



April 20, 2005

A Report to the Community:

Thank you for taking the time to learn more about the TREE Community Advisory Committee (CAC). We are pleased to update you on the efforts of our committee and seek your views on some of the important community issues related to the operation of the Turnkey facility.

As you may know, the CAC is a volunteer community advisory group that was created last summer to more fully address community and operational issues associated with Turnkey Recycling and Environmental Enterprise Landfill (TREE). The committee's mission is to provide input, suggestions and community feedback while developing a broader dialog with Waste Management and the various constituencies of the Turnkey facility. A more detailed review of the committee's mission and structure is included in these materials for your review.

Facility Operations

Anyone who has visited Turnkey knows it is a complex facility. Committee members have been working hard touring various aspects of the operations, learning from operational presentations, offering suggestions on various issues, as well as reviewing special landfill materials and construction activities, and industry expert reports. This review is important in developing a more thorough understanding of the issues related to effectively managing the disposal of solid waste and thoughtfully representing community concerns and issues.

Reducing Odors

The committee's principal efforts since its creation has been the review of landfill odor issues. Although the Turnkey facility had incidents of bothersome odors in the past, some residents noticed a decided increase in the duration, frequency and intensity of landfill odors-especially during the summer of 2004. These increased incidents of odors were caused by several factors but primarily associated with some performance issues related to the facility's comprehensive landfill gas extraction system. *(Please refer to the Brown & Caldwell Odor Investigation Report for a full discussion of the landfill odor causes and recommend corrective actions.)*

Since that time much has been accomplished and we believe the committee has been a positive and constructive voice in this process.

To improve landfill gas extraction and combustion, and reduce landfill odors, Waste Management has undertaken a multi-million dollar construction effort adding new gas pipelines and gas extraction wells. Additionally, improvements to the design of the gas

collections system has increased the effectiveness of the older, less efficient landfill gas extraction control systems. Other initiatives have also been undertaken to achieve the lowest possible incidences of bothersome landfill odors.

Thus far the results have been encouraging. The Brown and Caldwell odor investigation report indicated that Waste Management was now utilizing the best management practices (and in some cases exceeding them) in their efforts to control landfill odors. The overall number of resident complaints of landfill odors has been reduced considerably since their peak levels last summer. In fact, the Department of Environmental Services noted only one odor complaint last month. Nevertheless the committee is mindful that the construction process at Turnkey continues and that even under the best of conditions some escaping landfill odors will periodically occur.

Community Outreach

The committee believes that keeping area residents and businesses informed, as well as providing community input to Waste Management is important, and an on-going process. The committee continues to strive to broaden the awareness and understanding of the many issues associated with sound landfill management and its harmonious coexistence with area residents. We encourage your participation, comments, and suggestions on how we can better serve you. Thank you.



Clifford A. Newton
CAC Co-Chair
Rochester State Representative



Karen Pollard
CAC Co-Chair
City of Rochester
Economic Development Manager



Inform... Advise... Communicate.
Working together for a better community.

Definition

The Community Advisory Committee (CAC) is a volunteer advisory group that was created at the request of Waste Management to more fully address community issues associated with Turnkey Recycling and Environmental Enterprise (TREE) facility. The CAC was organized in during the summer of 2004 and conducted its first meeting in July of that year. Community members were chosen by the Cities of Rochester and Dover.

Statement of Purpose

The Community Advisory Committee's purpose is to:

- a. ***Inform*** Waste Management officials of issues regarding odor management and landfill operations as viewed from the perspective of area residents and business.
- b. ***Conduct*** information sessions as deemed appropriate for the purposes of soliciting further community perspective and technical expertise.
- c. ***Advise*** company officials regarding areas for broader dialog between various TREE constituencies.
- d. ***Communicate*** to other members of the community efforts underway or planned which have been designed to mitigate landfill odors, as well as other TREE operational issues.

The CAC generally has meets on the third Monday of each month at the TREE classroom facility. Committee meetings are open to the public.

Web Site

The CAC website address is **www.treecac.com**. At the website members of the community can learn more about the CAC'S efforts as well as comment or report a bothersome landfill odor.



Members of the Community Advisory Committee have reviewed virtually all aspects of landfill operations.

In this photo, committee members review one of the many new gas wells that have been installed as part of Waste Management's enhanced landfill gas collection and control program.



Collecting and controlling landfill gas is the primary method of controlling landfill odors. The newly installed landfill gas collection wells have many enhanced features designed to improve gas collection and reduce the likelihood of operational difficulties.

One of the measurements of improvement in controlling landfill odors is the amount of landfill gas collected. Since the installation of these new gas wells and systems, total gas collection has increased significantly.



As can be seen from this photo, sections of the landfill that were previously covered must be trenched in order to install the new piping system, which connects to the landfill gas extraction wells. This construction is a labor-intensive process and, because it requires uncovering areas of the landfill, that were previously covered, can create instances of unpleasant landfill odors.

Waste Management is in the third phase of its construction process that is expected to be completed within the next 45 days.

BACKGROUND INFORMATION

Municipal Waste

Ten years ago there were over 200 landfills operating in New Hampshire. Most of these older landfills posed potential environmental impacts since they were not lined and were ordered closed by state and federal officials. Today, there are less than twelve landfills remaining – with that number continuing to decline.

New Hampshire produces over one million tons of solid waste each year. The safe disposal of waste is an important environmental as well as an economic issue, which affects communities and businesses throughout the Granite State.

Waste Management

Waste Management is the leading provider of comprehensive waste and environmental services in the United States and Canada serving residential, industrial, municipal and commercial customers.

In New Hampshire, Waste Management is the leading recycling and waste disposal company operating in the state, employing over 560 people. The company owns and operates the TREE facility in Rochester, NH, and through its subsidiary, Wheelabrator Technologies, owns and operates two waste-to-energy facilities in the State.

Turnkey Landfill

The Turnkey Recycling and Environmental Enterprise (TREE) facility in Rochester, NH, includes the fully lined sanitary landfill to be licensed in NH. By virtually all industry standards, the Turnkey Landfill is considered a state-of-the-art facility and has been used as a model for other landfill operations throughout the country.

Landfill Gas & Odors

Methane gas is a natural by-product of decomposing refuse and is found in all landfills. Landfill gas, depending on a number of factors, can be found to have and unpleasant odor.

Although TREE maintains an elaborate gas collection system to collect and combust the majority of the landfill gas generated by the facility, certain environmental, weather and operational factors have created instances where escaping gas can unpleasantly affect some area residents.

Community Advisory Committee Structure

Committee members have been appointed by local officials to include, but are not limited to: Rochester and Dover city officials, neighbors and business representatives, member of the Rochester State Legislative delegation, representative from the State of New Hampshire Environmental Services, (DES).

The current members of the committee are as follows:

Co-chairs

Clifford A. Newton
State Representative

Karen Pollard
Economic Development Manager
City of Rochester - City Hall

Environmental Representative

Lorie Chase
Coheco River Watershed Coalition

Dover Resident Representative

Sam Crowley
Fleet Manager, City of Dover

Waste Management Representative

Alan Davis
District Manager, NH Post Collections
Waste Management of NH

**State of NH Department of
Environmental Services
Representative**

Trey Dykstra
Project Manager
NH Department of Environmental
Services, Waste Management Division

Rochester Business Representative

George Jenness
Jenness & Jenness Agency, Inc.

Rochester Resident Representative

Rhonda Knapp
Pickering Road

Rochester City Council Representative

Councilor John Laroche
152 Chesley Hill Road
Gonic, NH 03839-5525

**Rochester Planning Department
Representative**

Kenn Ortmann
Director of Planning
Planning Department - City Hall

City of Dover Representative

Dean Peschel
Environmental Projects Manager



**ODOR INVESTIGATION REPORT
TLR-III REFUSE DISPOSAL FACILITY
ROCHESTER, NEW HAMPSHIRE
September 20, 2004**



Brown and Caldwell Odor Investigation Report

At its September 20, 2004 meeting, the committee received a report from Brown and Caldwell Senior Associate Alan R. Kirschner. Brown and Caldwell is a nationally recognized engineering and consulting firm founded in 1947. The company was retained as a requirement of the Department of Environmental Services to review landfill odor issues at TREE.

Mr. Kirschner briefly outlined the study methodology, testing and recommendations. A written report was prepared which was provided to the DES as well as Waste Management with additional copies provided to the committee.

The Brown and Caldwell report is important in that it was mandated by the DES, and conducted under their supervision. The reports intent was to more fully understand the causes regarding increased landfill odors and comment on what was, can and should be done to mitigate them.

The report concluded that Waste Management's practices were consistent with, and in some cases exceeded the best practices in the industry in regarding landfill gas collection and odor control. Further, Waste Management has agreed to undertake the major recommendations included in the report.

The report's conclusions and recommendations have been copied herein and are as follows:

5.0 CONCLUSIONS AND RECOMMENDATIONS

Brown and Caldwell has performed an investigation of odors related to the TLR-III Refuse Disposal Facility in Rochester, New Hampshire. The study was performed at the request of New Hampshire Department of Environmental Services (NHDES) as part of their overall review of landfill odors at the facility. The study focused principally on the following:

1. Review and analysis of background information pertaining to the Facility;
2. Field investigation with air monitoring and data analysis; and
3. Recommendations and final report preparation.

This report contains the final results of the Brown and Caldwell study.

WMNH has instituted a variety of measures designed to enhance odor and landfill gas controls as a part of its ongoing landfill operation. The most recent measures implemented at the site are described in Section 4.2 of this report and include changes in routine landfill operations (i.e. cover materials), upgrades and expansion of the landfill gas system, and installation of interim low permeability covers on large surfaces of TLR-III and installation of additional final cover. In addition, WMNH commissioned the creation of interim grading plans for the landfill. These plans, submitted to the NHDES in June 2004, provide a road map for the sequence of landfill development for the next 8 years and a schedule for placing additional low permeability cover on the surfaces of the landfill. These plans will be augmented by a similar plan for the landfill gas system. The recent measures and long term plans developed by WMNH generally reflect best management practices employed by the solid waste industry today. Moreover, some of the practices being employed are a step beyond what is typical due to the cost associated with their implementation.

WMNH ceased accepting C&D fines in June 2004. In July 2004, the NHDES banned the codisposal of C&D fines with municipal solid waste, unless the fines originate from a facility that segregates gypsum. The NHDES believes there is a link between fines landfilled with municipal solid waste and the production of hydrogen sulfide, mercaptans and other reduced sulfur compounds, which have low odor thresholds.

Based on our investigation, we recommend additional measures as described below and the continued implementation of others already undertaken by WMNH. It should be noted that the current LFG enhancements are expected to reduce odors, however the installations of these systems will likely cause odors over the short term. Our recommendations are grouped in three categories: Routine Operations, Landfill Gas System and Cover Systems. Although these categories are interrelated from the standpoint of odor and landfill gas controls, they may be considered distinct from an implementation standpoint. Our final recommendation, presented below, is to integrate all aspects of landfill development into a comprehensive odor control strategy, which should be a part of the landfill operations plan.

A. Recommendations Related to Daily/Routine Operations

The potential for odor and gas emission begins with the delivery of solid waste to the landfill. Routine landfill operations include spreading, compacting and covering the waste received. Thus, the ways the waste is handled and managed may be a first line of

defense in the control of odors. With respect to routine operations, we offer the following suggestions:

1. Alternative daily cover materials (ADC). Landfills play an important role in the reuse and recycling of materials as daily cover. The net environmental benefit is a reduced reliance on soil, a natural resource. However, some ADC may present the potential for producing odors while others may not provide the same level of odor abatement. Construction and Demolition (C&D) Fines One alternative daily cover material, C&D fines, is extremely popular because of its availability and other operational benefits (i.e. it provides a good working base during wet weather). However, the use of C&D fines as daily cover has been associated with odor problems at a number of landfills in the northeastern United States during the past few years. TLR-III landfill had used C&D fines for daily cover up until June 2004. In July 2004, the NHDES banned the co-disposal of C&D fines and municipal solid waste at landfills. C&D fines may be a suitable ADC with the appropriate controls in place and sensitivity to the potential for odors. Therefore, we suggest the following guidelines related to the use of C&D fines:

- a. Give preference to C&D fines from sources that actively remove gypsum during production;
- b. C&D fines that are believed to contain gypsum should be amended to neutralize the potential for odors;
- c. Avoid using C&D fines on areas that will not be covered with low permeability interim or final covers in a short period of time or with solid waste the following day, unless they are amended.

When amending C&D fines for use as daily cover, use coal ash, cement kiln dust, soil or some other product that will neutralize the production of hydrogen sulfide. Typically, materials with a high pH are necessary for neutralization. The use of any C&D fines at TLR-III would require specific approval of the NHDES.

2. Evaluate alternative cover materials that have a neutralizing effect on odors. WMNH should consider seeking other alternative daily cover materials to offset the use C&D fines, which would have a neutralizing affect on odors. Also, a product to consider is Posi-Shell Cover System, an alternative cover material developed by Landfill Services Corporation, which due to its cementitious property may mitigate landfill odors.

3. Enhanced strategy for odor neutralizing related to daily operations. The existing odor neutralizing system for the active landfill face is in a fixed position on the landfill. Since the system is not portable, it cannot be relocated to accommodate the location of the active face or wind direction. We recommend supplementing the existing fixed-position system with a portable misting system.

4. Odor neutralizing during construction activities. Landfill construction activities that result in the disturbance of landfilled waste should include odor neutralization. These activities have the potential to produce short-term odor problems that should be addressed in a manner similar to the daily landfill operation. Projects that will disturb waste should include provisions for deploying odor-neutralizing compounds.

5. Routine landfill operations. Landfill operations should be conducted with odor control and minimization as a top priority. With this end in mind, we recommend the following:

a. Limit the number of active landfill faces. WMNH's goal should be to minimize the number of active faces. Multiple active faces should only be employed to address weather-related concerns, when there is need to place select waste on new cells or to segregate specific wastes (i.e. asbestos containing material). The goal of routine operations should be to attain interim or final landfill elevations, which permit the installation of landfill gas controls and interim, or final, cover systems.

b. Plan routine operations to address incoming waste. The operator should seek to identify patterns in the delivery waste that may contribute to odors. For example, in the summer months, the delivery of restaurant waste following a weekend may require special management to control odors. Similarly, the delivery of wastewater sludge should be scheduled so there is sufficient waste to readily mix with the sludge and landfilled without delay.

c. Weekly plan for routine landfill operations. In keeping with odor control as a top priority, we recommend that landfill operations be planned on a weekly basis. The plan should address the location of the active face, filling progression for the week, potential odorous waste deliveries and contingencies for weather-related problems. This level of planning should include operations and engineering/environmental staff with decision making responsibilities.

B. Recommendations Related to Landfill Gas Collection

The existing landfill gas system and proposed expansion of the system should provide adequate gas control. However, we recommend a few refinements to the current design criteria and a change in the operating strategy for the gas system.

1. Design recommendations. To address the pipe grade reversals and blockages experienced in the past year, we recommend modifying some of the criteria now employed for the landfill gas system.

a. Where feasible from a design and construction standpoint, the gradient on gas collection pipelines should be increased from 3 percent to 5 percent to accommodate landfill settlement.

b. The minimum diameter of lateral collection pipes should be increased from 4-inches to 6-inches, if pipe gradients of 5 percent or greater cannot be achieved.

c. The minimum diameter of sub-header collection pipes should be increased from 6-inches to 8-inches, if pipe gradient of 5 percent or greater cannot be achieved. d. Collection pipes on landfill side slopes should be installed, where feasible, perpendicular to the grade of the slope.

2. System operation strategy. The priority of the operational strategy for the landfill gas collection system should be odor control. Accordingly, we recommend WMNH consider approaching landfill gas extraction and control in manner that would maintain a steady flow of gas from the landfill. This has the potential to significantly affect the quality of landfill gas managed at the power generation facilities so a thorough evaluation of impacts should be conducted first.

C. Cover Systems

WMNH's interim cover strategy is a good one and we recommend this strategy continue as landfilling progresses. The interim cover strategy should be closely coordinated with the landfill gas installation strategy. It should also be amended as needed to ensure it is consistent with the filling progression.

D. Integrated Odor Control Plan

WMNH should develop an Integrated Odor Control Plan to more formally align the many elements of the landfill operations, fill progression, landfill gas control, covering operations, and waste acceptance. The plan should unite these elements by placing a priority on odor control. In addition, the landfill operations, engineering and sales teams should be united in setting their priorities as well.

We recommend the development of an Integrated Odor Control Plan that includes the following key components:

1. Identify key roles and responsibilities for controlling landfill odors;
2. Provide training and education on odor mitigation to those playing a key role in odor control and provide awareness training for others associated with the landfill;
3. Link fill progressions, and interim and final cover placement, to odor control;
4. Link landfill gas system development and operational strategy to odor control;
5. Develop a program for evaluating the suitability, from an odor control standpoint, of cover materials for use at the landfill;
6. Develop an odor response plan; and
7. Develop a routine monitoring plan to assess the effectiveness of odor control strategies employed at the landfill.

The Integrated Odor Control Plan should include an integrated landfill interim grading, and development sequence plan, and landfill gas control plan providing a single point of reference for many of the critical elements for odor control.
