We Are Here to Help...
Case Study of How Alternative Covers Can Help Solve Operational Issues

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Discussion Points

Product Information
- Properties & Applications

Why Test?
- Generalities on Site & Why Testing Alternative Covers
- Pilot Testing

Results
- Initial Pilot Study to Everyday Use
INTRODUCTION TO
ENVIRO COVER
**What is** Enviro Cover?

**Alternative Daily Cover System**

- Made of a non-reusable polyethylene film
- Can be used year-round
- Easy deployment
What is Enviro Cover?

- Doesn’t require removal prior to waste placement
  - Continuous coverage
  - Odor and emissions control
  - Minimizes rainwater infiltration and leachate generation
- Mechanically destroyed when additional waste placed
  - Won’t impede movement of landfill gas or leachate once waste placed above it
Complies with US EPA Requirements

“...control disease vectors, fires, odors, blowing litter and scavenging...”
Creates an Impermeable Barrier

- Limits escape of LFG and fugitive emissions
- Provides ongoing odor control
- Prevents rainwater infiltration for decreased leachate formation
- Restricts air intrusion (preventing fires)
- Puncture resistant and able to stretch
Material Installation
Deployment
Operational Information

Application rate of 3,200 sq ft/minute

Can be applied to 3:1 slopes
- steeper than 3:1 slopes not recommended
- film should be deployed up and down the slope

Overlaps are 12 to 18 inches to create an effective seal

Repairs
- if film is punctured or torn during deployment, the 800 with its low ground pressure can be driven over the previously deployed film
Landfill in Western New York

CASE STUDY
Why Test Enviro Cover?

Site Experienced Odor at Working Face

Investigated Source of Odors
  - Worst During the Morning Due to Daily Cover Stripping

Looking for Alternative Cover Materials
  - Wouldn’t require removal
  - Assist with odor control
Types of Materials Researched/Tested

- Soil Materials
- Tarps
- Spray on Cover Applications
- Enviro Cover
## Enviro Cover as a Potential Solution?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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</thead>
</table>
| Impermeable                     | • encourages water runoff  
• minimizes odor and emissions                                                                                                             |
| Removal not required            | • mechanically destroyed w/ waste placement  
• doesn’t impede movement of LFG or leachate                                                                                               |
| Holds up to waste at working face | • tear and puncture resistance  
• high tensile strength and elongation                                                                                                       |
| Works under variety of weather conditions |                                                                                                                                                     |
| Conserves airspace             |                                                                                                                                                      |
Pilot Test – December 2018
Pilot Test
Pilot Test
Odor Intensity Determination

**ASTM E544**
- Standard Practice for Referencing Suprathreshold Odor Intensity

**Suprathreshold**
- Higher than the threshold value required for the perception of a stimulus.

**Odor Intensity Referencing Scale (OIRS)**
- Method uses a series of increasing concentrations of a standard odorant, butanol
- Also known as the “n-butanol scale”
- An objective measure of ambient odor intensity
Odor Intensity Power Law

Steven’s Law: \( I = k C^n \)

\[
\log I = \log k + n \log C
\]
# Odor Intensity Training

<table>
<thead>
<tr>
<th>Scale</th>
<th>Odor Intensity</th>
<th>Irritation Intensity</th>
<th>Pleasantness</th>
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<tbody>
<tr>
<td>8</td>
<td>Maximal</td>
<td>Maximal</td>
<td>Extremely Unpleasant</td>
</tr>
<tr>
<td>7</td>
<td>Very Strong</td>
<td>Very Strong</td>
<td>Very Unpleasant</td>
</tr>
<tr>
<td>6</td>
<td>Strong</td>
<td>Strong</td>
<td>Moderately Unpleasant</td>
</tr>
<tr>
<td>5</td>
<td>Moderately Strong</td>
<td>Moderately Strong</td>
<td>Slightly Unpleasant</td>
</tr>
<tr>
<td>4</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Neutral</td>
</tr>
<tr>
<td>3</td>
<td>Moderately Weak</td>
<td>Moderately Weak</td>
<td>Slightly Pleasant</td>
</tr>
<tr>
<td>2</td>
<td>Weak</td>
<td>Weak</td>
<td>Moderately Pleasant</td>
</tr>
<tr>
<td>1</td>
<td>Very Weak</td>
<td>Very Weak</td>
<td>Very Pleasant</td>
</tr>
<tr>
<td>0</td>
<td>None at all</td>
<td>None at all</td>
<td>Extremely Pleasant</td>
</tr>
</tbody>
</table>
**Odor Intensity Results** Mid-January 2019

**Odor Intensity Readings**

- **Area with Soil Cover**
  - 0.5 to 1.0

- **Area with Enviro Cover**
  - trace (barely perceptible)

- **When Cut Enviro Cover**
  - odor intensity immediately jumps to 1.0
  - after 15 minutes it drops to 0.5 and then to background
Evolution of Use

- Initial 30 day trial period
- Extended to 6 month trial period
- Requested approval as ADC
- Currently part of regular operations
Benefits Noted

- Improvement in odor control
- Potential improvement in control of emissions
- Ease of deployment
- Year Round Use In All Weather Conditions
- Minimization of water infiltration
- Held up well, providing litter and vector control
- No perched leachate or poor LFG distribution
Take Aways

Several alternative cover products available

- Depends on site, budget, operational considerations

Recommend testing potential applications

- What works for one issue/site may not be best solution for another

Enviro Cover may be a good alternative
Thank you

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