PRELIMINARY DETERMINATION

PERMIT MINOR MODIFICATION & VARIANCE

Escambia County Environmental Corporation
P. O. Box 899
Greenville, Alabama 36037

Timberlands Sanitary Landfill
Permit No. 27-08

August 2, 2024

The Escambia County Environmental Corporation has submitted to the Alabama Department of Environmental Management (ADEM) a request to modify the Solid Waste Disposal Facility Permit for Timberlands Sanitary Landfill (Permit No. 27-08). The modification requests the use of tarps, Posi-Shell, VERDac, Atmos Cover/RusFoam, and a mulch/soil mixture as alternate daily cover material on interior slopes. Furthermore, the modification requests a variance from ADEM Admin. Code r. 335-13-4-.22(1)(b) for the use of a second working face temporarily during the initial placement of waste in each newly constructed cell. All other permit conditions remain unchanged.

The Land Division has determined that the permit application complies with the requirements of ADEM's Administrative Code 335-13 regulations for a municipal solid waste landfill.

Technical Contact:

Mr. Blake Holden
Solid Waste Engineering Section
Land Division
(334) 274-4248

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

SOLID WASTE DISPOSAL FACILITY *PERMIT*

PERMITTEE:	**Escambia County Environmental Corporation**
FACILITY NAME:	**Timberlands Sanitary Landfill**
FACILITY LOCATION:	**Sections 5 and 6, Township 3 North, Range 9 East, and located in Escambia County, Alabama. The total permitted area is approximately 246.23 acres with 134.33 acres approved for disposal.**
PERMIT NUMBER:	**27-08**
PERMIT TYPE:	**Municipal Solid Waste Landfill**
WASTE APPROVED FOR DISPOSAL:	**Non-hazardous solid waste, non-infectious putrescible and non-putrescible wastes including but not limited to household garbage, industrial waste, construction and demolition debris, commercial waste, appliances, tires, trees, limbs, stumps, sludge, paper and other similar type materials. Special waste including asbestos, foundry sand, petroleum contaminated waste, municipal solid waste ash, and other special waste as approved by ADEM may also be accepted.**
APPROVED WASTE VOLUME:	**Maximum Average Daily Volume of waste is 2500 tons per day**
APPROVED SERVICE AREA:	**Autauga, Baldwin, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Dallas, Elmore, Escambia, Geneva, Henry, Houston, Lowndes, Marengo, Mobile, Monroe, Montgomery, Perry, Pike, Washington, and Wilcox Counties in the State of Alabama; Bay, Escambia, Okaloosa, Santa Rosa, and Walton Counties in the State of Florida; George, Hancock, Harrison, Jackson, and Stone Counties in the State of Mississippi**

In accordance with and subject to the provisions of the Alabama Solid Wastes & Recyclable Materials Management Act, as amended, Code of Alabama 1975, §§ 22-27-1 to 22-27-27 ("SWRMMA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§ 22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to dispose of the above-described solid wastes at the above-described facility location.

ISSUANCE DATE:	**October 14, 2020**
EFFECTIVE DATE:	**October 14, 2020**
MODIFICATION DATE:	**XXXXXXXXXX**
EXPIRATION DATE:	**October 13, 2030**

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Alabama Department of Environmental Management

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
SOLID WASTE PERMIT

Permittee:	Escambia County Environmental Corporation P. O. Box 899 Greenville, Alabama 36037
Landfill Name:	Timberlands Sanitary Landfill
Landfill Location:	Sections 5 and 6, Township 3 North, Range 9 East on Highway 41 in Escambia County, Alabama
Permit Number:	27-08
Landfill Type:	Municipal Solid Waste

Pursuant to the Alabama Solid Wastes and Recyclable Materials Management Act, Code of Alabama 1975, §§ 22-27-1, *et seq*., as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), this permit is issued to Escambia County Environmental Corporation (hereinafter called the Permittee), to operate a solid waste disposal facility, known as the Timberlands Sanitary Landfill.

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in ADEM Admin. Code 335-13-1 through 335-13-16 of the ADEM Administrative Code (hereinafter referred to as the "ADEM Admin. Code"). Rules cited are set forth in this document for the purpose of Permittee reference. Any Rule that is cited incorrectly in this document does not constitute grounds for noncompliance on the part of the Permittee. Applicable ADEM Administrative Codes are those that are in effect on the date of issuance of this permit or any revisions approved after permit issuance.

This permit is based on the information submitted to the Department on March 19, 2019, for permit renewal and on July 15, 2024, for permit modification, and as amended, and is known as the Permit Application. Any inaccuracies found in this information could lead to the termination or modification of this permit and potential enforcement action. The Permittee must inform the Department of any deviation from or changes in the information in the Application that would affect the Permittee's ability to comply with the applicable ADEM Admin. Code or permit conditions.

This permit is effective as of October 14, 2020, modified on XXXXXXXXXXXX, and shall remain in effect until October 13, 2030, unless suspended or revoked.

_____ _____

Alabama Department of Environmental Management Date Signed

SECTION I. STANDARD CONDITIONS.

A. Effect of Permit

The Permittee is allowed to dispose of nonhazardous solid waste in accordance with the conditions of this permit and ADEM Admin. Code 335-13. Issuance of this permit does not convey property rights of any sort or an exclusive privilege, nor does it authorize the injury to persons or property, the invasion of other private rights, or the infringement of state or local laws or regulations. Except for actions brought under Code of Alabama 1975, §§22-27-1, *et seq*., as amended, compliance with the conditions of this permit shall be deemed to be compliance with applicable requirements in effect as of the date of issuance of this permit and future revisions.

B. Permit Actions

This permit may be suspended, revoked or modified for cause. The filing of a request for a permit modification or the notification of planned changes or anticipated noncompliance on the part of the Permittee, and the suspension or revocation does not stay the applicability or enforceability of permit condition.

C. Severability

The provisions of this permit are severable, and if a provision of this permit, or the application of a provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. Definitions

For the purpose of this permit, terms used herein shall have the same meaning as those in ADEM Admin. Code 335-13, unless this permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. "EPA" means the United States Environmental Protection Agency.

2. "Permit Application" means all permit application forms, design plans, operational plans, closure plans, technical data, reports, specifications, plats, geological and hydrological reports, and other materials which are submitted to the Department in pursuit of a solid waste disposal permit.

E. Duties and Requirements

1. Duty to Comply

The Permittee must comply with all conditions of this permit except to the extent and for the duration such noncompliance is authorized by a variance granted by the Department. Any permit noncompliance constitutes a violation of Code of Alabama 1975, §§22-27-1 et seq., as amended, and is grounds for enforcement action, permit suspension, revocation, modification, and/or denial of a permit renewal application.

2. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The renewal application must be submitted to the Department at least 180 days before this permit expires.

3. Permit Expiration

This permit and all conditions therein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application as required by Section I.E.2., and, through no fault of the Permittee, the Department has not made a final decision regarding the renewal application.

4. Need to Halt or Reduce Activity Not A Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.

5. Duty to Mitigate

In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

6. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit.

7. Duty to Provide Information

If requested, the Permittee shall furnish to the Department, within a reasonable time, the information that the Department may reasonably need to determine whether cause exists for denying, suspending, revoking, or modifying this permit, or to determine compliance with this permit. If requested, the Permittee shall also furnish the Department with copies of records kept as a requirement of this permit.

8. Inspection and Entry

Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow the employees of the Department or their authorized representative to:

a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

b. Have access to and copy, at reasonable times, the records that must be kept under the conditions of this permit.

c. Inspect, at reasonable times, the facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

d. Sample or monitor, at reasonable times, the substances or parameters at a location for the purposes of assuring permit compliance or as otherwise authorized by Code of Alabama 1975, §§22-27-1 *et seq*.

9. Monitoring, Corrective Actions, and Records

a. Samples and measurements taken for the purpose of monitoring or corrective action shall be representative of the monitored activity. The methods used to obtain representative samples to be analyzed must be the appropriate method from ADEM Admin. Code 335-13-4 or the methods as specified in the Application attached hereto and incorporated by reference. Laboratory methods must be those specified in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical

Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), other appropriate EPA methods, or as specified in the Application. All field tests must be conducted using approved EPA test kits and procedures.

b. The Permittee shall retain records, at the location specified in Section I.I., of all monitoring, or corrective action information, including all calibration and maintenance records, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report or record or for periods elsewhere specified in this permit. These periods may be extended by the request of the Department at any time and are automatically extended during the course of an unresolved enforcement action regarding this facility.

c. Records of monitoring and corrective action information shall include.

i. The exact place, date, and time of sampling or measurement.

ii. The individual(s) and company who performed the sampling or measurements.

iii. The date(s) analyses were performed.

iv. The individual(s) and company who performed the analyses.

v. The analytical techniques or methods used.

vi. The results of such analyses.

d. The Permittee shall submit all monitoring and corrective action results at the interval specified elsewhere in this permit.

10. Reporting Planned Changes

The Permittee shall notify the Department, in the form of a request for permit modification, at least 120 days prior to a change in the permitted service area, increase in the waste received, or change in the design or operating procedure as described in this permit, including planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

11. Transfer of Permit

This permit may be transferred to a new owner or operator. All requests for transfer of permits shall be in writing and shall be submitted on forms provided by the Department. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of this permit.

12. Certification of Construction

Before the Permittee may commence disposal of waste in any new cell or phase:

a. The Permittee must submit a letter to the Department signed by both the Permittee and a professional engineer stating that the facility has been constructed in compliance with the permit.

b. The Department must inspect the new cells or phases unless the Permittee in notified that the Department will waive the inspection.

c. The Permittee may not commence disposal activities in any new cells or phases until approval of the new cells or phases is granted by the Department.

13. Noncompliance

The Permittee shall report all instances of noncompliance with the permit at the time noncompliance is discovered.

14. Other Information

If the Permittee becomes aware that information required by the Application was not submitted or was incorrect in the Application or in a report to the Department, the Permittee shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department, within a reasonable time, information related to compliance with the permit.

F. Design and Operation of Facility

The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or an unplanned sudden or nonsudden release of contaminants (including leachate and explosive gases) to air, soil, groundwater, or surface water, which could threaten human health or the environment.

G. Inspection Requirements

1. The Permittee shall comply with all requirements of ADEM Admin. Code r.335-13-4-.21(1)(b).

2. The Permittee shall conduct random inspections of incoming loads.

3. Records of all inspections shall be included in the operating record.

H. Recordkeeping and Reporting

1. The Permittee shall maintain a written operating record at the location specified in Section I.I. The operating record shall include:

a. Documentation of inspection and maintenance activities.

b. Daily Volume reports.

c. Personnel training documents and records.

d. Solid/Hazardous Waste Determination Forms for Industrial Wastes, and the associated Department disposal approval correspondence for special wastes, industrial wastes, etc.

e. Groundwater monitoring records.

f. Explosive gas monitoring records.

g. Surface water and leachate monitoring records. Monitoring is subject to applicable conditions of Section VII. of the permit.

h. Copies of this Permit and the Application.

i. Copies of all variances granted by the Department, including copies of all approvals of special operating conditions (such as approvals for open burning,).

2. Quarterly Volume Report

Beginning with the effective date of this permit, the Permittee shall submit, within thirty (30) days after the end of each calendar quarter, a report summarizing the daily waste receipts for the previous (just ended) quarter. Copies of the quarterly reports shall be maintained in the operating record.

3. Monitoring and Corrective Action Reports

The Permittee shall submit reports on all monitoring and corrective action activities conducted pursuant to the requirements of this permit, including, but not limited to, groundwater, surface water, explosive gas and leachate monitoring. The groundwater monitoring shall be conducted in March and September of each year and the reports shall be submitted at least semi-annually. The reports should contain all monitoring results and conclusions from samples and measurements conducted during the sampling period. Explosive gas monitoring must be submitted on a quarterly basis, and the reports should be submitted to the Department and placed in the operating record within 30 days of the monitoring event. Copies of the semi-annual groundwater and quarterly explosive gas monitoring reports shall be maintained in the operating record.

4. Availability, Retention, and Disposition of Records

a. All records, including plans, required under this permit or ADEM Admin. Code 335-13 must be furnished upon request, and made available at reasonable times for inspection by an officer, employee, or representative of the Department.

b. All records, including plans, required under this permit or ADEM Admin. Code 335-13 shall be retained by the Permittee for a period of at least three years. The retention period for all records is extended automatically during the course of an unresolved enforcement action regarding the facility, or as requested by the Department.

c. A copy of records of waste disposal locations and quantities must be submitted to the Department and local land authority upon closure of the facility.

I. Documents to be Maintained by the Permittee

The Permittee shall maintain, at the Timberlands Sanitary Landfill office, the following documents and amendments, revisions and modifications to these documents until an engineer certifies closure.

1. Operating record.

2. Closure Plan.

J. Mailing Location

All reports, notifications, or other submissions which are required by this permit should be sent via signed mail (i.e. certified mail, express mail delivery service, etc.) or hand delivered to:

1. Mailing Address

Chief, Solid Waste Branch
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463

2. Physical Address

Chief, Solid Waste Branch

Alabama Department of Environmental Management
1400 Coliseum Blvd.
Montgomery, Alabama 36110-2400

K. Signatory Requirement

All applications, reports or information required by this permit, or otherwise submitted to the Department, shall be signed and certified by the owner as follows:

1. If an individual, by the applicant.

2. If a city, county, or other municipality or governmental entity, by the ranking elected official, or by a duly authorized representative of that person.

3. If a corporation, organization, or other legal entity, by a principal executive officer, of at least the level of Vice President, or by a duly authorized representative of that person.

L. Confidential Information

The Permittee may claim information submitted as confidential if the information is protected as per ADEM Admin. Code r. 335-1-1-.06(2).

M. State Laws and Regulations

Nothing in this permit shall be construed to preclude the initiation of a legal action or to relieve the Permittee from the responsibilities, liabilities, or penalties established pursuant to an applicable state law or regulation.

SECTION II. GENERAL OPERATING CONDITIONS.

A. Operation of Facility

The Permittee shall operate and maintain the disposal facility consistent with the Application, this permit, and ADEM Admin. Code 335-13.

B. Open Burning

The Permittee shall not allow open burning without prior written approval from the Department and other appropriate agencies. A burn request should be submitted in writing to the Department outlining why that burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation. The approval, if granted, shall be included in the operating record.

C. Prevention of Unauthorized Disposal

The Permittee shall follow the approved procedures, as provided in the Application, for detecting and preventing the disposal of free liquids, regulated hazardous waste, regulated PCB waste, regulated medical waste, and other unauthorized waste streams at the facility.

D. Unauthorized Discharge

The Permittee shall operate the disposal facility in such a manner that there will be no water pollution or unauthorized discharge. A discharge from the disposal facility or practice thereof may require a National Pollutant Discharge Elimination System permit under the Alabama Water Pollution Control Act.

E. Industrial and Medical Waste Disposal

The Permittee shall dispose of industrial process waste as required by ADEM Admin. Code 335-13. The Permittee, prior to disposal of industrial waste and/or medical waste, shall obtain from each generator a written certification that the material to be disposed does not contain free liquids, regulated hazardous wastes, regulated medical waste, or regulated PCB wastes and as per ADEM Admin. Code r. 335-13-4-.21 (c). All the additional requirements listed in the ADEM Admin. Code 335-13 should also need to be addressed by the permittee.

F. Boundary Markers

The Permittee shall ensure that the facility is identified with a sufficient number of permanent boundary markers that are at least visible from one marker to the next.

G. Certified Operator

The Permittee shall be required to have an operator certified by the Department on-site during hours of operation, in accordance with the requirements of ADEM Admin. Code r. 335-13-12.

SECTION III. SPECIFIC MSW LANDFILL REQUIREMENTS.

A. Waste Identification and Management

1. Subject to the terms of this permit, the Permittee may dispose of the nonhazardous solid wastes listed in Section III.B. Disposal of other waste streams is prohibited, except waste that is granted a temporary or one-time waiver by the Director.

2. The permitted facility boundary for the Timberlands Sanitary Landfill is approximately 246.23 acres, with a solid waste boundary for the municipal solid waste disposal area of 134.33 acres.

3. The maximum average daily volume of waste disposed at the facility, as contained in the permit application and approved by the Escambia County Commission, shall not exceed 2500 tons per day. Should the average daily volume exceed for two or more consecutive reporting quarters this value by 20% or 100 tons/day, whichever is less, the permittee shall be required to modify the permit in accordance with ADEM Admin. Code r. 335-13-5-.06(2)(b)2. An increase in maximum average daily volume shall not be approved by the Department unless the permittee has received local approval for the increased maximum average daily volume. The average daily volume shall be computed as specified by ADEM Admin. Code r. 335-13-4-22(2)(g).

B. Waste Streams

The Permittee may accept for disposal nonhazardous solid wastes, noninfectious putrescible and nonputrescible wastes including but not limited to household garbage, industrial waste, construction and demolition debris, commercial waste, appliances, tires, trees, limbs, stumps, sludge, paper and other similar type materials. Special waste approved by the Department may also be accepted.

C. Service Area

The service area for this landfill, as contained in the permit application and approved by the Escambia County Commission, is Autauga, Baldwin, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Dallas, Elmore, Escambia, Geneva, Henry, Houston, Lowndes, Marengo, Mobile, Monroe, Montgomery, Perry, Pike, Washington and Wilcox Counties in the State of Alabama; Bay, Escambia, Okaloosa, Santa Rosa, and Walton Counties in the State of Florida; Jackson, George, Harrison, Stone and Hancock Counties in the State of Mississippi.

D. Special Waste

The Permittee may dispose of special wastes in accordance with ADEM Admin. Code 335-13.

1. Asbestos Waste. The Permittee shall dispose of asbestos waste in accordance with ADEM Admin. Code r. 335-13-4-.26.

2. Foundry Sand. The Permittee shall dispose of foundry waste in accordance with ADEM Admin. Code r. 335-13-4-.26.

3. Petroleum Contaminated Waste. The Permittee shall dispose of petroleum contaminated waste in accordance with ADEM Admin. Code r. 335-13-4-.26.

4. Municipal Solid Waste Ash. The Permittee shall dispose of municipal solid waste ash in accordance with ADEM Admin. Code r. 335-13-4-.26.

E. Liner Requirements

The Permittee shall install a composite liner system for the municipal solid waste disposal area as described in the Application. The Permittee shall be required to construct either option 1 liner section or option 2 liner sections. Option 1 liner section shall consist of a two foot compacted clay liner with a permeability of $1x10^{-7}$ cm/sec overlain with a 60 mil HDPE geomembrane liner. Option 2 liner sections shall consist of 1 foot of compacted clay with a permeability of $1x10^{-5}$ cm/sec overlain with geosynthetic clay liner overlain with a 60 mil HDPE geomembrane liner. The Permittee shall be required to construct either option 1 drainage/protective soil layer or option 2 drainage/protective soil layers. Option 1 drainage/protective layer shall consist of one foot drainage layer with a permeability of $2x10^{-2}$ cm/sec overlain with a protective soil cover with a permeability of $1x10^{-4}$. Option 2 drainage/protective soil layer consists of a geocomposite drainage layer overlain with 1 foot drainage/protective soil layer with a permeability of $1x10^{-4}$ cm/sec. The Permittee shall be required to notify the department in writing which options will be utilized during construction. The base of the composite liner system shall be a minimum of five (5) feet above the highest measured groundwater level as determined by ADEM Admin. Code r. 335-13-4-.11(2)(a).

The Permittee was granted approval for the revised base grade plan, for cells 7, 8, 9 and 10 of the landfill. The revised base grade plan is depicted on sheet M-4 of the application for the major modification submitted on April 28, 2006. As part of the modification the permittee is required to install a new groundwater monitoring well at due south of former boring B-5.

The Permittee is allowed to use on-site protective cover soils in the place of sand on the base liner side slopes only. The on-site protective cover soil will be placed directly over the geocomposite.

F Septic Tank Pumpings and Sewage Sludge

The Permittee shall not dispose of septic tank pumpings and/or sewage sludge unless specifically approved in writing by the Department.

G. Large Dead Animals and Highly Putrescible Wastes

The Permittee shall handle the disposal of large dead animals and/or highly putrescible waste as required by ADEM Admin. Code r. 335-13-4-.22(1)(j). Disposal is allowed only in the municipal solid waste disposal area.

H. Cover Requirements

The Permittee shall cover all wastes as required by ADEM Admin. Code 335-13. A minimum of six inches of compacted earth or other alternate cover material approved by the Department and listed in Section X shall be added at the conclusion of each day's operation. The Permittee is approved to use tarps, contaminated soils,

shredder fluff, Posi-Shell, VERDac, Atmos Cover/ RusFoam, and a mulch/soil mixture as an alternate daily cover material on interior slopes. (See Section X.3., 4., 5., 6., 7.)

I. Waste Compaction

All waste shall be thoroughly compacted with adequate landfill equipment before the daily or weekly cover is applied. A completed daily cell shall not exceed eight feet in vertical thickness measured perpendicular to the slope of the preceding cell. A completed daily cell is allowed to be 15 feet in vertical thickness. (See Section X.2.)

J. Daily Cells

All waste shall be confined to an area as small as possible within a single working face and spread to a depth not exceeding two feet prior to compaction, and such compaction shall be accomplished on a face slope not to exceed 4 to 1or as otherwise approved by the Department. The Permittee shall be allowed to operate two working faces during the initial lift of waste in each newly constructed cell. (See Section X.8.)

K. Security

The Permittee shall provide artificial and/or natural barriers, which prevent entry of unauthorized vehicular traffic to the facility.

L. All Weather Access Roads

The Permittee shall provide an all-weather access road to the dumping face that is wide enough to allow passage of collection vehicles.

M. Adverse Weather Disposal

The Permittee shall provide for disposal activities in adverse weather conditions.

N. Personnel

The Permittee shall maintain adequate personnel to ensure continued and smooth operation of the facility.

O. Equipment

The Permittee shall provide the landfill equipment as required by ADEM Admin. Code r. 335-13-4-.22(1)(f).

P. Environmental Monitoring and Treatment Structures

The Permittee shall provide protection and proper maintenance of environmental monitoring and treatment structures.

Q. Vector Control

The Permittee shall provide for vector control as required by ADEM Admin. Code 335-13.

R. Bulk or Noncontainerized Liquid Waste

The Permittee shall not dispose of bulk or noncontainerized liquid waste, or containers capable of holding liquids, unless the conditions of ADEM Admin. Code r. 335-13-4-.22(1)(k) are met.

S. Empty Containers

The Permittee shall render empty containers larger than normally found in household waste unsuitable for holding liquids prior to delivery to the landfill unit unless otherwise approved by the Department.

T. Other Requirements

The Department may enhance or reduce the requirements for operating and maintaining the landfill as deemed necessary by the Land Division.

U. Other Permits

The Permittee shall operate the landfill according to this and other applicable permits.

V. Scavenging and Salvaging Operations

The Permittee shall prevent scavenging and salvaging operations, except as part of a controlled recycling effort.

W. Signs

The Permittee shall provide a sign outlining instructions for use of the site. The sign shall be posted and have the information required by ADEM Admin. Code r. 335-13-4-.22(1)(i).

X. Litter Control

The Permittee shall control litter within the permitted facility.

Y. Fire Control

The Permittee shall provide fire control measures.

SECTION IV. GROUNDWATER MONITORING REQUIREMENTS.

A. The Permittee shall install and/or maintain a groundwater monitoring system, as specified below.

1. The permittee shall maintain the groundwater monitoring wells and piezometers identified in Table 1 at the locations specified in the Application, and any other groundwater monitoring wells which are added during the active life and the post closure care period.

2. The Permittee shall maintain groundwater monitoring well UGW-1 as the background groundwater monitoring well for the entire facility.

3. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in the rate and extent of a plume of contamination or as otherwise deemed necessary to maintain compliance with the ADEM Admin. Code 335-13.

4. Prior to installing additional groundwater monitoring wells, the Permittee shall submit a plan to the Department with a permit modification request specifying the design, location and installation of additional monitoring wells. This plan shall be submitted within 120 days prior to the installation which, at a minimum, shall include.

    a. Well construction techniques including proposed casing depths, proposed total depth, and proposed screened interval of well(s);

b. Well development method(s);

c. A complete analysis of well construction materials;

d. A schedule of implementation for construction; and

e. Provisions for determining the lithologic characteristics, hydraulic conductivity and grain-size distribution for the applicable aquifer unit(s) at the location of the new well(s).

5. The Permittee is approved for inter-well method for statistical analysis.

B. Groundwater Monitoring Requirements

1. The Permittee shall determine the groundwater surface elevation at each monitoring well and piezometer identified in Table 1 each time the well or piezometer is sampled and at least semi-annually throughout the active life and post-closure care period.

2. The Permittee shall determine the groundwater flow rate and direction in the first zone of saturation at least annually or each time groundwater is sampled and submit as required by ADEM Admin. Code 335-13.

3. Prior to the initial receipt of waste at the facility, the Permittee shall sample, and analyze for the parameters listed in Appendix I of ADEM Admin. Code 335-13-4-.27, in all monitoring wells identified in Section IV.A.2. to establish background water quality and/or as directed by ADEM Admin. Code r. 335-13-4-.27(2)(j) and ADEM Admin. Code r. 335-13-4-.27(2)(a)(1).

4. The Permittee shall sample and analyze all monitoring wells identified in Table 1 for the parameters listed in Appendix I of ADEM Admin. Code 335-13-4-.27(3), on a semi-annual basis throughout the active life of the facility and the post-closure care period in accordance with ADEM Admin. Code 335-13-4-.27(3). Sampling shall be conducted during March and September of each year, beginning with the effective date of this permit. The records and results of this sampling and analysis activity shall be submitted to the Department, within ninety (90) days of the date of sampling. Groundwater monitoring shall be conducted according to the groundwater monitoring plan submitted June 17, 2020.

5. In addition to the requirements of Sections IV., B.1., B.2., B.3. and B.4., the Permittee shall record water levels, mean sea level elevation measuring point, depth to water, and the results of field tests for pH and specific conductance at the time of sampling for each well.

C. Sampling and Analysis Procedures

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Section IV.A. to provide a reliable indication of the quality of the groundwater.

1. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in the Application. Monitoring wells shall be bailed, pumped or micro-purged in accordance with the approved GWSAP to remove an adequate quantity of well water to allow sampling. Slow recharge wells shall be bailed until dry. Wells shall be allowed to recharge prior to sampling.

2. Samples shall be analyzed according to the procedures specified of the Application, Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), or other appropriate methods approved by this Department. All field tests must be conducted using approved EPA test kits and procedures.

3. Samples shall be tracked and controlled using the chain-of-custody and QA/QC procedures specified of the Application.

D. Recordkeeping and Reporting Requirements

1. Recording of Results

For each sample and/or measurement taken pursuant to the requirements of this permit, the Permittee shall record the information required by Section I.E.9.c.

2. Recordkeeping

Records and results of all groundwater monitoring, sampling, and analysis activities conducted pursuant to the requirements of this permit shall be included in the operating record required by Section I.I.1.

E. Permit Modification

If the Permittee or the Department determines that the groundwater monitoring system no longer satisfies the requirements of ADEM Admin. Code r. 335-13-4-.14 or Section IV.A. of this permit, the Permittee must, within 120 days, submit an application for a permit modification to make necessary and/or appropriate changes to the system.

TABLE 1
GROUNDWATER MONITORING WELLS.

Monitoring Well Number	Top of Casing (feet msl)	Part Monitoring
UGW-1	234.38	Cells 1 thru 10
GW-4	232.52	Cells 1 thru 6
GW-5	217.21	Cells 1 thru 6
GW-6	222.00	Cells 1 thru 6
GW-7	214.60	Cells 1 thru 6
GW-8	215.76	Cells 1 thru 6
GW-1	224.47	Cells 7 thru 10B
GW-2	291.91	Cells 7 thru 10B
GW-3	313.06	Cells 7 thru 10B
GW-9	234.85	Cells 7 thru 10B
GW-10	232.33	Cells 7 thru 10B

SECTION V. GAS MONITORING REQUIREMENTS.

The Permittee must install and maintain an explosive gas monitoring system in accordance with ADEM Admin. Code Division 13.

SECTION VI. MUNICIPAL SOLID WASTE LANDFILL AIR EMISSIONS.

This landfill may be subject to ADEM Admin. Code Division 3 and the Federal Clean Air Act. Contact the ADEM Air Division for applicable requirements and permits.

SECTION VII. LEACHATE AND SURFACE WATER MANAGEMENT REQUIREMENTS.

The Permittee must collect and dispose of the leachate that is generated at the facility, and the leachate must be recirculated into the landfill through injection or onto the working face and intermediate cover of the landfill surface so as not to run-off, or managed at a facility permitted to treat leachate. The Permittee shall install a leachate collection system designed to maintain less than 12 inches (30 cm) depth of leachate over the liner.

Timberlands Sanitary Landfill is permitted to construct and operate an on-site biological leachate treatment system. The on-site leachate treatment system is consisting of a series of constructed wetlands. The constructed wetlands will utilize both a horizontal surface flow wetland system and two parallel vertical flow wetland biofilter system (WBS) units, all of which will be double-lined with a 30 mil PVC primary liner underlain with geo composite and 60 mil HDPE geomembrane or with geo composite between two 60 mil HDPE geomembranes.

The treated leachate will be either: (i) discharged to a nearby stream; or (ii) returned to an existing on-site leachate storage tanks if the effluent does not meet discharge standards. The discharge of the treated leachate from the constructed wetland is monitored through the NPDES permit issued by ADEM's Industrial Water Section.

Timberlands Sanitary Landfill is also permitted to simplify the piping layout in Cell No. 9 to maximize the volume of leachate that can be treated using the constructed wetlands. For leachate collection pipes in Cell 10 and other future cells, the leachate collection stone shall be sized such that no more than 5% of the stones are smaller than 3/8 of an inch and no more than 5% of the stones are larger than 2 inches in the longest direction with 0% larger than 3 inches. Further, gravel for this work shall consist of hard, strong, durable, non-carbonate particles which are free of any metals, roots, trees, stumps, concrete, construction debris, other organic matter, deleterious materials or coatings. The stone shall be rounded and shall exhibit less than 15% carbonate content by weight when tested according to ASTM D 3042 (or later revision thereof). In the event that crushed or angular stone is utilized, an additional layer of geotextile shall cushion the stone if a geocomposite is not present immediately under the leachate collection corridor.

If Timberlands Sanitary Landfill is required to transport leachate to offsite prior to initial disposal, the permittee shall provide the Department with a letter from the receiving publicly or privately owned treatment works, approving the acceptance of the leachate. Discharges to publicly or privately owned treatment works may be subject to the requirements of the ADEM Water Division's State Indirect Discharge (SID) Program. The permittee shall construct and maintain run-on and run-off control structures. Surface water discharges from drainage control structures shall be permitted through the ADEM Water Division's National Pollutant Discharge Elimination System (NPDES) Program.

The Permittee has reconfigured Pond 3B to facilitate the construction of the pond without relocating the existing landfill gas flare station. The reconfigured design will discharge to the same tributary as did the previous design. The Permittee has redesigned Pond 5 to size the outlet structure to eliminate the need for re-routing the tributary into which the pond discharges. The reconfigured design will discharge into the same tributary as did the previous design, and avoids disturbance of 380 linear feet of the tributary that is currently permitted.

The Permittee revised the Leachate Collection Plan to dedicate an area onsite for 2 additional leachate storage tanks to be constructed in the future. The location of the additional leachate storage tanks will be in the currently permitted leachate tank storage area.

SECTION VIII. CLOSURE AND POST- CLOSURE REQUIREMENTS.

The Permittee shall close the landfill and perform post-closure care of the landfill in accordance with ADEM Admin. Code 335-13.

A. Final Cover

The landfill shall be closed in accordance with the approved application and ADEM Admin. Code 335-13. The final cover shall consist of 18 inch thick layer of cohesive clay soil with a hydraulic conductivity of

1×10^{-5} cm/sec or less, 40 mil LLDPE textured geomembrane, geotextile filter fabric, 12 inch sand layer and 6 inches of top soil. The permittee is approved for two alternate final covers. The first alternate final cover shall consist of an 18 inch soil infiltration layer with a hydraulic conductivity of 1×10^{-5} cm/sec or less, 40 mil LLDPE textured geomembrane, geocomposite drainage layer, and 18 inch layer of protective soil. The second alternate final cover shall consist of an12 inch infiltration layer with a hydraulic conductivity of 1×10^{-5} cm/sec or less, 50 mil HDPE drainage structured geomembrane, and 18 in layer of protective soil. The final cover grading plan has been revised to show 2-foot contour interval and tack-on stormwater diversion berms.

B. Vegetative Cover

The Permittee shall establish a vegetative or other appropriate cover within 90 days after completion of final grading requirements in the Application. Preparation of a vegetative cover shall include, but not be limited to, the placement of seed, fertilizer, mulch, and water.

C. Notice of Intent

The Permittee shall place in the operating record and notify the Department of their intent to close the landfill prior to beginning closure.

D. Completion of Closure Activities

The Permittee must complete closure activities of each landfill unit in accordance with the Closure Plan within 180 days of the last known receipt of waste.

E. Certification of Closure

Following closure of each unit, the Permittee must submit to the Department a certification, signed by an independent registered professional engineer, verifying the closure has been completed according to the Closure Plan.

F. Post-Closure Care Period

Post-closure care activities shall be conducted after closure of each unit throughout the life of this permit and continuing for a period of a minimum of thirty (30) years following closure of the facility. The Department may shorten or extend the post-closure care period applicable to the solid waste disposal facility.

G. Post-Closure Maintenance

The Permittee shall provide post closure maintenance of the facility to include regularly scheduled inspections. This shall include maintenance of the cover, vegetation, monitoring devices and pollution control equipment and correction of other deficiencies that may be observed by the Department. Monitoring requirements shall continue throughout the post closure period as determined by the Department unless all waste is removed and no unpermitted discharge to waters of the State have occurred.

H. Post-Closure Use of Property

The Permittee shall ensure that post closure use of the property never be allowed to disturb the integrity of the final cover, liner, or other components of the containment system. This shall preclude the growing of deep-rooted vegetation on the closed area.

I. Certification of Post-Closure

Following post-closure of each unit, the Permittee must submit to the Department a certification, signed by an independent registered professional engineer, verifying the post-closure has been completed according to the Post-Closure Plan.

J. Recording Instrument

The Permittee must provide documentation of compliance with the requirements of the Uniform Environmental Covenants Program in ADEM Admin. Code 335-5 and shall execute the following:

1. Record a notation onto the land deed within 90 days from the certification of closure. This notation shall state that the land has been used as a solid waste disposal facility, the name of the Permittee, type of disposal activity, location of the disposal facility, and beginning and closure dates of the disposal activity.

2. File the covenant at the courthouse where the land deed is held within thirty (30) days of receipt of the covenant signed by ADEM's Land Division Chief.

3. The Permittee shall submit a certified copy of the recording instrument to the Department within 120 days after permit expiration, revocation, or as directed by ADEM as described in the Application.

L. Removal of Waste

If the Permittee or other person(s) wishes to remove waste, waste residues, the liner, or any contaminated soils, the owner must request and receive prior approval from the Department.

SECTION IX. FINANCIAL ASSURANCE

A. The Permittee shall maintain detailed written cost estimates, in current dollars, at the landfill office and on file with the Department in accordance with ADEM Admin. Code r. 335-13-4-.28.

B. All cost estimates must be updated annually as required by ADEM Admin Code r. 335-13-4-.28.

C. The Permittee must place a copy of the financial assurance mechanism along with other items required by ADEM Admin. Code r. 335-13-4-28. into the landfill operating record and submitted to the Department before the initial receipt of waste in the case of closure, post-closure care, or no later than 120 days after corrective action remedy has been selected.

D. The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed.

E. The financial assurance mechanisms must be legally valid, binding, and enforceable under state and federal law.

F. The Permittee shall demonstrate continuous compliance with ADEM Admin. Code r. 335-13-4-28. by providing documentation of financial assurance in at least the amount that equals or exceeds the cost estimate. Changes in the financial assurance mechanism must be approved by the Department.

G. The Permittee shall increase the closure, post-closure or corrective action cost estimates and the amount of financial assurance if changes in the closure, post-closure or correction action plans or landfill conditions increase the maximum cost.

H. The Permittee may reduce the amount of financial assurance by submitting justification and a revised estimate to the Department for approval.

SECTION X. VARIANCES.

1. The Permittee is granted a variance to ADEM Admin. Code r. 335-13-4-.20(2)(c)2. requiring the maximum final grade of the final cover system shall not exceed 4 to 1. The maximum final slope of 3.5 to 1 shall be

allowed along the toe of the slope in cell 1 and cell 3-B. The final slope above the 243-foot elevation shall be 4 to 1 in cell 1 and cell 3-B. The final slopes in the remaining cells shall not exceed 4 to 1.

2. The Permittee is granted a variance to ADEM Admin. Code r. 335-13-4-.22(1)(c) requiring a daily completed cell shall not exceed 8 feet in vertical thickness measured perpendicular to the slope of the preceding cell. The Permittee shall be allowed a vertical thickness of 15 feet. (See Section III.I.)

3. The Permittee is granted permission to use tarps as an alternate daily cover material on interior slopes. The waste mass in its' entirety shall be covered using tarps and other approved cover materials when the tarps are not large enough. The Permittee shall be required to cover all active cells with six inches of earthen cover at the conclusion of each week's activities. All exterior slopes shall be covered with soil in accordance with approved plans and the permit. (See Section III.H.)

4. The Permittee is granted permission to use contaminated soils as an alternate daily cover material on interior slopes. A minimum of six inches of contaminated soil shall be applied as cover. The Permittee shall be required to cover all active cells with six inches of earthen cover at the conclusion of each week's activities. All exterior slopes shall be covered with soil in accordance with approved plans and the permit. (See Section III.H.)

5. The Permittee is granted permission to use shredder fluff as an alternative daily cover material on interior slopes. A minimum of six inches of shredder fluff shall be applied as cover. The alternate cover material should be mixed with sand or other soils in the ratio of 50% soil: 50% shredder fluff. The Permittee shall be required to cover all active cells with six inches of earthen cover at the conclusion of each week's activities. All exterior slopes shall be covered with soil in accordance with approved plans and the permit. (See Section III.H.)

6. The Permittee is granted permission to use Posi-Shell, VERDac and Atmos Cover/RusFoam as an alternate daily cover material on interior slopes. These materials shall be applied according to the manufacturing specifications as contained in the operation plan submitted May 24, 2024. The Permittee shall be required to cover all active cells with six inches of earthen cover at the conclusion of each week's activities. All exterior slopes shall be covered with soil in accordance with approved plans and permit. (See Section III.H.)

7. The Permittee is granted permission to use mulch/soil mixture as alternate daily cover material on interior slopes. The alternate cover material should be mixed with sand or other soils in the ratio of 50% soil: 50% mulch. A minimum of six inches of the mulch/soil mixture shall be applied as cover. The Permittee shall be required to cover all active cells with six inches of earthen cover at the conclusion of each week's activities. All exterior slopes shall be covered with soil in accordance with approved plans and permit. (See Section III.H.)

8. The Permittee has been granted a variance from ADEM Admin. Code r. 335-13-4-.22(1)(b) requiring all waste to be confined to as small an area as possible within a single working face. The Permittee shall be allowed to operate two working faces temporarily during the initial placement of waste in each newly constructed cell. (Section III.J.)

Any variance granted by the Department may be terminated by the Department whenever the Department finds, after notice and opportunity for hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation or any other provision of the variance, or that operation under the variance does not meet the minimum requirements established by state and federal laws and regulations or is unreasonably threatening the public health.

APPLICATION

Sustainability in Action

November 3, 2023
Revised May 22, 2024
Revised July 10, 2024

Jared Kelly
Chief, Solid Waste Engineering Section
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, AL 36110

RE: Timberlands Sanitary Landfill
Permit #27-08
Minor Modification for Additional ADCs and Second Working Face

Dear Mr. Kelly:

Escambia County Environmental Corporation is requesting approval of a minor modification to the Solid Waste Permit at the Timberlands Sanitary Landfill. The purpose of this modification is to allow the use of additional Alternate Daily Cover (ADCs) materials and allow for operating two working faces.

Alternate Daily Cover:

Timberlands Sanitary Landfill is requesting modification to Section III.H and X of the current Permit to allow the use of additional ADCs as listed below:

1. Spray Applied Covers
    a. Posi-Shell®, is a non-flammable, non-cellulose! mineral mortar coating spray-on cover.
    b. VERDac Landfll Cover, is a non-flammable, cellulose! mineral mortar coating (similar to Posi-Shell®) spray-on cover product.
    c. Atmos Cover ! RusFoam® ADC long duration foam, which is a patented formulation that produces a thick, long-lasting, viscous foam barrier.
2. Soil ! Mulch Mixture
3. Geosynthetic Tarps

To support this modification, we have attached an Alternative Daily Cover Operations Plan, which is being incorporated into the existing overall Landfill Operations Plan as Appendix D.

Timberlands Sanitary Landfill
22800 Highway 41, Brewton, Alabama 36426
O: (205) 401-1737, republicservices.com

Second Working Face:

Timberlands Sanitary Landfill is also requesting a modification to the current Permit to allow for use of the second working face as described below and as approved at other landfill facilities in Alabama.

> *Requested Revised Permit Language:*
>
> *The Permittee has been approved to operate two working faces at the Landfill such as the initial waste placement in newly constructed cells. Both working faces must be confined to as small an area as possible.*

The following documents are attached to support this modification request:

1. Completed application form (ADEM Form 439) – re-attached:
2. Fee in the amount of $3,275 for the application fee has been paid via the ADEM Online ePay website - receipt re-attached;
3. The map and list of adjacent property owners previously submitted to the Department on January 11, 2024, has been re-reviewed and confirmed to be accurate and up to date as of May 13, 2024 – re-attached.

If you have any questions regarding this matter, please feel free to contact me at 850-450-4241 or smadill@republicservices.com.

Sincerely,

Scott Madill
Environmental Manager
Republic Services

SOLID WASTE APPLICATION

PERMIT APPLICATION
SOLID WASTE DISPOSAL FACILITY
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
(Submit in Triplicate)

1. Facility type:

_____Municipal Solid Waste Landfill (MSWLF)
Industrial Landfill (ILF)
_____Construction and Demolition Landfill (C/DLF)
_____CCR Landfill (CCRLF)
_____CCR Surface Impoundment (CCRSI)
_____Other (explain)_____

2. Facility Name Timberlands Sanitary Landfill

3. Applicant/Permittee:

Name: Escambia County Environmental Corporation

Address: P.O. Box 899
Greenville, Alabama 36037

Telephone: (251) 867-8921

If applicant/permittee is a Corporation, please list officers:

0. Location: (include county highway map or USGS map)

Township 3N Range 9E
Section 5&6 County Escambia

1. Land Owner:

Name: Escambia County Environmental Corporation

Address: P.O. Box 899
Greenville, Alabama 36037

Telephone: (251) 867-8921

(Attach copy of agreement from landowner if applicable.)

6. Contact Person:

Name Andrew Rodgers

Position or Affiliation General Manager

Address: Timberlands Landfill, 22800 Hwy 41
Brewton, Alabama 36426

Telephone: (251) 867 -8921

7. Size of Facility: 246.23 **Acres**

Size of Disposal Area(s): 134.33 **Acres**

8. Identify proposed service area or specific industry that waste will be received from: Autanga, Baldwin, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Dallas, Elmore, Escambia, Geneva, Henry, Houston, Lowndes, Marengo, Mobile, Monroe, Montgomery, Perry, Pike, Washington, and Wilcox Counties **in** Alabama. Bay, Escambia, Okaloose, Santa Rosa, and Walton Counties in Florida George, Hancock, Harrison, Jackson, and Stone Counties in Mississippi

9. Proposed maximum average daily volume to be received at landfill (choose one):

2,500 **Tons/Day** _____ **Cubic Yards/Day**

10. List all waste streams to be accepted at the facility (i.e., household solid waste, wood boiler ash, tires, trees, limbs, stumps, etc.):

Nonhazardous solid wastes: noninfectious putrescible and nonputresdble wastes including but not limited to household garbage, industrial waste.

construction and demolition debris, commercial waste, appliances, tires, trees, limbs, stumps, sludge. paper. and other similar type materials.

Special wastes including asbestos. foundry sand, petroleum contaminated waste, municipal solid waste ash, and other special wastes as approved by the Department

SIGNATURE (Responsible official of permit applicant):

TITLE: I Genera Manager

DATE: 1/2/1.3

(please print or type name)

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

(334) 271-7700 1400 Coliseum Blvd. Montgomery, AL 36110
mailing address: Post Office Box 301463, Montgomery, AL 36130-1463

Receipt Confirmation Page

ADEM requires that when you pay online, you MUST print out the confirmation information and submit it as proof of payment with your permit application or any other correspondence requiring proof of payment.

Payment Summary	
Payment Item	**Fee**
Online Payment - 11/03/2023 11:04:57	$3,275.00
Total Fee through Alabama.gov (more info)	**$3,375.25**

Receipt Confirmation Number: 20231103000008720

General Invoice Information

Choose the type of payment you are making: 5343-LAND- RCRA- LAND PERMITS
Description of Other Fees:
Additional Information/Fee Description: Minor Mod Fee
Number on your ADEM invoice:
Date on your ADEM invoice:

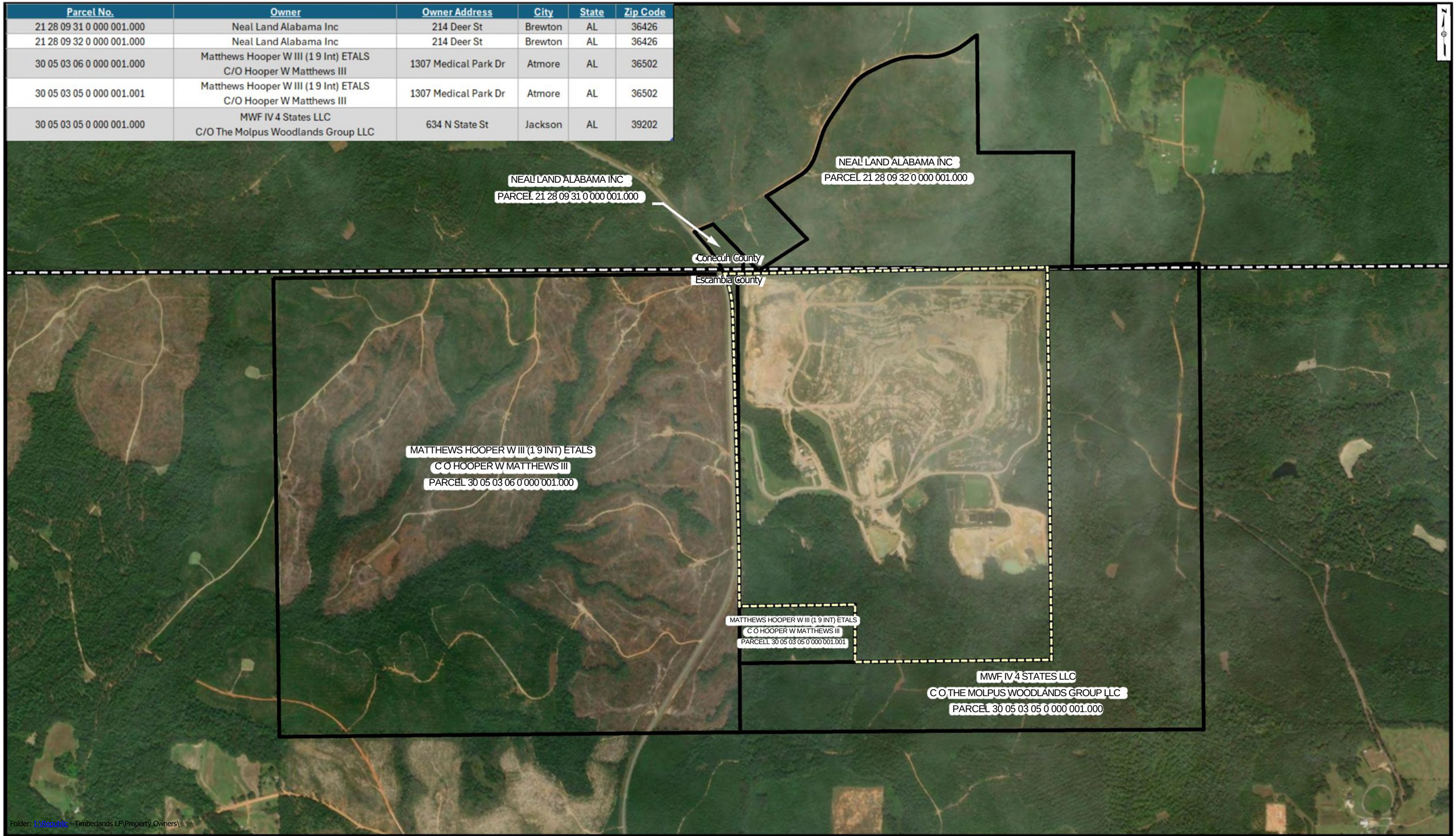
Contact Information

Company/Facility or Individual Name: Escambia County Environmental Corporation
Facility Permit Number (if applicable): 27-08
Company or Facility Phone: 850-450-4241
Contact Person: Scott Madill
Contact Phone: 850-450-4241
Contact email address: smadill@republicservices.com
Name of an ADEM Program Staff Member (if known): Jared Kelly

Policy Related Questions: 334-271-7700
Application Support: 866-353-3468 or support@alabamainteractive.org

Version 2.1.3

Parcel No.	Owner	Owner Address	City	State	Zip Code
21 28 09 31 0 000 001.000	Neal Land Alabama Inc	214 Deer St	Brewton	AL	36426
21 28 09 32 0 000 001.000	Neal Land Alabama Inc	214 Deer St	Brewton	AL	36426
30 05 03 06 0 000 001.000	Matthews Hooper W III (1 9 Int) ETALS C/O Hooper W Matthews III	1307 Medical Park Dr	Atmore	AL	36502
30 05 03 05 0 000 001.001	Matthews Hooper W III (1 9 Int) ETALS C/O Hooper W Matthews III	1307 Medical Park Dr	Atmore	AL	36502
30 05 03 05 0 000 001.000	MWF IV 4 States LLC C/O The Molpus Woodlands Group LLC	634 N State St	Jackson	AL	39202



Property Ownership Map

1,000 500 0 1,000
Feet

Timberlands Landfill
Escambia County, Alabama

Date: 1/10/2024 - Reconfirmed 5/13/2024

REPUBLIC SERVICES

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OPERATIONS PLAN
APPENDIX D – ALTERNATE DAILY COVER

TIMBERLANDS SANITARY LANDFILL
ESCAMBIA COUNTY, ALABAMA

FOR

BFI WASTE SYSTEMS OF ALABAMA, LLC

MAY 2024

REPUBLIC SERVICES

© Republic Services, Inc. (2024)

3920 Arkwright Road, Suite 101 | Macon, Georgia | Phone: (478) 743-7175 | Fax: (478) 743-1703

TABLE OF CONTENTS

INTRODUCTION

The Timberlands Sanitary Landfill (Timberlands) is located near Brewton, AL in Escambia County. Timberlands is a municipal solid waste landfill operating under the Alabama Department of Environmental Management (ADEM or Department) Solid Waste Permit No. 27-08. The most recent version of the solid waste permit was issued and became effective on October 14, 2020 and expires on October 13, 2030. The current permit includes approvals for shredder fluff and contaminated soils. This Operations Plan is being provided, as requested by ADEM, to provide material descriptions, performance, operating procedures, and compliance inspection verification for the additionally proposed ADC's included in a minor modification to ADEM originally submitted mid-March, 2024. The following Alternate Daily Cover (ADC) materials may be used at the Landfill in lieu of soil, given the operating conditions listed in this report for each ADC are met. Any ADC's must meet the requirements of ADEM Rule 335-13-4.15 Cover and the approved solid waste permit for the facility.

1. Shredder Fluff (currently approved by ADEM)
2. Contaminated Soils (currently approved by ADEM)
3. Spray Applied Covers
4. Soil / Mulch Mixture
5. Synthetic Tarps

All approved ADC's will pass the paint filter test, be non-hazardous and receive Department approval prior to use. In accordance with the current effective permit, if any ADC is being used, Timberlands will cover each Friday with a minimum of six inches of compacted soil.

1. SHREDDER FLUFF

Shredder Fluff has been previously approved and is currently listed in Section III.H of the Solid Waste Permit. The Shredder Fluff will be mixed at a ratio of 50% Shredder Fluff and 50% soil. The ADC shall pass the paint filter test, be nonhazardous and receive the Department's approval for disposal prior to acceptance. If this ADC is being used, the Permittee will cover each Friday with a minimum of six inches of compacted soil.

2. CONTAMINATED SOILS

Contaminated soils have been previously approved and are currently listed in Section III.H of the Solid Waste Permit. The ADC shall pass the paint filter test, be nonhazardous and receive the Department's approval for disposal prior to acceptance. If these ADC's are being used, the Permittee will cover each Friday with a minimum of six inches of compacted soil.

3. SPRAY APPLIED COVERS

The products listed below are included in the category of spray applied covers. Their material description, performance, operating procedures, and verification procedures are listed below.

3.1 MATERIAL DESCRIPTION

- Posi-Shell®, is a non-flammable, non-cellulose/ mineral mortar coating spray-on cover product and includes a patented blend of clay binders, reinforcing fibers, and polymers. Application completed by spray applying cover using standard hydroseeding units.
- VERDac Landfll Cover, is a non-flammable, cellulose/ mineral mortar coating (similar to Posi-Shell®) spray-on cover product. Application completed by spray applying cover using standard hydroseeding units.
- Atmos Cover / RusFoam® ADC long duration foam, is a patented formulation that produces a thick, long-lasting, viscous foam barrier. Application completed by spray applying foam using a self-propelled, single operator, Pneumatic Foam Unit.

Refer to the attached Manufacturers Specifications for additional technical information regarding each of the above-listed spray applied cover products.

The proprietary liquid concentrate is delivered to the site and mixed with water prior to application with proprietary equipment.

Operators will be trained in the use of the hydroseeding units or Pneumatic Foam Unit. Operator training will include the use and mechanics of the equipment and shall occur prior to operating the equipment. Potable water or pond water can be used as the water fraction of the spray applied covers.

3.2 MATERIAL PERFORMANCE

Spray applied covers are referenced in the EPA Project Summary Document entitled *The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills* (EPA/600/Sr-93/172), included in Appendix 4, and have been demonstrated to effectively meet the performance criteria of Subtitle D and achieve a level of performance equal to or greater than earthen cover material.

3.3 OPERATING PROCEDURES

- Spray-applied covers must be mixed and applied in accordance with the manufacturers' application guidelines. Specific Application Rates and Guidelines for each product are included in Appendix 1 of this Plan. Additionally, coverage thickness for each product is described below:
    - Posi-Shell® must be applied so that all waste is covered with no visible waste remaining after application (generally 1/8" thick).

  - VERDac Landfll Cover must be applied so that all waste is covered with no visible waste remaining after application (generally 1/8” thick).
  - Atmos Cover / RusFoam® ADC must be applied so that all waste is covered with no visible waste remaining after application (initially applied 2” thick and expands to 6” thick).

- The facility will cover all waste with a minimum of six inches of earthen cover at the conclusion of each week’s activities.
- Spray applied covers shall not be used on any exterior/outside slopes and may not be used for intermediate cover.
- In case of extreme weather or other conditions which would impede proper application of spray applied cover, such as heavy rainfall (typically 0.75” of rainfall or greater) or strong winds, an alternately approved cover material or compacted soil will be utilized in lieu of this ADC.

3.4 VERIFICATION AND INSPECTION PROCEDURES

- At the end of each working day, landfill personnel will inspect the working face to confirm that the minimum thickness of the spray applied cover has been placed over the working face in accordance with this Plan and manufacturer specifications listed in the Appendix.
- If an adverse condition event occurs after spray applied cover has been applied and becomes compromised, then the ADC should be reapplied if practical, otherwise, an alternately approved cover will be used.
- Landfill personnel will routinely assess the effectiveness of spray applied cover in controlling vectors, fires, odors, and windblown litter and waste.
- In the event it is determined that spray applied cover is not effectively controlling vectors, fires, odors, or windblown litter and waste, the ADC application process will be re-evaluated to ensure that the ADC material adequately covers the working face and serves its intended purpose.

4. SOIL / MULCH MIXTURE

4.1 MATERIAL DESCRIPTION

Soil/Mulch Mixture (S&M) is generally a mixture of native soils and wood mulch generated from the grinding, shredding, or chipping of yard trimming, land clearing debris and unpainted and untreated natural wood.

4.2 MATERIAL PERFORMANCE

S&M have been used extensively in other sites in Alabama and other States and have been well demonstrated to effectively meet the performance criteria of Subtitle D and achieve a level of performance equal to earthen cover material.

4.3 OPERATING PROCEDURES

- S&M will be applied to a full depth of six inches.
- S&M can be mixed at a ratio up to 50% soil to 50% mulch by volume.
- The facility will cover all waste with a minimum of six inches of earthen cover at the conclusion of each week's activities.
- S&M shall not be used on any exterior/outside slopes and may not be used for intermediate cover.

4.4 VERIFICATION AND INSPECTION PROCEDURES

- At the end of each working day, landfill personnel will inspect the working face to confirm that the minimum thickness of S&M has been placed over the working face in accordance with this Plan.
- If an adverse condition event occurs after S&M has been applied and becomes compromised, then the ADC should be reapplied if practical, otherwise, an alternately approved cover will be used.
- Landfill personnel will routinely assess the effectiveness of S&M in controlling vectors, fires, odors, and windblown litter and waste.
- In the event it is determined that S&M is not effectively controlling vectors, fires, odors, or windblown litter and waste, the ADC application process will be re-evaluated to ensure that the ADC material adequately covers the working face and serves its intended purpose.

5. GEOSYNTHETIC TARPS

5.1 MATERIAL DESCRIPTION

Geosynthetic Tarps, as described in the EPA Project Summary Document entitled *The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills* (EPA/600/Sr-93/172), included in Appendix 4, may be used as daily cover. These are generally categorized as high strength, flame-retardant, woven or non-woven polyethylene geotextile.

5.2 MATERIAL PERFORMANCE

Synthetic Tarps are referenced in the EPA Project Summary Document entitled *The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills* (EPA/600/Sr-93/172), included in Appendix 4, and have been demonstrated to effectively meet the performance criteria of Subtitle D and achieve a level of performance equal to or greater than earthen cover material.

5.3 OPERATING PROCEDURES

- Tarps will be applied by use of an Automatic Tarping Machine (ATM), by hand, or by using landfill equipment. Tarps maybe in the form of rolls or panels.
- Tarps will be placed over the entire working face. Any waste not covered by tarps must be covered by soil.
- Tires, sandbags, weighed chains or cables, or ballast soil will be placed along the edges to anchor the tarps.
- The facility will cover all waste with a minimum of six inches of earthen cover at the conclusion of each week's activities.
- Tarps shall not be used on any exterior/outside slopes and may not be used for intermediate cover.
- In case of extreme weather or other conditions which would impede proper application of tarps, such as heavy rainfall or strong winds, an alternately approved cover material will be utilized in lieu of this ADC.

5.4 VERIFICATION AND INSPECTION PROCEDURES

- At the end of each working day, landfill personnel will inspect the working face to confirm that the tarps have been placed over the working face in accordance with this Plan.
- If an adverse condition event occurs after tarps have been applied and becomes compromised, an alternately approved cover will be used.
- Landfill personnel will routinely assess the effectiveness of tarps in controlling vectors, fires, odors, and windblown litter and waste. Any torn or damaged tarps will be repaired or replaced, as needed.

- In the event it is determined that tarps are not effectively controlling vectors, fires, odors, or windblown litter and waste, the ADC application process will be re-evaluated to ensure that the ADC material adequately covers the working face and serves its intended purpose.

APPENDIX

1. Posi-Shell®
   - 1.a. Application Rates and Guidelines
   - 1.b. Safety Data Sheet
2. VERDac – Manufacturers Specifications
   - 2.a. Application Rates and Guidelines
   - 2.b. Safety Data Sheet
3. Atmos Cover / RusFoam® ADC – Manufacturers Specifications
   - 3.a. Application Rates and Guidelines
   - 3.b. Safety Data Sheet
4. *The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills* (EPA/600/Sr-93/172)

1. POSI-SHELL® – MANUFACTURERS SPECIFICATIONS

1.A. APPLICATION RATES AND GUIDELINES

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Posi-Shell®
ENVIRONMENTAL COATINGS

BASE MIX
USAGE GUIDE

Revised September 2016 LF

Table of Contents

This guide gives you specific, easy to follow instructions for the safe and efficient usage of LSC Environmental Products Posi-Shell® Base Mix product. For best results and to ensure safety, please follow the instructions carefully.

1.0 Definition of Posi-Shell® Base Mix

Posi-Shell® is a spray applied mineral mortar coating, similar to stucco, used for waste cover, erosion control, and hydroseeding. It is a low-cost alternative to the conventional six inches (150 mm) of soil used as daily cover at most landfills. Posi-Shell® is a noncombustible blend of materials providing a thin, non-toxic, stucco-like coating that performs all functions of landfill daily cover, intermediate cover, and erosion control. Applied with a standard hydroseeding unit, this system provides increased landfill capacity while providing a more environmentally effective cover system for the landfill.

1.1 Background and Concept

Landfilled solid waste must be covered each day to control vectors, fires, odors, blowing litter, and scavenging. Cover material is generally defined as a six inch (150 mm) soil layer or other suitable material.

Posi-Shell® is an alternative to traditional landfill daily cover materials. The coating is a spray-on slurry composed of water, Posi-Shell® Base Mix, and optional Portland cement that forms a coating for various types of landfill cover. Posi-Shell® is designed for use by a landfill operator at the close of each operating day for compliance with cover regulations. The material meets and exceeds regulatory requirements for the control of landfill vectors, fires, odors, blowing litter, and scavenging.

For most situations Posi-Shell® provides cover ranging from 4 to 10 ft^2 per gallon (0.10 to 0.25m^2/liter) of slurry but depending on conditions and desired quality coverage up to 40ft^2 per gallon (0.75m^2/L.) can be achieved. The coverage area is dependent upon the desired thickness and the texture of the covered surface. Application of Posi-Shell® is a one-man operation.

1.2 Environmental and Economic Benefits

Use of Posi-Shell® conserves energy, natural resources and improves air quality by eliminating the use of heavy earth-moving equipment for the transporting, laying, and reworking of some soil covers on the landfill.

The major benefit of the use of Posi-Shell® is the conservation of extremely valuable landfill capacity, commonly known as “air space”. Landfill air space is a valuable asset and the need to conserve capacity is paramount to achieve environmental and economic objectives for both landfill operators and regulatory agencies. Efficient use of air space today can directly translate into longer landfill life, decreased operating costs, and increased revenue generation. An increase in air space efficiency up to 20% delays the need for the siting and construction of new facilities that ultimately may have severe environmental and economic impacts.

1.3 Equipment

The equipment used for Posi-Shell® consists of a standard hydroseeding unit, a towing unit, and a water source. The towing unit is used for moving the hydroseeding unit around the landfill site. If a nearby hydrant or other water source is not available, then a water trailer or truck is required.

1.4 Personnel

One operator is required for Posi-Shell®. This operator must be capable of operating heavy equipment and be familiar with the mechanics of all equipment used. The operator will be trained by LSC Environmental Products in the use of Posi-Shell®. If preferred, a

two man operation may be used to expedite coverage time.

1.5 Materials

1.5.1 Water

Potable water, non-potable water and landfill leachate can be used as the liquid portion of Posi-Shell®. Use of leachate requires site-specific regulatory approval, operations, and safety plan to assure proper health and safety practices are implemented.

In most Posi-Shell® mixtures approximately 800 gallons (3030liters) of water is used for each 1000 gallon (3785liters) load of Posi-Shell®. The water can either be supplied by a hydrant, pumped from a nearby pond, or brought to and stored adjacent to the hydroseeding unit by water truck or trailer. The sizing of the specific water supply method should be adequate to ensure that the filling of the hydroseeding unit occurs within a few minutes' time.

As stated, leachate can be used as a water source if specific regulatory approval is obtained. It is not recommended that a high-strength leachate be used due to odor concerns and the added safety precautions required to assure worker safety. However, use of relatively dilute leachate is an effective method for reducing a portion of a landfill's total leachate production. The inherent odor-neutralizing properties of Posi-Shell® EC Series can mitigate the potential odor problems of leachate when it is used as a water source.

1.5.2 Posi-Shell® Base Mix

A proprietary blend of finely ground clay, reinforcing fiber, and coloring mixed with water creates the Posi-Shell® Base Formulation. See the back of this manual for a GHS Safety Data Sheet for this material.

1.5.3 Portland Cement

For more durable covers, optional Portland cement can be used as the cementitious mineral binder component of Posi-Shell® EC Series. Approximately 2000 lbs. (907kg) of this material is used for each 1000 gallon (3785 liter) Posi-Shell® load. The Portland cement further helps neutralize odors and contaminants found in leachate. Material Safety Data for this material is available through local suppliers.

1.5.4 Xtreme Rain Shield™

During light rains, Posi-Shell® coatings will not typically wash off. However, if heavy rains are expected prior to the product fully curing (12-24 hours) the addition of Xtreme Rain Shield™ is necessary to prevent washing. See the back of this manual for a GHS Safety Data Sheet for this material.

2.0 Safety

Posi-Shell® is nonhazardous and is composed of nonhazardous materials. Certain safety measures are recommended during different aspects of Posi-Shell® use. **Follow safety procedures specific to your hydroseeding unit, towing unit, or other equipment used.**

3.0 Operator Attire

The operator should wear appropriate protective clothing as specific by site management. Recommended protective clothing may include the following:

- Safety glasses
- Work gloves
- Approved work clothing
- Reinforced-Toe work shoes or boots
- P95 Dust mask while emptying bags into mixing unit

If leachate is being used as the liquid portion of the Posi-Shell® mixture, protective clothing in accordance with site regulations should be worn.

4.0 Towing Units

See table on Page 11 for Posi-Shell® material weights. To determine the total load weight, add the Posi-Shell® material weight to the weight of your hydroseeding unit. Ensure that the towing unit and hitch arrangement are capable of handling the total of these weights.

5.0 Loading and Mixing Procedure

It is important to add the Posi-Shell® materials in the order specified.

5.1 Liquid Addition (Step 1)

Before placing any dry material in the mixing tank, the tank must be filled with the appropriate amount of liquid (water or leachate). See chart on Page 11. If your hydroseeding unit has a reserve water tank, fill at this time with clean water. It is not recommended to use leachate as the clean out water.

All bags of material (Posi-Shell® Base Mix, Xtreme Rain Shield™, Portland cement) can be loaded through the side rails of the hydroseeding unit onto the mixing deck from the ground. Ensure that they do not obstruct the ladder area. Never attempt to carry materials up or down ladders. To avoid back injuries, always use proper lifting practices when handling bags. Frozen materials should not be used.

5.2 Posi-Shell® Base Mix Addition (Step 2) (If using component mix add Posi-Pak, PSM-200, and coloring at this time)

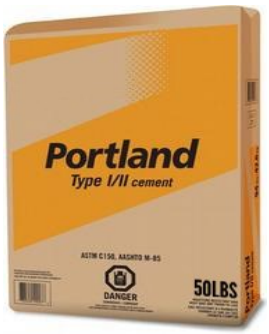
When handling Posi-Shell® Base Mix, Xtreme Rain Shield™, or Portland cement a dust mask is recommended to prevent inhalation, and coveralls and gloves to prevent skin contact. Safety glasses should be worn to keep dust from entering the eyes. Should eyes or skin come in physical contact with any Posi-Shell® ingredients thoroughly rinse with water.

With mixer paddles running at medium speed add Posi-Shell® Base Mix material by cutting open bag and dumping contents into the mixing tank (discard bag). See chart on Page 11 for quantities. Allow Posi-Shell® Base Mix to mix at high speed for about 5 minutes until peaks and craters are visible on the surface of the product. Properly thickened Posi-Shell® Base Mix will have the consistency of pudding. (see left photo below).

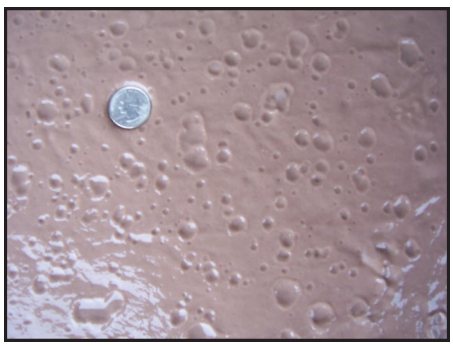
5.3 Optional Xtreme Rain Shield™

During light rains, Posi-Shell® coatings will not typically wash off. However, if heavier rains are expected prior to the product fully curing (12-24 hours), the addition of Xtreme Rain Shield™ may be necessary. Operator experience and discretion will determine which Xtreme Rain Shield™ formulation is best suited for the situation. With mixer paddles running at medium speed, add material to the already thickened Base Mix by cutting open the bag and gradually adding the contents into the mixing tank (discard bag). For better dispersion of this product into the Posi-Shell® Base Mix, recirculation through the pump and back to tank may be necessary. Properly thickened Posi-Shell® Base Mix with Xtreme Rain Shield™ added will be more sticky and "rubbery" than the Base Mix (see right photo below showing the elasticity of Xtreme Rain Shield™. Posi-Shell® Base Mix does not "stretch" this far). For best results, Portland cement should be added after the Xtreme Rain Shield™ has thickened to better activate the product. (See chart on Page 11 for quantities).

5.4 Optional Portland Cement Addition



At times more durable Posi-Shell® coatings may be desired. These can be achieved by the addition of Portland cement to the already thickened Posi-Shell® Base Mix. With mixer paddles still running at medium speed add Type I Portland cement material **(regular Portland cement, NOT concrete.)** by cutting open bag and dumping contents into the mixing tank (discard bag). See chart on Page 11 for quantities. After the Portland is added, the material will appear a more grayish brown and have a denser appearance. The thickness should still be about the same as the Posi-Shell® Base Mix (see middle photo below).



Properly Thickened Base Mix
(Quarter used for perspective)

With Portland Cement Added
(Quarter used for perspective)

With Xtreme Rain Shield™ Added
(Showing dripping from spray nozzle)

6.0 Transporting

Close inlet hopper lid prior to transportation and leave mixer paddles turning at low speed.

6.1 Cold Weather Posi-Shell® Transport

To prevent freezing during extremely cold weather (below 20°F -6°C), recirculate product through system back to mixing tank. Prior to disconnecting spray wand from recirculation hose, be sure to disengage pump.

6.2 Towing on Slopes

To avoid the possibility of equipment tipping over, always tow up or back down slopes. DO NOT traverse (tow sideways) across slopes.

Proper orientation of equipment on slope

7.0 Application of Posi-Shell®

For overnight cover, conventional end-of-day waste compaction and surface preparation are normally adequate prior to Posi-Shell® application. A smoother surface will require less material due to reduced surface area. For intermediate cover applications it may be desirable to create a smoother, more uniform receiving area by spreading available materials such as greenwaste, ash, or processed waste as leveling material over the conventional waste.

Methods of application and the recommended finished appearance of Posi-Shell® are shown in the photographs on the next page. In general, the operator should position the application unit upwind, and should select the spray nozzle appropriate to the distance from the waste pile. When changing nozzles, be sure to disengage pump before disconnecting nozzle. In some cases, it will be necessary to spray a given area from two directions to compensate for "spray shadow" effects or wind dispersion. The most effective method of coverage will vary with each site, but generally, if opposite spray angles cannot be achieved due to operational constraints, the product is best applied from the location at which it will be observed most often.

An example of Spray Shadow
(To correct, apply from opposing directions)

When high winds are encountered, it may be necessary to position the hydroseeding unit in an upwind position. Since pumps emit a high pressure stream of slurry it is not generally effected by light winds; however, wind direction should always be considered with respect to airborne dispersion of overspray.

The application process is not typically affected by cold weather. During extremely cold weather, Posi-Shell® will freeze before curing. After a thaw the material will cure. (See Page 16, Durability of Long Term Cover.)

Application of Posi-Shell® via
Deck -Mounted Discharge Wand

Application of Posi-Shell® via
Extension Hose

Daily and Intermediate Cover

Cured Long-Term Posi-Shell® Coating

7.1 Odor Control

The Posi-Shell® formulation has an inherent capability to suppress odors. By applying the Posi-Shell® as a daily cover, typical landfill odors will be reduced. Additionally if an EC Series coating is used the calcium oxide in Portland cement will further suppress odors.

Where excess or extreme odors warrant additional action, contact LSC for information about our Odor-Shell® product.

7.2 Vector Control

Posi-Shell® cover has proven affective at inhibiting the attraction of vectors to waste piles.

7.3 Scavenging

General animal scavenging is reduced since the Posi-Shell® seals in odors and hides the visible food source beneath the covering shell. Scavenging by humans is inhibited by the complete visual coverage of the waste pile and by the coating of slurry applied upon all surface objects.

7.4 Litter Control

Posi-Shell® cover is highly effective for litter control. Due to the sticky consistency and weight of the material, a shell is formed over the garbage which prevents litter from being blown away by high winds. A thin layer of Posi-Shell® cover is recommended for preventing blowing litter.

In extremely windy situations, Posi-Shell® can be applied to waste as it is being unloaded from garbage trucks. This technique has been proven highly effective.

7.5 Fire Control

Posi-Shell® cover is an extremely effective fire control material. Independent laboratory testing of Posi-Shell® by ASTM D-4982 method has certified that Posi-Shell® is non-fuel contributing, non-smoke producing, and non-combustible. When an acetylene torch is applied directly to the Posi-Shell® cover, ignition of the Posi-Shell® cover or underlying waste does not occur.

In addition to the non-flammable characteristic of Posi-Shell cover, the Posi-Shell® application unit can be used to fight landfill fires. Direct application of Posi-Shell® material to an open flame will smother it. If a subterranean landfill fire occurs, Posi-Shell® coating can be applied to the waste pile's surface and will form a fire smothering seal.

7.6 Additional Applications

Posi-Shell® cover fulfills the relevant performance criteria for various additional applications including erosion control, ditch lining, coating of sludge piles, contaminated soil piles, compost piles and temporary waste piles and excavations of various types. Posi-Shell® has been successfully applied to coal piles, salt piles, cement clinker piles and used at remediation sites to suppress volatile emissions. Posi-Shell® may also be used as the tackifier in hydroseeding mixtures.

Ditch Lining

Finished Appearance of Posi-Shell® Intermediate Cover, Daily Cover, and Erosion Control at a Major Municipal Landfill

Erosion Control

Odor Control

Posi-Shell®
Application Minimum Requirements Guideline

	SHORT TERM COVER (Depending on conditions cover can last overnight to several weeks)	MEDIUM TERM COVER (Depending on conditions cover can last several weeks to several months)	LONG TERM COVER (Depending on conditions cover can last several months to one year)
SLURRY MIXTURE*	Posi-Shell® Base Posi-Shell® EC-1 (See next page for mixtures)	Posi-Shell® EC-2 Posi-Shell® EC-4 (See next page for mixtures)	Posi-Shell® EC-2 Posi-Shell® EC-4 (See next page for mixtures)
APPLICATION RATE	Approx. 8-10 ft^2/gal.** (0.20 to 0.25 m^2/L.)	Approx. 6-8 ft^2/gal. (0.15 to 0.20 m^2/L.)	Approx. 4-6 ft^2/gal. (0.10 to 0.15 m^2/L.)
COVERAGE METHOD	Apply from two directions to eliminate spray shadow.	Apply from two directions to eliminate spray shadow.	Apply from two directions to eliminate spray shadow. For slope coverage extend cover 3-4 feet (0.9 to 1.2 meters) beyond crest of slope.
COVERAGE THICKNESS	Finished cover should be Approx. 1/8" (3.5 mm)	Finished cover should be Approx. 1/4" (6.5 mm)	Finished cover should be Approx. 3/8" (9.5 mm)
COVERAGE APPEARANCE	No waste/soil visible from any angle.	No waste/soil visible from any angle. Cover should have a "stucco-like" texture.	No waste/soil visible from any angle. Cover should have a "stucco-like" texture.
COVERAGE MAINTENANCE	None. Waste is placed over cover next working day.	Cover should be inspected periodically and touched up if waste/soil becomes visible.	Cover should be inspected periodically and touched up if waste/soil becomes visible.

* These are manufacturer's recommendations. Use and practice will determine the best mixture for each situation.

** Depending on conditions and desired quality, up to 40 ft^2/gal. (0.75m^2/L.) can be achieved.

Posi-Shell® Formulations Guide

Materials	Base	EC Series			Xtreme Rain Shield™ Series (XRS)		
		EC-1	EC-2	EC-4	Light	Medium	Heavy
Water or Leachate (Gallons)	800	800	800	800	800	800	800
Posi-Shell® Base Mix: 50 lb Bag	10	10 (500 lbs.)	10 (500 lbs.)	10 (500 lbs.)	10 (500 lbs.)	5 (250 lbs.)	5 (250 lbs.)
Portland cement (lbs)	-	500	1000	2000	500	1000	2000
Xtreme Rain Shield™ (50 lb Bag)	-	-	-	-	0.50 (25 lbs.)	2 (100 lbs.)	4 (200 lbs.)
Finished Product (Gallons)	800	850	900	1000	850	900	1000
Rain Guide (Inches)	0.0-0.25	0.0-0.5	0.0-0.5	0.0-0.5	0.5-1.0	1.0-2.0	>2.0

Materials	Base	EC Series			Xtreme Rain Shield™ Series (XRS)		
		EC-1	EC-2	EC-4	Light	Medium	Heavy
Water or Leachate (Liters)	3030	3030	3030	3030	3030	3030	3030
Posi-Shell® Base Mix: 50 lb Bag	10	10 (225 kg.)	10 (225 kg.)	10 (225 kg.)	10 (225 kg.)	6 (138 kg.)	5 (138 kg.)
Portland cement (kgs)	-	225	450	900	225	450	900
Xtreme Rain Shield™ (23 kg Bag)	-	-	-	-	0.50	2	4
Finished Product (Liters)	3030	3218	3407	3786	3218	3407	3786
Rain Guide (Centimeters)	0.0-1.25	0.0-1.25	0.0-1.25	0.0-1.25	1.25-2.54	2.54-5.08	>5.08

Amount of rainfall product typically sustains without washing.
Some leachate, hard water, and salty water may require more Posi-Shell® Base Mix to achieve proper thickness.
These are manufacturer's recommendations. Use and practice will determine the best mixture for each situation.

7.7 Discharge Nozzle Selection

While other nozzles may be used, LSC Environmental Products offers numerous types of discharge nozzles for the effective spraying of Posi-Shell® at a variety of ranges. Experience and operator discretion will determine which nozzle to use in each situation.

Long Range (Solid Stream) for Distances of 100—150 feet (30—46 meters)

Medium/Long Range (15° Flat Spray) for Distances of 75—100 feet (23—30 meters)

Medium Range (25° Flat Spray) for Distances of 25—75 feet (8—23 meters)

Short Range (50° Flat Spray) for Distances of 5—25 feet (1.5—8 meters)

High Efficiency (25° Low Flow Spray) for Distances of 5—25 feet (1.5—8 meters)

7.8 Handling the Discharge Spray Boom

Care must be taken to use the proper discharge nozzle in order to attain the desired spray range, as being too close to the surface will cause the Posi-Shell® stream to overturn waste on contact. At long range distances the Posi-Shell® stream will break up, causing the desired spray effect. At ranges under 75 ft. (23 meters) the medium or short nozzle should be used and are designed to spray in a wide ribbon pattern.

Blockages may occur in nozzles due to foreign objects in the raw materials. Refer to Section 11.1 for procedure on removing foreign object from discharge nozzle.

With the desired nozzle securely in place, firmly grasp discharge spray handle in one hand and point discharge nozzle in desired direction of spray. With the other hand engage product pump and begin covering area. For desired spray effect operator may adjust pump or throttle speed.

Never disconnect nozzles when pump is running. Never engage pump with discharge spray boom unattended. Never put hands in front of discharge nozzles.

Do not spray at or near other persons. Spray exits nozzle at a high velocity and could cause injury.

Do not spray toward power lines, transformers or other high voltage conductors. Avoid spraying into wind. When unavoidable, be sure to keep direction of spray near to ground. Safety glasses should be worn during spraying operation.

7.9 Coverage of Large Area

Coverage of a large area will require moving the application unit to several spray locations. Inspect the area from several perspectives to ensure that the spray has covered all areas.

7.10 Heavy Applications

Heavy applications may be applied in multiple coats by letting the previous coats partially dry between applications. Several thin applications provides a more consistent and durable shell than a single thick application.

8.0 Cleaning

It is recommended that the hydroseeding unit be cleaned after use. For sites using Posi-Shell® Base, the product MAY be used over several days and will not set up in the mixing tank. After the product is all used, the unit should be cleaned. For loads with Portland cement in the mixture, all the product should be used in one day and the unit cleaned after use.

1. When tank is empty of product, shut off pumps, paddles, and engine.
2. Open all inlet lids.
3. With clean water, rinse product from inlets, lids, deck, walls, etc.
4. Fill tank to mixing shaft.
5. Close inlet lids.
6. Agitate mixing paddles at high speed for several minutes, splashing water inside of tank.
7. Drain in approved location.
8. Repeat steps 4—7 as necessary.

A properly cleaned hydroseeding unit will remain free of any built-up product internally and externally.

9.0 Winter Care

In extreme cold it is imperative that engines and hydraulic systems are thoroughly warmed before introducing a load. Refer to the operations manual for your hydroseeding unit for proper winter usage and care. During cold weather periods, the hydroseeding unit tank and pump must be drained at the end of the day to avoid freezing. It is desirable, but not necessary, to bring the machinery into a heated building for overnight storage.

9.1 Posi-Shell® Winterizing Procedure

1. After cleanout, drain the mixing tank thoroughly. DO NOT REPLACE DRAIN CAP.
2. If your hydroseeding unit is equipped with a reserve water tank and/or pump, drain thoroughly. DO NOT REPLACE DRAIN CAPS.
3. Pour approximately one half gallon (1.9 L) of anti-freeze into pump or tank and slowly run through pump and lines to prevent freezing.

10.0 Materials Storage

All materials are inert, and can be stored on, or off, the boundaries of lined landfill cells.

10.1 Posi-Shell® Material Storage

10.1.1 Posi-Shell® Base Mix

Posi-Shell® Base Mix should be kept dry. Stretch wrapped pallets can be easily covered with a tarp or plastic.

10.1.2 Optional Portland Cement & Xtreme Rain Shield™

Portland cement & Xtreme Rain Shield™ should be kept dry. Stretch wrapped pallets can be easily covered with a tarp or plastic.

11.0 Troubleshooting

11.1 Removing Foreign Object from Discharge Nozzle

1. Immediately turn off pump.
2. If unit is equipped with pump reverse feature, reversing for a few seconds releases any potential pressure in lines. With nozzle pointing away, remove nozzle and clear obstruction.
3. Reconnect nozzle and continue spraying.

11.2 Removing Foreign Object from Mixing Tank

1. Shut off mixer, pump, and engine.
2. If object can be safely retrieved with extended gaff tool, remove and continue with operation. If object cannot be found, drain load in approved area, locate object, and safely remove with extended gaff tool.

11.3 Clearing Clogged Mixing Tank

1. In the unlikely event that the Posi-Shell® slurry has thickened in the mixing tank to the point that the mixer paddles will not turn, disengage mixer. Do not force mixer.
2. A strong stream of water applied to the surface of the material should begin to thin the slurry. Gently rocking the mixer should free up material and allow to mix back to normal consistency. If this procedure does not work, product would need to be manually removed from tank. It is recommended that deck plates are removed for this process, site specific PPE be worn, and confined space entry and lockout/tagout procedures are followed.

11.4 Lockout/Tagout & Confined Space Entry

1. The authorized employee must adhere to their own company's procedure for "Lockout/Tagout". He or she must understand the hazards and know how to control them.
2. If the equipment is operating, shut it down by normal stopping procedure (turn key switch off, depress emergency stop button, close valves, etc.) and remove the positive battery cable so that the machine or equipment is isolated from the battery.
3. Install tags on the battery cable lug and at the ignition control box with Date, Time, & Authorized Repair Employee's Name.
4. If repairing such items as springs, flywheels, hydraulic systems, air, gas or water pressure, etc..., stored or residual energy may be present and must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
5. Ensure that no other personnel are in the engine compartment or areas of isolation. Then verify the isolation of the equipment by operating the normal controls, testing to make certain the equipment will not operate.
6. Return all controls to "Neutral" or "OFF" after verifying the isolation of the equipment.
7. If entry into confined space is necessary, the authorized employee must adhere to their own company's procedure for "Confined Space Entry"

12.0 Contingency Soil Supply

In the event that you are unable to apply Posi-Shell®, the landfill operator should have a three-day supply of soil for daily cover material available on-site.

Recycling Waste Latex Paint With Posi-Shell®

Liquids in Landfills – To limit the generation of leachate in solid waste landfills, 40 CFR Part 264.314 and 265.314 cites restrictions on the disposal of material containing free liquids. The criteria used to determine whether a material contains free liquids is the ASTM B9095 Paint Filter Test Method in which 100-mL or 100-g of sample of material is placed into a standard conical paint filter (mesh number +/-5%, available at local paint stores). In short, if any of the material passes through and drops from the filter within a 5 minute test period, the material is deemed to contain free liquids.

Household Hazardous Waste - Household Hazardous Waste (HHW) departments offer various programs for residents and businesses to dispose of special wastes including but not limited to certain free liquids such as oils, aerosols, detergents, and paints most of which, after collection, are forwarded to specialty facilities for disposal or recycling.

Waste Latex Paint - Waste latex paint (WLP) can be generated in large quantities which results in high disposal costs for the solid waste facilities that collect it. Being water based, WLP is non-hazardous but is a free liquid and therefore may not be disposed in it's original form in solid waste facilities.

Traditional Methods of disposal - Methods employed by solid waste facilities for disposing of WLP, once collected, are varied. In some cases, residents are instructed to solidify the WLP by mixing it with a product such as litter box media or other absorbent and then dispose of it along with their other residential waste, while others facilities may collect the WLP, warehouse it, and offer residents a "drop and swap" program. Many facilities not favoring these programs will pay to have WLP removed by third party firms permitted to dispose of or recycle it in some way.

Beneficial Reuse with Posi-Shell® - Numerous solid waste facilities utilizing the Posi-Shell® Cover System (for alternate daily cover, intermediate cover, erosion control, etc.) recycle WLP through the spray-applied Posi-Shell® product. Since Posi-Shell® is a thick, viscous, mineral mortar slurry which passes the ASTM B9095 Paint Filter Test Method, approval to add quantities of WLP into this slurry can be obtained, thus altering the WLP from a free liquid into a beneficially reused solid.

LSC Environmental Products endorses the use of WLP in the Posi-Shell® mixture as this additive actually enhances the coating in a number of ways and has no negative effect on application equipment. The WLP becomes a part of the hardened coating and does not recirculate through the landfill as a free liquid . Under the compaction of heavy landfill equipment, the WLP-enhanced Posi-Shell® breaks up and falls into surface voids already present on the working face. Posi-Shell® does not create impermeable layers within a landfill cell and has no negative effect on leachate or leachate collection systems.

Numerous methods exist for collecting and storing WLP for use with Posi-Shell®. Facilities collecting only small quantities usually store the WLP in the original cans or containers in an approved area. Facilities collecting larger quantities utilize automated can crushers which puncture, empty, and size reduce one and five gallon cans and collect the paint into larger drums. Regardless of the collection process it is recommended to screen the WLP through a 5/16" expanded metal sieve prior to pouring into application equipment

Approval - Historically, obtaining approval for adding WLP to Posi-Shell® is not difficult. Generally, submittal to the state regulatory agency for a demonstration project period is required and possibly a minor modification to the operating permit.

Mixture Ratio - Approximately 10% WLP can be added to every gallon of finished Posi-Shell® slurry.

Mixture Procedure - WLP is added to the finished Posi-Shell® slurry, after all other ingredients have been mixed.

Durability of Posi-Shell® Long Term Cover

When used for long term cover, Posi-Shell® Coatings should be applied at 4-6 sq. ft. per gallon using application techniques described in the Base Mix Usage Guide. For best results apply product while outdoor temperature is above 50° F with no precipitation, and on a dry surface. These "ideal conditions" should remain for 48 hours after application to allow product to cure properly. When applied as described above customers in various climate and precipitation zones regularly achieve 12 months of durable cover with little to no maintenance.

The "duration" or "durability" of long term cover is understood to mean that the cover will perform as well as it did shortly after application and curing. Around the 12 month point, if no maintenance has been performed, the cover could begin to deteriorate from exposure to various elements, but will likely continue performing it's desired function (i.e.: erosion control, dust control, etc.). In this case, "durability" of cover could extend well beyond this 12 month period.

If an end user wants to maintain cover at "just applied" conditions, they may expect to use 5-20% of the original application materials for touch up annually, depending on the application surface.

Long term durability is best achieved using Posi-Shell® Coatings with durability enhancer added; however, if the product is applied in less than "ideal conditions" (i.e.: below 50° F, in rainy conditions, or on wet surfaces), the duration of the cover may become shortened. Describing exactly the shortened duration period is difficult, but field experience shows that the product will likely perform for several months even when applied in less than ideal conditions. Product should not be applied to standing water, or in heavy rainfall. The addition of Xtreme Rain Shield is recommended when application during rainfall is unavoidable, or when heavy rainfall is forecasted.

1.B. SAFETY DATA SHEET

GHS Safety Data Sheet SDS

LSC Environmental Products, LLC
Issue Date: June 15, 2015

Posi-Shell® Base Mix Page 1 of 4

1 Identification

Supplier LSC Environmental Products, LLC
2183 Pennsylvania Ave
Apalachin, NY 13732
Telephone: 607-625-3050
Fax: 607-625-2688
Web: www.lscenv.com

Product Name **Posi-Shell® Base Mix**
Description: Sodium Montmorillonite Clay (SMC) with Synthetic Fibers and Coloring
CAS Number: N/A
Recommended Use: Spray Applied Environmental Coatings.

2 Hazards Identification

Route of Entry: Eye Contact, Skin Contact, Inhalation
Hazards:
Eye: May cause mechanical irritation.
Skin: May cause drying resulting in dermatitis.
Ingestion: No known health effects.
Inhalation: Acute: Short term exposure may cause mechanical irritation resulting in dry cough. May aggravate existing respiratory illness.
Chronic: Repeated inhalation of respirable* crystalline silica above exposure limits can cause lung disease, including silicosis and lung cancer.

NFPA: Not regulated, Non-hazardous

3 Composition / Information on Ingredients

Component	CAS#	Amount
Sodium Montmorillonite Clay (SMC)*	N/A	> 90%

*Typical western SMC contains 1-6% crystalline silica as quartz CAS# 14808-60-7.

4 First-Aid Measures

Eye: Flush eyes and under eye lids with plenty of water until irritation ceases. Contact physician if irritation persists.
Skin: Wash with soap and water until clean. Contact physician if irritation develops.
Ingestion: None known.
Inhalation: Move to area free from dust. If symptoms of irritation persist, contact physician. Inhalation may aggravate existing respiratory illness.

GHS Safety Data Sheet SDS

LSC Environmental Products, LLC
Issue Date: June 15, 2015

5 Fire Fighting Measures

Flammability: Non-flammable

6 Accidental Release Measures

Personal Precaution: Avoid breathing dust; wear respirator approved for silica bearing dust.
Cleanup: Vacuum to avoid generating airborne dust. Avoid using water. Material becomes slippery when wet.

7 Handling and Storage

Handling: Use NIOSH/MSHA respirators approved for silica bearing dust when airborne SMC dust levels exceed PEL/TLVs. Clean up spills promptly to avoid making dust. Storage area floors may become slippery if wetted.
Storage: Store in a dry place.

8 Exposure Controls / Personal Protection

Exposure Guidelines (Inhalation):

Component	OSHA PEL (8 hr TWA)	ACGIH TVL
Crystalline Silica as Quartz	0.1 mg/m^3	0.1 mg/m^3
Particles not Otherwise Regulated		
Total Dust	15 mg/m^3	N/A
Respirable Dust	5 mg/m^3	N/A

Engineering Controls: None required for outdoor mixing and application. Use local ventilation to maintain PELs/TLVs if handling indoors.

Personal Protective Equipment:
- Eye and Face Protection: Wear safety glasses or goggles during loading and application to protect from dust, splashing, and spray mist.
- Skin Protection: Wear work gloves and approved work clothing. Personal hygiene measures, such as washing hands and face after working with materials, are recommended.
- Respiratory Protection: When handling generates dust wear P95 dust mask.

9 Physical and Chemical Properties

Appearance: Off-white dry powder. Small quantity of brown powder and fine white fibers also present in package.

GHS Safety Data Sheet SDS

LSC Environmental Products, LLC
Issue Date: June 15, 2015

Odor:	Not Determined
pH:	8-10 (5% aqueous suspension)
Relative Density (H2O=1):	2.45-2.55
Bulk Density (at 20º C):	55 lbs/cu ft as dry product
Melting Point:	Approx. 1450º C
Solubility in Water:	<2% soluble by weight.
Flammability:	Non-flammable

10 Stability and Reactivity

Stability:	Stable
Hazardous Decomposition Products:	None under normal handling conditions.
Hazardous Polymerization:	Will not occur.
Incompatible Materials:	Hydrofluoric Acid.

11 Toxicological Information

Carcinogenicity:

- Sodium Montmorillonite Clay is not listed by ACGIH, IARC, NTP, or OSHA.
- IARC, 1997, concludes that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica from occupational sources (IARC Class 1), that carcinogenicity was not detected in all industrial circumstances studied and that carcinogenicity may depend on characteristics of the crystalline silica or on external factors affecting its biological activity. NTP classifies respirable crystalline silica as "known to be a human carcinogen" (NTP 9th Report on Carcinogens - 2000). ACGIH classifies crystalline silica quartz as a suspected human carcinogen (A2).

12 Ecological Information

No information available.

13 Disposal Considerations

Bury in licensed landfill according to local, state, and federal regulations.

14 Transportation Information

US DOT: Non-regulated

15 Regulatory Information

None of the components in this product are known to be regulated by national or international regulatory bodies.

GHS Safety Data Sheet SDS

16 Other Information

SDS Status: Revised from MSDS format in 2015 to comply with GHS requirements.

All information presented herein is believed to be accurate; however, it is the user's responsibility to determine in advance of need that the information is current and suitable for their circumstances.
No warranty or guarantee, expressed or implied, is made by LSC Environmental Products, LLC as to this information or as to the safety, toxicity, or effect of the use of this product.

LSC
ENVIRONMENTAL
PRODUCTS, LLC

MATERIAL SAFETY DATA SHEET

PRODUCT: **OSHA 29CFR 1910.1200**

POSI-SHELL® SLURRY **DATE OF PREPARATION: APRIL 2006**

SECTION I -- IDENTITY

Distributor's Name and Address:	LSC Environmental Products, LLC 2183 Pennsylvania Avenue Apalachin, NY 13732
Emergency Telephone:	(607) 625-3050
Chemical Name and Synonyms:	Aqueous clay based slurry
Generic Name:	N/A
Trade Name:	Posi-Shell®

SECTION II -- HAZARDOUS INGREDIENTS

N/A

SECTION III -- PHYSICAL DATA

Boiling Point (°F) (Aqueous Portion):	212 (100° C)
Vapor Pressure (mm. Hg):	N/A
Vapor Density (Air=1):	N/A
Solubility in Water:	N/A
Percent Volatile by Volume (%):	N/A
Specific Gravity (H2O=1):	1.21
Evaporation Rate:	N/A
Appearance and Odor:	Brown viscid liquid slurry with a smell similar to liquid clay and wet cement if Portland cement is used.

SECTION IV -- CHEMICAL DATA

Chemical family:	N/A
Formula:	The major constituents are water (or landfill leachate), sodium montmorillinite clay, cellulosic polymers, soda ash, P.E.T. fibers, iron oxide coloring, and optional Portland cement.
Hazardous mixtures of other liquids, solids, or gases:	N/A

SECTION V -- FIRE AND EXPLOSION HAZARD DATA

Non-explosive, Non-flammable

LSC
ENVIRONMENTAL
PRODUCTS, LLC

MATERIAL SAFETY DATA SHEET

Date of Preparation: February 2011

SECTION 1 — IDENTIFICATION

Supplier: LSC Environmental Products, LLC
2183 Pennsylvania Ave
Apalachin, NY 13732
Emergency Telephone: 800-800-7671 (LSC)
Product/Trade Name: **Posi-Shell Base Mix**
Chemical Name: SODIUM MONTMORILLONITE CLAY WITH ADDITIVES AND FIBERS
Generic Name: SMC with proprietary additives and Polyester Fibers

SECTION 2 — HAZARD(S) IDENTIFICATION

POTENTIAL HEALTH EFFECTS (See Section 11 for toxicological data.)
EYE:Mechanical irritant.
SKIN:Possible drying resulting in dermatitis.
INGESTION:No adverse effects.
INHALATION:*Acute* (short term) exposure to dust levels exceeding the PEL may cause irritation of respiratory tract resulting in a dry cough. *Chronic* (long term) exposure to airborne SMC dust containing respirable size (=10μ) quarter particles, where respirable quartz particle levels are higher than TLVs, may lead to development of silicosis or other respiratory problems. Persistent dry cough and labored breathing upon exertion may be symptomatic.
CARCINOGENICITY:SMC is not listed by ACGIH, IARC, NTP, or OSHA. IARC, 1997, concludes that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica from occupational sources (IARC Class 1), that carcinogenicity was not detected in all industrial circumstances studied and that carcinogenicity may depend on characteristics of the crystalline silica or on external factors affecting its biological activity. NTP classifies respirable crystalline silica as "known to be a human carcinogen" (NTP 9th Report on Carcinogens - 2000). ACGIH classifies crystalline silica quartz as a suspected human carcinogen (A2).
NOTE: Polyester Staple is a family of fiber products having similar hazard and physical property characteristics. The polymer immobilizes the constituents of the polymer system (delusterants, catalyst residues, etc.) which, therefore, present no likelihood of exposure under normal conditions of processing and handling.

SECTION 3 — COMPOSITION / INFORMATION ON INGREDIENTS

Composition / Information on Ingredients

Sodium Montmorillonite Clay with Additives	CAS# 1318-93-0
Crystalline Silica (SiO_2) as Quartz	CAS# 14808-60-7
Polyethylene terephthalate polymer and one or more surface finishes (organic lubricants) – Polyester Staple	CAS#25038-59-9

SECTION 4 — FIRST AID MEASURES

EYE: Flush eyes with plenty of water until irritation ceases.
SKIN: Wash with soap and water until clean.
INHALATION: Move to area free from dust. If symptoms of irritation persist, contact physician. Inhalation may aggravate existing respiratory illness.

SECTION 5 — FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASH POINT: Not applicable.
SPECIAL FIRE FIGHTING PROCEDURES: Not applicable.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None. Product will not support combustion.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (°F):	N/A
Vapor Pressure (mm. Hg):	N/A
Vapor Density (Air=1):	N/A
Solubility in Water:	Insoluble, forms colloidal suspension
Density (at 20° C):	55 lbs/cu ft as product
Specific Gravity (H2O=1):	2.45-2.55
Melting Point:	Approx. 1450° C
Evaporation Rate (Butyl Acetate=1):	N/A
pH:	8-10 (5% aqueous suspension)

SECTION 10 — STABILITY AND REACTIVITY

CHEMICAL STABILITY:Polyethylene terephthalate is chemically stable and resistant to attack by oils, solvents, weak acids, and weak alkalis. SMC is stable.
CONDITIONS TO AVOID: None.
HAZARDOUS DECOMPOSITION PRODUCTS: None.
HAZARDOUS POLYMERIZATION: None.
INCOMPATIBILITY WITH OTHER MATERIALS: None.

SECTION 11 — TOXICOLOGICAL INFORMATION

(See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1). This product has not been fully evaluated for toxicological properties. Preliminary evaluation of chemical components used in the finish and toxicological testing of the polymer have given no indication that health problems would occur in normal handling and use.

SECTION 12 — ECOLOGICAL INFORMATION

(For detailed Ecological data, write or call the address or non-emergency number shown in Section 1)
ECOTOXICITY: Not expected to be acutely toxic.

SECTION 13 — DISPOSAL CONSIDERATIONS

(See Section 15 for Regulatory Information)
DISPOSAL: Product should be disposed of in accordance with applicable local, state, and federal regulations.

SECTION 14 — TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.): This product is not regulated by D.O.T. when shipped domestically by land.
CANADIAN TDG INFORMATION:For TDG regulatory information, if required, consult transportation regulations, product shipping papers.

SECTION 15 — REGULATORY INFORMATION

(Not meant to be all-inclusive—selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

These products are not classified as hazardous wastes under the Resource Conservation and Recovery Act, and unless prohibited by state or local regulation, can be disposed of in a municipal landfill or incinerated. Any finish oils contained in plant wastewater should be biodegradable in conventional biological wastewater treatment systems.

SECTION 16 — OTHER INFORMATION

MSDS STATUS: Revised to 16 Section format.

OTHER FLAMMABILITY INFORMATION: Mechanical handling can cause formation of dusts. To reduce the potential for dust explosion, do not permit dust to accumulate. Material can be ignited by static discharge. Electrically ground all equipment. Do not permit dust to accumulate. Dust layers can be ignited by spontaneous combustion or other ignition sources. When suspended in air dust can pose an explosion hazard.

EXTINGUISHING MEDIA: Water, carbon dioxide and dry chemical.

FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone. Hand held carbon dioxide or dry chemical hazard may result from forceful application of fire extinguishing agents.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

ACCIDENTAL RELEASE MEASURES (See Section 15 for Regulatory Information)

PROTECT PEOPLE: Material becomes slippery when wet.

PROTECT THE ENVIRONMENT: Contain spilled material to prevent contamination of soil, surface water or ground water.

CLEANUP: Spills should be cleaned up immediately using care to minimize generation of airborne dust.

HANDLING AND STORAGE

HANDLING: Good housekeeping and controlling of dusts are necessary for safe handling of product. No smoking, open flames or sources of ignition in handling and storage area.

STORAGE: Store in a dry place. Store below 90 F (32 C).

EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general and / or local exhaust ventilation to control airborne levels below the exposure guidelines.

PERSONAL PROTECTIVE EQUIPMENT

EYE / FACE PROTECTION: Use safety glasses. If there is a potential for exposure to particles, which could cause mechanical injury to the eye, wear chemical goggles.

SKIN PROTECTION: No precautions other than clean body-covering clothing should be needed.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. In dusty atmospheres, use an approved dust respirator.

EXPOSURE GUIDELINES: Hydroxopropyl methyl cellulose: IHG is 10 mg/m3.

PHYSICAL AND CHEMICAL PROPERITES

APPEARANCE / PHYSICAL STATE: White to off-white free-flowing powder.

ODOR: Not available.

VAPOR PRESSURE: Not applicable.

VAPOR DENSITY: Not applicable.

BOILING POINT: Not applicable.

SOLUBILITY IN WATER / MISCIBILITY: Not applicable.

SPECIFIC GRAVITY / OR DENSITY: Not applicable.

STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under recommended storage conditions. See Storage, Section 7.

CONDITIONS TO AVOID: product can decompose at elevated temperatures.

HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid contact with oxidizing materials. Avoid contact with strong acids, strong bases.

TOXICOLOGICAL INFORMATION (See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1)

INGESTION: The oral LD50 for rats is >10,000 mg/kg.

MUTAGENICITY: For methylcellulose, a similar cellulosic: in vitro mutagenicity studies were negative; animal mutagenicity studies were negative.

2. VERDAC – MANUFACTURERS SPECIFICATIONS

2.A. APPLICATION RATES AND GUIDELINES

ENVIRONMENTAL PRODUCTS, LLC™

2183 Pennsylvania Avenue
Apalachin, NY 13732
Ph: 800-800-7671
Fx: 607-625-2689
www.lscenv.com

VERDac
LANDFILL COVER PELLETS

USAGE GUIDE

August 2020

Table of Contents

This guide gives you specific, easy to follow instructions for the safe and efficient usage of LSC Environmental Products VERDac Landfill Cover Pellets product. For best results and to ensure safety, please follow the instructions carefully.

1.0 Definition of VERDac Landfill Cover Pellets

VERDac Landfill Cover Pellets is a spray-applied mulch and mineral mortar slurry comprised of water and a proprietary combination of cellulose fiber, powdered clay, adhesives, and water conditioners, used for waste cover and hydroseeding. It is a low-cost alternative to the conventional six inches (150 mm) of soil used as daily cover at most landfills. VERDac Pellets is a non-flammable blend of mulch and mineral binder providing a thin, non-toxic coating that performs all functions of landfill daily cover. Applied with a standard hydroseeding unit, this product provides increased landfill capacity while providing a more environmentally effective cover system for the landfill.

1.1 Background and Concept

Landfilled solid waste must be covered each day to control vectors, fires, odors, blowing litter, and scavenging. Cover material is generally defined as a six inch (150 mm) soil layer or other suitable material. VERDac Pellets is designed for use by a landfill operator at the close of each operating day for compliance with cover regulations.

For most situations VERDac Pellets provides cover ranging from 10 ft^2 to 15 ft^2 per gallon (0.93 to 1.4 m^2/liter) of slurry but depending on conditions and desired quality coverage up to 30t^2 per gallon (2.8 m^2/L.) can be achieved. The coverage area is dependent upon the desired thickness and the texture of the covered surface. Application of VERDac Pellets is a one-man operation.

1.2 Environmental and Economic Benefits

Use of VERDac Pellets conserves energy, natural resources and improves air quality by eliminating the use of heavy earthmoving equipment for the transporting, laying, and reworking of some soil covers on the landfill.

The major benefit of the use of VERDac Pellets is the conservation of extremely valuable landfill capacity, commonly known as “air space”. Landfill air space is a valuable asset and the need to conserve capacity is paramount to achieve environmental and economic objectives for both landfill operators and regulatory agencies. Efficient use of air space today can directly translate into longer landfill life, decreased operating costs, and increased revenue generation. An increase in air space efficiency up to 20% delays the need for the siting and construction of new facilities that ultimately may have severe environmental and economic impacts.

1.3 Equipment

The equipment used for VERDac Pellets consists of a standard hydroseeding unit, a towing unit, and a water source. The towing unit is used for moving the hydroseeding unit around the landfill site. If a nearby hydrant or other water source is not available, then a water trailer or truck is required.

1.4 Personnel

One operator is required for VERDac Pellets. This operator must be capable of operating heavy equipment and be familiar with the mechanics of all equipment used. The operator may be trained by LSC Environmental Products in the use of VERDac Pellets. If preferred, a two man operation may be used to expedite coverage time.

1.5 Materials

1.5.1 Water

Potable water, non-potable water and landfill leachate can be used as the liquid portion of VERDac Pellets. Use of leachate requires site-specific regulatory approval, operations, and safety plan to assure proper health and safety practices are implemented. In most VERDac Pellet mixtures approximately 1000 gallons (3785 liters) of water is used for each load of VERDac Pellets.

Each 50 lb (22.7 kg) bag of VERDac Pellets typically mixes with approximately 80 gallons (303 liters) of water. The water can either be supplied by a hydrant, pumped from a nearby pond, or brought to and stored adjacent to the hydroseeding unit by water truck or trailer. The sizing of the specific water supply method should be adequate to ensure that the filling of the hydroseeding unit occurs within a few minutes time.

As stated, leachate can be used as a water source if specific regulatory approval is obtained. It is not recommended that a high-strength leachate be used due to odor concerns and the added safety precautions required to assure worker safety. However, use of relatively dilute leachate is an effective method for reducing a portion of a landfill's total leachate production. The inherent odor-neutralizing properties of VERDac Pellets can mitigate the potential odor problems of leachate when it is used as a water source.

1.5.2 VERDac Landfill Cover Pellets

A proprietary blend of finely ground mulch, mineral binders and coloring mixed with water creates the VERDac Pellets Landfill Cover. See the back of this manual for a GHS Safety Data Sheet for this material.

1.5.3 Xtreme Rain Shield

During light rains, VERDac Pellets coatings will not typically wash off. However, if heavy rains are expected prior to the product fully drying (12-24 hours) the addition of Xtreme Rain Shield may help to prevent washing.

2.0 Safety

VERDac Pellets is nonhazardous and is composed of nonhazardous materials. Certain safety measures are recommended during different aspects of VERDac Pellets use. **Follow safety procedures specific to your hydroseeding unit, towing unit, or other equipment used.**

3.0 Operator Attire

The operator should wear appropriate protective clothing as specific by site management. Recommended protective clothing may include the following:

- Safety glasses
- Work gloves
- Approved work clothing
- Reinforced-Toe work shoes or boots
- P95 Dust mast while emptying bags into mixing unit

If leachate is being used as the liquid portion of the VERDac Pellets mixture, protective clothing in accordance with site regulations should be worn.

4.0 Towing Units

See table on Page 11 for VERDac Pellets material weights. To determine the total load weight, add the liquid weight, VERDac Pellets material weight and the weight of your hydroseeding unit. Ensure that the towing unit and hitch arrangement are capable of handling the total of these weights. *Note: 100 gallons/378.5 liters of water weighs approximately 836 lbs./379 kg.*

5.0 Loading and Mixing Procedure

It is important to add the VERDac Landfill Cover Pellets materials in the order specified.

5.1 Liquid Addition (Step 1)

Before placing any dry material in the mixing tank, the tank must be filled with the appropriate amount of liquid (water or leachate). Each 50 lb (22.7 kg) bag of VERDac Pellets typically mixes with 80 gallons (303 liters) of water. See chart on Page 11. If your hydroseeding unit has a reserve water tank, fill at this time with clean water. It is not recommended to use leachate as the clean out water.

All bags of material (VERDac Pellets Landfill Cover and Xtreme Rain Shield) can be loaded through the side rails of the hydroseeding unit onto the mixing deck from the ground. Ensure that they do not obstruct the ladder area. Never attempt to carry materials up or down ladders. To avoid back injuries, always use proper lifting practices when handling bags. Frozen materials should not be used.

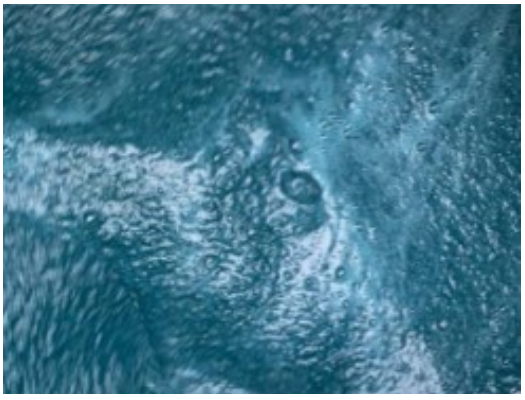
5.2 VERDac Landfill Cover Pellets Addition (Step 2)

VERDac Pellets or Xtreme Rain Shield produces very little dust but a dust mask is recommended to prevent inhalation, and coveralls and gloves to prevent skin contact. Safety glasses should be worn to keep dust from entering the eyes. Should eyes or skin come in physical contact with any VERDac ingredients thoroughly rinse with water.

With mixer paddles running at medium speed add VERDac Pellets material by cutting open bag and dumping contents into the mixing tank (discard bag). See chart on Page 11 for quantities. Allow VERDac Pellets to mix at high speed for about 5 minutes until peaks and craters are visible on the surface of the product. Properly thickened VERDac Pellets will have a somewhat homogenous consistency. (see left photo below).

5.3 Optional Xtreme Rain Shield

During light rains, VERDac Pellets coatings will not typically wash off. However, if heavier rains are expected prior to the product fully drying (12-24 hours), the addition of up to 20% Xtreme Rain Shield may be necessary. Operator experience and discretion will determine which Xtreme Rain Shield formulation is best suited for the situation. With mixer paddles running at medium speed, add material to the already thickened VERDac Pellets by cutting open the bag and gradually adding the contents into the mixing tank (discard bag). For better dispersion of this product into the VERDac Pellets, recirculation through the pump and back to tank may be necessary. Properly thickened VERDac Pellets with Xtreme Rain Shield added will be more homogenous and a lighter green color than basic VERDac Pellets (see right photo below).



Properly Thickened VERDac Pellets

6.0 Transporting

Close inlet hopper lid prior to transportation and leave mixer paddles turning at low speed.

6.1 Cold Weather VERDac Pellets Transport

To prevent freezing during extremely cold weather (below 20°F -6°C), recirculate product through system back to mixing tank.

6.2 Towing on Slopes

To avoid the possibility of equipment tipping over, always tow up or back down slopes. DO NOT traverse (tow sideways) across slopes.

Proper orientation of equipment on slope

7.0 Application of VERDac Pellets

For overnight cover, conventional end-of-day waste compaction and surface preparation are normally adequate prior to VERDac Pellets application. A smoother surface will require less material due to reduced surface area.

Methods of application and the recommended finished appearance of VERDac Pellets are shown in the photographs on the next page. In general, the operator should position the application unit upwind, and should select the spray nozzle appropriate to the distance from the waste pile. When changing nozzles, be sure to disengage pump before disconnecting nozzle. In some cases, it will be necessary to spray a given area from two directions to compensate for "spray shadow" effects or wind dispersion. The most effective method of coverage will vary with each site, but generally, if opposite spray angles cannot be achieved due to operational constraints, the product is best applied from the location at which it will be observed most often.

When high winds are encountered, it may be necessary to position the hydroseeding unit in an upwind position. Since pumps emit a high pressure stream of slurry it is not generally effected by light winds; however, wind direction should always be considered with respect to airborne dispersion of overspray.

The application process is not typically affected by cold weather.

Daily Cover

Application of VERDac Pellets for hydroseeding

Application of VERDac Pellets via
Deck -Mounted Discharge Wand

7.1 Odor Control

VERDac Pellets formulation has an inherent capability to suppress odors. By applying the VERDac Pellets as a daily cover, typical landfill odors will be reduced.

Where excess or extreme odors warrant additional action, contact LSC for information about our Odor-Shell® product.

7.2 Vector Control

VERDac Pellets Landfill Cover has proven affective at inhibiting the attraction of vectors to waste piles.

7.3 Scavenging

General animal scavenging is reduced since the VERDac Pellets seals in odors and hides the visible food source beneath the covering shell. Scavenging by humans is inhibited by the complete visual coverage of the waste pile and by the coating of slurry applied upon all surface objects.

7.4 Litter Control

VERDac Pellets is highly effective for litter control. Due to the sticky consistency and weight of the material, a shell is formed over the garbage which prevents litter from being blown away by high winds. A thin layer of VERDac Pellets is recommended for preventing blowing litter.

In extremely windy situations, VERDac Pellets can be applied to waste as it is being unloaded from garbage trucks. This technique has been proven highly effective.

7.5 Fire Control

VERDac Pellets is an extremely effective fire control material. Independent laboratory testing of VERDac Pellets by ASTM D-4982 method has certified that VERDac Pellets is non-fuel contributing, non-smoke producing, and non-combustible. When an acetylene torch is applied directly to the VERDac Pellets cover, ignition of the VERDac Pellets cover or underlying waste does not occur.

7.6 Additional Applications

VERDac Pellets may also be used as a hydroseeding medium. Addition of EarthGuard® may be required for some landfill surfaces. Contact us for more details.

VERDac Landfill Cover Pellets
Application Minimum Requirements Guideline

	SHORT TERM COVER (**Depending on conditions cover can last overnight to several days)**
SLURRY MIXTURE*	VERDac Landfill Cover Pellets (See next page for mixtures)
APPLICATION RATE	Approx. 10-15 ft^2/gal.** (0.93 - 1.4 m^2/L.)
COVERAGE METHOD	Apply from two directions to compensate for spray shadow.
COVERAGE THICKNESS	Finished cover should be Approx. 1/8" (3.5 mm)
COVERAGE APPEARANCE	Depending on surface conditions, some trash may be visible. Product still 100% functional.
COVERAGE MAINTENANCE	None. Waste is placed over cover next working day.

* These are manufacturer's recommendations. Use and practice will determine the best mixture for each situation.
** Depending on conditions and desired quality, up to 30 ft^2/gal. (2.8 m^2/L.) can be achieved.

VERDac Landfill Cover Pellets Formulations Guide

Materials	Base	
Water or Leachate (Gallons)	1000	(~80 gallons per bag of VERDac Pellets
VERDac: 50 lb Bag	13	
Xtreme Rain Shield (50 lb Bag)	1-2	(May be necessary for heavy rain)
Finished Product (Gallons)	1000	

Materials	Base	
Water or Leachate (Liters)	3,785	(~303 liters per bag of VERDac Pellets
VERDac 23 kg Bag	13	
Xtreme Rain Shield (23 kg Bag)	1-2	(May be necessary for heavy rain)
Finished Product (Liters)	3,785	

Some leachate, hard water, and salty water may require more VERDac Pellets to achieve proper thickness.
These are manufacturer's recommendations. Use and practice will determine the best mixture for each situation.

7.7 Discharge Nozzle Selection

While other nozzles may be used, LSC Environmental Products offers numerous types of discharge nozzles for the effective spraying of VERDac Pellets at a variety of ranges. Experience and operator discretion will determine which nozzle to use in each situation.

Long Range (Solid Stream) for Distances of 100—150 feet (30—46 meters)

Medium/Long Range (15° Flat Spray) for Distances of 75—100 feet (23—30 meters)

Medium Range (25° Flat Spray) for Distances of 25—75 feet

Short Range (50° Flat Spray) for Distances of 5—25 feet

High Efficiency (25° Low Flow Spray) for Distances of 5—25 feet

7.8 Handling the Discharge Spray Boom

Care must be taken to use the proper discharge nozzle in order to attain the desired spray range, as being too close to the surface will cause the VERDac Pellets stream to overturn waste on contact. At long range distances the VERDac Pellets stream will break up, causing the desired spray effect. At ranges under 75 ft. (23 meters) the medium or short nozzle should be used and are designed to spray in a wide fan pattern.

Blockages may occur in nozzles due to foreign objects in the raw materials. Refer to Section 11.1 for procedure on removing foreign object from discharge nozzle.

With the desired nozzle securely in place, firmly grasp discharge spray handle in one hand and point discharge nozzle in desired direction of spray. With the other hand engage product pump and begin covering area. For desired spray effect operator may adjust pump or throttle speed.

Never disconnect nozzles when pump is running. Never engage pump with discharge spray boom unattended. Never put hands in front of discharge nozzles.

Do not spray at or near other persons. Spray exits nozzle at a high velocity and could cause injury.

Do not spray toward power lines, transformers or other high voltage conductors. Avoid spraying into wind. When unavoidable, be sure to keep direction of spray near to ground. Safety glasses should be worn during spraying operation.

7.9 Coverage of Large Area

Coverage of a large area will require moving the application unit to several spray locations. Inspect the area from several perspectives to ensure that the spray has covered all areas.

8.0 Cleaning

It is recommended that the hydroseeding unit be cleaned after use. VERDac Pellets may be used over several days and will not set up in the mixing tank. After the product is all used, the unit should be cleaned.

1. When tank is empty of product, shut off pumps, paddles, and engine.
2. Open all inlet lids.
3. With clean water, rinse product from inlets, lids, deck, walls, etc.
4. Fill tank to mixing shaft.
5. Close inlet lids.
6. Agitate mixing paddles at high speed for several minutes, splashing water inside of tank.
7. Drain in approved location.
8. Repeat steps 4—7 as necessary.

A properly cleaned hydroseeding unit will remain free of any built-up product internally and externally.

9.0 Winter Care

In extreme cold it is imperative that engines and hydraulic systems are thoroughly warmed before introducing a load. Refer to the operations manual for your hydroseeding unit for proper winter usage and care. During cold weather periods, the hydroseeding unit tank and pump must be drained at the end of the day to avoid freezing. It is desirable, but not necessary, to bring the machinery into a heated building for overnight storage.

9.1 Applicator Winterizing Procedure

1. After cleanout, drain the mixing tank thoroughly. DO NOT REPLACE DRAIN CAP.
2. If your hydroseeding unit is equipped with a reserve water tank and/or pump, drain thoroughly. DO NOT REPLACE DRAIN CAPS.
3. Pour approximately one half gallon (1.9 L) of anti-freeze into pump or tank and slowly run through pump and lines to prevent freezing.

10.0 Materials Storage

All materials are inert and can be stored on or off the boundaries of lined landfill cells.

10.1 VERDac Pellets Material Storage

VERDac Pellets should be kept dry. Stretch wrapped pallets can be easily covered with a tarp or plastic as a secondary measure of protection.

10.2 Xtreme Rain Shield

Xtreme Rain Shield should be kept dry. Stretch wrapped pallets can be easily covered with a tarp or plastic as a secondary measure of protection. .

11.0 Troubleshooting

11.1 Removing Foreign Object from Discharge Nozzle

1. Immediately turn off pump.
2. If unit is equipped with pump reverse feature, reversing for a few seconds releases any potential pressure in lines. With nozzle pointing away, remove nozzle and clear obstruction.
3. Reconnect nozzle and continue spraying.

11.2 Removing Foreign Object from Mixing Tank

1. Shut off mixer, pump, and engine.
2. If object can be safely retrieved with extended gaff tool, remove and continue with operation. If object cannot be found, drain load in approved area, locate object, and safely remove with extended gaff tool.

11.3 Clearing Clogged Mixing Tank

1. In the unlikely event that the VERDac Pellets slurry has thickened in the mixing tank to the point that the mixer paddles will not turn, disengage mixer. Do not force mixer.
2. A strong stream of water applied to the surface of the material should begin to thin the slurry. Gently rocking the mixer should free up material and allow to mix back to normal consistency.

11.4 Lockout/Tagout & Confined Space Entry

1. The authorized employee must adhere to their own company's procedure for "Lockout/Tagout". He or she must understand the hazards and know how to control them.
2. If the equipment is operating, shut it down by normal stopping procedure (turn key switch off, depress emergency stop button, close valves, etc.) and remove the positive battery cable so that the machine or equipment is isolated from the battery.
3. Install tags on the battery cable lug and at the ignition control box with Date, Time, & Authorized Repair Employee's Name.
4. If repairing such items as springs, flywheels, hydraulic systems, air, gas or water pressure, etc…, stored or residual energy may be present and must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
5. Ensure that no other personnel are in the engine compartment or areas of isolation. Then verify the isolation of the equipment by operating the normal controls, testing to make certain the equipment will not operate.
6. Return all controls to "Neutral" or "OFF" after verifying the isolation of the equipment.
7. If entry into confined space is necessary, the authorized employee must adhere to their own company's procedure for "Confined Space Entry"

12.0 Contingency Soil Supply

In the event that you are unable to apply VERDac Pellets, the landfill operator should have a three-day supply of soil for daily cover material available on-site.

2.B. SAFETY DATA SHEET

GHS Safety Data Sheet SDS

LSC Environmental Products, LLC
Issue Date: July 10, 2020

1 Identification

Supplier LSC Environmental Products, LLC
2183 Pennsylvania Ave
Apalachin, NY 13732
Telephone: 607-625-3050
Fax: 607-625-2688
Web: www.lscenv.com

Product Name **VERDac Landfill Cover Pellets**
Description: Green Dyed Cellulose Fiber from Shredded Wastepaper and Corn Fiber and Sodium Montmorillonite Clay with Additives
CAS Number: N/A
Recommended Use: Alternative Daily Cover and Hydroseeding.

2 Hazards Identification

Route of Entry: Eye Contact, Skin Contact, Inhalation
Hazards:
Eye: May cause mechanical irritation.
Skin: May cause mild skin irritation.
Ingestion: No known health effects.
Inhalation: Acute: Short term exposure may cause mechanical irritation resulting in dry cough. May aggravate existing respiratory illness.
Chronic: Repeated inhalation of respirable* crystalline silica above exposure limits can cause lung disease, including silicosis and lung cancer.

3 Composition / Information on Ingredients

Components in order of Volume:
Cellulose Fiber, Corn Fiber, Sodium Montmorillonite Clay* (Cas # 1318-93-0), Proprietary ingredients and biodegradable green coloring.

*Typical western SMC contains 1-6% crystalline silica as quartz CAS# 14808-60-7.

4 First-Aid Measures

Eye: Flush eyes and under eye lids with plenty of water until irritation ceases. Contact physician if irritation persists.
Skin: Wash with soap and water until clean. Contact physician if irritation develops.

Ingestion: None known.
Inhalation: Move to area free from dust. If symptoms of irritation persist, contact physician.

Inhalation may aggravate existing respiratory illness.

5 Fire Fighting Measures

Flammability:	Combustible product
Auto-ignition Temp:	400-500 F
Fire Extinguishing Media:	Water, Carbon Dioxide, Sand.

6 Accidental Release Measures

Personal Precaution:	Avoid breathing dust; wear respirator approved for silica bearing dust.
Cleanup:	Vacuum to avoid generating airborne dust. Avoid using water. Material becomes slippery when wet.

7 Handling and Storage

Handling:	Use NIOSH/MSHA respirators approved for silica bearing dust when airborne SMC dust levels exceed PEL/TLVs. Clean up spills promptly to avoid making dust. Storage area floors may become slippery if wetted.
Storage:	Store in a dry place. Keep away from ignition sources.

8 Exposure Controls / Personal Protection

Exposure Guidelines (Inhalation):

Component	OSHA PEL (8 hr TWA)	ACGIH TVL
Crystalline Silica as Quartz	0.1 mg/m^3	0.1 mg/m^3
Wood Dust	1 mg/m^3	1 mg/m^3
Particles Not Otherwise Regulated		
Total Dust	15 mg/m^3	N/A
Respirable Dust	5 mg/m^3	N/A

Engineering Controls:	None required for outdoor mixing and application. Use local ventilation to maintain PELs/TLVs if handling indoors.
Personal Protective Equipment:	
Eye and Face Protection:	Wear safety glasses or goggles during loading and application to protect from dust, splashing, and spray mist.
Skin Protection:	Wear gloves and overalls to protect skin and clothing from contact with product. Personal hygiene measures, such as washing hands and face after working with materials, are recommended.

Respiratory Protection: When handling generates dust levels above exposure limits, use respirators approved by NIOSH/MSHA for silica bearing dust.

9 Physical and Chemical Properties

Appearance:	Green Pellets
Odor:	N/A
Physical State:	Granular Mixture of Cellulose Fiber, Corn Fiber, Sodium Montmorillonite Clay, Proprietary Ingredients, Dye
pH:	5.5-7.0
Specific Density:	20-35#'s/ft^3 (approximate)
Specific Gravity:	N/A
Solubility in Water:	<2%
Vapor Pressure (mm Hg):	N/A

10 Stability and Reactivity

Stability:	Stable
Conditions to Avoid:	Avoid open flame. Store in dry areas.
Materials to Avoid:	N/A
Hazardous Polymerization:	No.

11 Toxicological Information

Carcinogenicity:

- Sodium Montmorillonite Clay is not listed by ACGIH, IARC, NTP, or OSHA.
- IARC, 1997, concludes that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica from occupational sources (IARC Class 1), that carcinogenicity was not detected in all industrial circumstances studied and that carcinogenicity may depend on characteristics of the crystalline silica or on external factors affecting its biological activity. NTP classifies respirable crystalline silica as "known to be a human carcinogen" (NTP 9th Report on Carcinogens - 2000). ACGIH classifies crystalline silica quartz as a suspected human carcinogen (A2).

12 Ecological Information

No information available.

13 Disposal Considerations

Bury in licensed landfill according to local, state, and federal regulations.

14 Transportation Information

US DOT: Non-regulated

15 Regulatory Information

None of the components in this product are known to be regulated by national or international regulatory bodies.

16 Other Information

SDS Status: Revised from MSDS format in 2015 to comply with GHS requirements.

All information presented herein is believed to be accurate; however, it is the user's responsibility to determine in advance of need that the information is current and suitable for their circumstances.
No warranty or guarantee, expressed or implied, is made by LSC Environmental Products, LLC as to this information or as to the safety, toxicity, or effect of the use of this product.

3. ATMOS COVER / RUSFOAM® ADC – MANUFACTURERS SPECIFICATIONS

3.A. APPLICATION RATES AND GUIDELINES

ATMOS

PRODUCT DATA SHEET
SOIL EQUIVALENT FOAM AC-667SE

GENERAL DESCRIPTION

AC-667SE Soil Equivalent Foam is a patented product which produces a thick, long-lasting, viscous foam barrier for immediate control of foul odors, blowing litter, disease vectors and scavengers when applied to landfills as a daily cover material. AC-667-SE is also an excellent choice for emission control at remediation sites where dust, odors and volatile organic compounds (VOCs) are a concern. AC-667SE maintains its integrity for up to 72 hours and is designed for use with Atmos Pneumatic Foam Units.

FEATURES

- Biodegradable
- Will not add to treatment costs
- No ambient temperature limitations
- Easy to use
- More effective than tarps
- Can withstand moderate rainfall
- Non-hazardous
- Safe for workers and the environment
- Requires only water dilution
- No clean up necessary
- Non-combustible
- Maintains integrity for up to 72 hours

APPLICATIONS

The primary application for AC-667SE is to replace soil for the daily cover of landfills. Once diluted at a ratio of 5 parts water to 1 part chemical and applied at 2" depth, the soil equivalent product will expand to meet the requirement of Subtitle D Landfill. However it also effectively controls odors, VOCs and dust during active excavation and provides multi-day coverage of contaminated soils at hazardous waste sites. AC-667SE will adhere to vertical surfaces such as bale-fill landfills and can also be applied on top of liquid surfaces.

SPECIAL ODOR CONTROL PROBLEMS

The remediation of hazardous waste sites often includes excavation of soil contaminated with odorous compounds. AC-667SE forms a barrier between contaminants and the atmosphere and can be applied during active excavation to provide a continuous and effective barrier to minimize odors. It is completely biodegradable and poses no threat to workers, neighboring residents or ground water. AC-667SE will not add to soil treatment costs.

ENVIRONMENT IS EVERYTHING

ATMOS TECHNOLOGIES • 17 Campus Blvd. Suite 100 • Newton Square, PA 19073
Toll Free: 1.800.SEE.FOAM • P: 610.436.4314 • F: 610.436.8436 • www.atmos-technologies.com

ATMOS

PRODUCT DATA SHEET
SOIL EQUIVALENT FOAM AC-667SE

AC-667SE can also be applied on top of trucks for emission control during transport of materials such as contaminated soils or sewage sludge.

- Minimizes worker exposure
- Maintains fence-line odor and VOC emission limits
- Works on lagoon and pond closures
- Can be applied to liquid surfaces

FUGITIVE DUST

At hazardous waste sites, fugitive dust can present a health hazard. AC-667SE can be applied on top of the dusty material to prevent any wind-borne emissions. There is no need to mobilize equipment to immediately cover with soil or tarps. The Pneumatic Foam Unit can be filled and placed at the site to be used at a moment's notice.

EMERGENCY SPILL CLEAN UP

In emergency spills, odor and VOC control is often difficult because of the terrain and accident conditions. AC-667SE foam can be applied to any shaped object, as well as vertical slopes, water, mud, snow and ice. It is non-flammable and non-reactive so difficult spill problems can be accommodated.

METHOD OF APPLICATION

AC-667SE is supplied in either 450-pound (55 gal.) drums or by bulk load (approximately 46,000 pounds). Bulk shipments can be stored outside in a Atmos Bulk Storage-Dilution System. The Bulk Storage and Dilution system is comprised of a 7000 gallon heated and mixed chemical storage tank and a microprocessor controlled dispensing system to accurately dilute and transfer the chemical.

AC-667SE is designed to be applied with an Atmos Pneumatic Foam Unit. The Pneumatic Foam Units are available in a variety of sizes to accommodate a range of site conditions and application needs.

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3B. SAFETY DATA SHEET

SAFETY DATA SHEET

SOIL EQUIVALENT FOAM AC-667 SE

Section 1. Identification

GHS product identifier : SOIL EQUIVALENT FOAM AC667SE

Chemical name : Proprietary Surfactant.

Other means of identification : Aqueous anionic surfactant mixture.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Aqueous Surfactant. Spray application for VOC and Odor control.

Area of application : Industrial applications.

Supplier/Manufacturer : Atmos Technologies, Inc.
17 Campus Blvd., Suite 100
Newtown Square, PA 19073
Phone: 1-800-733-3626 or
610-436-4314

E-mail : info@atmos-technologies.com
Website: www.atmos-technologies.com

Emergency telephone number (with hours of operation) : CHEMTREC 800 424 9300

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Proprietary Surfactant.

Other means of identification : Aqueous anionic surfactant mixture.

CAS number/other identifiers

CAS number : Not available.

Product code : Not available.

Ingredient name	Other names	%	CAS number
Proprietary Surfactant.	-	100	-

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear viscous liquid.]

Color : Translucent. White.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : 99°C (210.2°F)

Flash point : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not applicable.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 3.3 kPa (25 mm Hg) [room temperature]

Vapor density : Not available.

Relative density : 1.01 to 1.06

Solubility : Easily soluble in the following materials: cold water and hot water.

Solubility in water : Easily soluble.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Keep away from heat.

Incompatible materials : No specific data.

Hazardous decomposition products : Low levels of sulfur oxides on exposure to high temperatures (concentrate).

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Conclusion/Summary : Not expected.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Section 11. Toxicological information

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Section 12. Ecological information

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be rinsed and recycled. If recycling is not an option, dispose of waste containers according to local regulations. Empty containers or liners may retain some product residues, which should be rinsed before disposal. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b)**: Not determined.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

No products were found.

SARA 313

Not applicable.

State regulations

Massachusetts : This material is not listed.

New York : This material is not listed.

New Jersey : This material is not listed.

Pennsylvania : This material is not listed.

California Prop. 65

None of the components are listed.

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

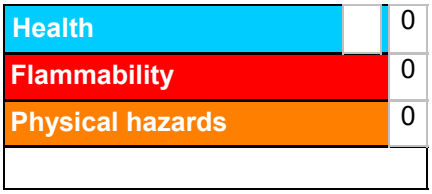
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
Not classified.	

History

Date of issue/Date of revision : 11/23/2020

Date of previous issue : No previous validation

Version : 1

Prepared by : IHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Section 16. Other information

References : HCS (U.S.A.)- Hazard Communication Standard
International transport regulations

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

LONG DURATION FOAM AC-900

Section 1. Identification

GHS product identifier : LONG DURATION FOAM AC-900

Chemical name : Proprietary Surfactant.

Other means of identification : Aqueous anionic surfactant mixture.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Aqueous Surfactant. Spray application for VOC and Odor control.

Area of application : Industrial applications.

Supplier/Manufacturer : Atmos Technologies. Inc.
17 Campus Blvd., Suite 100
Newtown Square, PA 19073
Phone: 1-800-733-3626 or
610-436-4314

E-mail : info@atmos-technologies.com
Website: www.atmos-technologies.com

Emergency telephone number (with hours of operation) : CHEMTREC 800 424 9300

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Proprietary Surfactant.

Other means of identification : Aqueous anionic surfactant mixture.

CAS number/other identifiers

CAS number : Not available.

Product code : Not available.

Ingredient name	Other names	%	CAS number
Proprietary Surfactant.	-	100	-

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear viscous liquid.]

Color : Translucent. White.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : 99°C (210.2°F)

Flash point : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not applicable.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 3.3 kPa (25 mm Hg) [room temperature]

Vapor density : Not available.

Relative density : 1.01 to 1.06

Solubility : Easily soluble in the following materials: cold water and hot water.

Solubility in water : Easily soluble.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Keep away from heat.

Incompatible materials : No specific data.

Hazardous decomposition products : Low levels of sulfur oxides on exposure to high temperatures (concentrate).

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Conclusion/Summary : Not expected.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Section 11. Toxicological information

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Section 12. Ecological information

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be rinsed and recycled. If recycling is not an option, dispose of waste containers according to local regulations. Empty containers or liners may retain some product residues, which should be rinsed before disposal. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b)**: Not determined.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

No products were found.

SARA 313

Not applicable.

State regulations

Massachusetts : This material is not listed.

New York : This material is not listed.

New Jersey : This material is not listed.

Pennsylvania : This material is not listed.

California Prop. 65

None of the components are listed.

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

United States

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	0
Flammability	0
Physical hazards	0

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The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
Not classified.	

History

Date of issue/Date of revision : 05/28/2015

Date of previous issue : No previous validation

Version : 1

Prepared by : IHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Section 16. Other information

References : HCS (U.S.A.)- Hazard Communication Standard
International transport regulations

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
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4. *THE USE OF ALTERNATIVE MATERIALS FOR DAILY COVER AT MUNICIPAL SOLID WASTE LANDFILLS* (EPA/600/SR-93/172)

United States
Environmental Protection
Agency

Risk Reduction
Engineering Laboratory
Cincinnati, OH 45268

Research and Development

EPA/600/SR-93/172 September 1993

EPA

Project Summary

The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills

Frederick G. Pohland and Johannes T. Graven

This investigation was conducted to assess the applicability of currently available (ca. 1992) alternative materials for use as daily cover at landfills. Information on characteristics, material and equipment requirements, methods of preparation and application, climatic and operational considerations, effectiveness, and costs were evaluated with respect to present status and potential for use.

Results indicated that alternative daily cover materials (ADCMs) can augment management practices at municipal solid waste landfills while enhancing environmental control. Although applicability of ADCMs varied depending on site specificity and the particular material used, most were easily applied, satisfied operational and regulatory requirements, saved landfill capacity, decreased soil requirements, and facilitated leachate and gas management and control. Although most materials met established criteria for daily cover, differences exist that warrant development of consensus performance standards for use and application. Further development and integration into overall landfill management practices are also justified.

This Project Summary was developed by EPA's Risk Reduction Engineering Laboratory, Cincinnati, OH, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

The diminishing availability of landfill sites and associated solid waste management challenges are major issues nationwide. In addition, landfilling costs are increasing as more stringent regulatory requirements make design and operation more complex and attentive to health and environmental safeguards. This has prompted recent changes in landfill management and operational practices to conserve space, improve efficiency, and enhance public acceptance. One such change is the emphasis being given to options for meeting daily cover requirements. These options include using alternative daily cover materials (ADCMs) that help conserve landfill space and reduce cover soil requirements without diminishing health, environmental aesthetics, and other site management and use standards.

Daily cover functions to control disease vectors, blowing litter, odors, scavenging, and fires. It should also be effective under various operating conditions, permit controlled management of leachates and gases, and improve aesthetics. Because of its usual availability and traditional use at landfills, soil remains the most commonly employed material for daily cover. However, soil tends to consume landfill capacity, is not always readily and economically available or suitable under various operational conditions, and requires allocation of equipment and personnel. Therefore, consideration of commercially available products and various indigenous

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materials as alternatives for daily cover is warranted.

This investigation addresses the feasibility, benefits, and limitations of currently available ADCMs from operational, performance, environmental, and economic perspectives and identifies issues deserving further consideration and development.

Methods and Procedures

Consistent with project objectives, various types of ADCMs were identified and characterized with respect to use and performance by evaluating the technical literature, interviewing landfill owners/operators, and visiting landfills where ADCMs were being applied. Supplemented by a questionnaire sent to state regulatory agencies, U.S. Environmental Protection Agency's (EPA) regional offices, known manufacturers and suppliers of ADCMs, solid waste management associations, and owners/operators with ADCM experience, we identified 16 commercially available and 8 indigenous ADCMs.

Results and Discussion

Types of ADCMs

Commercially Available Products

There has been a significant recent growth in developing, marketing, and using commercially available ADCMs at solid waste landfills. Based on composition, method of application, and general performance, the 16 identified ADCMs were: four foam, three spray-on, and nine geosynthetic products; their general characteristics and costs are presented in Tables 1 through 3. Although it is recognized that individual products will vary with respect to performance under varying operational conditions (Table 4), key features of each of the principal groups are described below.

Foams

Foam ADCMs are usually applied to the landfill working face in 2- to 6-in.- (5- to 15-cm) thick layers by using self-propelled or towed foam generation and application equipment specifically designed for a particular foam. Both hardening and nonhardening foams are available, and they retain their structural integrity from 15 hr to 7 days depending on the specific product and the effect of climatic conditions (particularly rainfall). Effectiveness as a daily cover depends on the thickness of application and sufficiency of coverage, which may be stipulated by permit requirements. Foam ADCMs are effectively destroyed placing additional wastes on them on the next operating day.

Spray-ons

Slurry or emulsion spray-on ADCMs are applied to the working face using towed or skid-mounted application equipment, similar to hydroseeders but specifically designed for use with a particular product. These products are applied in a 1/16- to 1/2-in.- (0.16 to 1.27-cm) thick layer and allowed to dry to a crust or shell. Spray-ons can retain their matted structure from 1 wk to 3 mo depending on product and thickness and continuity of coverage. Working face preparation and operator proficiency during application are important factors in determining the effectiveness of cover. Spray-on ADCMs are also mechanically destroyed by placing additional wastes on them on the next operating day.

Geosynthetics

Geosynthetic ADCMs consist of various types of geosynthetic materials that have either been developed or adapted for use as daily landfill cover. Panels fabricated from these materials are placed over the working face at the end of the day and retrieved before the start of the next operating day. Panel placement and retrieval is done manually or with available landfill equipment. At some landfills, specially designed and fabricated ancillary equipment such as tow bars, lifting bars, reels, or rollers is used to facilitate panel placement and retrieval. Most panels are reused until they no longer provide an effective cover because of their physical deterioration resulting from tears and punctures during placement and retrieval from climatic stresses from wind, rain, and freezing temperatures. Effective life of panels is 1 to 3 mo, although some panels have been used for 12 to 18 mo.

Indigenous Materials

Indigenous ADCMs may consist of various types of locally available waste products, including ash-based materials, shredded automobile components and tires, sludges and sludge-derived products, dredged materials, foundry sand, petroleum-contaminated soils, and shredded green wastes. Many of these same materials are routinely disposed of at landfills. Demonstrating their acceptability may require physical modification, chemical conditioning, or special analysis, since each can vary significantly with respect to physical and chemical characteristics and effectiveness under various operational and climatic conditions. Moreover, although indigenous materials are usually applied with available landfill equipment at the same (or greater) thickness as soil cover, additional equipment/facilities may be required for processing and on-site storage. Indigenous materials are generally able to meet established criteria for daily landfill cover; however, some materials such as dredged material, sludges, and sludge-derived products can intensify odors when first applied, and other materials such as green wastes and shredded tires are combustible.

Site Operation and Management Implications for ADCMs

The merit of using of ADCMs at landfills is often determined by operational, performance, and economic comparisons with soil. These comparisons may include inspection of the effect on landfill capacity, soil requirements, application and performance considerations, climatic conditions, leachate and gas management, operational costs, and other site-specific requirements.

Effect on Landfill Capacity

Landfill owners/operators identify the potential savings in landfill capacity as the most important reason for using ADCMs, primarily because of extended landfill life and additional revenues from the space otherwise occupied by soil. Such savings are generally independent of the type of alternative cover material used but directly depend on how often the ADCM is actually used in lieu of soil. The latter is largely determined by climatic conditions, but availability of materials or constituents, the condition and/or age of the material, and the efficiency and reliability of the application equipment or methods are also important.

Effect on Soil Requirements

Use of ADCMs decreases the need and relative costs for soil as daily cover, so that on-site soils are conserved or offsite acquisition is reduced. Equipment and personnel costs for moving and placing soil cover also decreases, as does vehicular traffic, road maintenance (both offsite and onsite), and noise and dust generation.

Application and Performance Considerations

Ease of application with less equipment, personnel, and time than that required for soil cover is an important operational and economic consideration. This can be particularly significant for sites where adverse weather conditions such as rain or freezing temperatures can curtail use of soil cover to a greater degree than would occur with certain ADCMs. Moreover, since

less time may be needed to apply ADCMs, larger quantities of wastes can be received at the landfill for longer periods of time than would otherwise be possible, thereby extending service and increasing associated revenues.

Although most ADCMs are able to meet established criteria for daily cover from both operational and regulatory perspectives, distinctions exist among the various ADCMs with regard to their effectiveness for odor and fire control and for minimizing moisture infiltration under various climatic and operational conditions. In addition, site-specific circumstances will often dictate the approach to satisfy cover criteria. With few exceptions, performance-based standards for evaluating the effectiveness of ADCMs have not been established, and subjective judgement comparing the ADCM to a standard 6 in. (15 cm) of compacted soil is often used.

Effect of Climatic Conditions

Various conditions of rainfall, temperature, and wind affect ADCM use—the ease and frequency of application and retrieval and the effectiveness. Moderate to heavy rains can wash out nonhardening foams, and hardening foams and spray-ons cannot be applied under such conditions. Rain can also increase the weight of nonwoven geosynthetics and make them more difficult to handle. Under windy conditions, panel placement may not only require additional time and personnel but may also be unsafe or impractical. Geosynthetic panels can also freeze to the working face or be covered with snow, both of which increase the risk of loss or damage on retrieval.

Leachate and Gas Management

The use of ADCMs can enhance controlled leachate and gas management by limiting the development of intervening cover layers. Eliminating such layers facilitates unimpeded movement and collection of leachates and gases within and between the landfill cells and when leachate recycle for accelerated stabilization is practiced. Therefore, commercially available products may be preferred over some of the indigenous materials.

Although foam and spray-on covers are mechanically destroyed when additional wastes are placed over them on subsequent operating days, these and some indigenous materials remain within the landfill and may affect leachate composition and its subsequent disposition or otherwise affect the progress of landfill stabilization. Because stabilization processes within a landfill normally occur over extended periods, and many ADCMs have been available and used for only a relatively short time, potential long-term effects of constituents leached from alternative cover materials, although generally considered to be minimal, may need to be established.

Operational Costs and Site Requirements

Operational costs and other site-specific requirements may also affect the feasibility of using a particular ADCM. Although the determination of potential cost savings associated with ADCMs is usually made by comparing them with soil as a daily cover, additional factors such as availability of storage facilities for some ADCM constituents and application equipment, utility requirements, landfill working-face preparation needs, and operator skills and safety implications must also be evaluated.

Conclusions

Based on the results of these investigations, the following conclusions can be drawn:

- Use of alternative materials for daily cover in lieu of soil can result in operational, performance, environ-mental, and economic benefits at municipal solid waste landfills. These benefits include ease of application, improved effectiveness in meeting site operational and regulatory requirements, savings in landfill capacity, decreased requirements for soil, and more effective management of leachates and gases.
- Most alternative daily cover materials are able to meet established criteria for daily cover under various operational and climatic conditions. Certain materials are more effective than soil as a daily cover, especially with respect to control of vector access, blowing litter, and odor generation and to the minimization of moisture infiltration.
- The effectiveness of ADCMs depends on properly preparing the landfill working face preparation and on equipment-operator proficiency. Climatic conditions and other site-specific considerations will also influence the choice of ADCM, its method of application, and effectiveness as daily cover.
- Evaluation of the effectiveness of ADCMs in meeting operational and regulatory criteria for daily cover is generally based on subjective comparisons with soil cover. Lack of consensus, performance-based standards for various operational and climatic conditions limits the selection and regulation of ADCMs for landfill applications.

Recommendations

Recommendations regarding the future development and use of ADCMs include:

- integration of ADCMs as alternative cover options into the design, construction, and operation of landfills for solid waste management;
- establishment of performance-based standards to permit more objective evaluations of the short- and long-term effectiveness and suitability of ADCMs; and
- coordination between manufacturers of ADCMs and the regulatory and user communities to ensure appropriate use of ADCMs and to establish training and certification programs.

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Table 1. *Foam Cover Products*

Product/ Manufacturer	Product Description	Material Cost*,†	Application Equipment Cost*	Comments
RUSMAR© RUSMAR, Inc. West Chester, PA	Nonhardening foam (consistency of shaving cream)	$0.06-0.07/ft² ($0.65-0.75/m²)	Self-propelled (includes BSD)- $250,000-$300,000 Towed- from $85,000	BSD Bulk Storage and Dilution Unit for foam concentrate. Self-propelled and large-capacity towed equipment are freeze protected. Average cover duration: 15-20 hr.‡
SaniFoam™ 3M Industrial Chemical Products Div. St. Paul, MN	Polyamino hardening foam (resembles Styrofoam® when cured)	$0.08-0.10/ft² ($0.86-1.08/m²)	Self-propelled- $130,000 Towed- $40,000-$70,000	Average cover duration: 3-6 days.‡
TerraFoam™ National Foam, Inc., Environmental Products Div. Exton, PA	Nonhardening foam (consistency of mousse)	$0.05-0.06/ft² ($0.54-0.65/m²)	Self-propelled- $300,000 Truck-mounted- $70,000	Average cover duration: 3-7 days.‡
TopCoat™ Central Fiber Corp. Wellsville, KS	Polymer-based hardening foam	$0.10-0.12/ft² ($1.08-1.29/m²)	Towed- $25,000	Cost information is based on limited field tests. Insufficient information is available on cover duration.

* 1992 cost information obtained from manufacturer's representative. Personnel costs associated with the application of the foam and application equipment maintenance costs are not included.
† Material cost is based on application of 3-in.-(7.5-cm) thick layer, except for SaniFoam™ which is based on a 2-in.-(5cm) thick layer.
‡ Duration of cover depends on climatic conditions, particularly rain.

Table 2. *Spray-on Cover Products*

Product/ Manufacturer	Product Description	Material Cost*	Application Equipment Cost*	Comments
ConCover© New Waste Concepts, Inc. (formerly Newastecon,Inc.) Perryburg, OH	Aqueous slurry of recycled newspaper/wood fibers and binding agent; hardens to form 1/8- to 1/4-in.- (0.32- to 0.64-cm) thick cover.	$0.07-0.09/ft² ($0.75-0.97/m²)	$18,000-$40,000	Small capacity application equipment is towed; large capacity units are skid-mounted. Average cover duration: 7-30 days.†
Land-Cover Formula 440 Enviro Group, Inc. Indianapolis, ID Bay Hill Marketing, Inc. Altamonte Springs, FL	Aqueous clay/polymer-based emulsion; hardens to form 1/16- to 1/8-in- (0.16- to 0.32-cm) thick cover.	$0.03-0.06/ft² ($0.32-0.65/m²)	$4,200-$12,500	Application equipment is skid-mounted. Average cover duration: 1-3 mo.†
Posi-Shell™ Landfill Services Corp. Apalachin, NY	Aqueous slurry of recycled newspaper/plastic fibers and cement kiln dust binder; hardens to form 1/4- to 1/2-in.- (0.64- to 1.27-cm) thick cover.	$0.03-0.05/ft² ($0.32-0.54/m²)	Equipment is leased for $4,700/mo.	Application equipment is towed. Storage silo required for cement kiln dust is also provided. Average cover duration: 1-3 mo.†

*1992 cost information obtained from manufacturer's representative. Personnel costs associated with spray-on application and application equipment maintenance costs are not included.
†Duration of cover depends on the thickness and continuity of application.

Table 3. *Geosynthetic Cover Products*

Product/ Manufacturer	Product Description	Material Cost*	Effective Cost†	Comments‡
Airspace Saver© Wire Rope Specialist Baton Rouge, LA	Woven, high-density polyethylene, coated with low-density polyethylene; 9 oz/yd^2 (305 g/m^2); reinforced with nylon strapping (one side)	$0.40/ft^2 ($4.31/m^2)	$0.0017-0.0020/ft^2 ($0.018-0.022/m^2)	Average duration of panels is 10-12 mo (200-240 reuses); some last 18 mo.
Aqua-Shed™ Aqua-Shed Manufacturing Corp. Florence, SC	Polyvinyl chloride coated on one side with adhesive; 7 oz/yd^2 (237 g/m^2)	$0.12-0.14/ft^2 ($1.29-1.51/m^2)	$0.12-0.14/ft^2 ($1.29-1.51/m^2)	Panels are only placed manually and adhere to the working face. They are not subsequently removed or reused. Average cover duration is 2-3 mo.
CORMIER Cormier Textile Products Sanford, ME	Woven, high-density polyethylene, coated with low-density polyethylene; WP-640 - 4.3 oz/yd^2 (146 g/m^2); WP-1440 - 5.2 oz/yd^2 (176 g/m^2)	$0.085-0.12/ft^2 ($0.015-0.032/m^2)	$0.0014-0.0030/ft^2 ($0.91-1.29/m^2)	Average duration of panels is 2-3 mo (40-60 reused); some last 6 mo.
COVERTECH C-440 COVERTECH Fabrication, Inc. Rexdale, Ontario	Woven, high-density polyethylene, coated with low-density polyethylene; 9 oz/yd^2 (305 g/m^2); reinforced with nylon strapping on both sides.	$0.55/ft^2 ($5.92/m^2)	$0.0023-0.0028/ft^2 ($0.025-0.030/m^2)	Average duration of panels is 10-12 mo (200-240 reuses); some last 14 mo.
FabriSoil® Phillips Fibers Corp. Greenville, SC	Nonwoven, needle-punched polypropylene; 6 oz/yd^2 (203 g/m^2)	$0.16-0.19/ft^2 ($1.72-2.05/m^2)	$0.0053-0.0095/ft^2 ($0.057-0.102/m^2)	Average duration of panels is 20-30 days (20-30 reuses).
Griffolyn® Reef Industries, Inc. Houston, TX	Low-density polyethylene-coated co-polymer and nylon yarn laminate; 4.9 oz/yd^2 (166 g/m^2)	$0.13-0.15/ft^2 ($1.40-1.61/m^2)	$0.0005-0.0008/ft^2 ($0.005-0.009/m^2)	Average duration of panel is 10-12 mo (200-240 reuses).
Polyfelt X0010 Polyfelt, Inc. Evergreen, AL	Nonwoven, spun-bonded, needle-punched polypropylene; 8 oz/yd^2 (271 g/m^2)	$0.22-0.25/ft^2 ($2.36-2.69/m^2)	$0.0037-0.0125/ft^2 ($0.040-0.135/m^2)	Average duration of panel is 1-3 mo (20-60 reuses).
SaniCover™ Fluid Systems, Inc. Cincinnati, OH	Polypropylene; 6 oz/yd^2 (203 g/m^2) (See comments)	$0.13-0.15/ft^2 ($1.40-1.61/m^2)	$0.004-0.008/ft^2 ($0.043-0.086/m^2)	SaniCover™ 150 is a nonwoven, needle-punched material while SaniCover™ 250 is a woven material. Average duration of panel is 20-30 days (20-30 reuses).
Typar® Exxon Chemical Company Old Hickory, TN	Nonwoven, spun-bonded, needle-punched polypropylene; 5.8 oz/yd^2 (197 g/m^2)	$0.15/ft^2 ($0.61/m^2)	$0.0025-0.0038/ft^2 ($0.027-0.041/m^2)	Average duration of panel is 2-3 mo (40-60 reuses).

* 1992 cost information obtained from manufacturer's representative. Equipment use and personnel costs associated with placement/retrieval of panels are not included.

† Effective cost = material cost/number of reuses. (For panels with effective life > 1 mo, 20 uses/mo were assumed).

‡ Unless indicated otherwise, geosynthetic panels are placed manually or with available landfill equipment. Specially designed and fabricated ancillary equipment (e.g., tow bar, lifting bar, reel, or roller) is used at some sites to facilitate panel placement/retrieval and reduce wear and tear.

Table 4. *Operational Considerations - Commercial Products*

Operational Feature	Foams	Spray-ons	Geo-synthetics	Comments
Access control (insects, birds and animals	Yes*	Yes*	Yes	The sticky consistency of nonhardening foams and hardening foam and spray-ons discourages insects and birds from landing and animals from digging. Hardening foams and spray-on subsequently form a resilient barrier. Geosynthetics completely cover wastes, denying access to insects, birds, and animals.
Fire retardation - Noncombustible	See comments	See comments	No	Nonhardening foams are noncombustible, and SaniFoam™, a hardening foam, is rated nonflammable and self-extinguishing. (Insufficient information is available regarding the combustibility of TopCoat™ foam.) Constituents of spray-ons may be combustible, but they are applied as an aqueous slurry/emulsion. Spray-ons are generally considered nonflammable when dry/hardened. Some geosynthetics are also rated nonflammable and self-extinguishing, while moisture absorbed by nonwoven materials can reduce their combustibility.
- Limits air intrusion	Yes*	Yes*	Yes†	Foams, spray-ons, and geosynthetics provide a barrier that can reduce/prevent the transfer of atmospheric oxygen to the working face.
- Provides barrier within landfill	No	No	No	Foams and spray-ons are destroyed and geosynthetics are removed before placement of wastes on subsequent days.
Blowing litter control	Yes*	Yes*	Yes	Foams and spray-ons adhere to and contain wastes, and geosynthetics completely cover the wastes, preventing blowing litter.
Odor and other air emission control	Yes*	Yes*	Yes†	Foams and spray-ons provide a barrier against odor and other emissions. Geosynthetics trap odors and emissions while in place; they may be released when panels are retrieved.
Dust control	Yes	Yes	Yes	Foams, spray-ons, and geosynthetics adhere to and/or contain materials prone to dusting. In addition, since the use of these materials eliminates the need to transport and place soil cover, that element of dust generation is also reduced.
Water infiltration control	See comments	Yes*	Yes†	Hardening foams and spray-ons form a cover that can shed rain-water when hardened whereas nonhardening foams are generally not as effective during moderate to heavy rain. Many geosynthetic materials effectively shed rainwater, particularly those that are water repellant. Although nonwoven geotextiles initially absorb some moisture, they are also able to subsequently shed rainwater.
Leachate and gas migration Control	See comments	See comments	See comments	Leachate and gas movement are not curtailed, since foams and spray-ons are destroyed and geosynthetics are removed on subsequent days.
Aesthetically pleasing appearance	Yes*	Yes*	Yes*	

* *Effectiveness depends on complete and continuous application onto the wastes.*
† *Effectiveness depends on the permeability of the particular material to air and water.*

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The complete report, entitled "The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills," (Order No. PB93-227197; Cost: $27.00, subject to change) will be available only from:
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