.17 Stabilization Method (DLS-2, HWLB-1, DLS-5)

DLD proposes to treat no more than one (1) pound of uninhibited waste or five (5) pounds of inhibited or quenched waste at a time fitting the descriptions presented in Sections C4.C.7 and C4.C.8 (above) using the Stabilization Method (presented in Sections C4.C.7(c)(iii) and C4.C.8(c)(iii) above).

C4.H.18 Detonation Method (Off-site)

DLD proposes to use 27 CFR 555.218 as a guideline to determine the maximum quantity of waste fitting the descriptions presented in Sections C4.C.7 and C4.C.8 (above) that may be safely treated at one time using the Detonation Method (presented in Sections C4.C.7(c)(iv) and C4.C.8(c)(iv) above).

C4.I DISTILLATION

Some of the wastes received at DLD are contaminated solvents and spent solutions that are no longer useful to the generator. Distillation allows the reclamation and re-use of spent materials that would normally be disposed of as waste. Most solvents can be recovered through either simple distillation or fractional distillation, with the reclaimed material being a pure or nearly pure, completely usable product. Many spent solutions can also be restored to working concentrations and specified purity for reuse.

Distillation will be performed using closed-loop distillation apparatuses which do not have process vents, and which consist of a process chamber (also called a boiler, reboiler, or pot), encapsulated heaters, condenser, associated piping, instrumentation, and collection vessel. Also, depending on the physical properties of the solvent/solution mixture, a reflux column and a vacuum pump unit may be used to facilitate separation and efficiency. Distillation on spent materials with a potential for generating fugitive emissions will be performed under a fume hood. Distillation will be performed underneath one of the organic fume hoods.

The following distillation methods will be used with the distillation apparatuses as described above:

C4.I.1 Simple Distillation

Simple distillation is typically used to separate liquids with greatly differing boiling points (50^{o}F or more, as a rule of thumb). It is also used for purifying volatile liquids that contain non-volatile impurities (i.e. -- oil, grease, rust).

In simple distillation, liquid is placed in the process chamber and heated to generate vapor from the lowest boiling constituent of the mixture. The vapor that travels out of the top of the process chamber, is cooled in a condenser, and is collected as a purified liquid in a collection vessel.

C4.I.2 Fractional Distillation

In cases where the boiling points of constituents in the liquid mixture are relatively close together, fractional distillation may be required. This type of distillation requires the addition of a packed reflux column between the process chamber and the condenser to provide repeated vaporization-condensation cycles within the confines of the reflux column. The repeated vaporization and condensation of the mixture allows the lower boiling point constituent, referred to as a fraction, to rise up the column in increasing purity and be captured as it leaves the condenser.

The passage of the lowest boiling point fraction allows the reflux column temperature to increase and begin purification of the next fraction. In this manner each constituent from the liquid mixture that is fractionable is separated and collected.

C4.I.3 Vacuum Distillation

By applying a vacuum to a system (i.e. – decreasing the pressure) the boiling point of constituents within the system will also be proportionally decreased. This is desirable if (1) the mixture to be distilled contains very high boiling compounds; (2) the normal boiling point of any constituent is above its decomposition temperature; or (3) a pressure swing is required to break an azeotrope.

Vacuum distillation is frequently used in the separation of oils.

C4.I.4 Azeotropic Distillation

An azeotrope is a mixture of two or more liquids whose composition cannot be changed by simple distillation. Azeotropes boil at a temperature that is different (higher or lower) from the boiling points of its constituents. Heating the mixture generates a vapor with the same ratio of constituents as the liquid mixture rendering simple distillation ineffective when attempting to separate the constituents.

Azeotropic distillation encompasses the use of techniques to break the azeotrope and allow the separation of pure constituents. One technique consists of adding additional constituents to the mixture that form a new mixture without an azeotrope or a mixture that forms an azeotrope that has already been surpassed by the temperature of the column. Pressure change, both negative and positive, is also commonly used to break azeotropes.

Distillation in DLS-5 will be performed in the area designated for this process (see Volume1, Attachment C1-6).

C4.J ELECTROLYTIC RECOVERY OF METALS

DLD proposes to use electrolysis to recover metals from wastes. Electrolytic recovery of metals, such as copper, silver, gold, platinum, and mercury, can reduce the amount of waste generated by this facility and return these metals to the industrial and consumer markets. Through the use of a controlled electric current, metals that are dissolved or suspended in waste solutions can be recovered. Solid wastes can be dissolved and the desirable metals can be subsequently recovered from solution and purified.

Electrolytic recovery of metals will be performed under a fume hood to control the potential release of toxic or otherwise dangerous emissions. A rectifier using an anode and cathode compatible with the waste material will be employed to carefully regulate the current to optimize the removal of the desired metal(s). Recovered metals will then be recycled.

All waste received at DLD is disposed of in accordance with State and Federal regulations with full consideration given to land disposal restriction requirements.

Electrolytic recovery of metals in DLS-5 will be performed in the area designated for this process (see Volume1, Attachment C1-6).

C4.K PROCESS AREA ALLOCATION

C4.K.1 Pods

To minimize the potential for unexpected chemical interaction during the processing and storage of waste, some secondary containment areas are divided into sections that are referred to as pods. Each pod delineates a footprint in which treatment for a specific waste stream, waste type, and/or waste process. Pod boundaries are designed to be sufficiently expansive to simultaneously house:

- Processing equipment and supplies pertinent to treatment
- Required pollution control devices
- Accumulation containers
- Containers of waste undergoing treatment per Volume 1, C4.H Treatment Capacities
- Storage of containers of waste awaiting processing
- Storage of containers of processed waste prior to transfer to a primary waste storage area
- Spill clean-up materials
- Safety equipment

Pods will be managed to maintain aisle space adequate for the entrance and egress of personnel and equipment. Pods will also be managed to maintain adequate space for treatment processes.

Pods will be considered active when the processing equipment has been installed and the pod is ready to commence treatment. Pods will be considered inactive: (1) prior to the installation of processing equipment and subsequent commencement of treatment or (2) if treatment is no longer being performed in it.

DLS-5 has been divided into sections that are referred to as pods. (see Volume 1, Attachment C1-6).

C4.K.2 Storage Within Pods

Waste stored within the boundaries of an inactive pod will conform to the storage specifications presented in Volume 1, C1: USE AND MANAGEMENT OF CONTAINERS.

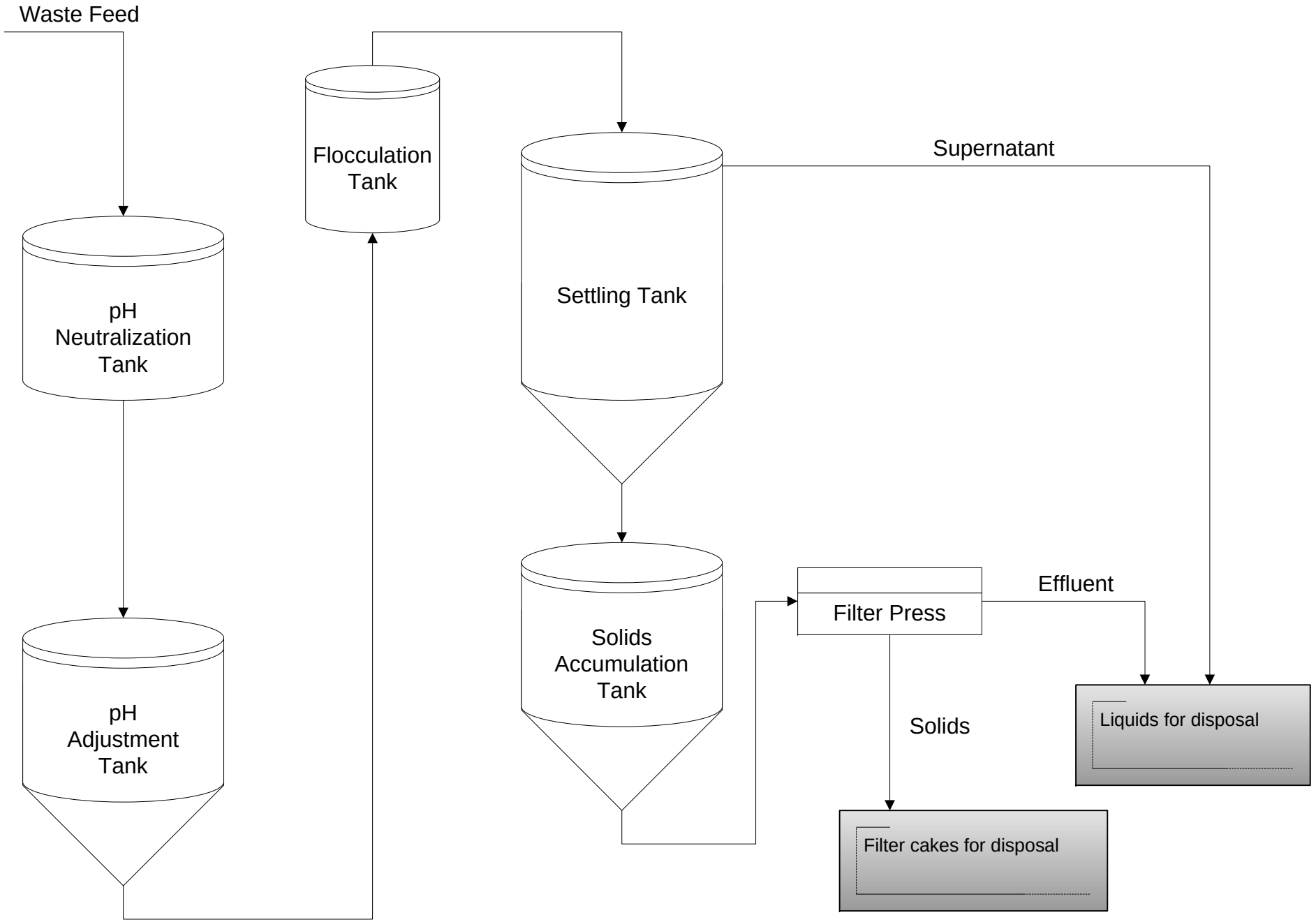
C4: TREATMENT

Index of Attachments

(Volume 1)

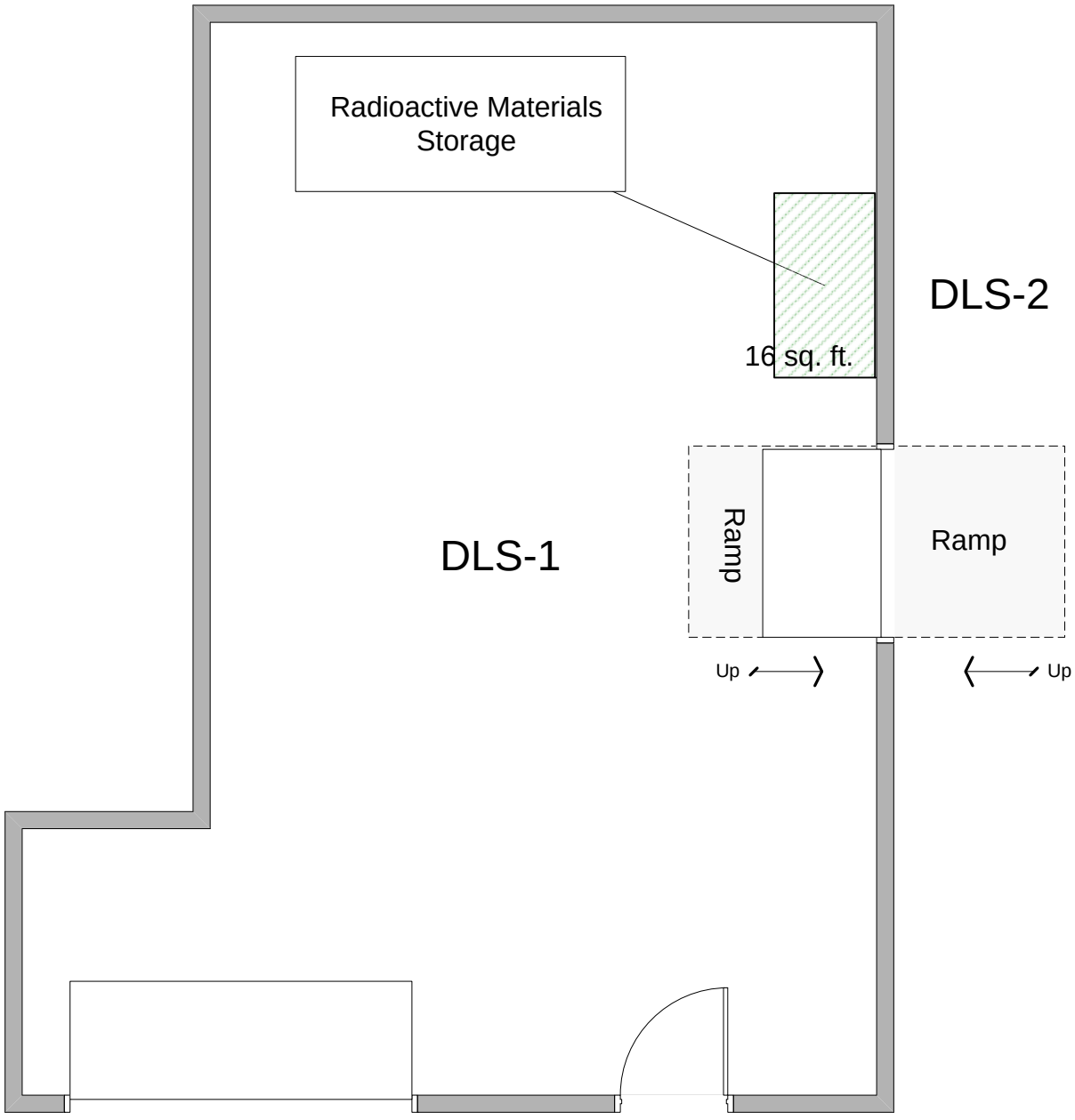
ATTACHMENT	DESCRIPTION
C4-30	Diagram Neutralization/Precipitation System
C4-Rad.1	Drawing DLS-1 Radioactive Materials Storage
C1-Rad.2	Drawing DLS-10 Radioactive Materials Storage

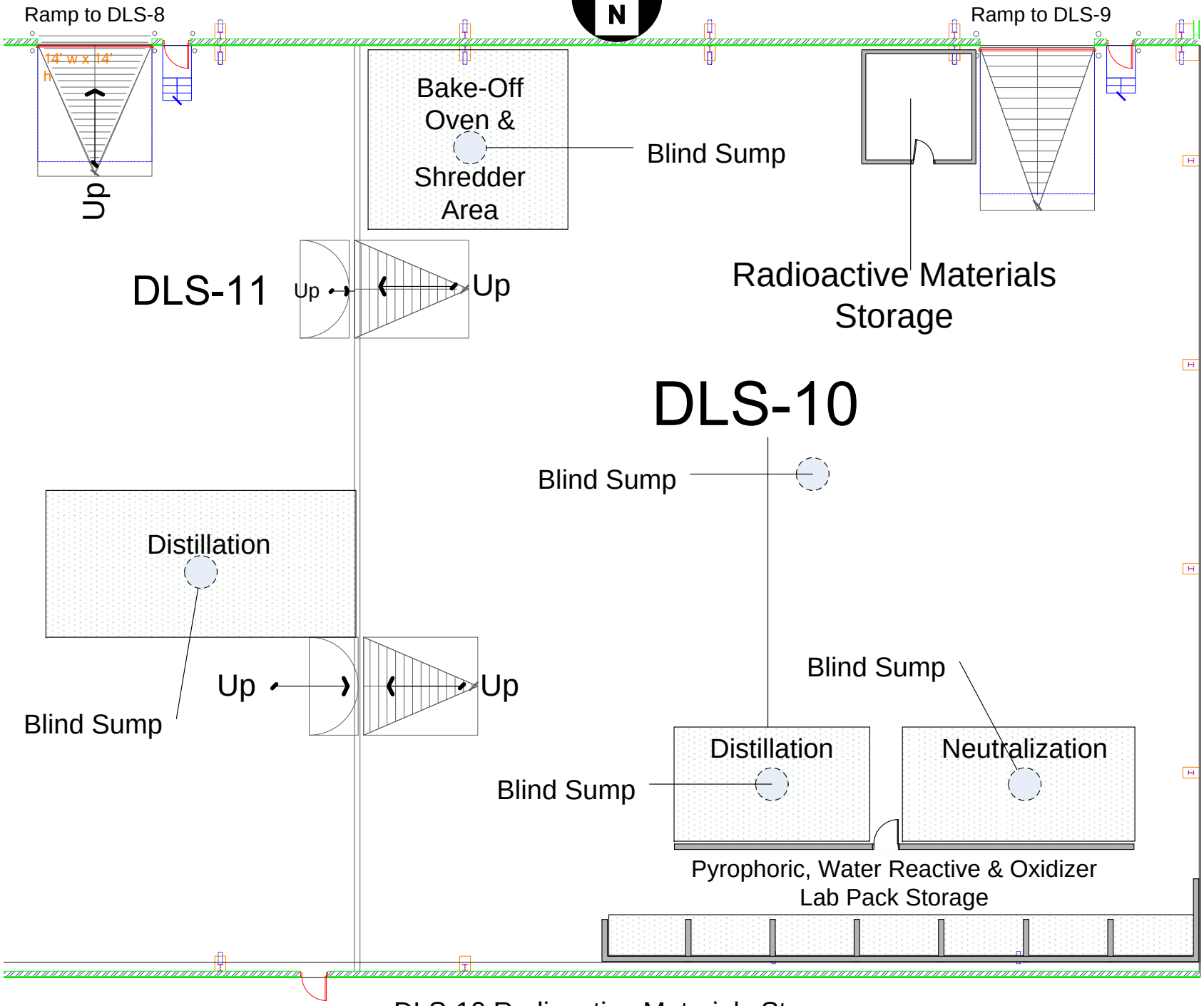
Neutralization/Precipitation System



C4 Treatment
Site ID No. MID 092 947 928

DLS-1 Radioactive Materials Storage





DLS-10 Radioactive Materials Storage

C9: MISCELLANEOUS UNITS

40 CFR §264 Subpart X

(Volume 1)

This section is organized as follows:

INTRODUCTION

DLD Environmental Services, Inc currently operates container shredders and a filter press for the processing of waste. These processing units are operated and maintained in accordance with 40 CFR §264 Subpart X – Miscellaneous Units and the provisions made in this section of this document.

C9.A SHREDDERS

C9.A.1 Design

While shredders can be located in any suitable current or future containment area, currently shredders are located in the recessed pit area of the DLS-2 containment area, and on the elevated portion of the DLS-5 containment area.

A schematic drawing of the DLS-2 containment area can be found in Volume 1, Section B6-1.3. For the DLS-5 containment area, engineering drawings can be found in Volume 1, Section B6, and a diagram showing processing area allocations can be found in Volume 1, Attachment C1-6.

In accordance with the provisions of 40 CFR §264 Subpart X – Miscellaneous Units, the shredders are made of or lined with materials that will not react with and are otherwise compatible with the hazardous waste to be treated. The construction, design, and maintenance of the shredders insure that their ability to treat the hazardous waste is not impaired and does not cause a safety hazard.

As such, the shredders are of steel construction, each consisting of an inlet hopper, shredding device, collection head, two motor assemblies, and emergency stop bar. Volume 1, Attachment C9-1 is a schematic providing details of the shredder assembly. They are designed to minimizing the volume of liquid and/or solid, which received in glass, metal, or plastic containers.

The shredders at DLD are equipped with the following safety features:

(1) Motors that will reverse and then stop if either motor draws too much current after start up;

(2) An emergency stop bar attached to the front of the inlet hopper;

(3) An emergency stop button located on the control panel; and

(4) Motor v-belt guards.

The shredders will not be operated if any of these safety features are missing or disabled.

An emission control device has been designed and installed on each shredder (see Volume 1, Attachment C9-2). Air that is potentially laden with vapors is collected from two points: the floor just outside the enclosed collection area, to collect heavier than air VOCs, and the collection head at the point where waste enters the collection drum. The air is then routed through a charcoal filter and the cleaned air is vented to the outside atmosphere.

C9.A.2 Operation

Wastes and waste containers that are fed into the inlet hopper go through the shredding machine and collection head and are collected in a container below the collection head. When the collection container is full, the shredder is turned off and the full container is covered and removed for sampling and subsequent storage. All containers used for storage will conform to DOT standards and Volume 1, Section C1 of this license.

Shredders may be used to process hazardous or non-hazardous waste. Decontamination of a shredder that has previously processed hazardous waste shall be done prior to that shredder being used to process non-hazardous waste.

Decontamination shall be accomplished as necessary to ensure no significant residue remains which would adversely impact non-hazardous waste streams. Decontamination can occur by triple rinsing the inlet hopper, shredding machine, and collection head with a mixture of ground cellulose (which acts as an abrasive) and/or a solvent capable of removing the contaminants. All rinse solutions will be disposed of as hazardous waste.

Decontamination procedures shall also be performed as necessary prior to shredding incompatible wastes in the same shredder. Waste shall not be processed in a shredder that has not been decontaminated and which previously held an incompatible waste or material. While operating the shredders, caution is exercised to prevent accidental ignition or reaction of waste.

In addition to the decontamination procedure, a liner may be placed in the inlet hopper during non-hazardous waste processing, as this area has been identified as the most likely in which cross-contamination will occur. The lining can then be removed when hazardous waste is processed.

C9.A.3 Monitoring and Maintenance

Shredders are inspected daily for physical and operating conditions. The emergency stop bar and emergency stop button are tested to insure they are operable and the belt guards are visually verified to be in place. The shredders are lubricated daily before waste operations commence. In the event that maintenance is needed, the shredder is removed from service and the maintenance is performed as soon as it is feasible. Appropriate lock-out devices are employed during maintenance and/or repair.

The air emission devices will also be checked daily to determine that there is proper flow through the carbon adsorption filters and that the exhaust fans are working properly. Air emission testing is performed on a regular basis to determine if breakthrough has occurred. The charcoal in the filter devices shall be replaced annually or when needed. Operation of the container shredders will

comply with 40 CFR §264 Subpart CC – Air Emission Standards for Tanks, Surface Impoundments, and Containers.

Waste accumulated from the operation of the container shredders will follow the guidelines presented in Volume 1, Section C1 of this license. Inspection and monitoring of the container shredders is noted on DLD's Daily Inspection Check Sheet, Monthly Inspection Check Sheet, and Air Emission Monitoring Record.

C9.B FILTER PRESS

C9.B.1 Design, Operation, and Monitoring

A filter press is a mobile apparatus designed for efficient liquid/solid separation. This separation is accomplished by transferring a solid/liquid mixture through several hollow filter plates that rest on a frame (see Volume 1, Attachment C9-3). Between the filter plates are porous membranes, called filter cloths, which trap solids and allow liquid to pass through them. The solid particles accumulate between the membranes under increased pressure creating a mass of filtered solids called filter cakes. This process creates separate liquid and solid wastes which are more amenable to individual handling, storage, and disposal. DLD will utilize up to three filter press units, each capable of handling up to 10 cubic feet of solids per filtration cycle.

Filter presses can be utilized for processing both hazardous and non-hazardous wastes. Prior to using for non-hazardous waste, the filter cloths and filter plates need to be decontaminated. First, the filter cloths are removed from the filter plates, soaked in a cleaning solution, and rinsed in water to remove solid particulates. The filter cloths are then placed back on the filter plates and the press is flushed with four gallons of cleaning solution. Finally, the filter press is flushed with water to remove remaining particulate matter. All of the solids and liquids generated from the decontamination procedure are collected and treated as hazardous waste.

When being used to treat wastes that are subject to 40 CFR §264, Subpart CC, the filter presses will be operated underneath an appropriate treatment hood. For wastes not subject to 40 CFR §264, Subpart CC, filter presses may be operated in any suitable containment unit.

In all cases, filter presses will be operated and maintained in accordance with the requirements of R299.9628 and 40 CFR §264, Subpart X.

C9.C AEROSOL DISCHARGE AND RECOVERY UNIT

C9.C.1 Design, Operation, and Monitoring

An aerosol discharge and recovery unit is an apparatus designed to puncture aerosol containers and safely capture its contents. It threads directly into a tight-head drum to collect the container's contents and remove volatile organic compounds (VOCs) from the released propellant (see Volume 1, Attachment C9-4). It uses a non-sparking puncture tip to penetrate the container and releases the remaining volume of constituents into the collection drum. The unit also utilizes a two-stage filter to coalesce and capture atomized liquids and activated carbon to adsorb VOCs before they can be released to the environment. To prevent release of VOCs, the activated carbon portion of the filter is equipped with a colorimetric indicator that denotes when the filter needs replacement before break-through occurs.

The end result of the use of the aerosol discharge and recovery unit is the collection of liquids that are either properly disposed of or recycled and an empty container that, according to 40 CFR §261.6(a)(3)(iv), would meet the definition of scrap metal and may be recycled. Although this unit will primarily be used for non-hazardous wastes, it can also be used for processing hazardous wastes. As such, decontamination of a unit that has previously processed hazardous waste shall be done prior to that unit being used to process non-hazardous waste.

Waste accumulated from the operation of these units will follow the guidelines presented in Volume 1, Section C1 of this license. Inspection of the seals and gaskets of the units will be done each day that a unit is operated to minimize the release of VOCs. While in operation the colorimetric indicator shall be checked daily to verify that the activated carbon portion of the filter has not exceeded its capacity.

In all cases, aerosol discharge and recovery units will be operated and maintained in accordance to the requirements of R299.9628 and 40 CFR §264, Subpart X.

C9.D Extractor – Liquid/Solid Separation Unit

C9.D.1 Design, Operation, and Monitoring

An Extractor is an apparatus designed to use high pressure in order to force separation of liquids from solids. The separation is accomplished by placing the material to be separated in a chamber which has holes allowing liquid to escape. A hydraulic ram is then used to compress material through the chamber, thereby squeezing/separating most of the liquids out of the compressed material. The hydraulic ram cycles back and forth thereby allowing additional materials to be alternately added and compressed. (See Volume 1, Attachment C9-5)

Solids remain in the chamber and are gradually forced through a constriction at the end of the chamber as more material is added during each cycle of the ram. The end result is that a log of solid material is slowly discharged from one end of the apparatus, while the liquids are collected beneath the unit and can be pumped into a suitable container. The now separated liquids and solids can each be managed independently for recycle or disposal as warranted under the circumstances.

In accordance with the provisions of 40 CFR §264 Subpart X – Miscellaneous Units, the extractors are made of or lined with materials that will not react with and are otherwise compatible with the hazardous waste to be treated. The construction, design, and maintenance of the extractors insure that their ability to treat the hazardous waste is not impaired and does not cause a safety hazard.

Waste accumulated from the operation of the extractors will follow the guidelines presented in Volume 1, Section C1 of this license. Inspection and monitoring of the extractors will be noted on DLD's Inspection Check Sheet, Monthly Inspection Check Sheet, and Air Emission Monitoring Record.

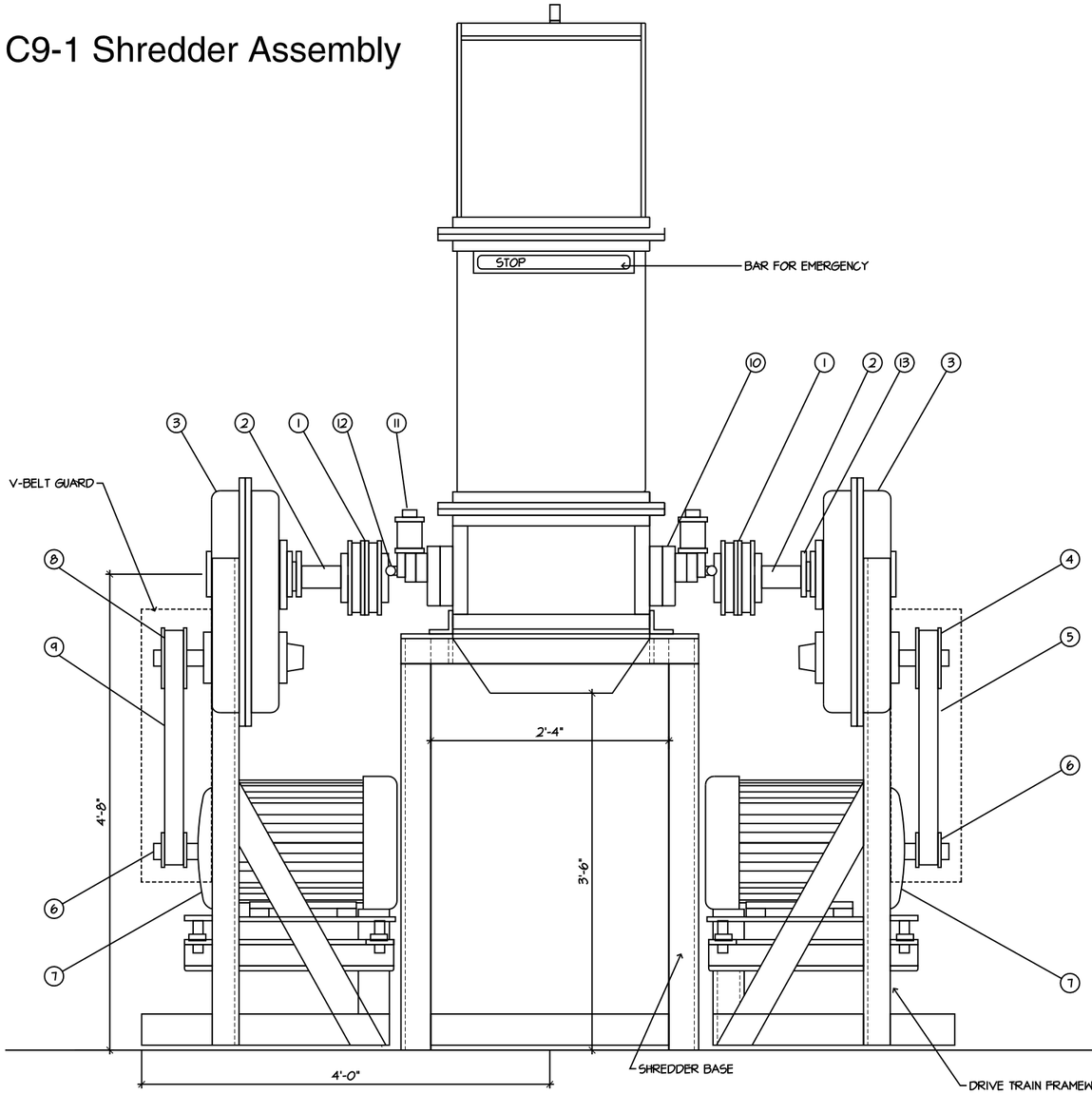
An emission control device will be installed on each extruder. Air that would be potentially laden with vapors, is collected and routed through the emission control device and the cleaned air is then vented to the outside atmosphere.

C9: MISCELLANEOUS UNITS INDEX

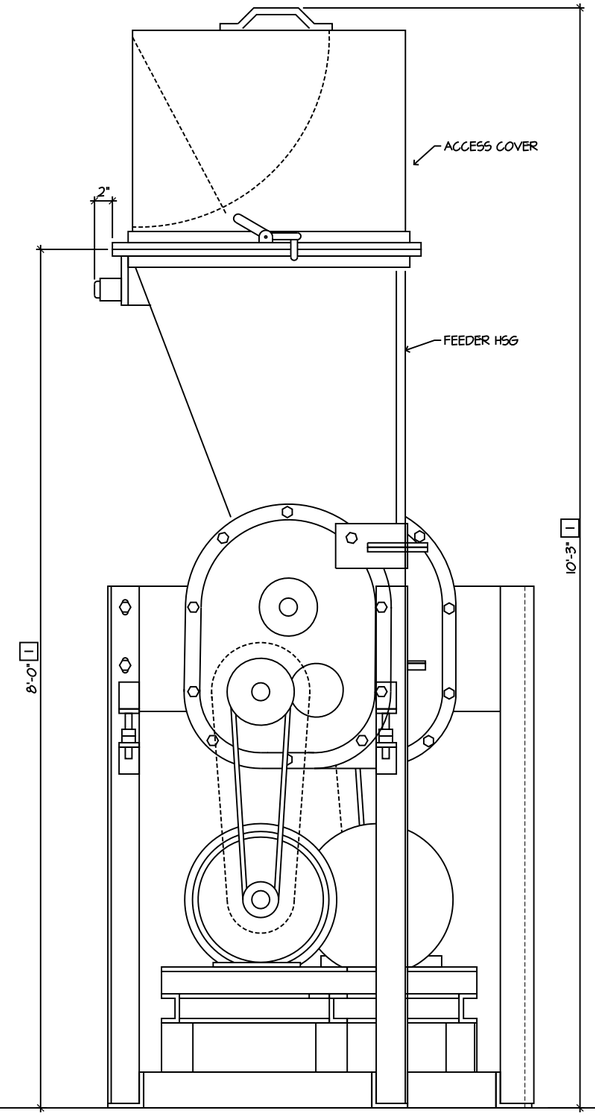
(Volume 1)

ATTACHMENT	DESCRIPTION
C9-1	Drawing 09024L Shredder.dwg Shredder Assembly
C9-2	Drawing 09024L Emission Control.dwg Shredder Emission Control Assembly
C9-3	Drawing 09024L Filter Press Assembly.dwg Filter Press Assembly
C9-4	Aerosol Puncture & Capture Device
C9-5	Extruder / Extractor Apparatus

Volume 1, Attachment C9-1 Shredder Assembly



FRONT VIEW
SCALE: 1" = 1'-0"



RIGHT SIDE VIEW
SCALE: 1" = 1'-0"

SYM	DESCRIPTION
1.	DODGE CHAIN COUPLER 10020
2.	DAVIS ENG: 1066 STUB SHAFT
3.	BROWING: REDUCER 307 SMT 15
4.	BROWING: BUSHING RI x1 3/8 SHIV 9" 3C90R
5.	BROWNING: V-BELT CX66 (3)
6.	BROWNING: BUSHING QI x 1 1/8 SHIV 6" 3C60Q
7.	BALDOR: MOTOR 15HP ECP4100T-5 3 PHASE, 575V, 1170 RPM
8.	BROWNING: BUSHING RI x 1 3/8 SHIV 12 3C120R
9.	BROWNING: V-BELT Cx70 (3)
10.	DAVIS ENG: 1052 SHREDDER HSG
11.	OIL-RITE B-543-1 CONST LEVEL OILER (2)
12.	TEE (2) & SHORT NIPPLE (2) 1/4 NPT OIL-RITE A-3432-1 (2) VENT - 1/8 NPT
13.	BROWNING: BUSHING 307TB200 (2)

NOTES:
[1] HEIGHT SHOULD BE ADJUSTED TO SUIT OPERATOR STANDING ON LOADING DOCK

SHREDDER OPERATION
1. BOTH MOTORS TO REVERSE FOR 3 SECONDS THEN STOP IF EITHER MOTOR DRAWS 20 AMPS AFTER START UP.
2. BOTH MOTORS TO REVERSE FOR 3 SECONDS THEN STOP IF EMERGENCY STOP BAR IS PUSHED.
3. SUBSEQUENT ACTUATIONS OF EMERGENCY STOP BAR TO CAUSE BOTH MOTORS TO OPERATE IN REVERSE DIRECTION FOR 3 SECOND THEN STOP.
4. SHREDDER NOT TO BE OPERATED WITHOUT MOTOR REVERSING FEATURES ACTIVE AND MOTOR V-BELT GUARDS IN PLACE.

Volume 1, Attachment C9-1

DRAW: SHREDDER		REF. SHEET NO.:	DATE: 9-8-2010
SCALE: 1" = 1'-0"	JOB NAME: Drug & Laboratory Disposal		
FILE NAME: 09024L Shredder.dwg	JOB NUMBER: 09024L	Broad Street, Plainwell MI 49080	

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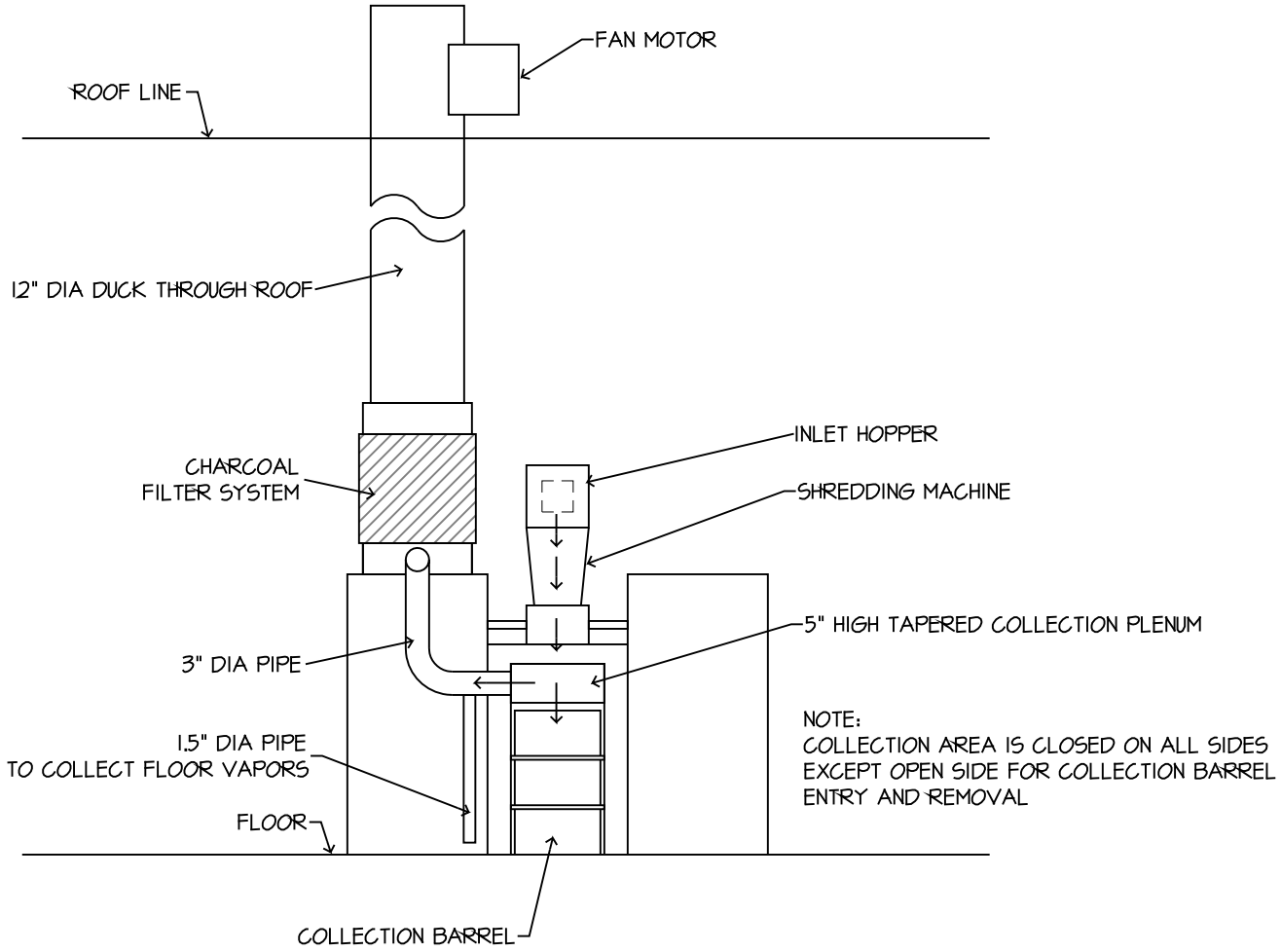

EMISSION CONTROL SYSTEM

SCALE: 1/2" = 1'-0"

DRAW: SHREDDER-1		REF. SHEET NO.:	DATE:
SCALE: 1/2" = 1'-0"	JOB NAME: Drug & Laboratory Disposal		
FILE NAME: 09024L Emission Control.dwg	JOB NUMBER: 09024L	Broad Street, Plainwell MI 49080	

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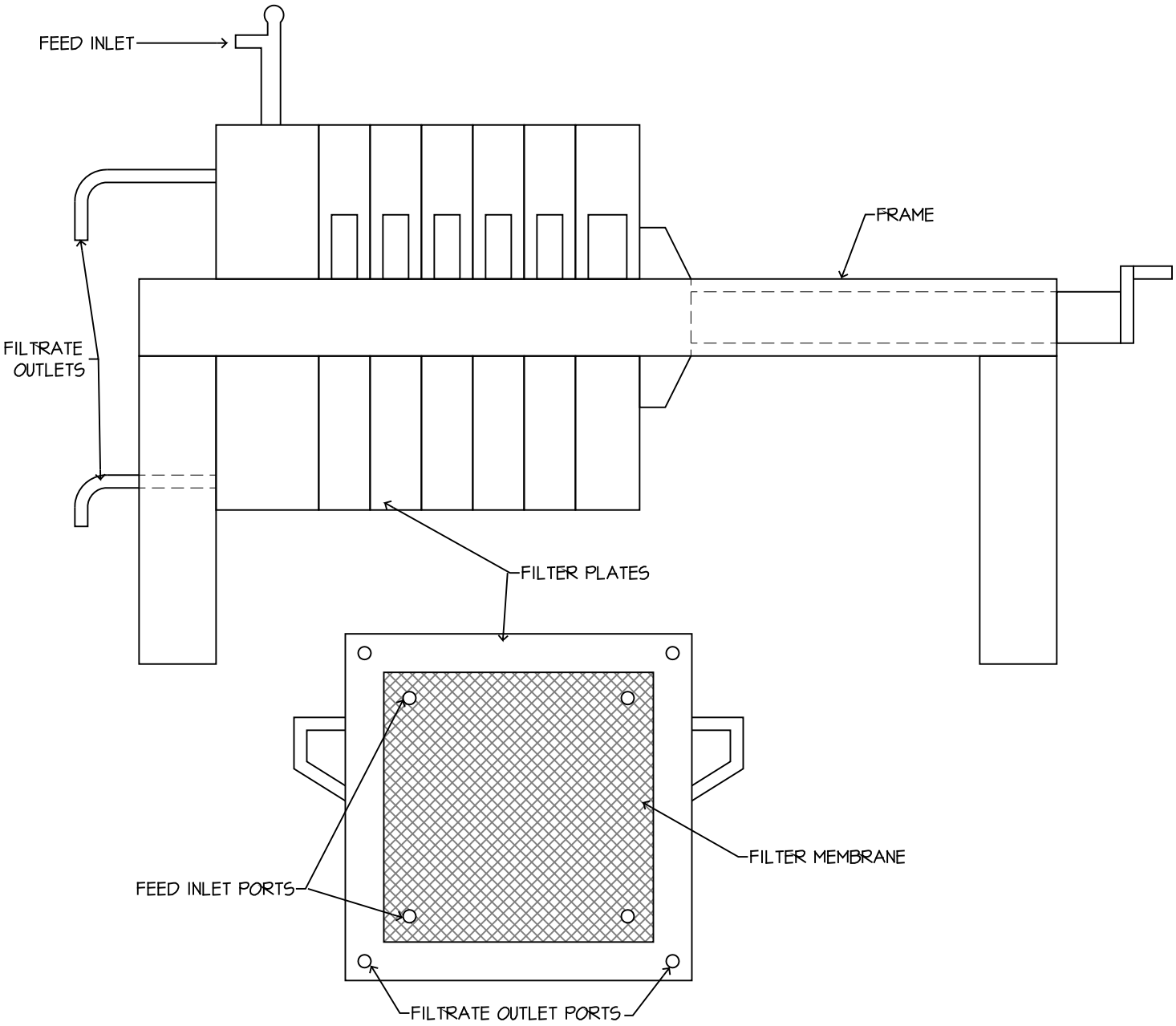

FILTER PRESS ASSEMBLY + FILTER PLATE

SCALE: 1/2" = 1'-0"

DRAW: FILTER-1		REF. SHEET NO.:	DATE:
SCALE: 1/2" = 1'-0"	JOB NAME: Drug & Laboratory Disposal		
FILE NAME: 09024L FILTER PRESS ASSEMBLY.dwg	JOB NUMBER: 09024L	Broad Street, Plainwell MI 49080	

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The Aerosolv Aerosol Can Recycling System Simplifies Aerosol Can Disposal

The Aerosolv puncturing unit threads directly to the 2" bung of any 30-gallon or 55-gallon drum. Simply place an aerosol can into the Aerosolv unit and lock the safety cap. With a press of the handle, a carbide-tipped puncture pin pierces the dome of the can. The carbide-tip is non-sparking, one of many safety features you'll appreciate about the Aerosolv system.

Liquids, Collect Directly Into the Drum

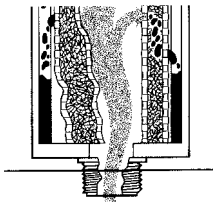
That's the neatest feature of the system. Residual liquids collect safely in the drum, ready for eventual transportation without further handling. And one 55-gallon drum will hold the residual liquids from 4,000 spent aerosol cans. As solid waste, the same cans would require at least forty 55-gallon lab-pack drums at a disposal cost of $12,000 or more.

Residual Propellant is Filtered of VOCs

The Combination Filter threads directly to the 3/4" bung of the drum, one of the many safety features incorporated into the system. Although not required by RCRA for aerosol can disposal, the filter addresses air quality and emissions standards.

The Combination Filter Does Two Things

The base of the Combination Filter is the Coalescing Cartridge. In it, the specially designed filter media coalesces microscopic liquids from the escaping propellant and forms them into droplets. The droplets collect in the reservoir of the Coalescing Cartridge and can be easily drained, directly into the drum if desired, by opening the drain valve on the bottom. Dry propellant then moves through the Activated Carbon Cartridge which adsorbs hydrocarbons and odor.



Accomodates a wide assortment of aerosol cans, even 3" jumbo cans. Whatever size can, the Aerosolv unit smoothly pierces the dome.

The Activated Carbon Cartridge Contains 1 ¼ Pounds of Activated Carbon

Made from ground coconut shell, the activated carbon promotes rapid evacuation of the propellant from even a full aerosol can. Independent lab tests indicate that VOC removal is significant: the propellant from a full can measured 70% below the OSHA Short Term Exposure Limit (STEL) for Toluene and 95% below for Xylene. From an empty can, the propellant measured 98% below the STEL for both. Total hydrocarbon emissions measured 70% below the 300 ppm desired limitation. The new colormetric carbon cartridge will clearly indicate cartridge replacement for maximum efficiency.

The Result? Recyclable Steel and RCRA Compliance

After using the system, you've got an empty steel can with a small, smooth-edged hole. In as little as five seconds. No spills. No jagged edges. And, no compressed gas, so it's ready for recycling with your other scrap steel.

With a simple half turn, remove and replace the Activated Carbon Cartridge as needed.

When Is An Aerosol Can Empty?

Relieve the Pressure of Aerosol Can Disposal

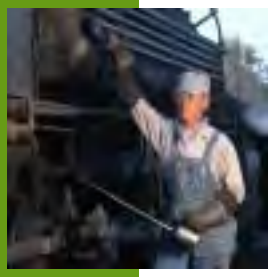
An aerosol can can't be relieved of pressure through normal use. Even when "empty", the retained propellant can react to heat or pressure when crushed or bailed. With the system, you can safely puncture the aerosol can, relieve the pressure, and collect any residual liquids. By recycling the punctured aerosol cans, you'll eliminate an entire category of waste from your waste stream.

Prevent Static Build-Up...Automatically

Each system is shipped with an Anti-Static Wire. The six-foot length anti-static wire provides convenient installation, anywhere in your plant. Attached to the unit by a brass screw and ring-terminal, it prevents static build-up by grounding the drum, as required by OSHA for liquid storage vessels.

Install an Aerosolv System on Separate Drums

By setting up the system on several drums in a shop, you can collect residual solvents into one drum and residual paints into another. The solvents can be recycled right in the shop as parts cleaner. Paints can be reclaimed, often resulting in waste minimization credit. And, of course, you've got the empty aerosol can, to be recycled with other scrap steel.



Designed for safety and longevity, the Puncture Pin point is non-sparking carbide and has shown no visible wear after 10,000 uses.

The punctured can has no sharp jagged edges or crushed metal.

Recycle More Than The Can.

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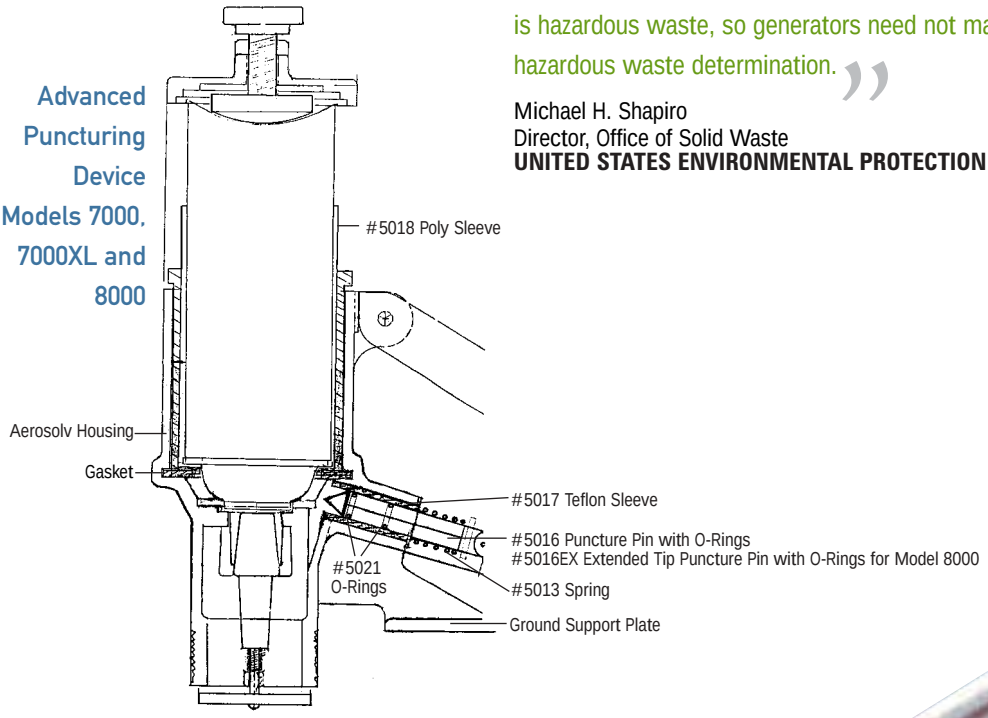
> "…a steel aerosol can that does not contain a significant amount of liquid (e.g., a can that has been punctured and drained) would meet the definition of scrap metal (40 CFR 261.1(c) (6), and, if it is to be recycled, would be exempt from regulation under 40 CFR 261.6(a) (3) (iv). Scrap metal that is recycled is exempt from RCRA regulation under this provision even if it is hazardous waste, so generators need not make a hazardous waste determination."

Michael H. Shapiro
Director, Office of Solid Waste
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Advanced Puncturing Device Models 7000, 7000XL and 8000



Whether you bake bread or build ships, refine oil or print books, brew beer or fly jets, make paper or

Your Plant Uses Aerosols Every Day

Aerosol products are sometimes used on the production line. But they're always used in maintaining your plant and your capital machinery. In maintenance shops throughout your facility, whether it's the Instrument Shop or Paint Shop, HVAC Shop or Welding Shop, Machine Shop or Auto Garage, aerosol products are used on a daily basis, increasing productivity and equipment longevity.

Aerosols Make Tough Jobs Easier

Aerosols... paints, solvents, lubricants, belt dressing, silicone releases, graphite, anti-seize, cutting fluids, contact cleaners, adhesives, coolants. They are so widely used because they offer the best method of delivery in hard-to-reach places. The most precise method of delivery where precision matters. The most efficient method of delivery where productivity matters.

Put the Aerosolv System to Work for You

Chances are, your plant uses more aerosols than you think. If you're in compliance, you're probably spending a lot for disposal. Start recycling your aerosols with Aerosolv.

A.R. Wilfley & Sons, A/C Industrial Services, ABC Appliance, Abel Manufacturing Co., Abitibi Consolidated, ACCI Aviation Services, Ad Art, Advanced Enviro. Recycling, Advanced Fixtures Inc., Aker Gulf Marine, Alaska Airlines, Alaska Ship and Drydock, Alcoa Cleveland Works, Alcoa Extrusions Inc., Alliant Tech Systems, Allied Signal, Alro Specialty Metals, Alro Steel Corporation, Alumax, AM Castle Metals, American Airlines, American Bumper Mfg. Co., American Candy Mfg. Co., American Eagle Airlines, American Video Glass Co., Amoco Fabrics & Fibers Co., AMSA 148G 81St. RSC, AMSA 152G, AMSA 53G, Amtrak, Anchor/Darling Valve Co., Appleton Mills, APV CREPACO, Arvin North American Auto, Asarco, Augusta State University, Autoliv, AV CRAD, Avery Dennison, Avex Electronics Inc., Avon Mfg., Babcock & Wilcox, Baker Hughes Inteq., Barrick Goldstrike Mine, Barry Controls, BASF Corporation, Bawden Printing, Bay City Forge, Bayex Inc., BBA Non-wovens, Becton Dickinson, Benchmark Electronics, Bennington Imp's Inc., Bethlehem Luken Plats, BF Goodrich Aerospace, BHP Diamonds (Euati), Birmingham Steel, Blee Cables Corporation, BNSF Railroad, Boise Cascade, Bonneville Power Admin., Bryn Mawr College, C.R. Hudgins Plating Inc., California Georgia Pacific, Callaway Golf, Canadian Regional Airlines, Carbbits Inc., Cargill Salt, Carlyle Compressor, Carpenter Co., CarQuest Distribution Center, Caterpillar Inc., CD McFarland, Char Nor Enterprises, Chelan County Public Works Dept., Chevron Cedar Bayou Plant, Chief Supply Coporation, Chino Mines Company, Chrysler Corporation, City of Kingston, City of Los Angeles, City of Vero Beach, Clay County Landfill, Climax Molybdenum Co., Cobre Mining Co., Coca-Cola Enterprises, Collier Keyworth Inc., Colorado National Guard, Colusa County Canning Co., Conoco Inc., Consumers Gas Co., Cooper Automotive, Cooper Energy Services, Cooper Tire, Coos Bay Lumber Company, Coos Curry Electric Coop, Copeland Corporation, Cordis Corporation, Courtaulds Fiber Inc., Crown Paper, Curries Company, Custom Clutch Joint & Hydraulics, Dana Corporation, Dana Corporation, Plumbing Div., Darling Store Fixtures, Dearborn Midwest Conveyor, Delavan, Delta Airlines, Delta Mold, Department of the Army, Dept. of Energy, DNS Laurel Technologies, Doswell Ltd. Partnership, Dover Elevator Systems, Dresser IVO, Dristeem Humidifier Co., Duffle Bag Inc., DuPont, DuPont Photomasks Inc., Dyn McDermott Petroleum, Dynamic Science Inc., Eastern Oregon Correctional Institute, Ecoflo Inc., ECS-43 81st RSC, EDO Western, EDO Fiber Science, EDP Inc., Edwards AFB B-2 CTF LGLH, Electro-Motor Inc., Elf Atochem N.A. Inc., Elliott Co., Emerson Elect. Fusite Div., Emerson Power Transmission, Energy Research Corporation, Enviro-American, Inc., Enviro-Care Corporation #204, Environmental Waste Resources, EPT Gearing Facility, ETS Inc., Executone Information, Exide Corporation, Fairbanks North Star, Federal Express Corporation, Federal Government, Filter Recycling Services, Fisher Engineering, Fisher Service Company, Flight Systems, Florida A University, Florida Power & Light, Florida State University, Florida State Universtiy EHES Department, Fluor Daniel, FMC Corporation, Fort James, Fritz Co. Inc., Ft. Chaffee CMTC, Ft. Richardson AKARNG Environmental, Ft. Stewart Dept. of Army-Env. Office, Ft. Stewart Environmental Branch, Gadsden County Recycling, Galyan's, Garrett Aviation, Gates and Sons, General Electric - Canada, General Electric Co., General Electric-Portland, General Motors, Genie Industries, GeoDiamond, Georgia Pacific, Getchell Gold Inc., Gilbarco Inc., GMPTG Saginaw Malleable, Golden Valley Microwave, Goodyear Proving Grounds, Goodyear Public Works, Goshen Stamping Inc., Graves Spray Supply, Greenfield Town, Greenway Environmental, Hach Co., Hallmark Cards Inc., Halter Marine PC, Hamilton Construction, Harding Metals, Harvey Point Base, Hawaii Air National Guard, Hayden Inc., Hayes-Lemmerz Inter., Heatube, Heavy Mob , Heckett Multiserv, Hedstrom Corporation, Hennessy Products Inc., HIARNG, HIARNG OMS #5, Hickam AFB Hazmat Pharmacy, High ALT TNG Site, Hillerich & Bradsby Co., Hitchiner Mfg. Co. Inc., Hobbs Corporation, Holmes Tuttle Ford, Holsum Bakers Of P.R., Holyoke DPW, Honda of America Mfg. 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"Thank you for your continued interest in our recycling program. During the period from 1 October 1992 to 31 September 1993, COMNAVBASE Norfolk realized a savings of $333,738.00 by utilizing the Aerosolv Aerosol Can Recycling System. The Aerosolv system was implemented as an alternative to the previous practice of hazardous waste disposal of aerosol cans bulked in drums as solid waste."

Commander
Naval Base Norfolk
UNITED STATES NAVY

"Fortunately, we discovered the Aerosolv disposal system. We have been able to reduce this overstock at an amazing rate, with no effect on our generator status and at a fraction of the cost for disposing of these items in their original form."

Stuart Jones
Safety and Environmental Engineer
FLEXIBLE PRODUCTS COMPANY

"Since we've been using the Aerosolv unit, our disposal costs for aerosol cans have dropped 80%."

Mike Sweeney
Manager
MENDOCINO SOLID WASTE MANAGEMENT AUTHORITY

Lane Upholstery, Lit-ning Products, Lockheed Martin, Lone Star Sttel Company, Los Alamos Post Office, Louisiana Pacific Corporation, Lower Colorado River Authority, Lucas Aerospce, Maine Army National Guard, Malibu Boats West, Marathon Oil Co., Marine Corps Comm. Elec. Sch., Mason & Hanger, Masoneilan/Dresser, Masonite Corporation, Master Craft, Matsvo Industries, Mattoon Precision Mfg. Inc., McLeod Regional Medical Center, Megtec Systems, Mells Trucking, Menada University, Metal Fabricating Corp., Metric Systems Corp., Metro Waste Authority, Michael Burnett Products, Midas Joint Venture, Midcoast Aviation Inc., Midcoast Little Rock, Midwest of Cannon Falls, Milliken Gerrish, Milliken-Enterprise, Ministry of Natural Resources, Minnesota County HHW Facility, Minnesota Elevator Inc., Mobil Oil Corporation, Mobile Tool International, Modine Mfg. Company, Mohawk Laboratories, Monaco Coach Corporation, Monrovia, Monsanto Company, Morris County MUA, Morton Bendix, Mountain Equipment, Mrs. Baird's Bakery - Dallas Plant, Mrs. Bairds Bakery, Nan Ya Plastics, National Defense Dept. 1CDN FD HOSP DND, National RV, National Weather Service, Nava, Inc., NC Air National Guard, NC Machinery Co., Nelson Division, Nelson Paint Company, New Jersey Mach. of NH, Newmont Gold, Nichols Homeshield Casting, Nim-cor, Niosh-Spokane Res. Lab., Noranda Aluminum Inc., Norcold Inc., Norfolk Southern RR, Norris Industries, Nortek Repair Center, North Star Steel, Northern States Power Co., Norton Solid Waste, Nova Chemicals Inc., Nucor Fastener, Nucor Steel SC, NW Minnesota Mgmt., NY Power Authority, Oak Ridge City, Occidental Chemical, Offutt AFB 55 CES/CEV, Ohio Air National Guard 179th Airlift Wing, OHM Remediation, Olean Advanced Products, Omnova Solutions Inc., OMS #18, Ontario City, Oregon Army National Guard, Orovelle Wyandotte -I.R. Dist., Ovako Ajax Inc., PA Power & Light Co., PAC-FAB. Inc., Pacificorp WOC, Parkans Int'l LLC, Patuxent River Naval Air Station, PCS Phosphates, PDM Strocal, Pennsylvania Air National Guard, Peoples Natural Gas, Perkins Papers Ltd., Phelps Dodge Tyrone Inc., Pimalco, Piper Impact, Pitney Bowes, Plano, City of , Plastic Omnium, Plymouth Tube Company, Pollution Control Industries, Portola Packaging Inc., Potlatch Corporation, PPG Industries Inc., Press Sales & Services, Prevost Car, Procter & Gamble, Products/Techniques Inc., Progress Rail Service, Purdue University, PWC Washington, Quinton Instrument Company, Raytheon Aerospace/USC, Raytheon Aircraft, Reese Products, Resinoid Eng. Corp., Rice County Waste Mgmt., Richland City, Rio Rancho Post Office, Risdon AMS, Rockingham County, Rockwell Collins Inc., Romania Imported Motors, Romania RV Center, Rosebud Mining Co., LLC, Roseburg Forest Product, Safari Motor Coaches, Sandusky International, Sargent Control Aerospace, Sauisbury Fire Rescue, Schindler Elevator Corporation, Scott Sign Systems Inc., Sea World of Florida, Seekins Ford Lincoln, Shawnee County Recycling, Shelby Williams Industry, SM&P Utility Resources, Smith Services Of Alabama, Smurfit Flexible Packaging, Smurfit-Stone Container, Socer, SA, Solvay Pharmaceuticals, Sonsub International, Sony Magnetic Products Inc., Southern Winding Service Inc., Space Mark Inc., Springfield Utility Board, Springs Window Fashions, Standadyne Automotive Co., Star Tribune, Stewart & Stevenson, Sullair Corp., Sullivan Industries Inc., Symons Corporation, Syntex Chemicals Inc., Takahashi Works USA, Tanner Pks., Target, Target Distribution Center T558, TEC Interface Systems, Tecumseh Products Co., Temple-Inland Forests, Tennessee Gas Pipeline, Texas A&M University, The Little Tikes Co., The Raymond Corporation, Thomas Lighting, Thomson Crown Wood Products, TMens Colony, Toro Co., Town of Southampton, Trandes Corporation, Trico Products, Trim Masters Inc., Trimeris Inc., Truseal Technologies, TRW Electronics, Tyson Distribution Center, U.S. Border Patrol, Ucar Carbon Company, Ulster County Resource Recove
Union Camp Hanford Corr., Union Tank Car Co., United Air Lines, United Defense, U
Guard, University of Texas-UTPA, US Air Force, US Coast Guard Lorsta, US Forest Service, US Navy, US Postal Service, US Postal Service VMF, US Postal Service, P&D Facility, USAF 166 Airlift Group/LGMG, USAF 24 CES/CEOHE, USAMU US Army, USMC 81st RSE MASA 55 W, USN NISE East MME Code 624, Utes #3 Army National Guard , Utitec Inc., Vacton Manufacturing Inc., Veratec, Vermont American, Virginia Internatioanl Terminals, Virginia Power, VPC-Schlumberger, Wabash Fibre Box Company, Waldorf Corp., WalMart, Warsten Manufacturing, WASP Inc., WC Wood Co., Inc., Weber Aircraft Inc., Wenco of Ohio, West Florida University, Western Lake Superior Sanitary Dist., Western States Environmental, Westinghouse Air Brake, Westover Air Reserve Board, White-Rodgers Co., Whitehead Die Casting, Wichita Falls Refurb., Wilderness Exchange, Wilson Laboratories Inc., Wix Filtration Products, Youngs RV Center, Yuam City, Yuasa Inc., Yuasa-Exide Inc.

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Aerosol Can Recycling Systems

Aerosolv Model 5000

INCLUDES: Puncturing Device, #6163 Combination Coalescing Activated Carbon Filter, Anti-Static Wire, and Safety Goggles

Aerosolv Model 7000

INCLUDES: Advanced Puncturing Device-Teflon Coated, Automatic Shut-off Valve, #7163 Combination Colormetric Carbon Filter, Anti-Static Wire, and Safety Goggles

Aerosolv Model 7000XL

INCLUDES: Advanced Puncturing Device-Teflon Coated, Automatic Shut-off Valve, #7163XL Combination Colormetric Carbon Filter with Automatic Check Valve, Drum Cover, Drum Under Containment, Anti-Static Wire, and Safety Goggles

Replacement Parts

Filters

#6163	Combination Coalescing Filter with Replaceable Activated Carbon Cartridge
#6363	Replacement Activated Carbon Cartridges (pkg. of 2)
#7163	Combination Coalescing Filter with Replaceable Colormetric Carbon Cartridge
#7363	Replacement Colormetric Carbon Cartridges (pkg. of 2)
#7163XL	Combination Coalescing Filter with Replaceable Colormetric Carbon Cartridge and Automatic Check Valve
#7363XL	Replacment Colormetric Carbon Cartridges with Automatic Check Valves (pkg. of 2)

Accessories

#5165	Maintenance Repair Kit INCLUDES: 1-Carbide-Tipped Puncture Pin with O-Rings, 1-Aeroprene Gasket, 1-Spring, 3-Bridge Pins,1-Tube of Grease
#5129	Aeroprene Gasket

For Technical & Sales Assistance contact:

S & G Enterprises, Inc.
N115 W19000 Edison Drive
Germantown, WI 53022
Tel: (262) 251-8300 (800) 233-3721 Fax: (262) 251-1616
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- Pharmaceutical
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- Food processors
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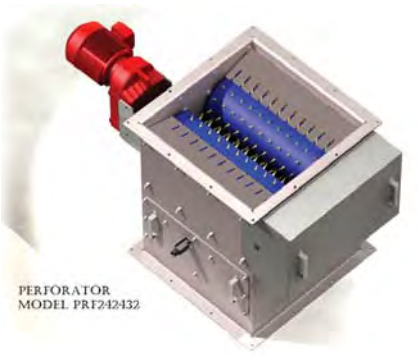
Separate the liquid from the package

Extruder/Extractor



Process over 12 cubic yards of aluminum cans per hour with the Xtractor

MODEL	OVERALL LENGTH *	OVERALL HEIGHT *	OVERALL WIDTH *	FEED CHAMBER LENGTH	FEED CHAMBER WIDTH	RAM FACE HEIGHT	MOTOR
2424XTR	120"	60"	36"	24"	24"	12"	10 Hp TEFC

* Measurements are approximate.

Due to product improvements, the manufacturer reserves the right to alter, or amend, without notice, any of these components, specifications and/or dimensions. Carbon steel machines and accessories are primer coated and finish painted. See standard color chart for available color selections.

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FORM EQP 5111 TEMPLATE MODULE C13 – SUBPART AA

C13-AA: AIR EMISSIONS FROM PROCESS VENTS

Volume 1

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) *for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities*. See Form EQP 5111 for details on how to use this attachment.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), R 299.9504, R 299.9508, R 299.9605, and R 299.9630; and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart AA, and 40 CFR §270.24 establish requirements for controlling organic air emissions from process vents. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template includes the information required by 40 CFR §270.24 to address air emission control requirements for process vents at hazardous waste management facilities for the DLD Environmental Services, Inc facility in Plainwell, Michigan.

(Check as Appropriate)

☐ Applicant for Operating License for Existing Facility

☐ Applicant for Operating License for New, Altered, Enlarged, or Expanded Facility

☐ Process Vents Subject to 40 CFR Part 264, Subpart AA (R 299.9630)

☒ No Process Vents Exist That Are Subject to 40 CFR Part 264, Subpart AA (R 299.9630)

FORM EQP 5111 TEMPLATE MODULE C13 - SUBPART BB

C13-BB: AIR EMISSIONS FROM EQUIPMENT LEAKS

(Volume 1)

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) *Instructions for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities*. See Form EQP 5111 for details on how to use this attachment.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), R 299.9504, R 299.9508, R 299.9605, and R 299.9631; and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart BB, and 40 CFR §270.25 establish requirements for controlling organic air emissions from equipment leaks. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template addresses air emission control requirements for equipment leaks at the hazardous waste management facility for the DLD Environmental Services, Inc facility in Plainwell, Michigan.

(Check as Appropriate)

☒ Applicant for Operating License for Existing Facility

☐ Applicant for Operating License for New, Altered, Enlarged, or Expanded Facility

☒ Equipment Subject 40 CFR Part 264, Subpart BB (R 299.9631)

☐ No Equipment Exists That Is Subject to 40 CFR Part 264, Subpart BB (R 299.9631)

☐ Applicant Elects to Document Compliance with the Relevant Provisions of the Regulations at 40 CFR Part 60, Part 61, or Part 63 Rather than 40 CFR Part 264, Subpart BB

This template is organized as follows:

C13.B AIR EMISSIONS FROM EQUIPMENT LEAKS

C13.B.1 Waste Streams

C13.B.1(b) Organic Concentration Determination Via Process Knowledge

C13.B.1(c) Date and Frequency of Determination

C13.B.1(d) Light or Heavy Liquid Designation

C13.B.2 Equipment Identification

C13.B.3 Equipment with No Detectable Emissions

C13.B.3(a) Identification Numbers

C13.B.3(b) Monitoring Procedures

C13.B.3(d) Pump Standards

C13.B.3(f) Valve Standards

C13.B.4(g)(3)(iv) Total Organic Compound Mass Flow Rate

C13.B.4(g)(3)(v) Total Organic Compound Emissions

C13.B.5 Pumps in Light Liquid Service

C13.B.10 Valves in Gas/Vapor Service or in Light Liquid Service

C13.B AIR EMISSIONS FROM EQUIPMENT LEAKS
[R 299.9631 and 40 CFR Part 264, Subpart BB]

☒ Pumps in Light Liquid Service

☐ Compressors

☐ Pressure Relief Devices in Gas or Vapor Service

☐ Sampling Connection Systems

☐ Open-ended Valves or Lines

☒ Valves in Gas or Vapor or Light Liquid Service

☐ Pumps and Valves in Heavy Liquid Service

☒ Flanges and Other Connectors

C13.B.1 Waste Streams
[R 299.9631 and 40 CFR §264.1050(b)]

C13.B.1(b) Organic Compound Concentration Determination Via Process Knowledge
[R 299.9631 and 40 CFR §264.1063(d)(3)]

Waste streams are identified by knowledge of incoming waste and by use of the Waste Analysis plan. Please see Volume 1, Section A3 for details.

C13.B.1(c) Date and Frequency of Determination
[R 299.9631 and 40 CFR §264.1063(d)]

Determinations are made whenever new waste is pumped into the storage tanks.

C13.B.1(d) Light or Heavy Liquid Designation
[R 299.9631 and 40 CFR §264.1063(h)]

All equipment and piping are intended for Light Liquid Service

C13.B.2 Equipment Identification
[R 299.9631 and 40 CFR §§264.1050 and 270.25(a)]

Subpart BB applies to DLD's pump and piping system.
See Attachments C13-BB-1 and C13-BB-2 for the piping diagrams.

C13.B.3 Equipment with No Detectable Emissions
[R 299.9631 and 40 CFR §264.1064(g)(2)]

Equipment regulated under this standard consists of flanges, connectors, and pipeline valves associated with the tank systems. Each piece of equipment is marked with a unique identification number.

C13.B.3(a) Identification Numbers
[R 299.9631 and 40 CFR §264.1064(g)(1)]

Please see Attachment C13-BB-3.

C13.B.3(b) Monitoring Procedures
[R 299.9631 and 40 CFR §264.1063]

The method of compliance with the standard is the Alternative Screening Procedure for no detectable emissions found in 4.3.3 of Method 21. A description of the inspections made can be found in Section A5. A form entitled "Potential Equipment Leak Form" is used if a leak or equipment failure is noted. It records the date and time of failure/discovery, type of failure, and time and date of repair.

C13.B.3(d) Pump Standards
[R 299.9631 and 40 CFR §§264.1052 and 264.1058]

For pump design, please see Attachment C13-BB-4.

C13.B.3(f) Valve Standards
[R 299.9631 and 40 CFR §264.1057 and 264.1058]

All valves employed in the tank systems at DLD conform to the specifications presented in ANSI/API Standards for valves.

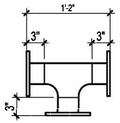
C13.B.5 Pumps in Light Liquid Service
[R 299.9631 and 40 CFR §270.25(d)]

Pumps are inspected before every use. The method of compliance with the standard is the Alternative Screening Procedure for no detectable emissions found in 4.3.3 of Method 21 found in 40 CFR 60. If failure occurs, the pump is repaired within 15 calendar days. Failure Information is recorded in DLD's inspection sheet and a form entitled "Potential Equipment Leak Form" is used if a leak or equipment failure is noted. This form records the date and time of failure discovery, type of failure and time and date of repair.

C13.B.10 Valves in Gas/Vapor Service or in Light Liquid Service
[R 299.9631 and 40 CFR §270.25(d)]

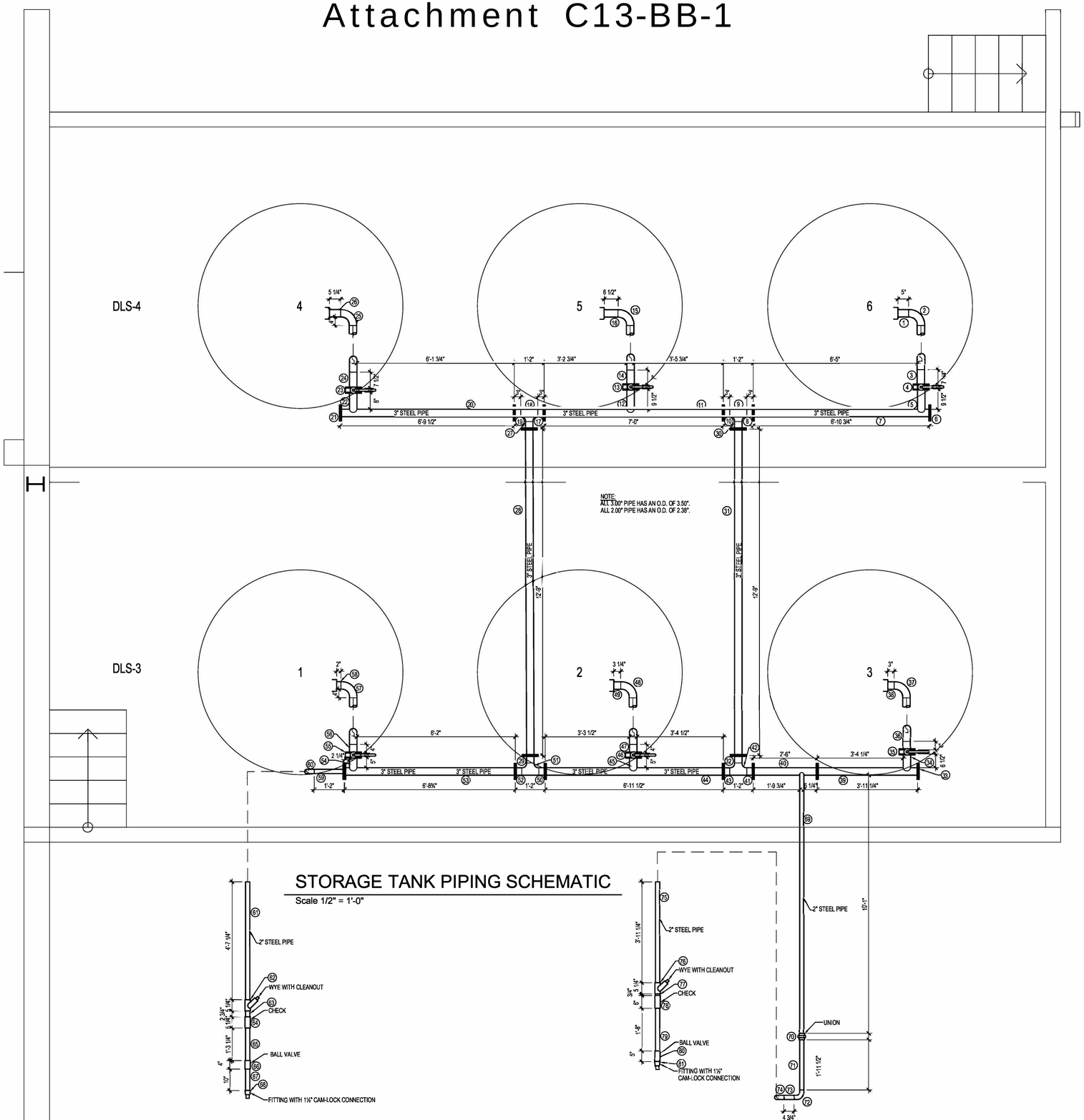
All valves employed in the tank systems at DLD conform to the specifications presented in ANSI/API Standards for valves. Please see Attachments C13- BB-1 & C13-BB-2 for locations.

Attachment C13-BB-1



ENLARGED TEE - JOINT (TYP.)

Scale: NONE



STORAGE TANK PIPING SCHEMATIC

Scale 1/2" = 1'-0"

Drug & Laboratory Disposal

Storage Tank Piping Dimensions

Broad Street

Plainwell, Michigan 49080

WEST-TECH DESIGN INC.
625 Harrison Street
PO Box 50909
Kalamazoo, MI 49005
PHONE: (269) 373-8000
FAX: (269) 373-5641

WTD JOB # 08-DLD-100

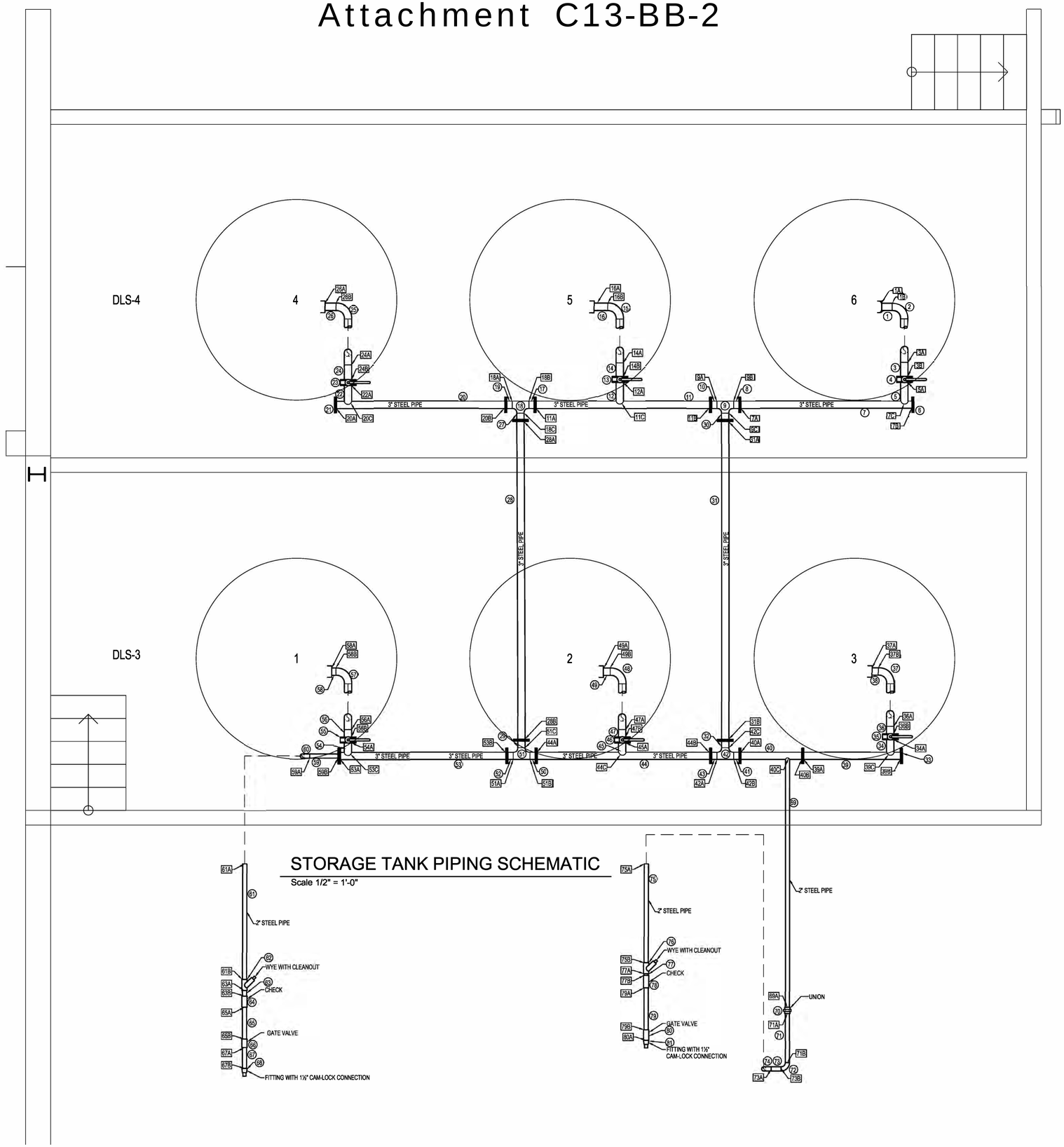
ISSUED
11-06-08 ISSUED FOR FUN

STORAGE TANK PIPING SCHEMATIC

M-101

08-170 M-101.dwg

Attachment C13-BB-2



STORAGE TANK PIPING SCHEMATIC

Scale 1/2" = 1'-0"

Drug & Laboratory Disposal

Storage Tank Piping Dimensions

Broad Street

Plainwell, Michigan 49080

WEST-TECH DESIGN INC.
625 Harrison Street
PO Box 50909
Kalamazoo, MI 49005
PHONE: (269) 373-8000
FAX: (269) 373-5641

WTD JOB # 08-OLD-100

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11-06-08 ISSUED FOR FUN

STORAGE TANK PIPING SCHEMATIC

M-102

08-170 M-102.dwg

STORAGE TANK FARM #1

PIPE NUMBER	PIPE SIZE	PIPE LENGTH	JOINT #	PIPE END	JOINT #	PIPE END	JOINT #	PIPE END	COMMENTS
1	3"	5"	1A	THREAD	1B	WELD			CONNECTS TO TANK
2	3"	90 BEND	1B	WELD	3A	WELD			
3	3"	7 1/4"	3A	WELD	3B	FLANGE			
4	3"	VALVE	3B	FLANGE	5A	FLANGE			
5	3"	9 1/2"	5A	FLANGE	7C	WELD			
6	3"	BLIND FLANGE	7B	FLANGE					END OF LINE CLEAN OUT
7	3"	6'-10 3/4"	7A	FLANGE	7B	FLANGE	7C	WELD	PIPE #5 IS WELDED TO PIPE SEE SCHEMATIC
8	3"	3"	7A	FLANGE	9B	WELD			
9	3"	TEE	9A	WELD	9B	WELD	9C	WELD	PIPE #30 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC
10	3"	3"	9A	WELD	11B	FLANGE			
11	3"	7'	11A	FLANGE	11B	FLANGE	11C	WELD	PIPE #12 IS WELDED TO PIPE SEE SCHEMATIC
12	3"	9-1/2"	11C	WELD	12A	FLANGE			
13	3"	VALVE	12A	FLANGE	14B	FLANGE			
14	3"	7"	14B	FLANGE	14A	WELD			
15	3"	90 BEND	14A	WELD	1B	WELD			
16	3"	6 1/2"	1B	WELD	1A	THREAD			CONNECTS TO TANK
17	3"	3"	11A	FLANGE	18B	WELD			
18	3"	TEE	18A	WELD	18B	WELD	18C	WELD	PIPE #27 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC.
19	3"	3"	18A	WELD	20B	FLANGE			
20	3"	6'-9 1/2"	20B	FLANGE	20A	FLANGE	20C	WELD	PIPE #22 IS WELDED TO PIPE. SEE SCHEMATIC.
21	3"	BLIND FLANGE	20A	FLANGE					END OF LINE CLEAN OUT
22	3"	8"	20C	WELD	22A	FLANGE			
23	3"	VALVE	22A	FLANGE	24B	FLANGE			
24	3"	7 1/2"	24B	FLANGE	24A	WELD			
25	3"	90 BEND	24A	WELD	26B	WELD			
26	3"	5 1/4"	26B	WELD	26A	THREAD			CONNECTS TO TANK
27	3"	3"	18C	WELD	28A	FLANGE			
28	3"	12'-9"	28A	FLANGE	28B	FLANGE			
29	3"	3"	28B	FLANGE	51C	WELD			
30	3"	3"	9C	WELD	31A	FLANGE			
31	3"	12'-9"	31A	FLANGE	31B	FLANGE			
32	3"	3"	31B	FLANGE	9C	WELD			
33	3"	BLIND FLANGE	39B	FLANGE					END OF LINE CLEAN OUT
34	3"	6 1/2"	39C	WELD	34A	FLANGE			
35	3"	VALVE	34A	FLANGE	36B	FLANGE			
36	3"	4"	36B	FLANGE	36A	WELD			
37	3"	90 BEND	36A	WELD	37B	WELD			
38	3"	3"	37B	WELD	37A	THREAD			CONNECTS TO TANK
39	3"	3'-11 1/4"	39B	FLANGE	39A	FLANGE	39C	WELD	PIPE #34 IS WELDED TO PIPE. SEE SCHEMATIC.
40	3"	2' 6"	40B	FLANGE	40A	FLANGE	40C	WELD	PIPE #69 IS WELDED TO PIPE. SEE SCHEMATIC.
41	3"	3"	42B	WELD	40A	FLANGE			
42	3"	TEE	42A	WELD	42B	WELD	42C	WELD	PIPE #32 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC.
43	3"	3"	42A	WELD	44B	FLANGE			
44	3"	6'-11 1/2"	44B	FLANGE	44A	FLANGE	44C	WELD	PIPE #45 IS WELDED TO PIPE. SEE SCHEMATIC.
45	3"	5"	44C	WELD	45A	FLANGE			
46	3"	VALVE	45A	FLANGE	47B	FLANGE			
47	3"	4"	47B	FLANGE	47A	WELD			
48	3"	90 BEND	47A	WELD	49B	WELD			
49	3"	3 1/4"	49B	WELD	49A	THREAD			CONNECTS TO TANK
50	3"	3"	51B	WELD	44A	FLANGE			
51	3"	TEE	51A	WELD	51B	WELD	51C	WELD	PIPE #29 IS WELDED AS A BRANCH TO PIPE. SEE SCHEMATIC.
52	3"	3"	51A	WELD	53B	FLANGE			
53	3"	6'-8 3/4""	53B	FLANGE	53A	FLANGE	53C	WELD	
54	3"	5"	53C	WELD	54A	FLANGE			
55	3"	VALVE	54A	FLANGE	56B	FLANGE			
56	3"	4'	56B	FLANGE	56A	WELD			
57	3"	90 BEND	56A	WELD	58B	WELD			
58	3'	2"	58B	WELD	58A	THREAD			CONNECTS TO TANK
59	2"	1'-2"	59B	FLANGE	59A	THREAD			
60	2"	20"	59A	THREAD	61A	THREAD			
61	2"	4'-7 1/4"	61A	THREAD	61B	THREAD			
62	2"	WYE W/ CO	61B	THREAD	63A	THREAD			
63	2"	2 3/4"	63A	THREAD	63B	THREAD			
64	2"	VALVE	63B	THREAD	65A	THREAD			
65	2"	1'-3 1/4"	65A	THREAD	65B	THREAD			
66	2"	VALVE	65B	THREAD	67A	THREAD			
67	2"	10"	67A	THREAD	67B	THREAD			
68	2"	CAM-LOCK	67B	THREAD					
69	2"	121 1/2"	40C	WELD	69A	THREAD			
70	2"	UNION	69A	THREAD	71A	THREAD			
71	2"	1'-11 1/2"	71A	THREAD	71B	THREAD			
72	2"	90 BEND	71B	THREAD	73A	THREAD			
73	2"	4 3/4"	73A	THREAD	73B	THREAD			
74	2"	90 BEND	73B	THREAD	75A	THREAD			
75	2"	3'-11 1/4"	75A	THREAD	75B	THREAD			
76	2"	WYE W/ CO	75B	THREAD	77A	THREAD			
77	2"	3/4"	77A	THREAD	77B	THREAD			
78	2"	VALVE	77B	THREAD	79A	THREAD			
79	2"	20"	79A	THREAD	79B	THREAD			
80	2"	VALVE	79B	THREAD	80A	THREAD			
81	2"	CAM-LOCK	80A	THREAD					

Attachment C13-BB-4

Design Standards for Pumps						
Minimum Total Dynamic Head	Motor	Self-Priming	Minimum Suction Lift	Minimum Operating Temperature	Maximum Volume of Suspended Solids	Maximum Particle Size
15' @ 20 psi	explosion proof	Yes	15'	0^{o}F	50%	1/8"
Other Considerations						
Construction material of pump must be compatible with the application for which it is used. Typical configuration for solvent application would include an aluminum, mild steel,or stainless steel housing with teflon seals/diaphragms.						

FORM EQP 5111 TEMPLATE MODULE C13 - SUBPART CC

C13 - SUBPART CC
AIR EMISSIONS FROM TANKS, CONTAINERS, AND SURFACE IMPOUNDMENTS

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's (EGLE) *Instructions for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities*. See Form EQP 5111 for details on how to use this attachment.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), R 299.9504, R 299.9508, R 299.9605, and R 299.9634; and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart CC, and 40 CFR §270.27, establish requirements for controlling organic air emissions from tanks, containers, and surface impoundments. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template addresses air emission control requirements for tanks, containers, and surface impoundments at the hazardous waste management facility for the DLD Environmental Services, Inc facility in Plainwell, Michigan.

(Check as Appropriate)

☒ Applicant for Operating License for Existing Facility

☒ Applicant for Operating License for New, Altered, Enlarged, or Expanded Facility

☒ Tanks, Containers, or Surface Impoundments Subject to 40 CFR Part 264, Subpart CC (R 299.9634)

☐ No Tanks, Containers, or Surface Impoundments Subject to 40 CFR Part 264, Subpart CC, Exist at the Facility (R 299.9634)

This template is organized as follows:

C13.C AIR EMISSIONS FROM TANKS, CONTAINERS, AND SURFACE IMPOUNDMENTS

C13.C.1 Waste Streams

C13.C.1(a) Average Volatile Organic (VO) Concentration Determination Via Direct Measurement at the Point of Waste Origination

C13.C.1(c) Average VO Concentration Determination Via Direct Measurement at the Point of Waste Treatment

C13.C.1(d) Maximum Organic Vapor Pressure Determination of Hazardous Waste in a Tank Using Level 1 Controls Via Direct Measurement

C13.C.1(e) Maximum Organic Vapor Pressure Determination of Hazardous Waste in a Tank Using Level 1 Controls Via Process Knowledge

C13.C.1(f) Description of Procedures for Determining No Detectable Organic Emissions

C13.C.2 Tanks Description

C13.C.2(a) Description of Level 1 Controls

C13.C.2(a)(1) Maximum Organic Vapor Pressure Limit Design Capacity

C13.C.2(a)(2) Description of Fixed Roof

C13.C.2(a)(3) Description of Closure Devices and Operating Procedures

C13.C.2(a)(4) Description of Inspection Procedures

C13.C.2(b) Description of Level 2 Controls

C13.C.3 Surface Impoundment Description

C13.C.4 Container Descriptions

C13.C.4(a) Description of Container Level 1 Controls

C13.C.4(a)(1) Michigan Department of Transportation Specifications

C13.C.4(a)(2) Cover and Closure Devices

C13.C.4(a)(3) Open-Top Containers with Organic Vapor-Suppressing Barrier

C13.C.4(a)(4) Inspection Procedures

C13.C.4(b) Description of Container Level 2 Controls

C13.C.4(c) Description of Container Level 3 Controls

C13.C.6 Description of Record Keeping Procedures

C13.C.6(a) Description of Tank Record Keeping Procedures

- C13.C.6(a)(1) Tank Identification Numbers
- C13.C.6(a)(2) Inspection Records

C13.C.6(d) Closed-Vent System and Control Device Records

- C13.C.6(d)(1) Performance Certification
- C13.C.6(d)(2) Design Analysis Documentation
- C13.C.6(d)(3) Performance Test Plan and Results
- C13.C.6(d)(4) Descriptions of Sensors, Modifications, and Locations
- C13.C.6(d)(5) Planned Routine Maintenance Schedules
- C13.C.6(d)(6) Descriptions of Unplanned Malfunctions
- C13.C.6(d)(7) Management of Carbon Removed from a Carbon Absorption System

C13.C.6(e) Records Required for Exempt Units

C13.C.6(f) Description of Covers Designated as Unsafe to Inspect and Monitor

C13.C.6(g) Documentation of Alternative Compliance with 40 CFR, Part 60, Subpart VV, or 40 CFR, Part 61, Subpart V

C13.C.6(h) Documentation Required for Tanks and Containers Not Using Air Emission Controls

- C13.C.6(h)(1) List of Organic Peroxide Compounds
- C13.C.6(h)(2) Management of Organic Peroxide Compounds
- C13.C.6(h)(3) Justification for Claiming that Air Emission Controls Would Create an Undue Safety Hazard

C13.C.6(i) Certifications and Identification of Clean Air Act Requirements

C13.C AIR EMISSIONS FROM TANKS, CONTAINERS, AND SURFACE IMPOUNDMENTS

[R 299.9634 and 40 CFR Part 264, Subpart CC]

☒ Tanks

☒ Containers

☐ Surface Impoundments

C13.C.1 Waste Streams

[R 299.9634 and 40 CFR §264.1082(c)]

C13.C.1(a) Average VO Concentration Determination Via Direct Measurement at the Point of Waste Origination

[R 299.9634 and 40 CFR §264.1083]

No exemption is claimed.

C13.C.1(c) Average VO Concentration Determination Via Direct Measurement at the Point of Waste Treatment

[R 299.9634 and 40 CFR §264.1083(b)]

No exemption is claimed.

C13.C.1(d) Maximum Organic Vapor Pressure Determination of Hazardous Waste in a Tank Using Level 1 Controls Via Direct Measurement

[R 299.9634 and 40 CFR §264.1083(c)]

Process knowledge used.

C13.C.1(e) Maximum Organic Vapor Pressure Determination of Hazardous Waste in a Tank Using Level 1 Controls Via Process Knowledge

[R 299.9634 and 40 CFR §264.1083(c)]

No Vapor Pressure determination is required for hazardous waste managed using Subpart CC air emission controls.

C13.C.1(f) Description of Procedures for Determining No Detectable Organic Compound Emissions

[R 299.9634 and 40 CFR §§264.1083(d) and 270.27(a)(6)]

DLD has fixed-roof tanks vented to carbon adsorption vapor recovery/reduction control systems.

C13.C.2 Tanks Description

[R 299.9634 and 40 CFR §270.27(a)(1) and (3)]

DLD's tanks have stationary, fixed roofs that are an integral part of the structural design. Closure devices are designed with no visible cracks, holes, gaps, or other open spaces. Please see Section C2 for tank design description.

C13.C.2(a) Description of Level 1 Controls

[R 299.9634 and 40 CFR §264.1084(c)]

DLD's current tanks have Level 1 controls. They have fixed roofs that form a continuous barrier with no openings to the atmosphere and are connected to a closed-vent system and control device.

The hazardous waste in the tank is not heated to a temperature that is greater than the temperature at which the maximum organic vapor pressure is determined for the purpose of compliance with the limits listed in C13.C.2(a)(1) below.

The hazardous waste in the tank is not treated by using a waste stabilization process.

(Proposed tanks which are to reside in DLS-7 will have similar construction to DLD's current six tanks, and also have Level 1 controls).

C13.C.2(a)(1) Maximum Organic Vapor Pressure Limit Design Capacity

[R 299.9634 and 40 CFR §264.1084(b)]

Each tank is <75 m^3 and has a maximum organic vapor pressure of <76.6 kPa. All tanks are equipped with air pollution control devices.

C13.C.2(a)(2) Description of Fixed Roof

[R 299.9634 and 40 CFR §264.1084(c)(2)]

Please see volume 1, Section C2 for description of currently used tanks.

C13.C.2(a)(3) Description of Closure Devices and Operating Procedures

[R 299.9634 and 40 CFR §264.1084(c)(3)]

Each tank has a hatch located on the fixed roof. The hatch is designed to be a pressure relief valve as well as egress from the tank while cleaning, etc. The hatch is constructed to open a maximum of four inches when there is pressure build-up and then automatically close.

C13.C.2(a)(4) Description of Inspection Procedures

[R 299.9634 and 40 CFR §264.1084(c)(4)]

Tank exteriors and auxiliary piping are checked daily. All tanks are subject to interior inspections once a year by a licensed engineer. The tanks are also subject to a MIDEQ inspection once every three years. Please see volume 1, Section A5 for a description of the tank inspections.

C13.C.2(b) Description of Level 2 Controls

[R 299.9634 and 40 CFR §264.1084(d)]

Level 2 controls are not applicable to DLD's equipment.

C13.C.3 Surface Impoundment Description

[R 299.9634 and 40 CFR §264.1085]

DLD has no surface impoundments.

C13.C.4 Container Descriptions

[R 299.9634 and 40 CFR §§264.1086, and 270.27(a)(2)]

C13.C.4(a) Description of Container Level 1 Controls

[R 299.9634 and 40 CFR §264.1086(b) and (c)]

DLD uses DOT approved containers for all storage and transport of hazardous materials, thus has no further compliance obligations.

C13.C.4(a)(1) Michigan Department of Transportation Specifications

[R 299.9634 and 40 CFR §264.1086(c)(1)]

Please see Volume 1, Section C1 for details.

C13.C.4(a)(2) Cover and Closure Devices

[R 299.9634 and 40 CFR §264.1086(c)]

Please see Volume 1, Section C1 for description.

C13.C.4(a)(3) Open-Top Containers with Organic Vapor-Suppressing Barrier
[R 299.9634 and 40 CFR §264.1086(c)]

Not Applicable.

C13.C.4(a)(4) Inspection Procedures
[R 299.9634 and 40 CFR §264.1086(c)(4)]

When transferring waste into a container, containers are checked to make sure closure devices are in good condition and closed when transfer is complete. When containerized waste is received from off-site sources, and the container is not emptied within 24 hours, then the containers are visually checked and defects repaired or corrected. For inspection timelines, please see volume 1, Section A5.

C13.C.4(b) Description of Container Level 2 Controls
[R 299.9634 and 40 CFR §264.1086(d)]

DLD utilizes totes, which have a capacity greater than 0.46 m^3. These totes are not in light material service (materials stored in totes do not have a vapor pressure greater than 0.3 kPa @ 20^oC), thus do not require Level 2 Controls. If, during the time span of this license, DLD does use totes in light material service, DLD will comply with the Level 2 Control Standards.

C13.C.4(c) Description of Container Level 3 Controls
[R 299.9634 and 40 CFR §264.1086(e)]

DLD does not use container Level 3 Controls. No waste stabilization process, current or proposed, which would be subject to subpart CC, will take place in containers which have a capacity greater than 0.46 m^3.

C13.C.6 Description of Record Keeping Procedures
[R 299.9634 and 40 CFR §264.1089(a)]

C13.C.6(a) Description of Tank Record Keeping Procedures
[R 299.9634 and 40 CFR §264.1089(b)]

Level 1 Tank Controls - Recordkeeping Requirements

Records to be maintained permanently at DLD:

- Unique tank ID numbers.

  (DLS-3 contains tanks 1-3. DLS-4 contains tanks 4-6)

- Records of tank unit dimensions and analysis of tank capacity for as long as the tank is in service.

- Records that show that the air control device is designed for the required performance level, either as a signed certification or as performance test results. This is satisfied by our MIDEQ issued Permit to Install.

Records to be kept a minimum of 3 years:

- Inspections, including unit number, inspection date and defects.

- Semiannual updates for planned routine maintenance operations.

- Records of unexpected malfunctions, duration and corrective actions.

- For each defect found, records are maintained on-site of:

  - Location of problem
  - Description of problem
  - Date it was found
  - Corrective action taken
  - Date of repair or emptying and removal of unit from service
  - If repair is delayed more than 45 days due to lack of alternative tank capacity, DLD must record the reason for the delay and expected completion date of repair.

C13.C.6(a)(1) Tank Identification Numbers

[R 299.9634 and 40 CFR §264.1089(b)(1)(i)]

DLD currently has six tanks, numbered 1 through 6.

C13.C.6(a)(2) Inspection Records

[R 299.9634 and 40 CFR §264.1089(b)(1)(ii)]

See volume 1, Section C13.C.6(a).

C13.C.6(d) Closed-Vent System and Control Device Records

[R 299.9634 and 40 CFR §264.1089(e)]

Records that are to be maintained until air emission control equipment is replaced or taken out of service:

- Description and date of modifications to control device and identification of operating parameters.
- Description of monitoring procedures and analytical results.

C13.C.6(d)(1) Performance Certification

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)]

Please see Attachment C13- CC-1 for Permit to Install No. 759-83A, issued by the Michigan Dept. of Environmental Quality, for the design parameters and performance standards for the carbon filter devices on the tanks.

C13.C.6(d)(2) Design Analysis Documentation

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)(ii)]

Not applicable.

C13.C.6(d)(3) Performance Test Plan and Results

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)(iii)]

Not applicable.

C13.C.6(d)(4) Descriptions of Sensors, Modifications, and Locations

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)(iv)]

Not applicable.

C13.C.6(d)(5) Planned Routine Maintenance Schedules

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)(v)]

Routine maintenance on the carbon filters is planned for the period of time the tank is out-of-service for the yearly inspections.

C13.C.6(d)(6) Descriptions of Unplanned Malfunctions

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)(vi)]

DLD maintains a "*Defect Detection and Repair Form*" that records defects and malfunctions to the tanks when they occur, the date they occur, what action was taken to fix the problem and when. This document, once filled out, resides in DLD's Operating Log.

C13.C.6(d)(7) Management of Carbon Removed from a Carbon Absorption System

[R 299.9634 and 40 CFR §264.1089(e)(1)(i)(vii)]

Carbon removal dates are recorded on our Monthly Inspection Sheets and kept in DLD's Operating Log.

C13.C.6(e) Records Required for Exempt Units

[R 299.9634 and 40 CFR §264.1089(f)]

Not applicable.

C13.C.6(f) Description of Covers Designated as Unsafe to Inspect and Monitor

[R 299.9634 and 40 CFR §264.1089(g)]

Not applicable.

C13.C.6(g) Documentation of Alternative Compliance with 40 CFR Part 60, Subpart VV, or 40 CFR Part 61, Subpart V

[R 299.9634 and 40 CFR §264.1089(h)]

Not applicable.

C13.C.6(h) Documentation Required for Tanks and Containers Not Using Air Emission Controls

[R 299.9634 and 40 CFR §264.1089(i)]

C13.C.6(h)(1) List of Organic Peroxide Compounds

[R 299.9634 and 40 CFR §264.1089(i)(1)]

Organic peroxides are not manufactured at DLD.

C13.C.6(h)(2) Management of Organic Peroxide Compounds

[R 299.9634 and 40 CFR §264.1089(i)(2)]

Not applicable.

C13.C.6(h)(3) Justification for Claiming that Air Emission Controls Would Create an Undue Safety Hazard

[R 299.9634 and 40 CFR §264.1089(i)(3)]

Not applicable.

C13.C.6(i) Certifications and Identification of Federal Clean Air Act of 1990 Requirements

[R 299.9634 and 40 CFR §264.1089(j)(1) and (2)]

Not Applicable.

Attachment C13-CC-1

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

"Better Service for a Better Environment"

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: www.deq.state.mi.us

RUSSELL J. HARDING, Director

REPLY TO:

AIR QUALITY DIVISION
PO BOX 30260
LANSING MI 48909-7760

May 4, 2000

Mr. Ward T. Walter, President
Drug & Laboratory Disposal
331 Broad Street
Plainwell, Michigan 49080

Dear Mr. Walter:

This letter is in reference to your Permit to Install application for six existing storage tanks with carbon adsorbers located at 331 Broad Street, Plainwell, Michigan. This application, identified as No. 759-83A, has been evaluated and approved by the Air Quality Division, pursuant to the delegation of authority from the Michigan Department of Environmental Quality.

This approval is based upon and subject to compliance with all administrative rules of the Department and conditions stipulated in the attached supplement. Please review these conditions thoroughly so that you may take the actions necessary to ensure compliance with all of these conditions.

You are advised that contaminants discharged to the surface waters and/or groundwaters; materials disposed of on land; hazardous waste storage, treatment, and disposal; and resource recovery facilities must be approved by other divisions of the Department of Environmental Quality

Also, Permit to Install Nos. 759-83 and 773-91 have been voided because the equipment is now covered by Permit to Install No. 759-83A.

Please contact me if you have any questions regarding this permit.

Sincerely,

Brad Myott, Engineer
Chemical Process Unit
Permit Section
Air Quality Division
(517) 335-6978

BM:PK
Attachments
cc: Ms. Mary Douglas, District Supervisor

EQP 0100e
(Rev. 1/98)

Attachment C13-CC-1

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - AIR QUALITY DIVISION

AIR USE PERMIT APPLICATION

For authority to install, construct, reconstruct, relocate, modify, or alter process, fuel-burning or refuse burning equipment and/or control equipment (permits to install are required by administrative rules pursuant to section 5505 of act 451, p.a. 1994 as amended).

FOR DEQ USE ONLY
APPLICATION NUMBER: 759-83A

Please type or print clearly. For further instructions, see the reverse side of this form or contact the Air Quality Division at 517-373-7023.

AIR QUALITY DIVISION
NOV 18 1999
PERMIT SECTION

1. APPLICANT NAME: (Business License Name of Corporation, Partnership, Individual Owner, Government Agency)
Drug & Laboratory Disposal, Inc.

2. APPLICANT ADDRESS: (Number and Street)
331 Broad Street

CITY: (City or Village): Plainwell
STATE: MI
ZIP CODE: 49080
COUNTY: Allegan

3. EQUIPMENT OR PROCESS LOCATION: (Number and Street) (If different than item 2)

CITY: (City or Village)
ZIP CODE: 10-13-99

4. GENERAL NATURE OF BUSINESS:
Hazardous Waste Treatment and Storage Facility

5. EQUIPMENT OR PROCESS DESCRIPTION: **A Description MUST Be Provided Here.** (Attach additional sheets, if necessary. Include Source Classification Codes [SCC].)

Charcoal Filters for three storage tanks of 5000 gallons capacity each, all of which are ~~covered under Permit 759-83. Request change to Special Condition #16 of Permit 759-83~~ to allow vent gas testing and/or replacement of carbon adsorbers every six months. Request Special Condition #16 of Permit #759-83 to read the same as Special Condition #16 of Permit 773-91, which covers three identical tanks with carbon adsorbers. Wording of Special Condition #16 of Permit 773-91 is as follows:

16. Every six months applicant shall perform either of the two options listed below and the results of the chosen option shall be kept on file for a period of at least two years and made available to the Air Quality Division upon request.
    1. Test the vent gases from the carbon adsobers for breakthrough and replace(cont)

6. FACILITY CODES:
STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE: 4 9 5 3
STATE REGISTRATION (EMISSION INVENTORY) NO.:

7. ACTION AND TIMING: (Enter dates for those which apply)	ESTIMATED STARTING DATE	ESTIMATED COMPLETION DATE
INSTALLATION, CONSTRUCTION, RECONSTRUCTION OR ALTERATION:	N/A	N/A
RELOCATION:	N/A	N/A
CHANGE OF OWNERSHIP:	N/A	N/A

8. NAME OF PRIOR OWNER, IF ANY: N/A
PRIOR AIR USE PERMIT NUMBER, IF ANY: 759-83

9. AUTHORIZED FIRM MEMBER CERTIFICATION:
PRINTED OR TYPED NAME: Ward T. Walter
TITLE: President
PHONE NUMBER: (Include Area Code) (616)685-9824
SIGNATURE: Ward T. Walter Pres
DATE: 11-09-99

10. CONTACT PERSON NAME: (If different than name in item 9)
PHONE NUMBER: (Include Area Code)

11. DISPOSITION OF APPLICATION: **FOR DEQ USE ONLY. DO NOT WRITE BELOW**

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: 11/00 3/20/00

DATE PERMIT TO INSTALL APPROVED:* 5-3-00
SIGNATURE: Lynn Fiedler

DATE APPLICATION / PERMIT VOIDED:
SIGNATURE:

DATE APPLICATION / PERMIT DENIED:
SIGNATURE:

***SUBJECT TO COMPLIANCE WITH ALL DEPARTMENT RULES AND THE CONDITIONS STIPULATED IN THE ATTACHED SUPPLEMENT.**

EQP 5615 (Rev. 3/98)

SUPPLEMENT to PERMIT No. 759-83A
Drug & Laboratory Disposal
Plainwell, Michigan
May 3, 2000

GENERAL CONDITIONS

1. Rule 201(1) - The process or process equipment covered by this permit shall not be reconstructed, relocated, altered, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule.

2. Rule 201(4) - If the installation, reconstruction, relocation, or alteration of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the person to whom this permit was issued, or the designated authorized agent, shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or alteration of the equipment allowed by this Permit to Install.

3. Rule 201(6)(a) - If this Permit to Install is issued for a process or process equipment located at a stationary source that is subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, trial operation is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install and until the appropriate terms and conditions of this Permit to Install have been incorporated into the Renewable Operating Permit. Upon incorporation of the appropriate terms and conditions into the Renewable Operating Permit, this Permit to Install shall become void.

4. Rules 201(6)(b) - If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install.

5. Rule 201(8) and Section 5510 of Act 451, P.A. 1994 - The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Departments' rules or the Clean Air Act.

6. Rule 219 - The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b) and (c) of R 336.1219. The written request shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality.

7. Rule 901 - Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property.

8. Rule 912 - The owner or operator of a source, process, or process equipment shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant in excess of standards for more than one hour, or of any air contaminant in excess of standards for more than two hours, as required in this rule, to the District Supervisor, Air Quality Division. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the District Supervisor within 10 days, with the information required in this rule.

9. Approval of this permit does not exempt the person to whom this permit was issued from complying with any future applicable requirements which may be promulgated under Part 55 of Act 451, P.A. 1994 or the Clean Air Act.

10. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

11. Operation of this equipment may be subject to other requirements of Part 55 of Act 451, P.A. 1994, and the rules promulgated thereunder.

12. Rule 301 - Except as provided in subrules (2), and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303.

    a) A 6-minute average of 20% opacity, except for one 6-minute average per hour of not more than 27% opacity.

    b) A visible emission limit specified by an applicable federal new source performance standard.

    c) A visible emission limit specified as a condition of this permit to install.

13. Rule 370 - Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2).

14. Rule 285 - Except as allowed by Rule 285 (a), (b), and (c), applicant shall not substitute any fuels, coatings, nor raw materials for those described in the application and allowed by this permit, nor make changes to the process or process equipment described in the application, without prior notification to and approval by the Air Quality Division.

15. The Department may require the applicant to conduct acceptable performance tests, at the applicant's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001.

SPECIAL CONDITIONS
May 3, 2000
(2 Special Conditions)

FG Tanks

1. The applicant shall not operate the flexible group consisting of six storage tanks, hereinafter "FG Tanks", unless the carbon adsorbers are installed and operating properly. [R336.1910]

2. Every six months applicant shall perform either of the two options listed below and the results of the chosen option shall be kept on file for a period of at least five years and made available to the Department upon request. [R336.1910, R336.1901]

    1. Test the vent gases from each carbon adsorber for breakthrough and replace the carbon adsorber if breakthrough occurs. Breakthrough occurs when the methylene chloride emissions from any one carbon adsorber exceeds 0.05 pound per hour. This is based on a methylene chloride concentration of 94.5 ppm by weight in the vent gases from the carbon adsorber.

    2. Replace the carbon adsorbers.

Attachment C13-CC-1

STATE OF MICHIGAN

DEPARTMENT OF NATURAL RESOURCES
AIR QUALITY DIVISION
P.O. BOX 30028
LANSING, MICHIGAN 48909

AIR USE PERMIT APPLICATION

APPLICATION NO. 773-91

AIR QUALITY DIVISION

JUN 26 1991

PERMIT SECTION

FOR AUTHORITY TO INSTALL, CONSTRUCT, RECONSTRUCT, RELOCATE, OR ALTER, AND OPERATE PROCESS, FUEL-BURNING, OR REFUSE-BURNING EQUIPMENT AND/OR CONTROL EQUIPMENT (PERMITS TO INSTALL AND OPERATE ARE REQUIRED BY ADMINISTRATIVE RULES PURSUANT TO ACT 348, P.A. 1965, AS AMENDED).

1. APPLICANT: Business License Name of Corporation, Partnership, Individual Owner, Government Agency
Drug & Laboratory Disposal, Inc.

2. MAILING ADDRESS: Number and Street; City or Village; State; Zip Code
331 Broad Street; Plainwell, MI 49080

3. EQUIPMENT OR PROCESS LOCATION: Number and Street; City, Village or Township | COUNTY | ZIP CODE
331 Broad Street; Plainwell, | Allegan | 49080

4. GENERAL NATURE OF BUSINESS:
Hazardous Waste Treatment and Storage Facility

5. EQUIPMENT OR PROCESS DESCRIPTION:
Charcoal filters for 3 storage tanks of 5,000 gallons capacity each

6. ESTIMATED COST:
Air Pollution Control Equipment $ 4,000 ; Total Project $ 160,000

7. ACTION AND TIMING:

	ESTIMATED STARTING DATE	ESTIMATED COMPLETION DATE
[X] Installation, construction, reconstruction, or alteration	3-91	4-91
[ ] Relocation		
[ ] Change of Ownership		

8. NAME OF PRIOR OWNER AS IN ITEM 1 ABOVE, AND PRIOR AIR USE PERMIT NUMBER, IF ANY
NAME PERMIT NO.

9. NAME AND TITLE OF OWNER OR AUTHORIZED MEMBER OF FIRM
Name Ward T. Walter Signature
Title: President Date: 06-04-91 Phone No. (616) 685-9824

10. CONTACT PERSON IF DIFFERENT THAN ITEM 9:
Name Phone No. ( )

11. DISPOSITION OF APPLICATION: FOR DNR USE ONLY

Receipt of all information required by Rule 203	5-3-00 6-26-91	
Permit to install approved * on	11-20-91	Signature Robert Miller
Permit to operate approved * on		Signature
Application/permit voided on	5-3-00	Signature Lynn Fiedler
Application/permit denied on		Signature

*Subject to compliance with all Commission Rules and Conditions stipulated in the attached supplement.

AQ-1 INSTRUCTIONS FOR COMPLETING AND FILING ARE ON REVERSE SIDE PR 5615 3/88

Attachment C13-CC-1

AIR QUALITY DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
P.O. BOX 30028, LANSING, MICHIGAN 48909

APPLICATION NO. 759-83

Air Pollution Control
DEC 07 1983

APPLICATION TO THE AIR POLLUTION CONTROL COMMISSION

for authority to construct, install or alter
and
for permit to operate process, fuel burning, refuse burning and/or air pollution control equipment

1 PERMIT TO BE ISSUED TO: *(Business License Name of Corporation, Partnership, Individual Owner, Governmental Agency)*
Drug & Laboratory Disposal, Inc.

2 MAILING ADDRESS: *(Number, Street, City or Village, Zip Code)*
P. O. Box 140 Plainwell, MI 49080

3 EQUIPMENT OR PROCESS LOCATION: *(Number, Street, City or Village, Township, Zip Code)*
331 Broad Street Plainwell, MI 49080

4 TYPE OF ORGANIZATION:
☒ Corporation ☐ Partnership ☐ Individual Owner ☐ Governmental Agency

5 GENERAL NATURE OF BUSINESS:
Transporter of small volume hazardous waste

6 EQUIPMENT DESCRIPTION: Application is hereby made for permission to construct, install or alter and to operate the following equipment

Charcoal Filters for Storage Tanks (see attached)

3 NEW LIQUID STORAGE TANKS

7 ESTIMATED COST: Air Pollution Control Equipment $ 2,000.00 Total Project $ 2,000.00

8 PRESENT STATUS OF EQUIPMENT: *(Check and complete applicable items)*

		Estimated Starting Date	Estimated Completion Date
✓	Construction or installation not started	Upon approval	Two weeks thereafter
( )	Construction or installation partly completed		
( )	Construction completed		
( )	Equipment is to be altered		
( )	Equipment is partly altered		
( )	Equipment has been altered		
( )	Change of location and/or ownership		

9 NAME OF PRIOR OWNER AS IN (1) ABOVE, AND PRIOR AIR POLLUTION CONTROL PERMIT NUMBER, IF ANY:
(Name) N/A (Permit Number)

10 TYPE OR PRINT NAME AND TITLE OF OWNER OR AUTHORIZED MEMBER OF FIRM:
(Name) Ward T. Salter, RPH MS (Title) President
(Signature) [signature] (Date) 12-01-83 (Phone No.) (616) 685-9024

MDNR USE ONLY

11 DISPOSITION OF APPLICATION:
* Subject to compliance with all Commission Rules and conditions stipulated in the attached supplement.

Permit to install approved and issued on MAR 1 - 1984 Signature Robert Miller

Permit to operate approved and issued VOID 5-3-00 Signature Lynn Fiedler

FORM AP-1 1M 6/78

(Instructions for completing this form are on reverse side)