

## **Odor Management Plan**

Apex has an Odor Management Plan that includes four main components:

1. Odor monitoring practices;
2. Best management practices for active waste disposal operations;
3. Major odor control systems; and
4. Landfill gas control and collection system.

Apex will continue to research and implement improved methods to manage odors at the facility. The components discussed within this plan may be revised based on continued research and odor management practices at the site.

### **1. Odor Monitoring Practices**

During waste disposal operations, Apex will be staffed with trained odor control personnel to provide direction, technical assessment, and monitoring of the landfill and the applied odor control system(s) to reduce odor generation. Apex odor control personnel will maintain certification as trained odor control professionals. Apex odor control personnel will provide training and direction to landfill staff relative to odor minimization and abatement. Training will be conducted annually; however, more frequent training may be conducted as necessary. Apex will also periodically conduct formal odor control surveys, either with certified Apex personnel or a third party firm.

During waste disposal operations, Apex's odor control personnel will perform and document daily monitoring for odors to assess the effectiveness of the applied odor control measure(s). When odors are detected, personnel will determine what operational changes need to be made to abate the odors. Apex will maintain an Odor Control Log which documents the location and settings of the deployed odor control equipment, and the location(s) of waste disposal operations. Additionally, the on-site weather station and wind socks will be utilized to monitor and document meteorological conditions to project and react to weather impacts to odor generation and its abatement. Apex personnel will document the meteorological conditions including temperature, barometric pressure, precipitation, and wind speed and direction.

Apex's odor control personnel will document their response to an "odor complaint event" by utilizing the established complaint evaluation procedures. An odor complaint event may originate from multiple odor complaints that share a common time and location. An odor complaint form will be used to document complaints received by the landfill. The odor complaint form will include the name of complainant with address or location, type of odor and strength, and time and duration of odor. A complaint database will be maintained and will include the odor complaint form, the odor control log, and weather station data. The odor complaint evaluation procedures include the following:

- When an initial odor complaint is received, document weather conditions and which odor control system(s) are operational.
- Determine the probable source of the odor(s).
- Select and implement corrective action(s).
- Evaluate the effectiveness of the corrective action(s) and adjust if necessary.
- Document follow-up information as necessary.

The complaint and monitoring data will be maintained on-site for review by the Jefferson County General Health District and the Ohio EPA. Copies or reports will be provided to those agencies upon request.

## **2. Best Management Practices for Active Waste Disposal Operations**

Apex uses best management practices (BMPs) to reduce odors during waste disposal operations. The BMPs are discussed below as they relate to waste placement, cover soil application and materials, and placing additional waste on the western and eastern slopes.

### **Waste Placement**

To reduce the potential for odors resulting from active waste disposal operations, Apex will work with transporters to mitigate odor generation and minimize transit time. Additionally, Apex will

identify waste loads with a probability of causing odors using container transit reports and implement preemptive measures to manage odors.

During waste placement, Apex will minimize the working face size and dispose of odorous waste during the most favorable meteorological conditions. Apex will provide separate treatment of more odorous waste by quickly covering with low odor waste and/or spraying directly with odor neutralizer. Apex will apply odor control product(s) with the major odor control system(s) as necessary, including utilizing the northern slope odor control bench for placement of an odor control system. To the extent possible, Apex will place waste in the northern and eastern sections of each phase to provide screening of waste disposal operations.

Apex will comply with the approved phase development plans to fill to the permitted final waste grades to allow the installation of transitional and final covers as soon as possible. Apex will also progressively place intermediate or transitional covers and establish vegetation to minimize odor generation. Additionally, with prior authorization from the Ohio EPA, Apex may use multiple working faces and/or changes to phase development plans to adjust to seasonal and meteorological conditions.

### **Cover Soil Applications and Materials**

Apex will use soil of proper thickness to maintain proper daily and intermediate cover. Apex will minimize the working face area to the smallest practical size for the incoming volumes. Apex may use New Waste Concepts Proguard to progressively cover exposed waste as an odor control method. Cover soil placement will be performed by Apex personnel and supplemented with an earthwork contractor when on-site.

### **Odor Control and Waste Placement Techniques for Placing Additional Waste on Western and Eastern Slopes**

Apex is proposing to place additional waste on the currently filled slope on the eastern slope of Phase 3 and the western slope of Phase 1. These slopes will be filled from the currently permitted 4H:1V slope to the proposed 3H:1V slopes. Additional waste will not be placed on the

north slope to reduce the potential for odor impacts. The following techniques will be used during placement of waste on the existing slopes to decrease odors.

- A small working face will be used to minimize odors. During this operation, a second working face may be required at another active disposal area.
- Mobile odor control equipment will be placed at the working face when necessary.
- The existing soil cover will be stripped from the slope and New Waste Concepts Proguard may be sprayed over the in-place waste to control odors when necessary.
- Waste will be placed on the eastern slope of Phase 3 from November to April 15.

### 3. MAJOR ODOR CONTROL SYSTEMS

Apex's odor control system is comprised of the seven major systems listed below. Please note that the specific types of equipment presented are the current equipment used at the site and may be revised as equipment improves. Similar equipment that provides the same function may be used in place of the equipment identified here.

#### **HLDA (Hinsilblon Laboratories Diffused Air) Vapor Diffusion Stanchion System**

This waterless vapor odor control system utilizes eco-scent essential oils. With the use of heat the oil is turned into a vapor which is then blown through perforated piping. Each part of the vapor system is positioned approximately 18 feet in height and covers the downwind perimeter of the working face. The vapor system will be expanded or relocated with the development of the landfill and is in operation 24 hours per day, 7 days per week.

#### **HVMU (High Volume Misting Unit)**

This system is a modified snow making machine and modified spray nozzles to offer superior misting coverage. This water/neutralizing unit is capable of fogging very large areas with odor neutralizing agents. The HVMU also automatically oscillates allowing this machine to cover the entire working face with little to no adjustments to the machine.

### **Jacto Agricultural Sprayer**

The Jacto J600 is a conventional agricultural sprayer. Apex utilizes the sprayer and a neutralizing liquid which is pumped through a variety of nozzles then ejected by a fan creating a mist capable of covering the entire tipping area. This misting system is the first line of defense when intermodal containers are opened and odors are exposed to the air.

### **Water Truck Direct Application**

Odor control products are added to the water truck and the mixture is directly applied to odor emitting areas quickly by utilizing the trucks front, side, and rear spray bars. In addition to the spray bars, the truck is equipped with a fire hose which provides heavy working face coverage helping to eliminate odor directly from the source.

### **Rail Yard High Pressure System**

Apex has installed a high pressure system in the rail yard as requested by Jefferson County Health Department. This system is used to control odors during the staging and unloading of rail cars. An odor neutralizing liquid is atomized under high pressure and distributed by high pressure nozzles.

### **New Waste Concepts CAPS 3300**

New Waste Concepts Proguard may be used for odor control at the working face or while stripping existing soil from the western and eastern slopes. The NWC CAPS 3300 machine is used to apply a paper fiber and polymer mix, which when applied to the waste surface creates a thin cohesive odor barrier thereby abating odors caused by in place waste. In addition to the material's ability to seal off odor created by in-place waste, an odor neutralizing agent can be added to the mix further abating the potential for fugitive odor emissions. The Proguard is not presently approved as an ADC and is only used for odor control.

## **Temporary Collection of Landfill Gas from Leachate Collection System Cleanout Piping**

In July 2009, a temporary flare was installed at Apex as part of an Environmentally Beneficial Determination approval dated April 10, 2009. The flare is installed on the western limit of Phase 1. The flare combusts landfill gas collected from the leachate cleanout pipes to control potential odors from landfill gas. The flare is temporary to combust gas until the permanent gas collection and control system (GCCS) is installed, scheduled for August 2010. The permanent GCCS will also collect landfill gas from the leachate cleanout pipes as discussed in Section 4 of this Plan.

### **4. Landfill Gas Collection and Control Systems**

The anaerobic decomposition of solid waste produces landfill gas consisting of methane, carbon dioxide, and trace volatile organic compounds (VOCs). Methane and carbon dioxide are both odorless but the VOCs have the potential to produce odors. The gas collection and control system (GCCS) applies a vacuum to the waste mass to collect the landfill gas, transmits the gas through a piping system, and combusts the gas, which destroys the odors. Applying a vacuum to the waste mass reduces the amount of landfill gas that escapes and is emitted to the atmosphere without combusting.

The landfill GCCS includes the following main components:

- Extraction wells;
- Horizontal gas collectors, as needed;
- Leachate collection cleanout pipes;
- Header pipes, valves and condensate management system;
- Landfill gas combustor.

A landfill gas flare will be used to combust the landfill gas produced by the landfill. Apex may install a gas recovery project to use the landfill gas to produce electricity or other energy sources. In that case, the odors will still be reduced because the landfill gas will be collected and processed. The flare would then serve as a backup control device.

The maximum volume of landfill gas is conservatively estimated to be 5,600 standard cubic feet per minute (scfm). This estimate is based on the AMDWR being accepted 365 days per year. The landfill gas estimate is included in the GCCS Design Plan submitted to DAPC on February 26, 2009 and the Air PTI Application submitted to DAPC on March 13, 2009.

In accordance with the applicable air quality regulations and the site permits, Apex is not required to install the GCCS until August 2010. Apex intends to install the GCCS earlier than required, pending Ohio EPA approval, to control landfill gas odors.