

Landfill Advisory Memorandums (LAM) and Issued Notifications

**Division of Waste Management
Solid Waste Branch**

February 2023



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LAM #1 – Effects of Freeze/Thaw and Desiccation on Liners

**LANDFILL
ADVISORY
MEMORANDUM**

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Effects of Freeze/Thaw and Desiccation
on Liners

Kentucky Department for
Environmental Protection

Notice to All Landfill Owners and Engineers

All compacted clay liners for transition landfills and composite liners for contained landfills should be protected from freeze-thaw and desiccation damage. To protect your expensive clay liner system, the Division of Waste Management recommends the following:

- Place a minimum of 18 inches (in thickness) of selected soil free of sharp stones, waste, boards, pipes and other protrusions, over the liner within 48 hours of construction. (This is also important in summer, to protect the liner from erosion and heat cracks.)
- Avoid construction during the winter months, if possible.
- Choose an appropriate size liner to last through the winter months and to make the protective cover more manageable.

If waste is used as a protective layer, an operating permit must be obtained for that area before its placement. Daily and interim cover also must be applied according to the regulations. This is advisory information only, unless it is adopted as a regulation. If you have any questions, please call D. S. Nagda, P.E., at (502) 564-6716.

APPROVED

Caroline P. Haight
Caroline P. Haight

Date

3/26/93

LAM #2 – When to Provide Low Permeability Test Results

**LANDFILL
ADVISORY
MEMORANDUM**

From: Caroline P. Haight, Director
Division of Waste Management

Subject: When to Provide Low Permeability Test Results

**Kentucky Department for
Environmental Protection**

Notice to All Landfill Owners and Engineers

The time frame for submittal of moisture-density permeability test results are:

1. One permeability test series based upon Optimum Proctor Moisture and three (3) Densities (Optimum, 92% of Optimum and a density based upon the first two results), shall be submitted with the Administrative Application. The volume of soil represented in this sample shall be adequate for the initial working area's low permeability soil requirement. The test results shall be plotted on semi-log graph paper.
2. A low permeability soil window shall be developed and submitted in the Technical Application for all low permeability soils to be used in the first working area. (See attached February 13, 1992 notice.)
3. A low permeability soil window shall be developed and submitted ninety (90) days prior to the placement of low permeability layers for each additional working area to be constructed.

This information is advisory only until it is adopted into the regulations.

APPROVED

Caroline P. Haight
Caroline P. Haight

6/30/93
Date

LAM #3 – Procedures for Locating Soil Borings

**LANDFILL
ADVISORY
MEMORANDUM**

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Procedures for Locating Soil Borings

**Kentucky Department for
Environmental Protection**

Notice to All Landfill Owners and Engineers

401 KAR 47:170 Section 3(7) requires that the methods and accuracy, to be used to determine the location of the rock core and soil borings during the subsurface investigation, be included in the geotechnical information in the notice of intent.

The soil borings as proposed in the N.O.I. can be located in the field by using topographic features. Once the boring is drilled, it needs to be located by survey to an accuracy of 1 ft. horizontally and 0.1 ft. vertically.

If you do not have a Notice of Intent application on file with the Division which is complete and approved as of the date of this LAM, the above accuracy shall be used.

For further details on soil boring procedures, please refer to our February 13, 1992 notice to all landfill consulting engineers or LAM #2.

APPROVED

Caroline P. Haight
Caroline P. Haight

6/30/93
Date

LAM #4 – Nested Groundwater Monitoring Well Systems

LANDFILL

ADVISORY

MEMORANDUM

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Nested Groundwater Monitoring Well
Systems

Kentucky Department for Environmental Protection

Notice to All Landfill Owners, Engineers, and Geologists

Nested wells are required in the design of a groundwater monitoring system to completely and accurately analyzing groundwater quality and characterizing local groundwater flow. A single well screened over a thick saturated interval may produce inaccurate water elevation measurements and sampling results due to dilution of the sample. A nested well monitoring system provides more specific information about vertically distributed water quality, hydraulic head, and flow in the monitored formation.

Most waste disposal facilities are required to install and implement a groundwater monitoring system meeting the requirements of 401 KAR 48:300 for solid waste or 401 KAR 45:160 for special waste. When the uppermost aquifer thickness precludes the use of a standard ten (10) foot well screen, the Division of Waste Management recommends the following:

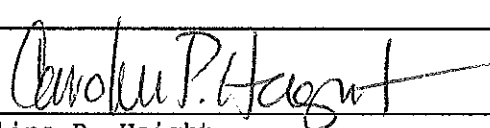
1. A nested well system consisting of a series of single-riser/limited interval wells installed in multiple boreholes that are closely spaced and screened within different hydrostratigraphic zones;
2. A longer screen length which must be proposed to the cabinet in writing and be compatible with the physical, chemical, and biological properties of the aquifer as well as the chemical characteristics of any anticipated leachate which could potentially threaten groundwater quality. The permittee or applicant must demonstrate to the cabinet's satisfaction that an alternate screen length will provide accurate monitoring without intermingling aquifers or diluting a potentially contaminated sample beyond what is representative of the uppermost aquifer;
3. An alternate designs to be considered by the cabinet on a case-by-case basis.

Site specific geologic and hydrogeologic conditions will ultimately determine the design of the groundwater monitoring system. If data gathered from the hydrogeologic investigation supports the design of a nested monitoring well system, the Division of Waste Management will require it.

Please refer to EPA/625/6-90/0166 Handbook: Groundwater Volume II: Methodology for additional information.

This is advisory information only, unless it is adopted as regulation. If you have any questions, please call Bill Stapleton or C. Edward Harris, P.G. at (502) 565-6716.

APPROVED


Caroline P. Haight

Date

11/10/93

LAM #4 REVISED - Nested Groundwater Monitoring Well Systems

LANDFILL

ADVISORY

MEMORANDUM

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Nested Groundwater Monitoring Well
Systems

Kentucky Department for Environmental Protection

Notice to All Landfill Owners, Engineers, and Geologists

Nested wells may be required in the design of a groundwater monitoring system capable of completely and accurately analyzing groundwater quality and characterizing local groundwater flow and flow systems. A single well screened over a thick saturated interval may produce inaccurate water elevation measurements as well as misleading sampling results due to dilution of the sample. A nested well monitoring system provides more specific information about vertically distributed water quality, hydraulic head, and flow in the monitored formation.

For all waste disposal facilities required to install and implement a groundwater monitoring system meeting the requirements of 401 KAR 48:300 for solid waste or 401 KAR 45:160 for special waste in which the thickness of the uppermost aquifer precludes the use of a standard 10 foot well screen to provide complete monitoring of the saturated zone, the Division of Waste Management recommends the following:

1. A nested well system consisting of a series of single-riser/limited interval wells installed in multiple boreholes that are closely spaced and screened within different hydrostratigraphic zones;
2. A longer screen length which must be proposed to the cabinet in writing and be compatible with the physical, chemical, and biological properties of the aquifer as well as the chemical characteristics of any anticipated leachate that could potentially threaten groundwater quality. The permittee or applicant must demonstrate to the cabinet's satisfaction that an alternate screen length will provide accurate monitoring without intermingling aquifers or diluting a potentially contaminated sample beyond what is representative of the uppermost aquifer;
3. Alternate designs will be considered by the cabinet on a case-by-case basis.

Site specific geologic and hydrogeologic conditions will ultimately determine the design of the groundwater monitoring system. If data gathered from the hydrogeologic investigation support the design of a nested monitoring well system, the Division of Waste Management will require it.

Please refer to EPA/600/4-89/034 Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells, March 1991, for additional information.

This is advisory information only, unless it is adopted as regulation. If you have any questions, please call Bill Stapleton or C. Edward Harris, P.G. at (502) 564-6716.

bbs

APPROVED David W. Torgan for
Caroline P. Haight

1/7/94
Date

LAM #5 - Laboratory Determination of Friction Angles and Factor of Safety in Stability
Analysis of the Liner and Cap Design

**LANDFILL
ADVISORY
MEMORANDUM**

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Laboratory Determination of Friction
Angles and Factor of Safety in Stability
Analysis of the Liner and Cap Design

**Kentucky Department for
Environmental Protection**

Notice to All Solid Waste Landfill Owners and Engineers

The Solid Waste Management regulation 401 KAR 48:080 Section 5, 8 and 10 requires that each component of the liner and cap shall be designed to have a minimum static factor of safety of 1.25 and 1.5, respectively. The use of geosynthetic is required by the regulations in construction of the composite liner, cap and in any alternate design. The use of internal friction angles and interfacial friction angles are widely required in the stability analysis of sliding and tensile failure of the liner components. An accurate determination of these angles is critical to the design. Therefore,

- The Division will accept the manufacturer's published data of the friction angles when the specifications of the soils (such as grain size analysis, Atterberg's limits, soil classification (USCS), moisture, compaction, cohesion, and friction angle), or sand used in obtaining these data correlate with the site specific soil or sand and the appropriate static factor of safety is obtained by stability analysis per 401 KAR 48:080 Section 10.
- Laboratory tests on the site specific clay, soil or other liner construction material is required for the interfacial friction angles and other parameters - such as adhesion, cohesion, internal friction angles - if the correlation between the published soil data and site soil data does not exist. These tests are required under the worst condition scenario (i.e. a saturated or wet condition and under the range of anticipated site specific conditions).

This information is advisory only until it is adopted in the regulations.

APPROVED


Caroline P. Haight

Date

12-10-93

LAM #6 - Stability Analysis of the Liner and Cap and the Factor of Safety in Landfill Design

LANDFILL

ADVISORY

MEMORANDUM

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Stability Analysis of the Liner and Cap
and the Factor of Safety in Landfill
Design

Kentucky Department for Environmental Protection

Notice to All Solid Waste Landfill Owners and Engineers

401 KAR 48:080 Section 5(2)(c) requires that, for slopes greater than 25%, synthetic liners shall be designed to withstand tensile forces generated due to its own weight and the weight of the material and waste overlying it. The maximum elongation must not exceed 10% and a factor of safety must be above 1.25 for each component of the liner in accordance with 401 KAR 48:080 Section 10. Therefore,

- In calculating the elongation, the liner thickness is first determined. This requires a laboratory determination, or the manufacturer's data listing of the interfacial friction angles between the upper and lower surfaces of the synthetic liner and the respective contact surface. LAM #5 requires laboratory tests for site specific material in certain cases. Use the allowable tensile strength which is obtained from the yield strength using various factors of safety. Different factors of safety exist for construction practice, creep, puncture, UV degradation. Use the load of the thickest lift under worst site-specific loading conditions (whether the live load or the load due to the waste lift). A theta (θ) angle of 45° and a mobilizing distance corresponding to the stress, liner type and thickness can be used under some conditions (for a sample calculation, please refer to pp. 465-466 & 411-13, Designing with Geosynthetics by Robert M. Koerner).
- In calculating the elongation in the synthetic liner of a specified thickness, the loading due to the vertical height of the waste lift and other components such as Leachate Collection System (LCS), protective layer and cap must be considered. The design must be done for static and dynamic loading under static conditions, and no slippage must be allowed. The algebraic sum of the friction forces above the liner and the driving force component of the vertical loading will be the total failure force above the liner. The liner will be in tension if the failure (top) forces exceed the resisting (bottom) forces. The tensile stress can be calculated from the tensile force and liner cross-section (thickness). The strain (or % elongation) can be determined from the elasticity definition, and the factor of safety can then be calculated.
- The factor of safety of each of the synthetic component of the liner is similarly determined.
- The factor of safety of the soil and sand component of the liner system is determined by comparing the acting forces with their internal shear strength.
- The stability analysis due to sliding and rotational failure is separately required to ensure a factor of safety of 2.0 for the subbase, 1.25 for each component of the liner and 1.5 for each component of the cap. Please note that the seismic factors of safety is also needed. The seismic factor of safety is usually approximately 0.87 times the static factor of safety, however, engineers should make their own judgement depending upon the location of the site. Refer to the EPA Subtitle D technical manual (Solid Waste Disposal Facility Criteria - A Technical Manual (EPA530-R-93-017)) for further guidance.

The above is an advisory only and the design engineer should make sure that the prepared design is suited to the site specific situation. This LAM may be changed if and when additional information is available to the Cabinet.

APPROVED


Caroline P. Haight

Date

2/13/94

LAM #7 - Slopes and Double Composite Liner Requirement

**LANDFILL
ADVISORY
MEMORANDUM**

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Slopes and Double Composite Liner
Requirement

**Kentucky Department for
Environmental Protection**

To All Landfill Owners and Engineers:

401 KAR 48:080 Section 7 allows elimination of the secondary composite liner for slopes greater than 10% on the bottom liners. Many municipal solid waste (MSW) landfill sites are taking advantage of this regulation and modifying the bottom slopes to make it steeper than 10% in most areas, but even in these cases, the bottom of the V-shaped valley and the corners of some rectangular areas have slopes of less than 10%.

The Division of Waste Management will accept these (less than 10% slope) areas without requirement of a secondary liner if the width of these slopes is less than 20 feet. This is based on the maximum width of landfill construction equipment. The Division requires a double composite liner, as in 401 KAR 48:080 Section 1 and 2, for any and all areas 20 feet or wider having less than 10% slopes. This should provide adequate room for the leachate collection system.

Please note that this is an advisory, only to clarify the application of the regulation. If you have any questions, please call D. S. Nagda, P.E., at (502) 564-2225, ext. 287.

dsn

APPROVED

Caroline P. Haight
Caroline P. Haight

Date

1/6/94

LAM #8 – Standard Deviations for Sediment Pond Construction

DRAFT

LAM #8

LANDFILL
ADVISORY
MEMORANDUM

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Standard Deviations

Kentucky Department for
Environmental Protection

To Landfill Owners and Engineers

Several Situations have developed concerning ponds that have deviations from the approved design and what was actually constructed. This LAM is to set general standard tolerances for pond construction. Permittees who have constructed ponds within these deviations may submit these minor changes as "as-built" noting the changes from the approved design. Please note that any change cannot affect the principal design of the pond. If the deviations fall outside the standard tolerances, or changes and have effect on the principal design of the pond, a minor modification must be submitted for review or the pond must be reconstructed to the approved design (within standard deviations).

Attached to this LAM is a pond certification form to be used by the certifying engineer.

DRAFT

swf

APPROVED _____

Caroline P. Haight

Date _____

DRAFT

POND CERTIFICATION

Company Name _____ Permit No. _____ Structure No. _____

Hazard Classification _____ Certification Date _____ Cert. as Disig _____ As Built _____

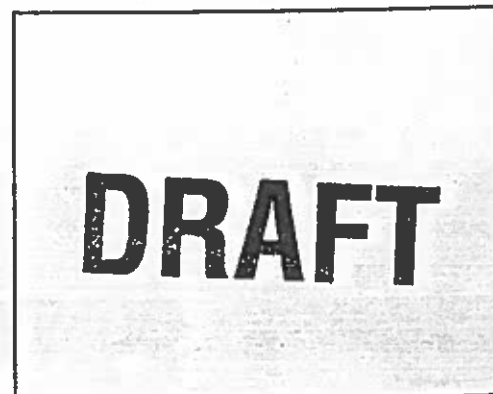
Criteria	Designed	As-Built	Deviation		Deviation Tolerance
			Unit	%	
1) Embankment Top Width	Feet				±10%
2) Embankment Lateral Width	Feet				±10%
3) Emergency Spillway Width	Feet				±5%
4) Elevation difference Between Emergency and Principal Spillways	Feet			NA	±0.5 Ft.
5) Elevation Difference Between Emergency Spillway and Top of Dam	Feet			NA	-0.5 Ft. +1.0 Ft.
6) Top of Dam Elevation at the Lowest Point	Feet				±0.5 Ft.
7) Upstream Embankment Slope	Degrees				±10% Not Over 27°
8) Downstream Embankment Slope	Degrees				±10% Not Over 27°
9) Principal Spillway Diameter	Inches				Zero
10) Principal Spillway Slope	Degrees				±0.5% But Not Less Than 1%
11) No. of Anti-Seep Collar				NA	Zero
12) Length of Principal Spillway	Feet				±0.5 Ft.

Engineer's Name _____

Registration No. _____

Engineering Firm _____

Address _____



Engineer Stamp

LAM #9 – Approved Alternate Daily Cover Materials

**LANDFILL
ADVISORY
MEMORANDUM**

From: Caroline P. Haight, Director
Division of Waste Management

Subject: Approved Alternate Daily Cover
Materials

**Kentucky Department for
Environmental Protection**

Notice to All Landfill Owners and Engineers:

The Division of Waste Management approves the use of Fabri-Soil and Belton Geotextiles Cover, Style 113 as alternate daily cover on a full-time basis at all landfills. This approval is subject to the following conditions:

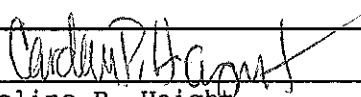
1. The Division shall be notified in writing prior to using the product(s).
2. The use of the product shall not violate the environmental performance standards (401 KAR 47:030).
3. An evaluation of the product's performance based upon records kept during the use of the product, shall be submitted with quarterly reports.
4. No one piece of Fabri-Soil shall be used for more than thirty (30) days.
5. The material shall be replaced if any damage occurs that affects the performance of this product. Repairs that can be made shall be according to manufacturers' recommendations.
6. Cabinet representatives reserve the right to revoke this approval if the product is found being misused or abused, or if any of the above conditions are not met.

Trial approval for the use of other alternate daily covers may still be granted and must be applied for as a minor modification. As other products are approved for full-time use based on six-month trial period evaluations, this Landfill Advisory Memorandum (LAM) may be updated.

This is advisory information only and may be changed if and when additional information is available to the Cabinet. If you have any questions, please call Margi Jones at (502) 564-2225, ext. 665.

msj

APPROVED


Caroline P. Haight

Date

12/29/94

NOTICE – Liner and Drainage Layer Protection



KENTUCKY DIVISION OF WASTE MANAGEMENT

NOTICE

TO

ALL CONTAINED SOLID WASTE LANDFILLS

Effective Date. November 17, 2000

Subject. Liner and Drainage Layer Protection

Issue. The Kentucky Division of Waste Management (KDWM) has evaluated new and continuing information on the performance of approved liner and drainage layer designs for contained solid waste landfills. The KDWM has determined that bottom liners whose design allows intimate contact between solid waste or cover materials and any geosynthetic component of the liner system are at significant risk for penetrations of the protective geomembrane. The KDWM has further determined that contained landfills that re-circulate any portion of their leachate are at significant risk from clogging of the drainage layer from biologic activity and infiltration of fines. These problems are in contravention to solid waste regulations including 401 KAR 48:080 Section 2 (3) (c) & (d) and Section 11 that require protection of the drainage layer and equivalence of performance for substitute materials.

Action. The KDWM requires all owners and operators of applicable permitted solid waste facilities to reflect compliance with the following three statements of consideration.

- Liner and Drainage Layer Protection: General Provisions (Revised 11-14-00)
- Liner and Drainage Layer Protection: Tire Chips (Revised 11-14-00)
- Liner and Drainage Layer Protection: Initial Lift (Revised 11-14-00)

Applicability. This requirement is made pursuant to 401 KAR 47:130 Section 2 (Modification or Revocation of Permits) and applies to all permitted solid waste facilities with a contained landfill activity. Compliance is required for all areas of future disposal not approved for waste placement on or before the effective date of this Notice.

Point of Contact. If you need clarification or additional information concerning this Notice, contact Ronald D. Gruzesky, P. E., Manager, Solid Waste Branch in Frankfort at (502) 564-2225, extension 240.

Robert H. Daniell, Director
Kentucky Division of Waste Management

KENTUCKY DIVISION OF WASTE MANAGEMENT

Liner and Drainage Layer Protection: General Provisions

(Revised November 14, 2000)

The following considerations of liner and drainage layer protection must be addressed in the design and construction of the composite liner system for any solid waste facility with a contained landfill activity in accordance with 401 KAR 48:080.

- **Direct placement of solid waste on any geosynthetic component of a liner is prohibited on slopes of 25% or less.** There shall be a liner protection/drainage layer of approved material between any waste or cover and any geosynthetic component of any composite liner system on a slope less than or equal to 25%.
- **Protection of the liner and drainage layer shall be provided by a granular material with a permeability of greater than or equal to 1×10^{-2} cm/sec.** This granular material shall consist of a minimum of 12 inches of uniform-sized, well-rounded, silica-based material with a total carbonate content of less than or equal to 50% of the total aggregate material as per ASTM D-4373 or equivalent approved material or method.
- **Approved tire chips may be used as the granular material of the liner protection/drainage layer.** Tire chips may be used alone or in conjunction with other approved materials as the liner protection/drainage layer if they meet the specification entitled "Liner and Drainage Layer Protection: Tire Chips".
- **Re-circulation of leachate requires additional design considerations.** If leachate re-circulation is proposed, additional design considerations must be addressed to assure adequate flow capacity and protection against clogging from biologic activity and infiltration of fines. Design considerations include increased thickness of the drainage layer, increased aggregate size, addition of a geocomposite, increased capacity and slope of lateral lines and headers, etc.
- **Installation of the liner and drainage protection layer may be phased.** The granular material of the liner protection/drainage layer may be installed in phases, each preceding the placement of any solid waste. Placement of a confining layer on any geosynthetic clay liner (GCL) and protection of the geomembrane should occur in a timely manner in accordance with manufacturers recommendation. Liners uncovered for periods exceeding the recommended time are subject to re-inspection by the KDWM.
- **Alternate designs may be proposed.** Substitute materials and/or designs may be acceptable in consideration of site-specific circumstances. Appropriate narrative justification and adequate supporting documentation must accompany alternate design proposals.

KENTUCKY DIVISION OF WASTE MANAGEMENT

Liner and Drainage Layer Protection: Tire Chips

(Revised: November 14, 2000)

The following considerations must be addressed in the design and construction of any solid waste facility using tire chips (alone or in combination with other approved material) as the liner and drainage layer protection for the synthetic components of a composite liner system in accordance with 401 KAR 48:080 Section 2 (3) (c).

- **Cushion Layer.** A cushion layer of geosynthetic or natural materials must be placed between any geomembrane and the tire chips to reduce the potential for liner damage from steel wire in the tire chips.
- **Cushion Layer Specification.** Cushion layers of geosynthetic material must be comprised of a geonet with non-woven geotextile on both sides. The total nominal thickness of the cushion layer must be greater than or equal to 1.0" (2.5 cm) as per ASTM D-5199 or equivalent approved method. Cushion layers of natural material must meet the specifications for granular materials in the statement of consideration entitled "Liner and Drainage Layer Protection: General Provisions".
- **Tire Chip Layer.** The minimum compressed thickness of any layer of tire chips (or tire chips in combination with other approved material) must be greater than or equal to 12" (30.5 cm). Compliance with this specification may be achieved through either in-situ verification of the tire chip layer under compression or application of an initial loose lift of tire chips equal to or greater than 20" (50.8 cm).
- **Tire Chip Specification.** A minimum of 80% of all tire chips must pass through a 3" (7.6-cm) square opening. The length of any exposed bead wire must be less than or equal to 0.75" (19mm) in a minimum of 90% of all tire chips.
- **Alternate designs may be proposed.** Substitute materials and/or designs may be acceptable in consideration of site-specific circumstances. Appropriate narrative justification and adequate supporting documentation must accompany alternate design proposals.



3-inch (7.6 cm) square

KENTUCKY DIVISION OF WASTE MANAGEMENT

Liner and Drainage Layer Protection: Initial Lift

(Revised: November 14, 2000)

The following considerations of liner and drainage layer protection must be addressed during placement of the initial lift of solid waste (a.k.a. "fluff layer" or "select waste") over the constructed liner system in accordance with 401 KAR 48:090 Section 9 (3).

- **Direct placement of waste on any geosynthetic component of a liner is prohibited on slopes of 25% or less.** There shall be a liner protection/drainage layer of approved material between any solid waste and any geosynthetic component of any composite liner system on a slope less than or equal to 25%.
- **Initial lift of waste must be free of all objects that may damage the bottom liner.** The initial lift of waste (minimum of two (2) feet) placed directly on a constructed liner system shall have all materials removed from it that have a potential to damage the liner upon compression of the waste from the load placed on it from above.
- **Dispose of removed material appropriately.** Materials that are unsuitable for the initial lift shall be disposed on the top of the current lift or other appropriate manner to prevent damage to the liner.
- **All vehicles must be operated in a manner to prevent damage to the liner.** Only lightweight vehicles with low-pressure tires or tracks may be used to haul objects recovered from the waste, to place waste or cover material, or perform other duties.
- **No direct placement of soil/cover on any geosynthetic component of the liner system at any time!** No soils or cover (daily, interim, or long-term) may come in contact with any geosynthetic component of the liner. All cover must be free of rock greater than 12 inches in diameter or other material that may damage the liner when compacted.
- **If any part of the liner system is observed to be damaged at anytime, all waste placement activities in the area of the damage must stop IMMEDIATELY and facility management contacted!** No known or suspected area of liner damage may be covered in waste without appropriate investigation and/or repair.
- **All liner damage shall be repaired as soon as practicable.** Appropriate licensed personnel shall certify each liner repair in accordance with the approved facility Construction Quality Assurance Plan.
- **Alternate designs may be proposed.** Substitute materials and/or designs may be acceptable in consideration of site-specific circumstances. Appropriate narrative justification and adequate supporting documentation must accompany alternate design proposals.

NOTICE – Alternative Specification to Quarterly Groundwater Monitoring Parameters



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

**NOTICE
TO CONTAINED AND CLOSED RESIDENTIAL LANDFILL
OWNERS AND OPERATORS
MARCH 28, 1996**

It has come to the Division of Waste Management's attention that six parameters on Kentucky's quarterly groundwater monitoring list (401 KAR 48:300, Section 11(3)) are not on the federal list (40 CFR 258 Appendix I). The intent of the November 6, 1994 regulatory amendments was to make the state list identical to the federal. The additional state parameters are:

2-Chloroethyl Vinyl Ether ✓
Ethanol ✓
4-Bromofluorobenzene ✓
1,4-Difluorobenzene ✓
Dichlorodifluoromethane ✓
Ethyl Methacrylate ✓

The Natural Resources and Environmental Protection Cabinet will attempt to correct this difference when the solid waste regulations are next amended. In the meantime, owners or operators of contained landfills may delete the above six parameters from the quarterly detection monitoring program.

The Cabinet hereby grants an alternative specification pursuant to 401 KAR 47:190 Section 9, 47:120 Section 2 (permit conditions), and 47:130 Section 2 (changes to permits) and KRS 13A (administrative procedures).

The cabinet believes that the federal list will perform equally to that in 401 KAR 48:300 Section 11(3), regarding safety and environmental protection, for the following technical reasons:

- Two of the parameters cannot be consistently tested.
2 Chloroethyl Vinyl Ether (unstable)
Ethanol (poor purging)
- Two chemicals are added by laboratories to incoming water samples as laboratory standards.
4 Bromofluorobenzene
1,4-Difluorobenzene



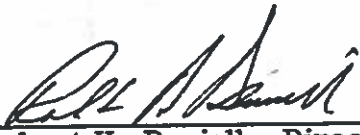
Page 2

- The final two parameters can be analyzed.

Dichlorodifluoromethane
Ethyl Methacrylate

However, any contamination from a landfill would be detected by one of the indicators or other chemicals on the federal list.

This alternative specification to quarterly groundwater monitoring is effective immediately. If you have any questions, please call George Gilbert, Jr., P.E. at (502) 564-6716, ext. 239.



Robert H. Daniell, Director
Division of Waste Management

RHD:GFG:akw

c: Regional Offices
Field Geologists
SWB Geologists
Consultants

NOTICE – Installation of Waste Boundary Identification Markers



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

NOTICE

August 25, 1999

Originally sent January 20, 1993

TO: All Solid Waste Landfills

In accordance with 401 KAR 47:120, Section 1(8), the Division of Waste Management requires that all landfills comply with the following conditions:

Installation of Waste Boundary Identification Markers

- Applies to all existing waste area(s) that have not received final cover as of the date of this notice.
- Installation of permanent markers (i.e., 18" stakes, 36" slats) will be established along the entire perimeter of the waste permit boundary. Markers to be of treated 2" x 2" lumber or standard 5' steel.
- Permanent markers will be installed on one hundred (100) foot centers and be used as an offset to the baseline stations unless impractical to do so.
- The boundary markers will be flagged with a durable material or the tops may be painted to make them easily visible and identifiable.
- The boundary markers will also contain the baseline station number, marked in a permanent manner and distance right or left of the baseline.

Landfill Permit Boundary Identification

- The landfills permitted boundary will be marked or identified in the field in such a manner that Division personnel can easily recognize it. The Division suggests flagging or placarding be placed at intervals along boundary fencing. If fencing does not exist, then 36" slats should be used if possible to show the permanent boundaries.

Annual Survey and Report

- All landfills will submit the enclosed Annual Survey Summary Report in conjunction with the next annual survey due and subsequently thereafter.
- The landfill will establish at least two (2) permanent reference monuments for both the beginning and ending stations of the landfill's baseline.
- The monuments (i.e., hub and tack, metal pin) will be permanently protected, and flagged or marked to be easily seen.

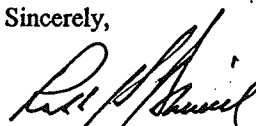


Notice
Page 2
August 5, 1999

- All information including angles, distances, and elevations needed to reestablish the baseline will be maintained on file at the landfill office.
- The landfill will also establish a permanent bench mark to be used for all elevations taken at the landfill. Said bench mark will be located in an easily accessible location and clearly marked. The elevation shall be referenced to Mean Sea Level (MSL) based on U- S. G. S. datum.

All markers and reference points must be installed within ninety (90) calendar days from the date of this notice. If you have any questions, please contact Mary Ann Goins at (502) 564-6716, ext. 276.

Sincerely,



Robert H. Daniell, Director
Division of Waste Management

RHD/mag

c: Regional Offices
Solid Waste Branch
Consulting Engineers

ANNUAL SURVEY SUMMARY SHEET FOR SOLID WASTE LANDFILLS

(To be submitted in conjunction with the annual survey report required by 401 KAR 47:190, Section 8)

The original and one (1) copy of the following information shall be completed and attached with the Annual Survey Cross Sections. Submittal of the Annual Survey shall be made to:

Division of Waste Management
Solid Waste Branch
Permit Administration Section
14 Reilly Road
Frankfort, KY 40601-1190

A. OWNER INFORMATION:

1. Permittee Name: _____
2. Facility Name: _____
3. Permit No.: _____
4. Facility Mailing Address: _____
(Street/P. O. Box)

(City) (State) (Zip)
5. Contact Person: _____ Phone: _____

B. SURVEY PREPARATION INFORMATION:

1. Firm Name: _____
2. Mailing Address: _____
(Street/P. O. Box)

(City) (State) (Zip)
3. Individual Name: _____
4. Mailing Address: _____
(Street/P. O. Box)

(City) (State) (Zip)

5. Contact Person: _____ Phone: _____
6. Name of licensed person performing survey: _____
- Firm - KY P. E. License No.: _____ Expires: _____
- Individual - KY P. E. License No.: _____ Expires: _____
- Firm - KY L. S. License No.: _____ Expires: _____
- Individual - KY L. S. License No.: _____ Expires: _____

C. LANDFILL INFORMATION:

1. Date of current overflight/survey: _____
2. Date of last overflight/survey: _____
3. Number of days between overflight/survey: _____
4. For the present working area, provide the constructed permitted airspace in cubic yards as of the date of this survey:
- _____ Cubic Yards
5. For the present working area, provide the remaining unconstructed permitted airspace in cubic yards as of the date of this survey:
- _____ Cubic Yards
6. For the entire facility, provide the total permitted airspace (both filled and unfilled) in cubic yards as of this survey.
- _____ Cubic Yards Constructed
(Plus (+))
- _____ Cubic Yards Not Constructed
(Equal (=))
- _____ Total Approved Airspace for Entire Facility
7. If approval has been granted by the Cabinet for any increase in permitted airspace since the date of the last survey, indicate the volume approved:
- _____ Cubic Yards & Application No. _____
8. For the entire facility, provide the remaining unfilled permitted airspace in cubic yards as of the date of this survey:
- _____ Cubic Yards
9. Have any waste limits been exceeded horizontally or vertically?
- Yes _____ No _____

10. If the answer to question number 9 is "yes", provide a summary description (on the following lines) of the area(s) where the waste boundary or limits have been exceeded. Include in this summary a description of the specific locations or areas exceeded, along with volume calculations specifying the amount in cubic yards filled outside permitted airspace. Clearly delineate the areas on the cross sections that must accompany this submittal.

11. Provide the quantity of waste (in tons) disposed per day by dividing the number of days since the last survey by the total waste (in tons) received for the number of days to the date of this annual survey (based on 365 calendar days per year).

_____ Tons Per Day

Example: ABC Landfill conducts its current annual survey on April 1. The last one was done on March 15 of the previous year. During the time period from March 15 of the previous year to April 1 of the current year, ABC Landfill disposed of 381,000 tons of all wastes. Divide 381,000 by 381 (365+16=381 days between March 15 of 1998 and April 1 of 1999). Thus the ABC Landfill disposed of an average of 1,000 tons of waste per day.

12. Provide the rate of compaction of waste by subtracting the volume of airspace consumed since the last annual survey and dividing the resulting figure by the pounds of waste received since the date of the last survey.

Example: In the previous example, if 381,000 tons of waste was received between March 15 of the last year and April 1 of this year, and 481,234 CY were filled, the landfill achieved a compaction rate of 1,583 lbs. per cubic yard.

$$\frac{(\# \text{ TONS}) (2,000 \text{ LBS.})}{\text{CY}} = \frac{(381,000)(2,000)}{481,234} = \frac{1,583.43 \text{ LB.}}{\text{CY}}$$

NOTE:

Solid Waste Regulations require the landfill owner or operator to notify the Cabinet no less than fifteen (15) calendar days prior to the date the survey is to be conducted. Additionally, the annual survey is required to be made between January 1 and May 1 each year. The results of the survey must be submitted to the Cabinet within sixty (60) days of the date of the survey unless aerial photography is used. If aerial photography is used, the results must be submitted within ninety (90) days of the aerial photography. Refer to 401 KAR 47:190, Section 8 for additional requirements for annual surveys.

ANNUAL SURVEY REPORT CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations."

Signature* _____ Date _____
(ORIGINAL SIGNATURE ONLY [IN BLUE INK] - NO PHOTOCOPIES)

Name _____ Title _____
(TYPE OR PRINT)

***The person signing for the owner or operator must be an individual authorized according to the requirements of 401 KAR 47:160, Section 6.**

NOTICE – Tire Chip Use in Landfills



Paul E. Patton

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
14 REILLY RD
FRANKFORT KY 40601-1190

NOTICE

September 15, 1999

TO ALL CONTAINED AND CONSTRUCTION DEMOLITION DEBRIS LANDFILLS

Kentucky's Division of Waste Management is charged with developing an infrastructure for the environmentally responsible management of waste tires. An essential component of our strategy is to develop a system of beneficial end-use markets for waste tire materials.

The attached document, "Tire Chip Use in Landfills" incorporates material specifications and engineering guidelines for landfill construction applications including:

- Methane recovery trenches and layers
- Flexible membrane liner (FML) protective layers
- Leachate collection trenches for residential landfills
- Leachate collection layers for construction/demolition debris landfills
- Closure cap drainage layers

This notice and attachment may function as a permit condition for your facility under the authority of Kentucky Revised Statutes 224.40-100, 224.40-305 and 224.40-310 and 401 Kentucky Administrative Regulation 47:120, Section 2. In order to use tire chips at your solid waste facility in accordance with this notice you must: 1) Submit a letter detailing your intention to the Division of Waste Management, Solid Waste Branch, 14 Reilly Road, Frankfort, KY 40601, and 2) Retain this notice and attachment with your facility's permit. Facilities may begin implementation of the construction detailed in the letter five (5) days from the date of receipt of the letter by the Division.

This notice and attachment also allow owners or operators to store tire chips for landfill construction projects up to 180 days before construction of the trench or layer without further registration. Storage of processed or unprocessed tires for purposes other than construction pursuant to this notice requires registration under the requirements of Kentucky Revised Statutes 224.50-850 through 224.50-866.

In accordance with 401 KAR 47:130, Section 2, any landfill construction uses of tire chips outside the scope of those detailed in this attachment will be considered a modification to the facility's permit and must receive prior approval from the Division of Waste Management.

Contact Ron Gruzsky, P. E., Manager of the Solid Waste Branch at (502) 564-6716 if you have any questions about this notice.



Robert H. Daniell
Robert H. Daniell, Director
Division of Waste Management



Tire Chip Use in Landfills

**Kentucky Natural Resources and Environmental Protection Cabinet
Department for Environmental Protection
Division of Waste Management
(502) 564-6716 x217**

September 15, 1999

Tire Chip Use in Landfills Contents

Narrative

- Methane Recovery Trenches and Layers
- Flexible Membrane Liner (FML) Protective Layer
- Leachate Collection Trench for a Residential Landfill
- Leachate Collection Layer for a Construction-Demolition Debris Landfill
- Closure Cap Drainage Layer
- Tire Chip Storage during Construction

Engineering Considerations

- Major Design Considerations
- Quality Control Specifications
- ASTM D6270-98 Standard Practice for Use of Scrap Tires in Civil Engineering Applications

Landfill Tire Chip Specifications

Design Diagrams for Recommended Uses

September 7, 1999

Tire Chip Use in Landfills

Researchers, trade associations and states produce a substantial body of data detailing the performance of tire chips in a variety of civil engineering applications. Review of the data reveal a promising application for Kentucky in landfill construction. The most favorable landfill uses include methane recovery, flexible membrane liner protection, leachate collection and closure cap drainage. This paper outlines the specific beneficial reuses that a landfill owner or operator may chose to implement at his site, following the procedures described below.

Methane Recovery Trenches and Layers

The potential for use of tire chips in methane recovery trenches is an extremely important application. There are three different collection methods which require three types of design; collection during ongoing operations, from a cutoff trench near a closed landfill and from passive vents through a cap.

First, consider a trench to control ongoing methane problems at a closed residential site. Methane may travel through the soil in unlined landfills and underground through sand lenses, solution channels or other fissures in the ground. The methane may enter basements and explode if lit by a pilot light from a hot water heater or furnace. To correct this problem, the engineer designs a trench to intercept methane at the ground water elevation or the rock soil interface. The operator excavates the trench two feet wide and one-two feet below the lowest static ground water elevation levels. The excavator next places gravel in the trench from the bottom to about two feet above the highest ground water elevation. Then, the operator places a bed of tires chips at a minimum depth of eight inches, a six inch PVC SDR 17 pipe, and a two foot layer of chips. He caps the trench with a two-foot thick soil layer. The tire material has approximately 100 percent more diffusivity (gas flow capacity) than normal aggregate. The landfill owner or operator may build a methane recovery trench if he follows the dictates of figure 1A and this paper. Note that use of an active collection system negates the need for the passive vent.

Second, look at a trench to control methane at an operating landfill. The standard design incorporates "horizontal collectors". The operator may place these pipes in aggregate-filled trench in those phases of the landfill not at final grade within five years of initial waste placement, as shown in figure 1B. Typically, one spaces the lines 250 feet laterally and 40-50 feet vertically, staggered in an alternating pattern. Then, the operator vertically connects these pipes to a passive vent placed on the top of the current waste lift. The operator may also use this horizontal collector in conjunction with an active methane recovery system. The permittee places the system in service with a vacuum after 20 feet of waste is above the collector as indicated in figure 2. Owners commonly use this design to meet the recent Clean Air Act amendments controlling greenhouse emissions.

Third, consider the use of tire chips in a venting layer under a closure cap as drawn in figure 3. This layer connects to passive or active vents and allows gas to escape from the top of the landfill

in a controlled manner, rather than break out in an unknown area or migrate underground. The operator opens windows through the daily cover and interim cover to allow passage of gas and leachate. Then, the construction agent places the venting layer using 6-12 inches of tire chips as discussed in the attached "Landfill Tire Chip Specifications". The approved cap design will depend upon when waste was last placed: garbage landfills ceasing to accept garbage before July 1, 1992 use the residential specifications while those stopping afterwards follow contained rules. The contained cap design requires (from bottom to top), the tire chips, geotextile to prevent plugging, 12-18 inches of soil foundation, an 18 inch thick clay layer, flexible membrane liner (if a bottom plastic liner is present), and a 36 inch vegetative layer. The residential cap requires the tire chips, a geotextile, 12-18 inches of foundation soil, six inches of clay, and an 18 inch-thick vegetative layer.

Flexible Membrane Liner (FML) Protective Layer

The use of tire chips as a leachate collection layer is also acceptable as shown in figure 4. For slopes of less than 10%, the contractor or operator places (from bottom to top) 12 inches of clay, a flexible membrane liner, 12 inches of sand, another geotextile, 36 inches of clay, a flexible membrane liner, 12 inches of pea gravel, one foot of tire chips and a four foot thick "fluff" layer. "Fluff" is loosely deposited household wastes. For greater than 10% slopes, the construction agent may place the following (from bottom to top): 36 inches of clay, a flexible membrane liner, a geonet drainage layer which may be substituted for pea gravel, a four foot thick "fluff" layer and one foot of tire chips. The tire chips prevents spearing by a board or pipe through the synthetic liner releasing leachate to the clay liner and possibly the groundwater. This design, with the use of tires as a protective layer, decreases the required fluff layer to four-five feet, instead of the eight-ten feet which is normally required. The operator places the fluff and tire chips using a bulldozer weighing less than 24,000 pounds or other equipment providing low ground pressure.

Leachate collection layer for a Greater-Than-One Acre Construction/Demolition-Debris (CDD) Landfill

Engineers may also specify tire chips as a replacement aggregate for the required leachate collection system at a greater-than-one acre construction/demolition-debris (CDD) landfills as specified in figure 5. This would be an excellent use because the wire cannot damage the soil liner required for a CDD landfill. The operator places the twelve-inch thick soil layer, twelve-inch clay liner, geotextile to prevent clogging by the underlying soil particles, then twelve inches of tire chips. Since CDD is normally larger than the tire chips, sand or geotextile is usually unnecessary between the debris and the tire layer.

An alternate design is to substitute an additional six inches of chipped tires sacrificial clogging layer as a substitute for the geotextile. The typical design cross-section is then twelve inches of clay, 18 inches of chips with the CDD on top.

Leachate Collection Trench for a Residential Landfill

Several owners or operators have closed residential landfills or residential cells, which now operate as C/D/D landfills. The cabinet requires trenches around the low end of the facility, cut

through the cap, through the waste and just below the original ground to collect the internal drainage. The typical design cross-section is shown in figure 6, from bottom to top, twelve inches of clay, a geotextile to prevent clogging wrapped around two feet of tire chips containing a PVC pipe.

Closure cap drainage layer

The use of tire chips in the drainage layers for closure cap is allowable. The normally required drainage layer is one-foot thick sand in contained (garbage) landfills with a slope less than 15%. The cross-section design is indicated in figure 7, from bottom to top: the gas collection layer, 18 inches of clay, a flexible membrane liner, a geotextile, 12 inches of tire chips, another geotextile, and 36 inches of soil. The tire chip substitution in this case increases the water drainage capabilities.

Tire Storage

The owner or operator may temporarily store on-specification tire chips up to 180 days before construction of the liner or the cap without registering as a tire facility. Note that this does NOT apply to whole tires. An operator holding whole tires for future processing must register as an accumulator. The owner or operator accumulating tire chips must only comply with the technical, siting and operating requirements of KRS 224.50-860 for the storage of processed tire material. The owner must note the use of tire chips in the permit application or notify the Division by letter that he is using the tire chips and the method of its use. If he decides not to use the material in construction, he would have to immediately dispose of the tire pieces or register as an accumulator. If the owner accumulates tire chips for a longer period of time before construction begins, or accumulates whole tires for later processing, or shreds the tires, he would register as a tire facility under KRS 224.50-858 (HB 636).

Implementation

A landfill owner who desires to use tire chips for one of the above applications must forward a letter detailing those intentions to the Division of Waste Management, Solid Waste Branch. Facilities may begin implementation of the construction detailed in the letter five (5) days from the date of receipt of the letter by the Division.

Engineering Considerations

The most important design parameters are related in a report from HDR Engineering. These are the critical analysis points to evaluate when designing with tires. The Scrap Tire Management Council also provides "Design Guidelines to Minimize Internal Heating of Tire Chips Fills". These guidelines recommend a maximum depth of tire chips less than three meters (approximately ten feet).

Other major design considerations are:

Properties	Applications
Shear strength	On side slopes
Compressibility	Under high normal stresses
Permeability	Lateral or vertical fluid flow
Filtration	In contact with soils material
Puncture	In contact with synthetic liners
Leachability	In contact with groundwater or infiltration
Durability	As compared to other materials
Depth	less than ten feet

Quality Control Specifications

The key to the use of tires in landfill application is the quality assurance of the materials used in the construction. Recently, the American Society for the Testing of Materials (ASTM) established guidelines incorporated within a design aid titled "ASTM Designation D6270-98: Standard Practice for Use of Scrap Tires in Civil Engineering Applications". To order a copy, call ASTM Customer Service at (610) 832-9585, or visit their web site at "<http://www.astm.org>".

The Cabinet requires the referenced ASTM testing and all construction to conform to approved plans. The final construction will have to be surveyed to ensure compliance with thickness requirements. A Professional Engineer must sign the as-built drawings.

If further information is needed on these tire chip reuse specifications, please contact George Gilbert at (502) 564-6716, ext. 217.

September 7, 1999

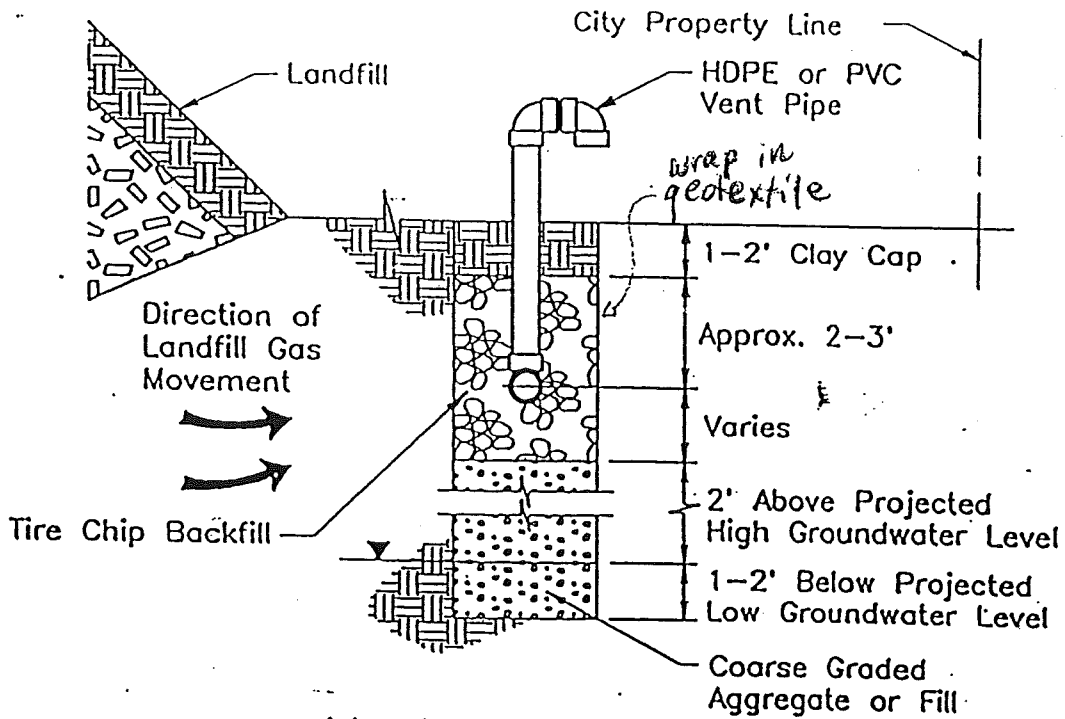
Landfill Tire Chip Specifications

- Tire chip aggregate shall generally not contain greater than ½ inch exposed wire.
- The maximum exposed wire length shall not exceed 1½ inch.
- The tire chip size shall be two (2) inch nominal:
 - 50% by weight shall pass through a 2 inch (50 mm) square orifice;
 - 100% shall be less than 4 inches long (100 mm) in the longest dimension.

Exposed Wire Test

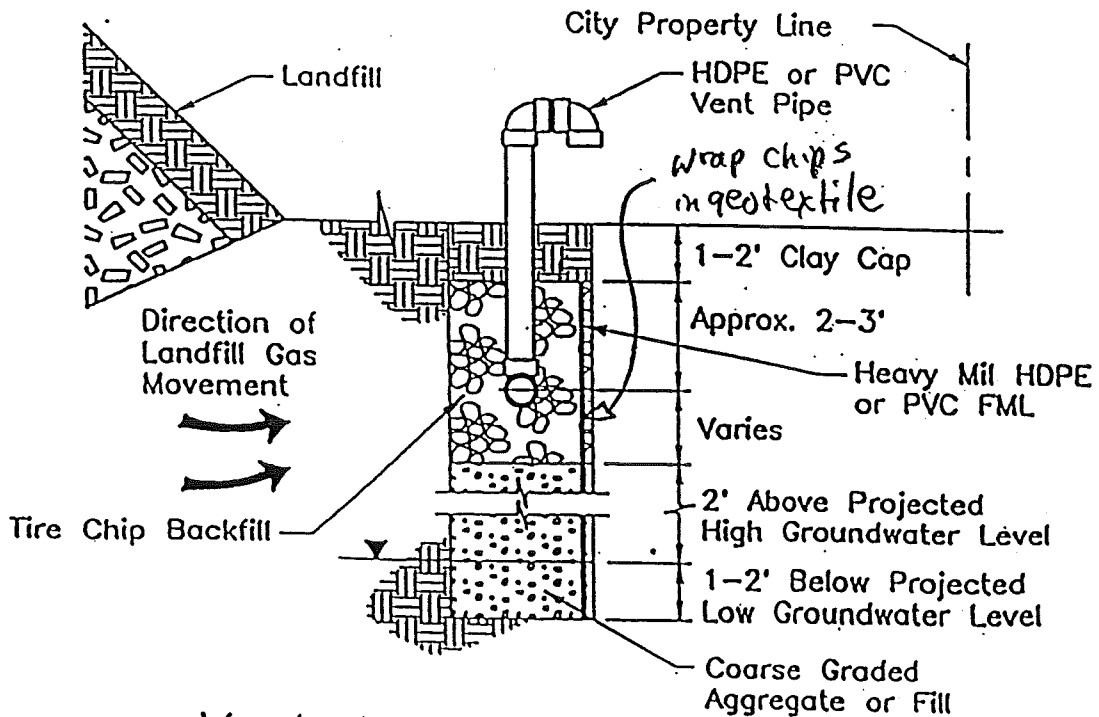
- The sample should be representative of the pile. Collect chips from several locations in the pile;
- Mix the chips;
- Select the sample size (100, 200, 500 chips, etc.);
- Measure the exposed wire. If the number of chips with exposed wire length greater than ½ inch exceeds 10% of your sample, or if any wire exceeds 1 ½ inch, the chips do not meet the standard.

Design Diagrams for Recommended Uses



Vented Trench

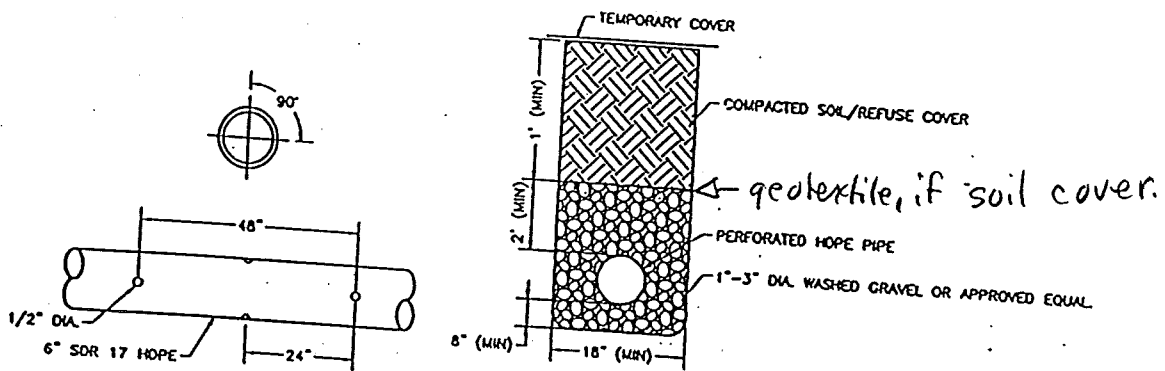
No Scale



Vented Trench with Barrier

No Scale

FIGURE 1A



HORIZONTAL GAS COLLECTOR

DETAIL

SCALE: NOT TO SCALE



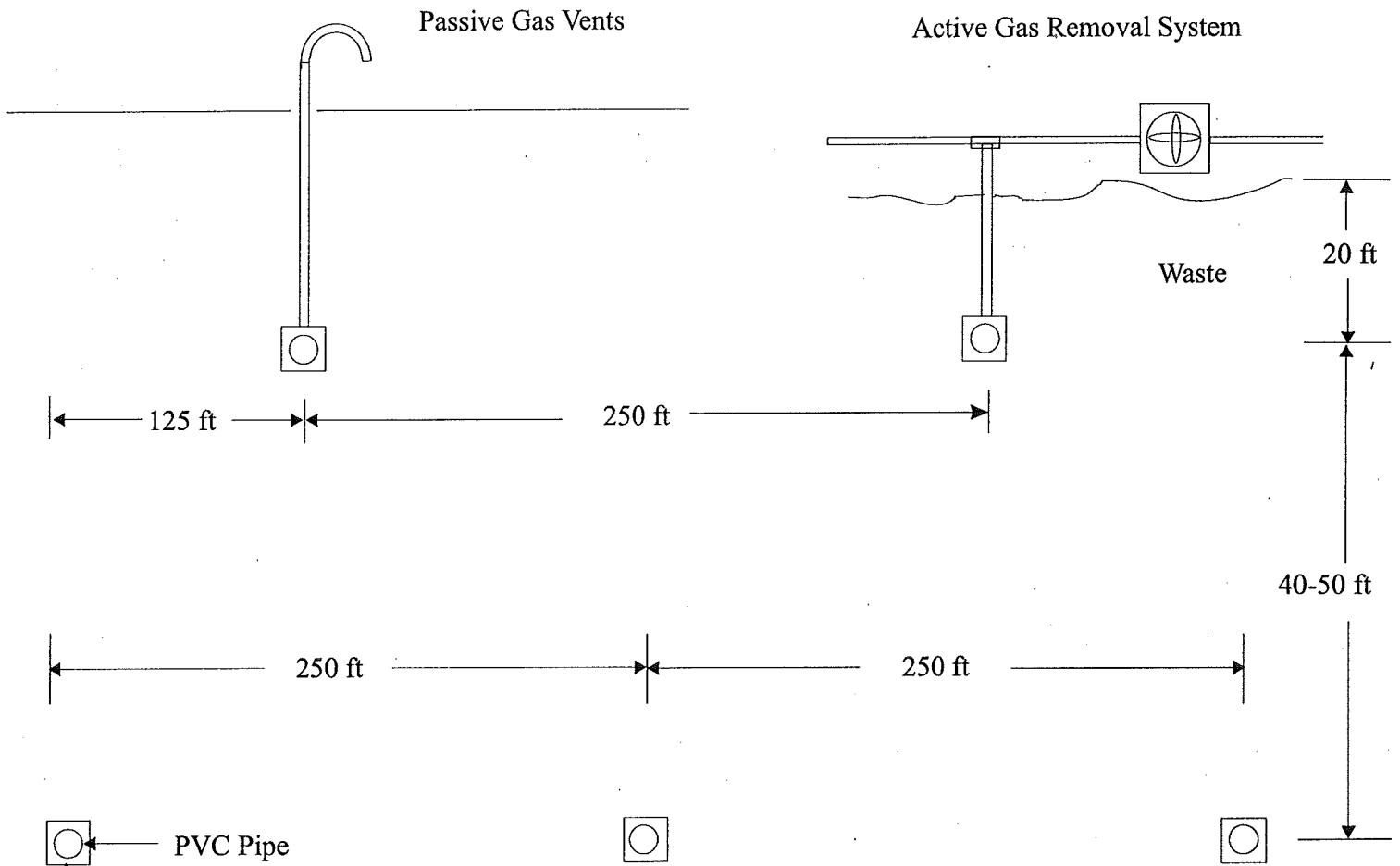
NOTE:

IF SHREDDED/CHIPPED TIRES ARE USED AS BACKFILL
 INCREASE TRENCH WIDTH TO 36" (MIN) TO ACCOMMODATE
 LARGER BACKFILL MATERIAL (2" CHIP SIZE).
 INCREASE MIN. BASE/BACKFILL THICKNESS TO 8".

NOTE: 2" = 2 IN. NOMINAL

FIGURE 1B

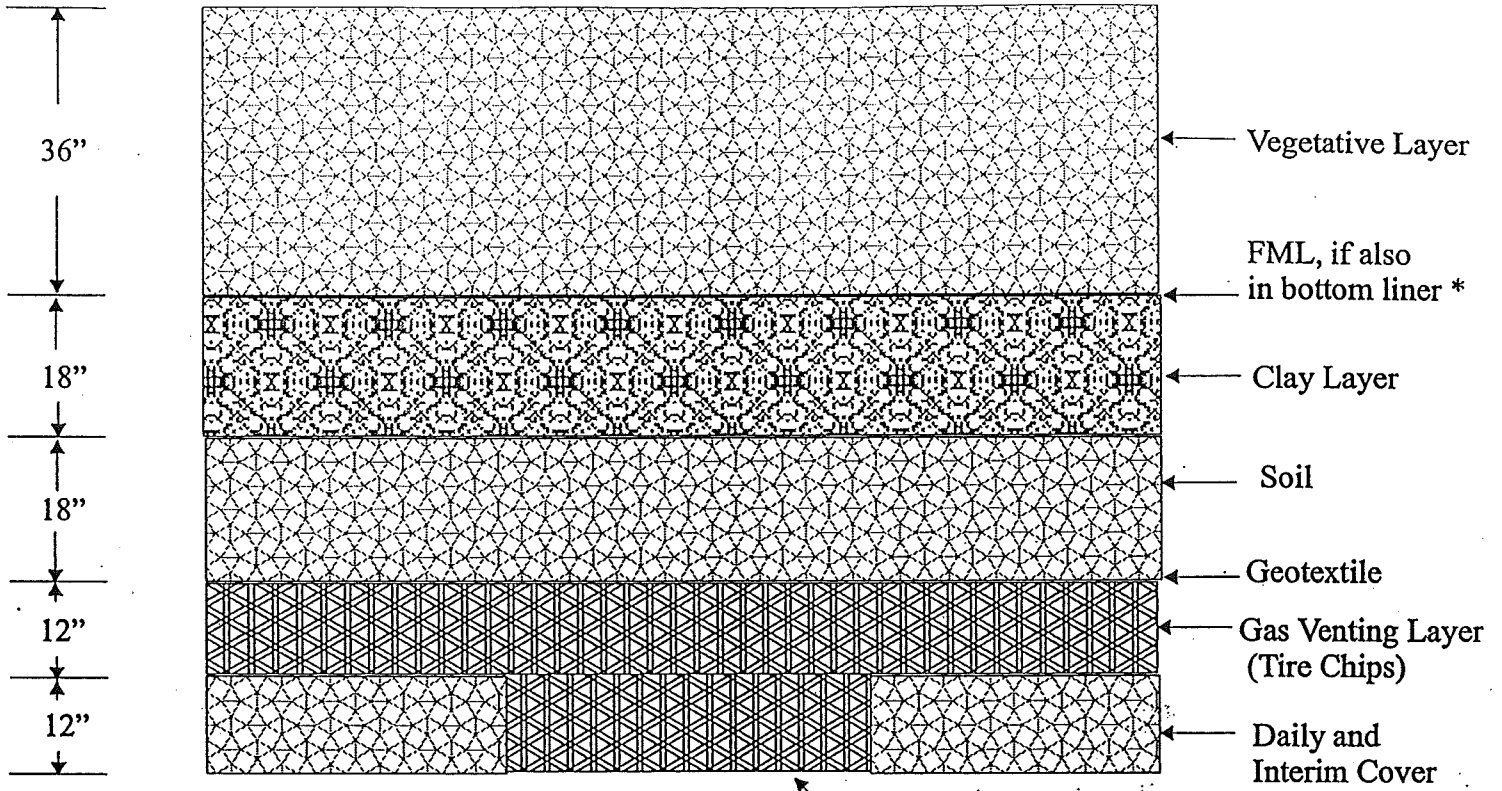
Tire Chip Reuse in Landfills
Horizontal Gas Collectors
Overall Cross-Section



(See figure 1B typical cross-section)

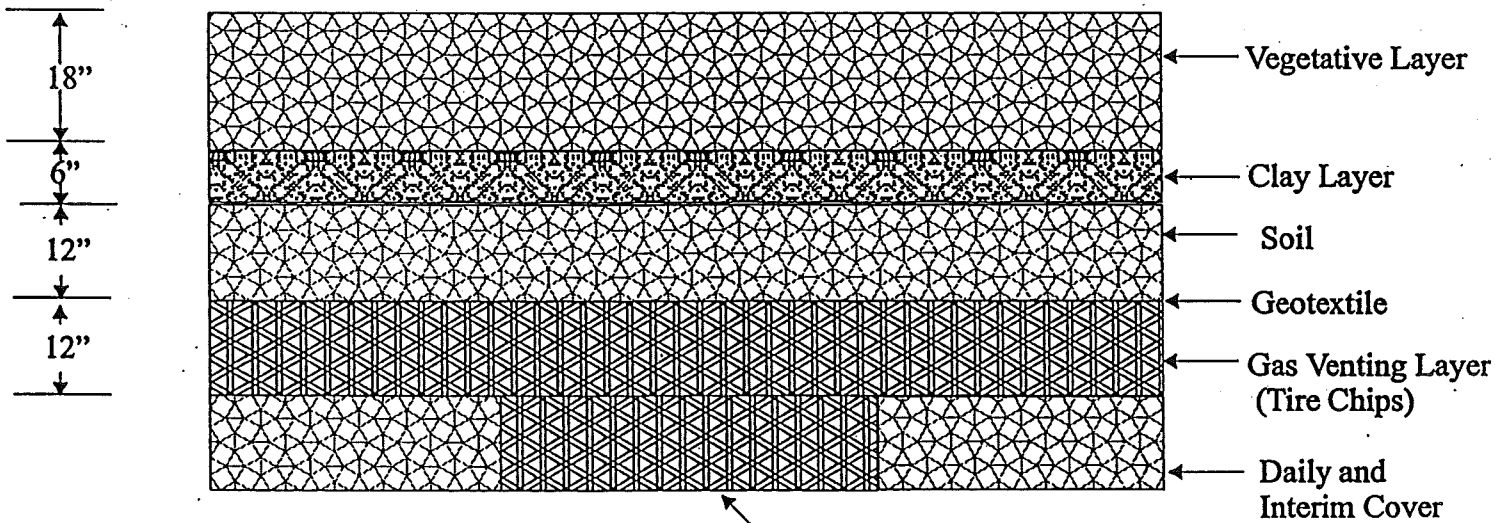
Figure 2
July 20, 1999

Tire Chip Use
 Contained Landfill Cap
 (Operated after 7-1-92)



Waste
 "Window" or remove cover to allow gas migration.

Residential Cap
 (Operated before 7-1-92)



"Window" or remove cover to allow gas migration.

* 6" clay layer if FML used

Figure 3

Tire Chip Use Contained Landfill Liner Protection

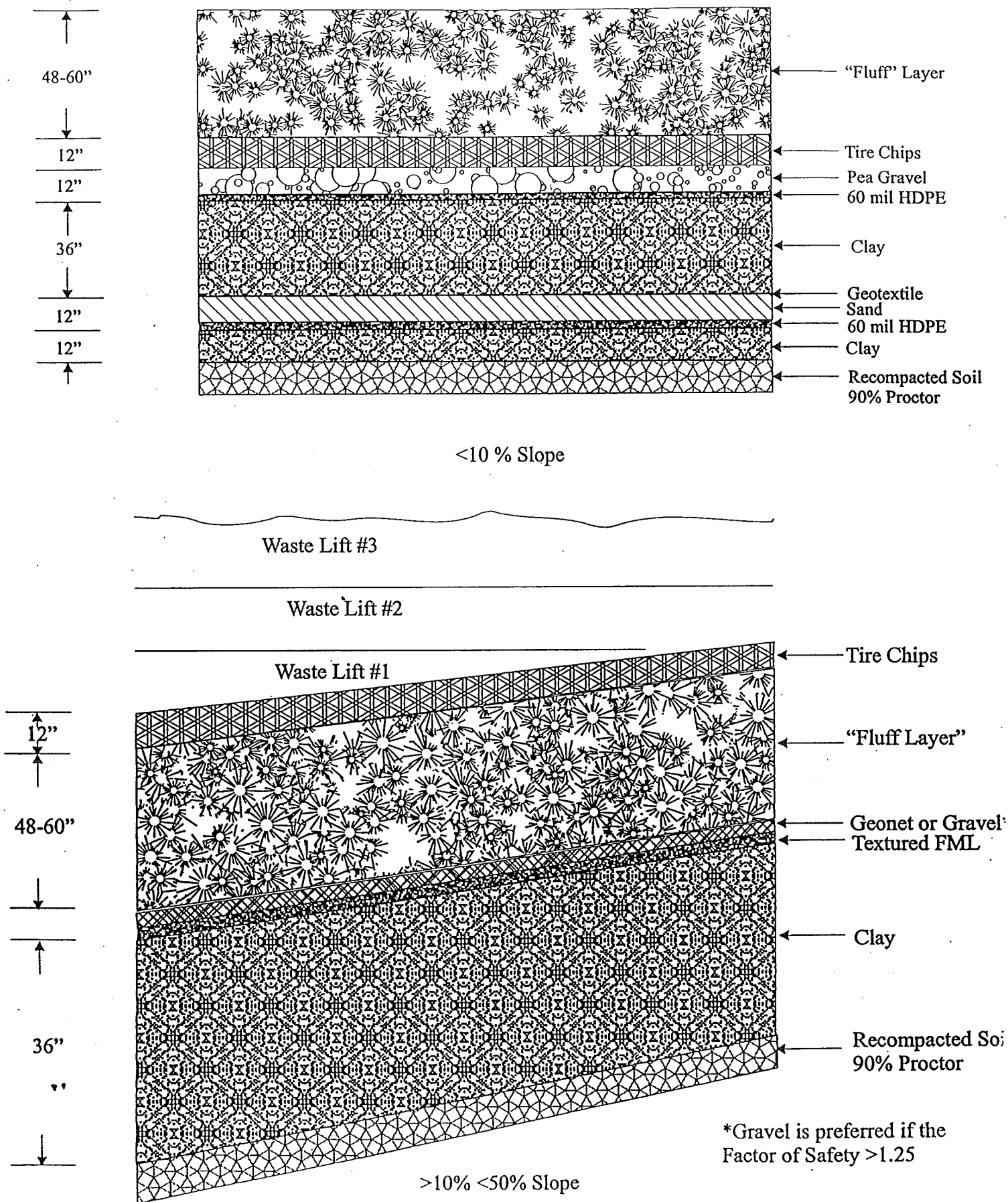


Figure 4

Tire Chip Use
Construction-Demolition/Debris Landfill Liner Protection

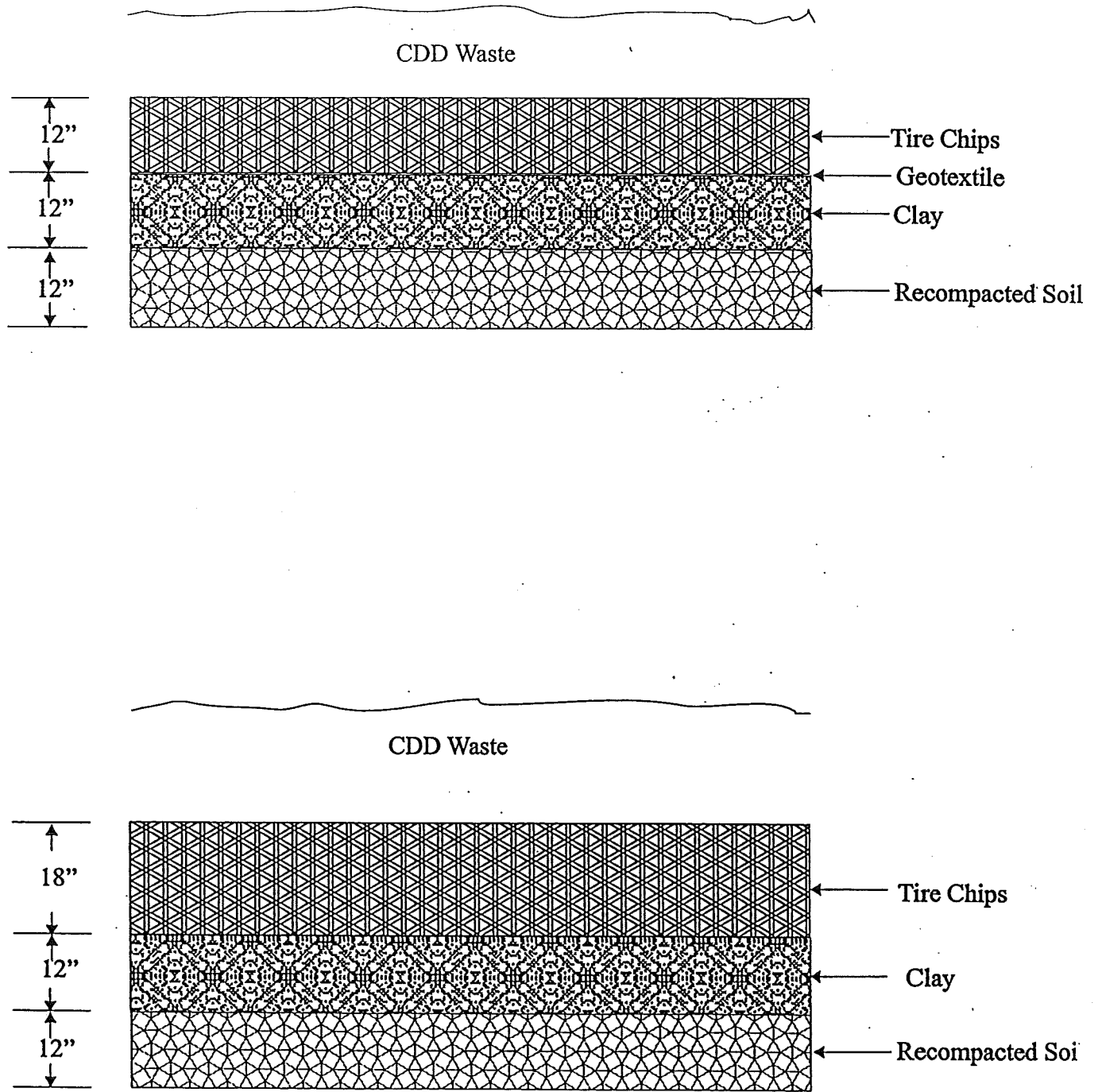
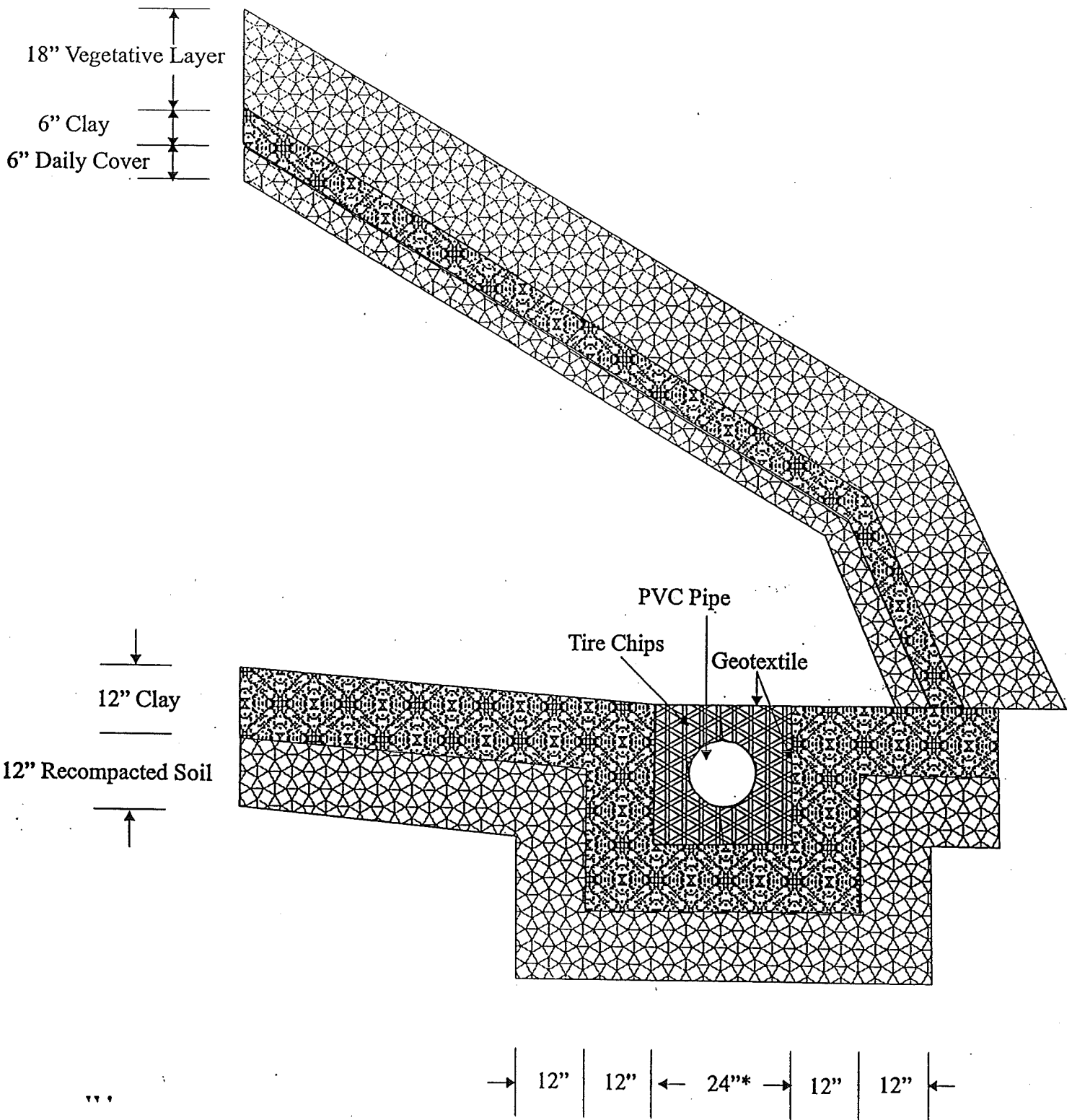


Figure 5

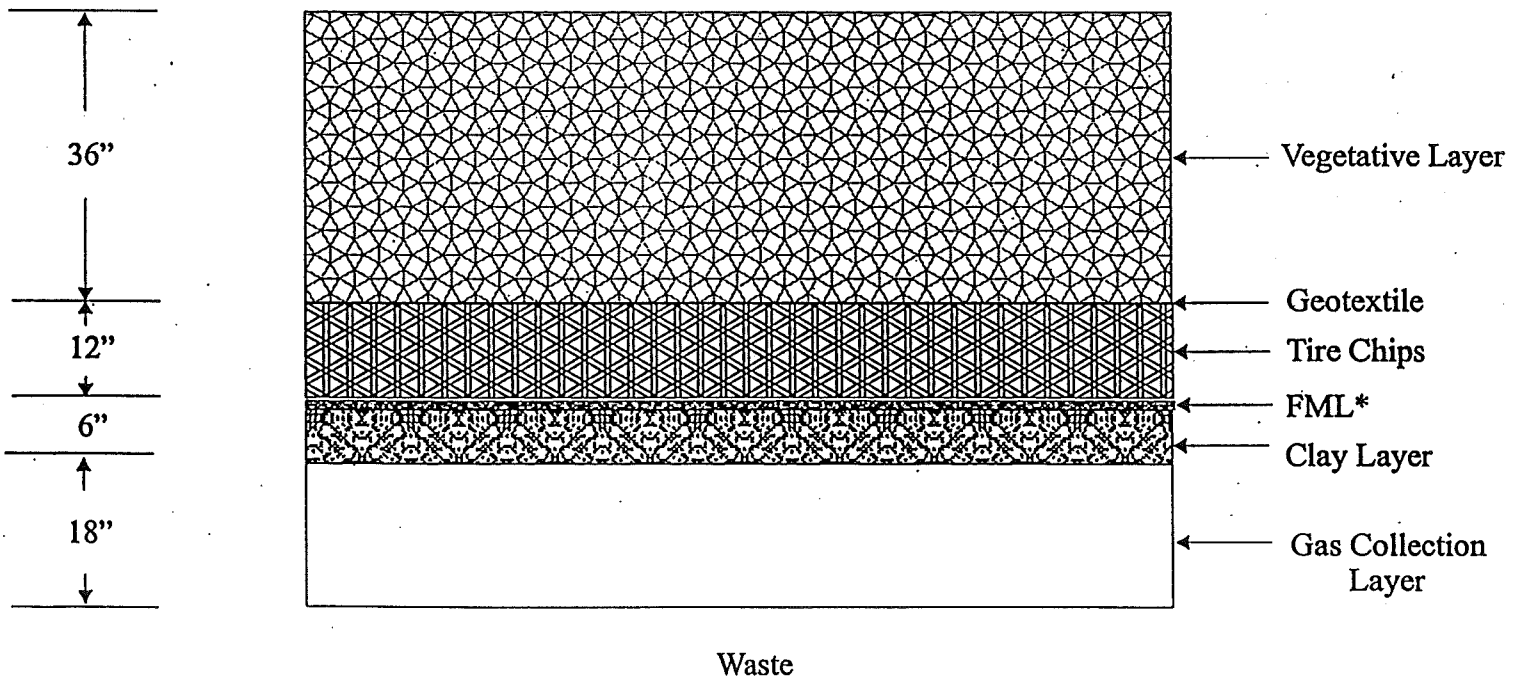
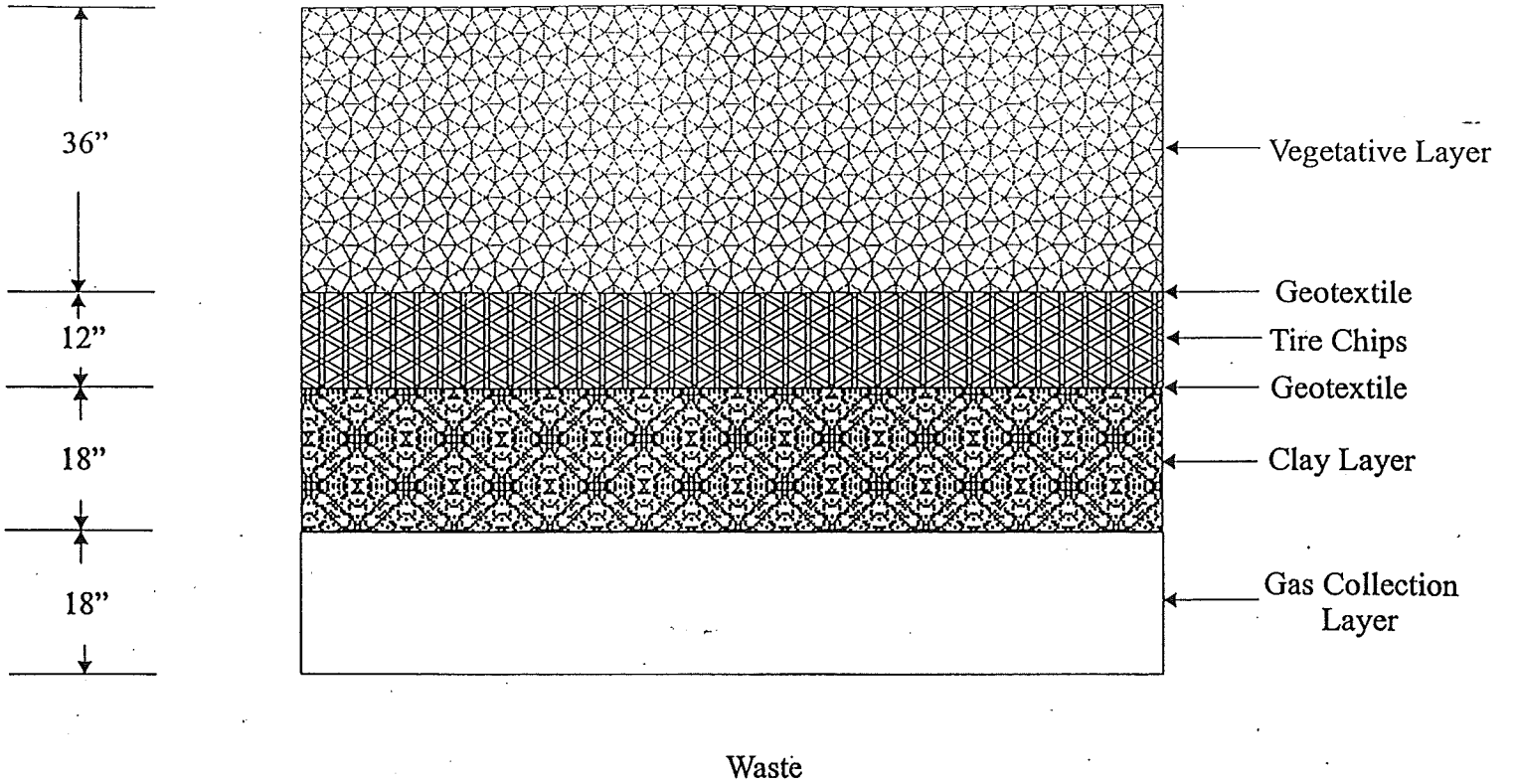
Tire Chip Use
Residential Landfill Leachate Collection Trench



* or sized, as necessary, to carry the design flow.

Figure 6

Tire Chip Use
 Contained Cap Drainage Layer
 <15% Slope



* Required if bottom FML liner present

Figure 7

NOTICE – Disposal of Large Off-the-Road (OTR) Tires

Notice to All Contained Landfill Owners and Waste Tire Facilities Registrants
Disposal Of Large Off-the-Road (OTR) Tires
December 15, 1999

Effective immediately, all contained landfill owners and operators may dispose of large off-the-road (OTR) tires, such as that used on construction and mining equipment, in the bottom of the daily cell, or working face. The daily cell is that volume which contains the refuse disposed by the owner or operator for a one-day period. This notice does NOT apply to residual or construction-demolition debris (CDD) landfill owners or operators.

A large off-the-road (OTR) tire is defined as having the following characteristics:

- A tread width of at least fourteen (14) inches, and
- A rim diameter of at least twenty-four (24) inches, and
- Formerly used on an off-road construction or mining vehicle or equipment.

This includes foam-filled tires, solid tires pressed-onto rims and aircraft tires that cannot be recapped. This does not include truck tires or tires off any vehicle licensed for over the highway travel.

The following additional requirements apply:

- To prevent possible damage to constructed landfill features, the operator must dispose of the tire at least twenty (20) feet:
 - Above the geomembrane (plastic) liner;
 - Under the final cap; and
 - Away from the unit waste boundary.
- Clean tires filled with lead ballast or other adverse material before disposal; and
- The operator must cover the tires with only residential waste. The operator must have enough waste to cover the tires at the time of disposal.

The tire law states that "If transferred to a contained landfill, the waste tires shall be processed to prevent the entrapment of air and water..." The purpose of the law is to prevent tires floating to the surface and interfering with disposal equipment. The weight of the off-road tire, combined with the bulk of the overlying garbage, should prevent the waste tire from rising to the surface. Thus, this proper placement of the large tires is considered to be in compliance with the technical intent of KRS 224.50-856.

The authority for this notice is 401 KAR 47:120, Section 2 "Conditions applicable to all solid waste permits-Establishing Permit Conditions". The rule gives the cabinet the authority to add requirements to landfill permits, on a case-by-case basis, to protect the human health and environment

Remember, RAM#111 grants permission to surface mining permittees to dispose of mining equipment tires, only, at the mine site.

If you have any questions about this notice, please contact Ron Gruzesky, Manager of the Solid Waste Branch, or George Gilbert, Environmental Engineer Consultant in my office, at (502) 564-6716.

Robert H. Daniell, Director
Division of Waste Management

GFG/gfg

cc: Bill Burger, Field Operations Branch
Ron Gruzesky, Solid Waste Branch
Charles Peters, RCLA Branch



Kentucky
Department for Surface Mining
Reclamation and Enforcement

Reclamation Advisory Memorandum

From: Dave Rosenbaum, Commissioner

A handwritten signature in cursive script that reads "Dave Rosenbaum".

Date: May 4, 1993

Subject: Noncoal Mine Waste and Hazardous Waste

RAM # 111

INTRODUCTION

Waste disposal at coal mines is subject to Kentucky laws and administrative regulations adopted primarily in response to the federal Resource Conservation and Recovery Act of 1976 (RCRA) and the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). These laws and regulations are administered by agencies within the Natural Resources and Environmental Protection Cabinet. Additionally, certain substances such as polychlorinated biphenyls (PCB) are regulated by the U.S. Environmental Protection Agency under federal regulations pursuant to the Toxic Substances Control Act of 1976.

In response to federal RCRA, the Division of Waste Management (DWM) in the cabinet's Department for Environmental Protection regulates waste disposal, including waste at coal mines, under a comprehensive program set forth in statutes KRS 224.40-100 to 224.60-160 and administrative regulations 401 KAR Chapters 30-49. In response to federal SMCRA, the Department for Surface Mining Reclamation and Enforcement (DSMRE) regulates surface coal mining and reclamation operations, including waste disposal associated with such operations, under KRS Chapter 350 and 405 KAR Chapters 7-24. Coal mining permittees and operators are subject to waste disposal requirements under these two separate lines of Kentucky authority.

Several different types of wastes are of concern at minesites. The regulatory names of these wastes, which come from two separate regulatory programs, can be confusing. The following informal breakdown of these wastes may help clarify the terminology. Please note that "special wastes" (item C below) are listed only for clarification -- these wastes are not the subject of this RAM and are not discussed further.

- A. **"Noncoal mine waste"** (DSMRE) and **"coal mining solid waste"** (DWM) have almost the same meaning. They include garbage, mine timbers, abandoned mining machinery, lumber, etc. generated on the minesite.
- B. **"Hazardous waste"** (DWM) poses a substantial threat to human health or the environment if improperly managed. Some wastes are specifically listed by law or regulation as hazardous. Other wastes must be tested to determine if they are hazardous.

- C. **"Special waste"** (DWM) is waste of high volume and low hazard, including:
1. **"Coal mine waste"** (DSMRE) and **"coal mining waste"** (DWM) have almost the same meaning. They include spoil, coal processing waste, etc. (Note that this is a completely different waste from **"coal mining solid waste"** in item A above.)
 2. **"Utility waste"** (DWM) includes coal combustion fly ash, bottom ash, and scrubber sludge.

The purpose of this RAM is to clarify the requirements applicable to wastes generated by coal mines, particularly "noncoal mine waste" under 405 KAR 16:150 and 18:150 (and the closely related "coal mining solid waste" under 401 KAR 30:040); and "hazardous waste" under 401 KAR Chapters 30-40.

No garbage or other waste may be brought from offsite to the permit area for disposal unless the DWM has issued a permit for the disposal and the DSMRE permit specifically authorizes the disposal. Unauthorized dumping at minesites will subject the permittee and operator to enforcement actions by the cabinet, and pollution resulting from such dumping could result in major, long term liability. The permittee and operator should secure the minesite against unauthorized entry and dumping by the public, and should instruct mine employees not to bring their household waste to the minesite. Minesites will not be allowed to become illegal open dumps.

NONCOAL MINE WASTE (COAL MINING SOLID WASTE)

"Noncoal mine waste" is the name DSMRE regulations (405 KAR 16:150 and 18:150) give to certain waste materials generated during surface and underground coal mining activities, such as grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustibles. In DWM regulations (401 KAR 30:010), this kind of waste is called **"coal mining solid waste."** 401 KAR 30:040 transfers regulatory responsibility for coal mining solid waste from DWM to DSMRE, except for any of the waste that is hazardous.

Noncoal mine waste (coal mining solid waste) consists primarily of manufactured materials and, despite the similarity in names, is fundamentally different from the earth materials that make up "coal mine waste" as defined in DSMRE regulations (405 KAR 16:001), which consists of coal processing waste and underground development waste, and "coal mining waste" as defined in DWM regulations (401 KAR 30:010), which consists of overburden, spoil, coal processing waste and some coal mining by-products.

Noncoal mine waste materials may be temporarily stored within the permit area until they can be disposed of properly. They must be placed and stored in a controlled manner in a designated portion of the permit area. Placement and storage must ensure that leachate and surface runoff do not degrade surface or ground water, that fires are prevented, and that the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings.

Except for hazardous waste and some materials discussed below, noncoal mine waste materials may be disposed of in an approved designated site in the permit area, or may be taken away from the permit area and permanently disposed of in a facility approved by DWM such as a municipal solid waste disposal facility. 405 KAR 8:030/8:040 Section 24(2)(b)4 and 24(3)(b)5 require the application for a DSMRE permit to detail any plans for removal, handling, transportation, storage, and disposal of noncoal mine waste on the permit area.

A disposal site in the permit area must be designed and constructed to ensure that leachate and drainage do not degrade surface or ground water, which may require use of clay liners and/or synthetic liners. The waste must be routinely compacted and covered to prevent combustion and to prevent the waste from being windblown. At least two feet of soil cover must be placed on the completed disposal site, slopes must be stabilized, and the site must be revegetated in accordance with 405 KAR 16:200 and 18:200. The disposal site must be operated in accordance with all applicable federal, state and local requirements. The waste must not be placed in refuse piles or impounding structures. Excavations for waste disposal must not be located within eight feet of any coal outcrop or coal storage area.

Burning. Except for land-clearing debris, wastes must not be disposed of by open burning.

Free liquids. 405 KAR 16:150 and 18:150 require that disposal sites be designed and constructed to ensure that leachate and surface drainage do not degrade surface water or ground water. Free liquids are liquids that readily separate from the solid portion of a waste under ambient temperature and pressure, including liquids in containers. Permittees and operators must not dump free liquids into backfills or place containers with free liquids in the disposal area unless such disposal is specifically approved in the permit. Because free liquids have the potential to readily enter and degrade ground water and surface water, permit applicants proposing to dispose of free liquids on the permit area should be prepared to design the disposal area to include impermeable barriers such as clay liners and/or synthetic liners. Whatever design the applicant proposes for disposal areas that will receive free liquids, the design must be fully set forth in the permit application and must demonstrate to the satisfaction of DSMRE that leachate and surface drainage will not degrade surface water and ground water. Additional monitoring of surface water and ground water may be required for disposal areas that will receive free liquids. DSMRE expects to consult with DWM for technical assistance on these applications.

~~**Lead acid batteries.** KRS 224.50-410, -413. Lead acid batteries must not be disposed of on the permit area or be incinerated. They must be disposed of through designated entities including wholesale or retail sellers of new batteries, battery recycling facilities, secondary lead smelters, and collection centers that deliver to recycling facilities or smelters. Also see the section below on hazardous waste.~~

Used oil. KRS 224.50-545. Used oils must not be disposed of in any way that might permit them to enter surface or ground water, and must not be incinerated except for energy generating purposes. A simple and effective means of handling used oil is through collectors of such oil for recycling.

The term "used oil" includes any oil that has become unsuitable for its original purpose due to the presence of impurities or loss of original properties. The term includes not only oil that has been drained from machinery, but also oil that has not been placed in a machine but has been contaminated or has lost its original properties. Further, both used oil and unused oil generally test hazardous.

Used oil is exempt from the hazardous waste regulations only if it is collected for recycling or burned for energy recovery. It cannot be used for road oiling unless it has been analyzed for hazardous waste characteristics and the analyses show the oil is not a hazardous waste. If used for road oiling, a copy of the laboratory results must be carried in the truck, and the oil must not migrate to surface water or ground water, either immediately or over time. The requirements of the hazardous waste program and the used oil provisions of KRS 224.50-545 effectively preclude the disposal of any oil at the mine site. Also see the section below on hazardous waste.

Oil filters must be recycled, handled as hazardous waste, or crushed and drained and taken to an appropriately permitted landfill. They may be disposed of onsite only if they are crushed and drained, analyzed for hazardous waste characteristics (e.g. using TCLP), determined not to be a hazardous waste, and placed in the backfill using a methodology that precludes the generation of leachate. Note that oil filters that are tar coated are considered to be hazardous and cannot be disposed of onsite, regardless of the processing or disposal practices.

Waste tires. KRS 224.50-820 to 224.50-846. Not more than 100 used tires may be accumulated without registering with DWM and certifying compliance with the waste tire control program requirements. If stored, the tires must be covered with a tarp or otherwise managed to prevent the entrapment of water. Tires must not be disposed of in the permit area unless they are shredded or otherwise processed (at least quartering is recommended) so they will not hold air and water. Off-road tires in the 1200 series (approximately 200 pounds) or larger, which are too large for most cutting and shredding equipment, may be processed by placing them whole on the pit floor and filling them with clay, sand, or other fine grained material, which must then be compacted. Spoil must then be placed on top of the tire (at least 40 feet is recommended). Solid tires, such as those from forklifts, also may be buried whole. Regardless of type, tires must not be burned except at an incinerator licensed to do so.

~~Transformers and other oil-filled electrical equipment.~~ 40 CFR Part 761 (federal regulations). Storage and disposal of these wastes are regulated under stringent standards. In most instances, disposal of such wastes cannot occur on the minesite. Please refer to 40 CFR Part 761, or contact DWM for additional information.

HAZARDOUS WASTE

Hazardous waste is regulated under KRS 224.43-610, -614, 224.46, and 401 KAR Chapters 30-40. **No hazardous waste may be burned or disposed of on the permit area unless a permit has been obtained from DWM and DSMRE specifically for disposal of hazardous waste on the minesite.** Hazardous waste generated at a coal mine should be sent to an existing facility authorized to handle that waste. Even if hazardous waste is taken away from the minesite, a generator of hazardous waste must comply with certain registration, storage, and reporting requirements. The specific requirements depend on the type of hazardous waste and the amount generated each month.

Hazardous waste generated onsite can be stored onsite in containers or tanks that meet the standards of 401 KAR Chapter 35. These wastes may be stored up to 90-210 days, depending on the type and amount of waste generated. Hazardous waste generators are also required to have training plans and contingency plans.

The coal mine permittee and operator have the burden of determining whether any of the waste generated at the mine is hazardous. 401 KAR Chapter 31 sets forth criteria for identifying hazardous waste. Some wastes must be tested to determine if they are hazardous, but other wastes are specifically listed as hazardous and need not be tested. Certain specific hazardous wastes are listed in 401 KAR 31:040. The list includes certain spent solvents and possibly other materials that can be generated in mining.

Further, wastes can be hazardous because they are ignitable, corrosive, reactive, or toxic. 401 KAR 31:030 Sections 2-5 list the properties that determine the characteristics of ignitability, corrosivity, reactivity and toxicity, respectively, and provide test methods to determine if a waste has any of these properties. Used solvents, such as those associated with parts washers, are usually ignitable and toxic. Lead acid batteries are generally hazardous because of corrosive acids, and flashlight batteries are generally hazardous due to the presence of cadmium and mercury. Unused explosives may be hazardous because of their reactive properties. Paints, oils and pesticides are often hazardous because of their toxicity.

Wastes that exhibit toxicity are important concerns for mining operations because of their potential threat to ground water and surface water. The standard method to determine if a waste may leach toxic concentrations of various constituents is a laboratory testing procedure called the "Toxicity Characteristic Leaching Procedure" (TCLP). Please contact the DWM or your consulting firm if you need additional information on TCLP or other test procedures.

CONCLUSION

As you can see from the foregoing discussion, sorting out your responsibilities for proper handling of wastes can get complicated. This RAM can provide only limited information on this extremely important subject. Please read and understand the applicable laws and regulations thoroughly, and do not hesitate to contact DSMRE or DWM as appropriate.

The Division of Waste Management can provide further information about how to determine if any of your waste materials are hazardous, about locations of authorized sites for disposal of hazardous waste, about registered haulers of hazardous waste, and about registered collectors of recyclable materials such as batteries, tires and oils. If you have questions about these or any other aspect of waste disposal that involves DWM, please do not hesitate to contact DWM at (502) 564-6716.

Requests to purchase informational copies of DWM regulations should be sent to: REGREQ, Division of Waste Management, 14 Reilly Road, Frankfort, KY 40601. Telephone (502) 564-6716. Before ordering regulations, please contact DWM to determine the cost of the regulations.

NOTICE – TENORM Disposal



ENERGY AND ENVIRONMENT CABINET

Matthew G. Bevin
Governor

Charles G. Snavey
Secretary

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
200 FAIR OAKS LANE, 2ND FLOOR
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-6716
www.dep.ky.gov

NOTICE TO ALL SOLID AND SPECIAL WASTE FACILITY OWNERS AND OPERATORS

Date: February 22, 2016


Subject: Technologically Enhanced Naturally-Occurring Radioactive Material (TENORM)

Issue: It has come to the attention of the Kentucky Division of Waste Management (DWM) that TENORM waste, some of which has been further processed prior to disposal, resulting from oil and gas drilling activities has been transported into Kentucky and disposed at certain solid waste landfills. TENORM is naturally-occurring materials containing radionuclides that are present in rocks, soils, water, and minerals which, due to human activities, have become concentrated and/or exposed to the accessible environment. Based on our investigation, it has been determined that some of these TENORM wastes were generated in Ohio, West Virginia, and Pennsylvania.

Per the Central Midwest Interstate Low-Level Radioactive Waste Commission's Regional Management Plan as developed by the Commission in accordance with KRS 211.859, the Commission classifies "...TENORM wastes as [Low-Level Radioactive Waste] LLRW and, as such, these wastes are subject to the LLRW policies enumerated in the Plan."

The Cabinet for Health and Family Services (CHFS) regulates radioactive materials, radioactive waste, and the disposal of such waste. Therefore, DWM would like to remind holders of permits issued by DWM that it is the duty of such permit holders to duly conform to all statutes and regulations concerning such radioactive materials and activities. The regulation of radioactive materials, waste, and disposal by CHFS is governed by Chapter 211 of the Kentucky Revised Statutes and Title 902, Chapter 100 of the Kentucky Administrative Regulations.

Point of Contact: For information regarding TENORM, please contact Matthew McKinley, Branch Manager, Radiation Health Branch, Division of Public Health Protection and Safety at (502) 564-3700. For information regarding this Notice, please contact Danny Anderson, Branch Manager, Solid Waste Branch at (502) 564-6716. For a radiation emergency, please contact the Radiation Health Branch during business hours or the Kentucky Emergency Management Duty Office at (800) 255-2587 after business hours.



Anthony R. Hatton, P.G., Director
Kentucky Division of Waste Management

ARH:DJA:jhc



Page 2 of 2
TENORM NOTICE

cc: Sec. Vickie Glisson, CHFS
Sec. Charles G. Snavelly, EEC
Comm. Stephanie M. Gibson, DPH
Comm. R. Bruce Scott, DEP
Dir. Kathy Fowler, DPHPS
Matthew McKinley, RHB



MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Environmental Assessment
100 Morrissey Boulevard
Boston, MA 02122
Tel: 617-725-3300
Fax: 617-725-3301

Environmental Assessment Division
100 Morrissey Boulevard
Boston, MA 02122

Page 2 of 2

Environmental Assessment Division
100 Morrissey Boulevard
Boston, MA 02122

The following information was obtained from the records of the Environmental Assessment Division on [redacted] regarding the [redacted] project. The information is being provided to you for your information and is not intended to be used for any other purpose. The information is being provided to you in confidence and is not to be disseminated outside of your organization. If you have any questions regarding this information, please contact the Environmental Assessment Division at [redacted].

The information provided in this document is for informational purposes only and does not constitute an offer of insurance or any other financial product. It is not intended to be used for any other purpose. The information is being provided to you in confidence and is not to be disseminated outside of your organization. If you have any questions regarding this information, please contact the Environmental Assessment Division at [redacted].

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Environmental Assessment Division
100 Morrissey Boulevard
Boston, MA 02122

Environmental Assessment Division
100 Morrissey Boulevard
Boston, MA 02122

NOTICE - Revised Solid Waste Regulation 401 KAR 48:090 (TENORM)

MATTHEW G. BEVIN
GOVERNOR



CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

NOTICE
TO ALL CONTAINED LANDFILL PERMITTEES

Date: April 4, 2018

Subject: Revised Solid Waste Regulation 401 KAR 48:090

Issue: The Kentucky Division of Waste Management (DWM), Solid Waste Branch is writing this notice as a reminder of a revision to the Kentucky Administrative Regulations which became effective December 7, 2017. The revision is in regards to Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) generated from oil & gas development activities and can be found at <http://www.lrc.ky.gov/kar/401/048/090.htm>.

More specifically, Section 2 of 401 KAR 48:090 now includes TENORM wastes as a waste type to include in the Procedures for Excluding the Receipt of Prohibited Waste, and Section 3 has been modified to outline interim TENORM disposal criteria, additional operating criteria and final capping criteria dependent on TENORM radionuclide activity concentrations, and solid waste permit modification requirements, including timelines. Lastly, Section 4 includes additional requirements for daily cover applied over TENORM wastes as well as additional recordkeeping requirements.

Be advised, pursuant to Section 3, an owner or operator accepting TENORM shall submit a modification that may trigger a public notice as established in 401 KAR 47:140. In order to ensure enough time is allowed for review, issuance of the public notice, and if approved, compilation of the revised permit, please submit the modification no later than July 1, 2018 along with the appropriate fee and application established in 401 KAR 47:090 and 401 KAR 47:130.

Be advised that the TENORM waste generated from oil & gas development activities is described in 902 KAR 100:180.

A handwritten signature in black ink that reads "Danny Anderson".

Danny Anderson, P.E.
Manager, Solid Waste Branch

DA/ch/jn

NOTICE - Environmental Remediation Fee (ERF) Applicability



KENTUCKY DIVISION OF WASTE MANAGEMENT

NOTICE

TO

ALL MUNICIPAL SOLID WASTE LANDFILLS

Subject: Environmental Remediation Fee

Issue: Effective January 1, 2005, the Kentucky Division of Waste Management (KDWM) has determined that special waste, as defined by KRS 224.50-760, is not subject to the environmental remediation fee.

Applicability: This applies to all permitted municipal solid waste landfills that accept special waste. Special waste is defined as those wastes of high volume and low hazard which include but are not limited to mining wastes, utility wastes (fly ash, bottom ash, scrubber sludge), sludge from water treatment facilities and wastewater treatment facilities, cement kiln dust, gas and oil drilling muds, oil production brines and other wastes as defined by the cabinet.

Point of Contact: If you need clarification or additional information concerning this Notice, contact Ronald D. Gruzesky, P. E., Manager, Solid Waste Branch in Frankfort at (502) 564-2225, extension 240.

R. Bruce Scott, P.E.
Director

3/2/05

Date

NOTICE – Change for Environmental Remediation Fee (ERF)



MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

**ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

April 18, 2017

RE: Change for Environmental Remediation Fee Submittal

Beginning May 15, 2017, the Environmental Remediation Fee (ERF) and form shall be sent to the Division of Waste Management (DWM) at the address listed below in lieu of the Department of Revenue.

**Division of Waste Management
Solid Waste Branch
300 Sower Blvd., Second Floor
Frankfort, Kentucky 40601**

KRS 224.43-500, no later than thirty (30) days following the last day of each calendar quarter, every owner or operator of a transfer station or municipal solid waste disposal facility shall remit to the cabinet the Environmental Remediation Fee collected during the prior quarter, with a report stating the number of tons of waste for which the Environmental Remediation Fee was collected. Pursuant to 401 KAR 47:095, Sections 1(4) and 2(5), the quarterly payments shall be due on April 30, July 31, October 31, and January 30 of each year.

401 KAR 47:120, Section 1(15) requires a quarterly Waste Quantity Report to be submitted to the Division of Waste Management covering facility activities during the specified reporting period, as required in the permit. In addition, 401 KAR 47:090, Section 8(1), requires the quarterly reports to be submitted no later than the 15th of the month following the end of each quarter year. The quarters end on March 31, June 30, September 30, and December 31 of each year.

All contained, greater than one acre construction demolition debris, residual (non-captive), and less than one acre construction demolition debris landfills are required to submit the Waste Quantity Report (Form 7046Q), Environmental Remediation form (Form 5032), and payment to the Division of Waste Management by the due date specified above.

All transfer stations and convenience centers that take waste out of state or store on site are required to submit the Quarterly Waste Quantity Report (form 7046Q), Environmental Remediation Fee form (form 5032), and payment to DWM by the due date specified above. The Annual Waste Quantity form (7046A) can be submitted by facilities that have not taken waste out of state or stored on site throughout the year.



Please be advised that if you fail to submit the required reports or payments, a Notice of Violation will be issued.

For Waste Quantity Report (Form 7046Q), the Division of Waste Management is implementing a 15 day grace period, to allow facilities to submit both the forms and check together.

All forms are available at: <http://dep.ky.gov/formslibrary/Pages/default.aspx> or can be mailed out upon request.

Please find attached a copy of the Environmental Remediation Fee and Quarterly Waste Quantity Reporting and Submittal Form, for those wanting to submit the required information on a single form. Please retain a copy of this form for future reporting. This form will not be mailed to you quarterly.

Should you have any questions please contact Ken Melton at 502-782-6415.

Sincerely,



Danny Anderson
Manager, Solid Waste Branch

DA/km

NOTICE – Registered Permit By Rule (RPBR)





MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

**ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

October 18, 2016

Notice to All Solid Waste Registered Permit-by-Rule Owners and Operators

Please be advised that persons wishing to submit a new or revised Registered Permit-by-Rule (RPBR)¹ application shall meet all requirements of 401 KAR 47:110, Section 1. This requirement includes, but is not limited to, a Public Notice advertised not less than 2 weeks prior to submittal of the registration to the Kentucky Division of Waste Management. The types of changes that require a revised registration to be submitted to the Cabinet are found in 401 KAR 47:110, Section 3. For more information concerning the requirements of 401 KAR 47:110, please consult <http://www.lrc.ky.gov/kar/401/047/110.htm>. This notice can also be found on the Kentucky Division of Waste Management website at the following link: <http://waste.ky.gov/Pages/default.aspx>.

If your existing Solid Waste Registered Permit-by-Rule facility is no longer in operation and closure requirements have been performed, please request termination as defined in KRS 224.1-010(26).

Should you have any questions please contact the Registered Permit-by-Rule section of the Solid Waste Branch at (502) 564-6716.

1. The RPBR category includes: Solid Waste Transfer Stations, Medical Waste Transfer Stations, Convenience Centers, Recycling Centers, Solid Waste Composting Facilities, Class I Solid Waste Landfarming Facilities, Less-than-One Acre Construction/Demolition Debris Landfills, and Solid Waste Incinerators.

Sincerely,

Jon Maybriar
Director, Division of Waste Management

NOTICE – All Landfill Owner or Operators Who Ceased Disposal Before July 1, 1992



OCT 21 1992

**NOTICE TO ALL LANDFILL OWNER OR OPERATORS
WHO CEASED DISPOSAL BEFORE JULY 1, 1992**

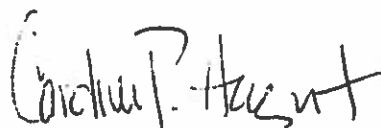
This Notice applies to all landfill owners or operators who submitted closure plans for all or a portion of their landfill on or before May 8, 1991, and ceased accepting waste for disposal in these portions before July 1, 1992. If you meet these two conditions, you may be eligible to close under 401 KAR 47:080 Section 4(4) and Section 5. These regulations require, among other items, six inches of clay overlain by 18 inches of general soil and groundwater monitoring for indicators, metals, volatiles and semi-volatiles.

To speed up closure and better protect the environment, the Division of Waste Management will allow the immediate installation of the six-inch daily cover, six-inch interim cover, six-inch clay plus 18 inch soil cap in accordance with previously submitted plans. Remember that the clay soil layer must have a permeability of 1×10^{-7} cm./sec. or lower, and the side slopes should fall between 5% to 25%.

Your consulting engineer must perform quality assurance/quality control on the cap installation. You must contact the cabinet two days prior to clay installation and again upon cap completion. The consultant must certify the clay installation and proper thickness by submitting the results of a permeability test (if one has not yet been conducted) and a final contour elevation map showing the cap thickness on a 100 feet by 100 feet grid. The cabinet will then review the certification for acceptability of the cap.

The remaining closure items required by 401 KAR 47:080 Section 4(4) and 5 concerning groundwater monitoring, two-years post-closure and others will be reviewed by the Division as resources become available. A final closure plan will have to be approved before your landfill can complete its closure and post-closure obligations. I am enclosing a copy of the closure plan checklist to allow your engineer to make any needed revisions before final review commences.

If you have any questions concerning this process, please call George Gilbert, P.E., at (502) 564-6716.



Caroline P. Haight, Director
Division of Waste Management

CPH:GFG:akw

c: Regional Offices
Consulting Engineers

NOTICES- TCLP



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

April 30, 1990

NOTICE

TO: Kentucky Industries Generating Waste

The U.S. Environmental Protection Agency promulgated the Toxicity Characteristic Leaching Procedure (TCLP) rule on Thursday, March 29, 1990. The rule adds 25 chemicals to the eight metals and six pesticides on the existing list of constituents now regulated under the Extraction Procedures (EP) toxicity test. The rule establishes regulatory levels for the new organic chemicals listed and replaces the Extraction Procedure (EP) toxicity test with the Toxicity Characteristic Leaching Procedure (TCLP). The complete list of chemicals with their regulated concentration levels (reported in milligrams per liter (mg/l)) and the corresponding EPA waste numbers are given below.

<u>EPA WASTE NUMBER</u>	<u>CONTAMINANT</u>	<u>REGULATORY LEVEL</u>
D004	Arsenic	5.0
D005	Barium	100.0
D018	Benzene	0.5
D006	Cadmium	1.0
D019	Carbon Tetrachloride	0.5
D020	Chlordane	0.03
D021	Chorobenzene	100.0
D022	Chloroform	6.0
D007	Chromium	5.0
D023	o-Cresol	** 200.0
D024	m-Cresol	** 200.0
D025	p-Cresol	** 200.0
D026	Cresol	** 200.0
D016	2,4-D	10.0
D027	1,4-Dichlorobenzene	7.5
D028	1,2-Dichloroethane	0.5
D029	1,1-Dichloroethylene	0.7
D030	2,4-Dinitrotoluene	* 0.13
D012	Endrin	0.02
D031	Heptochlor (and its Hydroxide)	0.008
D032	Hexachlorobenzene	* 0.13
D033	Hexachlorobutadiene	0.5
D034	Hexachloroethane	3.0
D008	Lead	5.0
D013	Lindane	0.4

<u>EPA WASTE NUMBER</u>	<u>CONTAMINANT</u>	<u>REGULATORY LEVEL</u>
D009	Mercury	0.2
D014	Methoxychlor	10.0
D035	Methyl ethyl ketone	200.0
D036	Nitrobenzene	2.0
D037	Pentachlorophenol	100.0
D038	Pyridine	* 5.0
D010	Selenium	1.0
D011	Silver	5.0
D039	Tetrachloroethylene	0.7
D015	Toxaphene	0.5
D040	Trichloroethylene	0.5
D041	2,4,5-Trichlorophenol	400.0
D042	2,4,6-Trichlorophenol	2.0
D017	2,4,5-TP (silvex)	1.0
D043	Vinyl chloride	0.2

*Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

**If o-, m-, and p- cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/L.

The method for the Toxicity Characteristic Leaching Procedure was published in the Federal Register on Thursday, March 29, 1990. The Toxicity Characteristic rule will not be applicable to UST petroleum contaminated media and debris regulated under Subtitle I of RCRA at present.

Because this federal rule was promulgated pursuant to the Hazardous and Solid Waste Amendments of 1984, these regulations will go into effect in Kentucky prior to the state adopting them. Listed below are some important dates for compliance in Kentucky:

June 27, 1990 The Kentucky Notification of Hazardous Waste Activity form is due to EPA for generation of 100 kg/mo. or more and treatment, storage or disposal facilities.

September 25, 1990 Facilities managing TCLP hazardous waste on this date will be subject to Subtitle C (hazardous waste) regulations.

Large quantity generators begin to comply with all applicable regulations for newly regulated TCLP wastes.

Newly regulated facilities submit Part A application's and Kentucky Notification of Hazardous Waste Activity to EPA and state and start complying with Federal Interim Status Standards.

Interim status facilities already regulated for other hazardous waste activities must submit amended Part A application if

applicable and start complying with state and/or federal interim status standards.

Permitted facilities submit permit modification applications to EPA and state and start complying with federal and/or state interim status standards.

March 29, 1991 Small quantity generators start complying with all applicable rules for newly regulated TCLP wastes.

Permitted Treatment Storage or Disposal Facilities submit class 2 or class 3 permit modification to EPA.

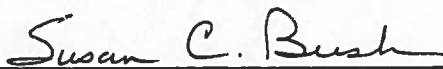
June 27, 1991 Newly regulated land disposal units submit Part B application and certification to EPA. Otherwise interim status will terminate on this dates.

Note: The generator quantity will be determined by all of a generators hazardous waste, not just newly regulated hazardous waste.

The Commonwealth of Kentucky will promulgate similar regulations in the near future. However some facilities are required to submit Part A and notification to the state in addition to EPA.

Notification of Hazardous Waste Activity forms are available from the Hazardous Waste Branch, Division of Waste Management, 18 Reilly Road, Frankfort, Kentucky 40601. These forms must be sent both to EPA - Region IV, 345 Courtland Street, NE, Atlanta, GA 30365 and the Kentucky Division of Waste Management.

For additional information concerning the TCLP, contact Mohammad Alauddin at (502) 564-6716.



Susan C. Bush, Director
Division of Waste Management

CARL H. BRADLEY
SECRETARY



WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

NOTICE

May 30, 1990

TO: SOLID WASTE FACILITY PERMITTEES

The U.S. Environmental Protection Agency promulgated the Toxicity Characteristic Leaching Procedure (TCLP) rule on Thursday, March 29, 1990. The rule adds 25 chemicals to the eight metals and six pesticides on the existing list of constituents now regulated under the Extraction Procedures (EP) toxicity test. The rule establishes regulatory levels for the new organic chemicals listed and replaces the Extraction Procedure (EP) toxicity test with the Toxicity Characteristic Leaching Procedure (TCLP). The complete list of chemicals with their regulated concentration levels (reported in milligrams per liter (mg/l)) and the corresponding EPA waste numbers are given below.

<u>EPA WASTE NUMBER</u>	<u>CONTAMINANT</u>	<u>REGULATORY LEVEL</u>
D004	Arsenic	5.0
D005	Barium	100.0
D018	Benzene	0.5
D006	Cadmium	1.0
D019	Carbon Tetrachloride	0.5
D020	Chlordane	0.03
D021	Chlorobenzene	100.0
D022	Chloroform	6.0
D007	Chromium	5.0
D023	o-Cresol	200.0 **
D024	m-Cresol	200.0 **
D025	p-Cresol	200.0 **
D026	Cresol	200.0 **
D016	2,4-D	10.0
D027	1,4-Dichlorobenzene	7.5
D028	1,2-Dichloroethane	0.5
D029	1,1-Dichloroethylene	0.7
D030	2,4-Dinitrotoluene	0.13 *
D012	Endrin	0.02
D031	Heptachlor (and its Hydroxide)	0.008
D032	Hexachlorobenzene	0.13 *
D033	Hexachlorobutadiene	0.5
D034	Hexachloroethane	3.0
D008	Lead	5.0
D013	Lindane	0.4

<u>EPA WASTE NUMBER</u>	<u>CONTAMINANT</u>	<u>REGULATORY LEVEL</u>
D009	Mercury	0.2
D014	Methoxychlor	10.0
D035	Methyl ethyl ketone	200.0
D036	Nitrobenzene	2.0
D037	Pentachlorophenol	100.0
D038	Pyridine	5.0 *
D010	Selenium	1.0
D011	Silver	5.0
D039	Tetrachloroethylene	0.7
D015	Toxaphene	0.5
D040	Trichloroethylene	0.5
D041	2,4,5-Trichlorophenol	400.0
D042	2,4,6-Trichlorophenol	2.0
D017	2,4,5-TP (silvex)	1.0
D043	Vinyl Chloride	0.2

* Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

** If o-, m-, and p- cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

The method for the Toxicity Characteristic Leaching Procedure was published in the Federal Register on Thursday, March 29, 1990. The Toxicity Characteristic rule will not be applicable to UST petroleum contaminated media and other similar debris regulated under Subtitle I of RCRA at present.

Because this federal rule was promulgated pursuant to the Hazardous and Solid Waste amendments of 1984, these regulations will go into effect in Kentucky prior to the state adopting them. All permit modifications granted to a landfill except UST removals, are subject to the TCLP requirements after September 25, 1990. Any continuing waste stream generator who was granted a permit modification will need to submit a TCLP analysis to the Division for review in order to continue disposing of the waste at that landfill. Any one-time only waste disposal before September 25, 1990 is not required to submit a TCLP analysis for waste disposed. If a waste is disposed of without the TCLP analysis before the effective dates and fails at a later date then the landfill may come under the constraints of the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and KRS 224.877 requirements. Such authority would entail the possibility of the removal of the waste from the landfill or other corrective action.

The following action is recommended:

- * Generators should sample immediately.
- * Analyses should be complete before June 13, 1990.
- * Generators disposing of waste at your landfill shall submit TCLP analyses to landfills by June 20, 1990.

- Landfill owners shall submit the analyses to this office before June 27, 1990.
- Any wastes not passing the TCLP should immediately be diverted to a hazardous waste landfill to avoid further Superfund liability. Accept no TCLP failing waste after September 24, 1990 from large-quantity generators. Accept no TCLP failing wastes from small quantity generators after March 28, 1991.

If you have any questions please contact Shelby C. Jett, P.E., Manager, Solid Waste Branch, Division of Waste Management, 18 Reilly Road, Frankfort, Kentucky 40601, telephone number (502) 564-6716, ext. 239

Susan C. Bush by CPH

Susan C. Bush, Director
Division of Waste Management

cc: Hannah Helm