

# **Odor Management Plan Arbor Hills Landfill**

**April 5, 2017**

*Prepared for:*

**Michigan Department of Environmental Quality  
Air Quality Division  
Jackson District Office  
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*Prepared by:*

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# Odor Management Plan

## Arbor Hills Landfill

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### INTRODUCTION

This work plan is developed to address odor assessment and odor control related items at the Advanced Disposal Services Arbor Hills Landfill, Inc. (ADS) facility in Northville, Michigan.

The ADS has an active landfill, Arbor Hills Landfill, and a composting operation.

RK & Associates, Inc. (RKA) has been retained to investigate on-site odor sources, to estimate odor emissions (as measured by Scentometer) from its current operations, evaluate odors on-site and in surrounding community, and recommend odor control measures to mitigate these odors.

### 1. DAILY ODOR MONITORING

RKA will conduct daily community and perimeter odor measurements. Following is a description of these activities. These daily measurements will be taken from now through the end of June 2017. Prior to June 30<sup>th</sup> 2017, RKA will present a compilation of the results and, based on an evaluation of the data, may recommend reducing the frequency of the measurements subject to MDEQ approval.

#### **Scentometer Readings at Selected Landfill Perimeter (fence line) Locations**

Landfill perimeter Scentometer readings are taken twice a day, a morning scan between 6 a.m. and 8 a.m., and an afternoon scan between 6 p.m. and 8 p.m. The readings are taken at eight (8) locations along the landfill fence line as shown on Figure 1 and one (1) location at the compost facility fence line (Locations identified as P-1 through P-9).

If any perimeter measurements of odors are greater than 7 on Scentometer scale, measurements will immediately (within one business day) be sent to the representatives of DEQ and ADS. .

#### **Scentometer Readings at Selected Community Locations**

Community Scentometer readings will be taken two times a day, a morning scan between 6 a.m. and 8 a.m., and an evening scan between 6 p.m. and 8 p.m., at fifteen (15) locations in the nearby residential community surrounding the landfill as shown on , Figure 1 (Location identified as C-1 through C-19). A larger network of community monitoring locations have been placed in residential neighborhoods northeast of the landfill based on the historical record of complaints.

If any community measurements are greater than 2 on the Scentometer scale, measurements will immediately (within one business day) be sent to the representatives of DEQ and Advanced Disposal.

Suggested time for Scentometer readings is, of course, flexible based on personnel scheduling issues and weather conditions (high winds and snow conditions, etc.)

A Daily Perimeter and Community Log sheet is attached as shown in Figure 2. If odor is present, the field operator will identify the nature of the odor using the following descriptors:

- A. Perfume Odor\*

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- B. Perfume and Landfill Odor\*
- C. Landfill Gas
- D. Compost
- E. Fresh Garbage
- F. Leachate
- G. Other (e.g. fresh cut grass, etc...)
- H. Garbage Pickup Date in the Community

(\* ) to be used when and if, air neutralizer systems are implemented at the facility

### On-Site Meteorological Data

ADS maintains a meteorological station at the landfill. ADS staff downloads this information including time, wind speed, wind direction, temperature, humidity, barometric pressure, and rainfall related information. These data are used in the evaluation of potential off-site impacts from landfill odor sources and for investigating odor complaints.

## 2. BI-MONTHLY (ONCE EVERY TWO MONTHS) LANDFILL ODOR MONITORING

RKA will conduct bi-monthly odor scans of the landfill surface. Scentometer readings are taken in all areas of the landfill accessible by RKA field personnel. Areas where heavy equipment is operated and in close proximity of the working face may not be inspected. Scentometer reading will be taken next to selected gas wells and on areas of compromised cover material to identify odorous fugitive areas and leaks from gas wells.

Potential odor sources from landfill waste operations (compost, garbage, leachate, distressed areas of cover, erosion) will be evaluated. Landfill gas collection and control systems will also be evaluated. Potential sources of landfill gas odors (positive pressure on extraction wells, insufficient gas extraction flow rate, physical damage to well, lines, or other gces components, etc) will also be assessed.

If any on-site landfill surface measurements are greater than 7 on Scentometer scale, measurements will immediately (within one business day) be sent to the representatives of DEQ, and ADS. .

If any leaks are detected or any odorous hotspots are identified, the landfill operation staff will be notified. A follow up inspection will be conducted to ensure reported leaks were properly fixed within timeframes established by DEQ and facility representatives.

If any leachate leaks are observed during the RKA inspection, the location of the leak with respect to the nearest well will be noted. The apparent cause of the leak and whether the leak has already been treated will be noted and presented to DEQ and landfill operations staff the following business day. A follow up inspection will be conducted to ensure reported leaks were properly fixed within timeframes established by DEQ and facility representatives.

Similar to daily monitoring, at the end of June 2017, RKA will evaluate results of past landfill scan and present the findings to MDEQ. Based on these results, RKA a revised schedule with less frequency may be presented to MDEQ for approval

### 3. DATA ANALYSIS AND WEEKLY REPORTS

RKA will compile the data from the daily odor scans of the landfill, community and perimeter locations, daily meteorological data, and odor complaint data to evaluate the impact of landfill odors in the nearby community. RKA will evaluate if measured odors correlate with community odor complaints.

RKA will prepare weekly reports that will summarize daily odor readings for the week and will evaluate if the monitoring location was downwind or upwind to the landfill. Sample report tables are shown in Figure 4 and Figure 5.

In addition, recommended corrective action to be taken by Advanced will be presented and documented, when implemented.

Weekly reports will be forwarded to DEQ and facility within 3 business days following completion of each week's activities.

### 4. ODOR CONTROL SCENARIOS

#### Landfill Gas collection and treatment

RKA will contact ADSto recommend any measures to improve gas collection efficiency and to better control landfill gas odors (in terms of sulfur compounds) in the community. In addition to improvements in gas collection, the control malfunction plan will also be reviewed.

#### Operational sources

##### Leachate spill treatment options

RKA will analyze different odor control options for landfill leachate, landfill surface water, and leachate impacted cover soils which are assumed to be a source of odors in the community. Such control options may include odorous vapor control treatment from vents from leachate tanks, treatment of spill leachate with chemicals, etc. The objective will be to evaluate odors from the above sources, by collecting samples and analyzing them using Olfactometer odor panel in accordance with ASTM Method E-679-04.

If any of the sources demonstrate odor emissions that may require odor control, then the objective will be to determine the effectiveness of different treatment options. Samples will be prepared by applying selected treatment options to the leachate sample and then analyzing the post treatment odors by conducting an odor panel. Odor reduction effectiveness of the treatment options will be analyzed to select most effective option.

##### Odor panel testing for Waste Material with potential to create odors

On occasion, it is our understanding that some of the waste collected by ADS may be more odorous than normal household waste. RKA will perform odor panel on these special waste stream, if identified, during the course of this plan implementation and

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determine its odor threshold. Possible odor control measure will be evaluated to see if by pretreating this waste its odor impact can be reduced.

### Compost treatment options

Windrow composting is currently being used. If composting is determined to be an odor source in the community, RKA will recommend that ADS determine if any improvements can be made in the windrow process at the landfill.

### Air Dispersion Modeling

Odor dispersion modeling can be used to predict odor impact in the community from landfill sources. The model input parameters will include source specific characteristics, such as source type and dimensions, local topography, surface parameters, land use, etc. Dispersion model uses local meteorological data to estimate the off-site impacts. Odor emission rates that will be input in the model will be determined by odor panels for each source type. Odor concentrations are defined as a volume ratio and therefore are dimensionless. A unit of odor unit per cubic meter or OU/m<sup>3</sup> is used to describe dilution to threshold ratio.

## 5. OTHER ITEMS

In the future, it may be useful to conduct a community odor panels to understand impacted community member's sense of smell and their characterization of odors in terms of ASTM odor parameters. MDEQ and facility representative may decide to do one such panel in the future. When and if such a need arises, RKA will assist MDEQ and ADS to perform such a community odor panel based on a format which is technical in nature.

Moreover, there may be a need to acquire air permits for the selected odor control options. When and if, such need arises it will be addressed.

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## **FIGURES**



RK No.	Location
<b>Perimeter</b>	
P-1	Napier Rd & Entrance to GLR
P-2	5 Mile Rd & Entr to Energy Ctr.
P-3	5 Mile Rd & Utility Corridor
P-4	6 Mile Rd & NW Corner of LF
P-5	6 Mile Rd & LF Office
P-6	6 Mile Rd & Napier Rd
P-7	Napier & Private Road
P-8	Napier & Railroad
P-9	Napier & Entr to Composting
<b>Community</b>	
C-1	Mulberry Ct. & Mulberry Way
C-2	Boulder & Parkside Dr.
C-3	Entrance to Steeplechase
C-4	Ridgewood Elementary School Waterway Park on Ridgeway Dr.
C-5	Dr.
C-6	Bayberry Way & Rose Terrace
C-7	NW Corner of Briar Ridge Ln.
C-8	Brier Ridge Ln. & Trail Entrance
C-9	SW Corner of Ridgeway Dr.
C-10	Napier & Last Drive
C-11	Salem Rd. & Jessica J Ln
C-12	6 Mile & Pearl Street
C-13	Tamarack Trail
C-14	Starlite Run
C-15	Northstar Way
C-16	Northville High School
C-17	Main St. & Creek Crossing
C-18	Westhill St. & Timberlane
C-19	Timberlane Cul-de-sac

**RK**  
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COMMENTS:  
**Perimeter and Community Odor  
Monitoring Location**

**Arbor Hills Landfill**  
Advanced Disposal  
Northville, MI 48168

FIGURE  
**1**

DRAWN BY: <b>DD</b>	APPROVED BY: <b>SR</b>	PROJECT NUMBER: <b>R16417</b>	DATE DRAWN: <b>11-16-2016</b>	REVISED DATE: <b>2-8-2017</b>
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## Perimeter & Community Locations

Date \_\_\_\_\_

Field Person \_\_\_\_\_

Locations		Wind Direction	Wind Speed	Scentometer Reading	Time	Odor Description
<b>Perimeter Locations</b>						
	<b>#</b>					
Napier Rd & Entrance to GLR	P-1					
5 Mile Rd & Entr to Energy Ctr.	P-2					
5 Mile Rd & Utility Corridor	P-3					
6 Mile Rd & NW Corner of LF	P-4					
6 Mile Rd & LF Office	P-5					
6 Mile Rd & Napier Rd	P-6					
Napier & Private Road	P-7					
Napier & Railroad	P-8					
Napier & Entr to Composting	P-9					
<b>Community Receptors</b>						
	<b>#</b>					
Mulberry Ct. & Mulberry Way	C-1					
Boulder & Parkside Dr.	C-2					
Entrance to Steeplechase	C-3					
Ridgewood Elementary School	C-4					
Waterway Park on Ridgeway Dr.	C-5					
Bayberry Way & Rose Terrace	C-6					
NW Corner of Briar Ridge Ln.	C-7					
Brier Ridge Ln. & Trail Entrance	C-8					
SW Corner of Ridgeway Dr.	C-9					
Napier & Last Drive	C-10					
Salem Rd. & Jessica J Ln	C-11					
6 Mile & Pearl Street	C-12					
Tamarack Trail	C-13					
Starlite Run	C-14					
Northstar Way	C-15					
Northville High School	C-16					
Main St. & Creek Crossing	C-17					
Westhill St. & Timberlane	C-18					
Timberlane Cul-de-sac	C-19					

A\* = Perfume Odor

C = Landfill Gas

E = Fresh Garbage

G= Other (explain; e.g. fresh cut grass)

B\* = Perfume and LF Odor

D = Compost

F = Leachate

H= Garbage Pickup Date in the Community

\* When masking agent spray system comes to play





**Figure 3**  
**Arbor Hills Landfill**  
**Odor Identification & Repair Log**

Field Person:		DATE:		
Odor Source Location	D/T	Odor Source *	Response Action **	Date Fixed or Sent for Engineering Review

**\* Odor Source Legend:**

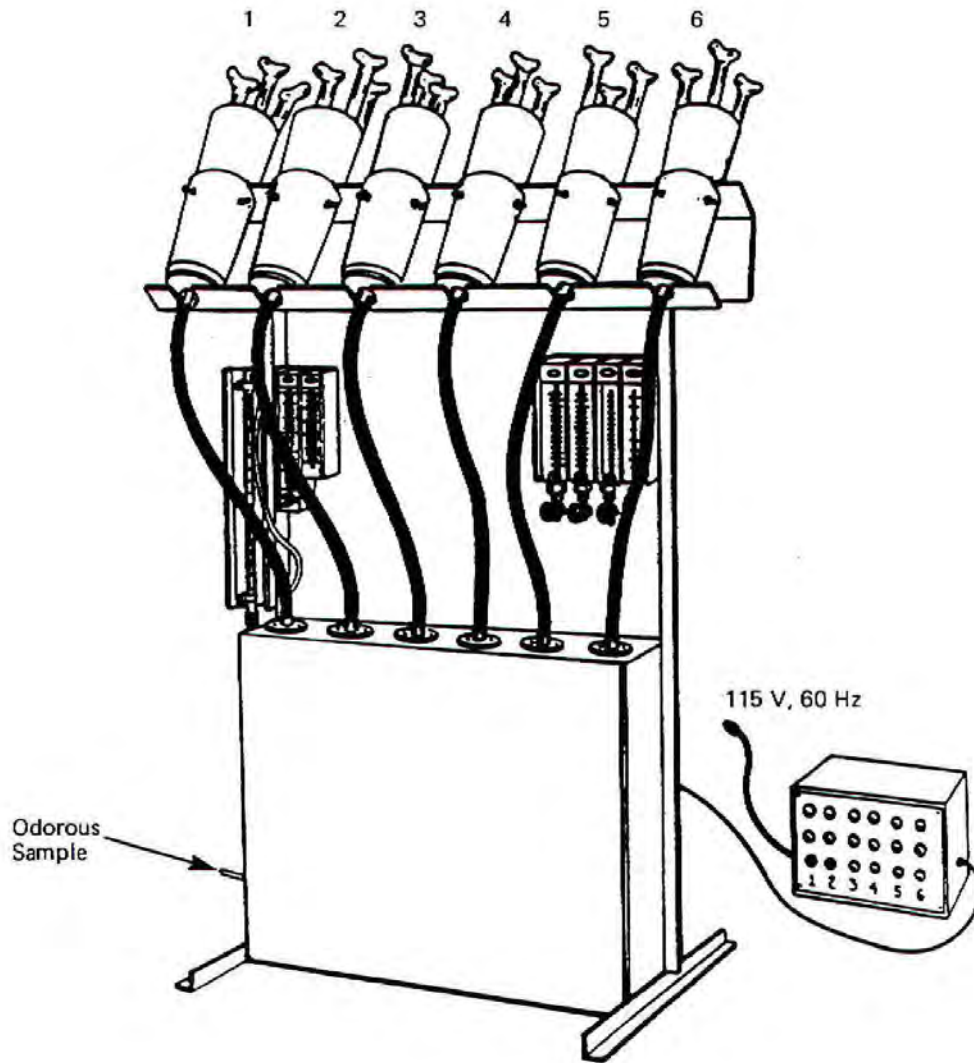
- 1 = Gas venting from soil cover;
- 2 = Positive pressure from well
- 3 = Well Boot leak
- 4 = Leachate spill;
- 5 = Area under repair (describe)
- 6 = Portion of Tarp damaged;
- 7 = Tarp edge loose;
- 8 = Flare exhaust
- 9 = Composting (turning) odor
- 10 = Other (describe)


**\*\* Response Action Legend:**

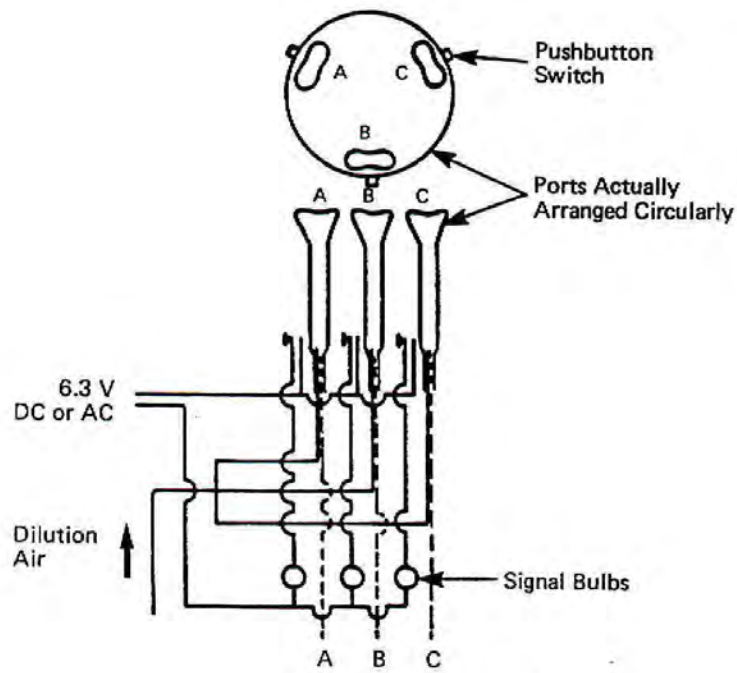
- A = Place soil
- B = Tarp repair
- C = Leachate removal
- D = Solution Requires Engineering assessment
- E = Review Flare operations
- F = Review Compost Turning Schedule
- G = Other (describe)








 28631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-790-2966	COMMENTS: <b>Odor Sampling Protocol          Arbor Hills Landfill,          Michigan</b>		<b>OLFACTOMETER</b>		FIGURE <b>6</b>
	DRAWN BY:	APPROVED BY: <b>SR</b>	PROJECT NUMBER <b>R16417</b>	DATE DRAWN: <b>11-16-2016</b>	REVISED DATE



 <p>28631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-790-2966</p>	<p>COMMENTS:</p> <p><b>Odor Sampling Protocol Arbor Hills Landfill, Michigan</b></p>		<p><b>OLFACTOMETER DILUTION LEVEL</b></p>		<p>FIGURE <b>7</b></p>
	<p>DRAWN BY:</p>	<p>APPROVED BY: <b>SR</b></p>	<p>PROJECT NUMBER <b>R16417</b></p>	<p>DATE DRAWN: <b>11-16-2016</b></p>	<p>REVISED DATE</p>