WASTE MANAGEMENT

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January 9, 2003

Mr. Cleve Holladay
Division of Air Resources Management
Department of Environmental Protection
2600 Blair Stone Road, MS-5505
Tallahassee, FL 32399

Re: Response to Modeling Comments in December 6, 2002, Letter from Miami-Dade Department of Environmental Management, on the Medley Landfill and Recycling Center Flare Permit Application

Dear Mr. Holladay:

On behalf of Waste Management, Inc. of Florida, EMCON/OWT Inc. (EMCON) offers these responses to the Florida Department of Environmental Protection comments regarding the impact analysis for the proposed enclosed flare that were included in the letter referenced above from the Miami-Dade Department of Environmental Resource Management (DERM). After discussing the issues with you and DERM in a teleconference on December 11, 2002, EMCON is submitting more detailed information regarding the impact analysis comments, as follows.

1. *Please provide additional information to demonstrate the applicability of the Pollution Control Exemption contained in Rule 62-212.400(2)2.c.*

As discussed in a letter responding to H. Patrick Wong, Miami-Dade Department of Environmental Resource Management (DERM), the proposed hydrocarbon flare is a pollution control project (PCP) that is required under 40 CFR Subpart WWW. EMCON has sent a copy of that letter to DEP.

2. *The rules do not exempt the applicant from demonstrating to the Department that the increase in emissions does not violate an ambient air quality standard (AAQS), maximum allowable increase (increment), or visibility limitation. This includes an evaluation of both short term and long term impacts. The evaluation of short-term impacts should be based on the highest expected short-term emission rate. This value is usually greater than the long-term emission rate. Please provide calculations and documentation for all stack parameters used in the modeling analyses.*

Calculations were contained in Document 5 of the application. The landfill gas generation rate at a landfill is relatively constant over a year's time. Because landfill gas collection and control systems must operate continuously, the short term (hourly) emission rates for the proposed flare were based on the hourly design capacity using Medley's gas. The annual rate was calculated assuming 8760 hour annual operation. Thus, the highest short term emission rates are the same as, rather than higher than, the long-term emission rates. These rates were the basis for the AAQS, increment, and visibility analyses submitted.

2 a) ...Medley Landfill [should] demonstrate that the impact of the projected increase in emissions will not result in exceedences of significant impact levels for Class 1 as well as Class 2 PSD areas. The applicant should redo the short-term significant impact modeling if the highest expected short-term rates are greater than those proposed in the permit application. If any significant impact levels are exceeded, then further multi-source impact analyses will be required for any pollutant and averaging time that an above significant impact level is predicted. This multi-source modeling is required to demonstrate that increased emission will not result in an exceedance of any federal, state, or local ambient air quality standards of PSD increments.

As discussed in our teleconference on December 11, 2002, the screening results presented in the application were higher than the Class 1 significant impact levels used by the Federal Land Managers. DEP performed a refined modeling analysis using ISC and the results of a CAL-PUFF model run, and the flare's impacts were found to be lower than the screening results at the Class 1 Everglades boundary, although still above the significant impact levels.

You indicated that the analysis you performed considered the effects of nearby sources from a modeling study submitted previously. DEP said that it had determined, with the Federal Land Manager, that the air quality concentrations resulting from the proposed flare will not exceed AAQS or the increments in the Class I or Class 2 areas. DEP has concluded that the proposed project impacts are acceptable. EMCON prepared an expanded summary of the analysis as described in our response to Comments 3 and 4.

As discussed under Comment 2), the short-term impact modeling submitted with the application reflected the highest short-term emission rates.

b) submit a modeling protocol for approval...

As discussed in the teleconference, the modeling analysis is adequate and no protocol is required to be submitted.

While not included in the comment letter, during the teleconference you asked about whether the "flare option" had been used in the screen modeling run. EMCON did run the

inputs using the "flare option" and found that the impacts were lower. As a result, EMCON submitted results in the impact report that were not modeled using the "flare option."

3. Demonstrate that the emissions will not violate the Miami-Dade SO_2 ambient air quality standards.

The modeling results have been compared against the local AAQS in a revision to Table Ambient Air Quality Standards Modeling Results in the application. The AAQS will not be exceeded.

The revised table is presented in Attachment 1.

3. *Statewide minor source baselines have been established for PM10, SO_2, and NOx.*

The teleconference clarified this point and indicated that the minor source baseline issue does not need to be addressed further.

4. *Provide adequate information such as the elevations of different structures surrounding the proposed flare, including existing and proposed landfill cells, pine trees, etc. and demonstrate why downwash does not apply in this case.*

More complete details of nearby structures near the proposed flare have been included in a revision to the facility plan of the facility in order to more thoroughly evaluate the Good Engineering Practice (GEP) stack height and the potential for downwash.

A chart presenting detailed information and a description of the GEP analysis is included with the revised plan (Figure 2) in Attachment 2.

5. *Submit a sample analysis and detailed characterization of the off-gases generated at the landfill specifically to determine the methane and non-methane organic composition.*

Gas characterization information was included in the DERM letter. As indicated above, a copy of this letter has been sent to you.

6. *Clarify if the existing flares will be replaced by this proposed flare... Submit a netting analysis of emissions.*

Emission information for the facility is included in the DERM letter. A copy of this letter was sent to your office.

The modeling comments discussed in detail above were briefly addressed in the letter to DERM referenced above. EMCON is sending a copy of this letter to DERM to complete their file with the detailed responses to the modeling issues. We have requested that DERM proceed with processing the application based on the responses contained in both letters.

Should you have further questions, comments, or information needs, please contact me or Sarah Simon at 978-691-2126

Sincerely,

EMCON/OWT, Inc.

Bryan Tindell,
Engineer

Sarah J. Simon
Senior Air Engineer

Attachments: Attachment 1: Revised Table AAQS Modeling Results
Attachment 2: GEP Analysis and Nearby Building Plan

cc: H. Patrick Wong, DERM
Mallika Muthiah, DERM
Juene K. Franklin – EMCON
Bruce Maillet – EMCON
Scott Miller - EMCON
Syed Arif, DEP

ATTACHMENT 1

SCREEN3 Modeling
Revised AAQS Modeling Results
Waste Management, Inc. of Florida
Medley Landfill
Medley, Florida

Dilution Factor[a] 0.9235 $\mu g/m^3/g/s$
Is the factor 1 hour (1 hrb Simple Terrain
Annual operation[e] 8,760 hr/yr

Criteria Pollutants

Pollutant	Emission Rate [(c)] ton/yr	Emission Rate [(c)] g/s	Averaging Period (hr)	Maximum Modeled Concentration ($\mu g/m^3$)	Monitored Concentration [d] ($\mu g/m^3$)	Total ($\mu g/m^3$)	Miami-Dade AAQS [(e)] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	59.0	1.70	Annual	0.13	34.9	35.0		100
SO_2	370	10.63	3	8.84	37.1	46.0	350	1,300
			24	3.93	11.4	15.4	110	365
			Annual	0.79	2.86	3.64	25	80
CO	173	4.99	1	4.61	10,995	11,000		40,000
			8	3.23	5,747	5,751		10,000
PM_{10}	7.67	0.22	24	0.08	95.0	95.1		150
			Annual	0.02	28.4	28.4		50

[a] Source: SCREEN3 maximum modeled concentration

[b] Conversions per EPA guidance from 1 hour to 1 hour 1.00 24 hour 0.40
3 hour 0.90 Annual 0.08
8 hour 0.70

[c] Emission Rates taken from Medley Modeling 6K Flare.xls:Source Information

[d] Source: AIRS database; maximum high-second high over the latest 4+ years listed (except for annual)
Monitored Concentrations taken from
Medley Modeling 6K Flare.xls:Monitored NO2 Concentrations'!

[e] Miami Dade AAQS added; taken from Miami-Dade DERM Website

ATTACHMENT 2

3 Riverside Drive
Andover, MA 01810-1141
Phone: 978-682-1980
Fax: 978-975-2065

Memorandum

Date: January 8, 2003

To: Rick Garcia

CC: Bryan Tindell

From: Scott D. Miller/Sarah Simon

RE: GEP and Downwash Potential for New Flare at Medley Landfill

Good Engineering Practice Stack Height Analysis

In some cases, the aerodynamic turbulence induced by a *nearby* (i.e., structures within a distance of five times the lesser of the height or width of the structure, but not greater than 0.5 miles) building will cause a pollutant emitted from an elevated source to be mixed rapidly toward the ground (*downwash*), resulting in higher ground-level concentrations immediately to the lee of the building than would otherwise occur. SCREEN3 can calculate ground-level pollutant concentrations that occur as a result of the downwash. The building downwash screening procedure is divided into the *cavity* region and *wake* region.

A simple rule-of-thumb, known as "GEP" (Good Engineering Practice) stack height, is typically applied to determine the stack height (h_s) necessary to *avoid* downwash problems:

$$h_s \geq h_b + 1.5\, L_b$$

where h_b is building height and L_b is the lesser of either building height or maximum projected building width. In other words, if the stack height is equal to or greater than $h_b + 1.5\, L_b$, downwash is unlikely to be a problem.

A GEP stack height analysis identifies nearby structures on an off a site that have the potential to influence stack exhaust. If more than one structure is considered in the analysis, the structure (or tier on a structure) that results in the highest GEP formula height is considered the *controlling* structure (or tier) and is input to SCREEN3.

Cavity Region

Generally, downwash has its greatest impact when the effluent is caught in the cavity region. Cavity calculations are based on the determination of a *critical* (i.e., minimum) wind speed required to cause *entrainment* of the plume in the cavity (defined as being when the

plume centerline height equals the cavity height). Two cavity calculations are made, the first using the minimum horizontal dimension alongwind, and the second using the maximum horizontal dimension alongwind. SCREEN3 provides the cavity concentration, cavity length (measured from the lee side of the building), cavity height, and critical wind speed for each orientation. The highest concentration value that potentially affects ambient air is used as the maximum 1-hour cavity concentration for the source.

Wake Region

The cavity may not extend beyond the plant boundary and, in some instances, impacts in the *wake* region may exceed impacts in the cavity region. SCREEN3 accounts for downwash effects within the *near* wake region (out to 10 times the lesser of the building height or projected building width, $10L_b$), and also accounts for the effects of enhanced dispersion of the plume within the *far* wake region (i.e., beyond $10L_b$). The same building dimensions as described above for the cavity calculations are used, and SCREEN3 calculates the maximum projected width from the values input for the minimum and maximum horizontal dimensions.

Structures Considered for this Analysis

Figure 2 is a footprint showing all structures considered in the GEP analysis. Table 1 (next page) shows that the flare is far enough away from all buildings/structures such that dimensions do not have to be considered in the modeling.

Shaw™ Shaw Environmental, Inc.

Table 1. Good Engineering Stack Height Analysis
Flare3 is located beyond the furthest "aerodynamic" extent of any building/structure

	Dimensions[a,b]							
Building/Structure	Height (ft)	Length (ft)	Width (ft)	MPW (ft)	L (ft)	5L (ft)	Distance to Flare 3[d] (ft)	GEP Formula Height[c] (ft)
Administation Building	35	95	70	110	35	175	195	87.5
Truck Wash Cover	35	65	50	80	35	175	345	87.5
Treatment Plant	30	60	50	80	30	150	515	75.0
Tank 1(round)	30	--	--	32	30	150	520	75.0
Tank 2 (round)	30	--	--	32	30	150	570	75.0

MPW - maximum projected width

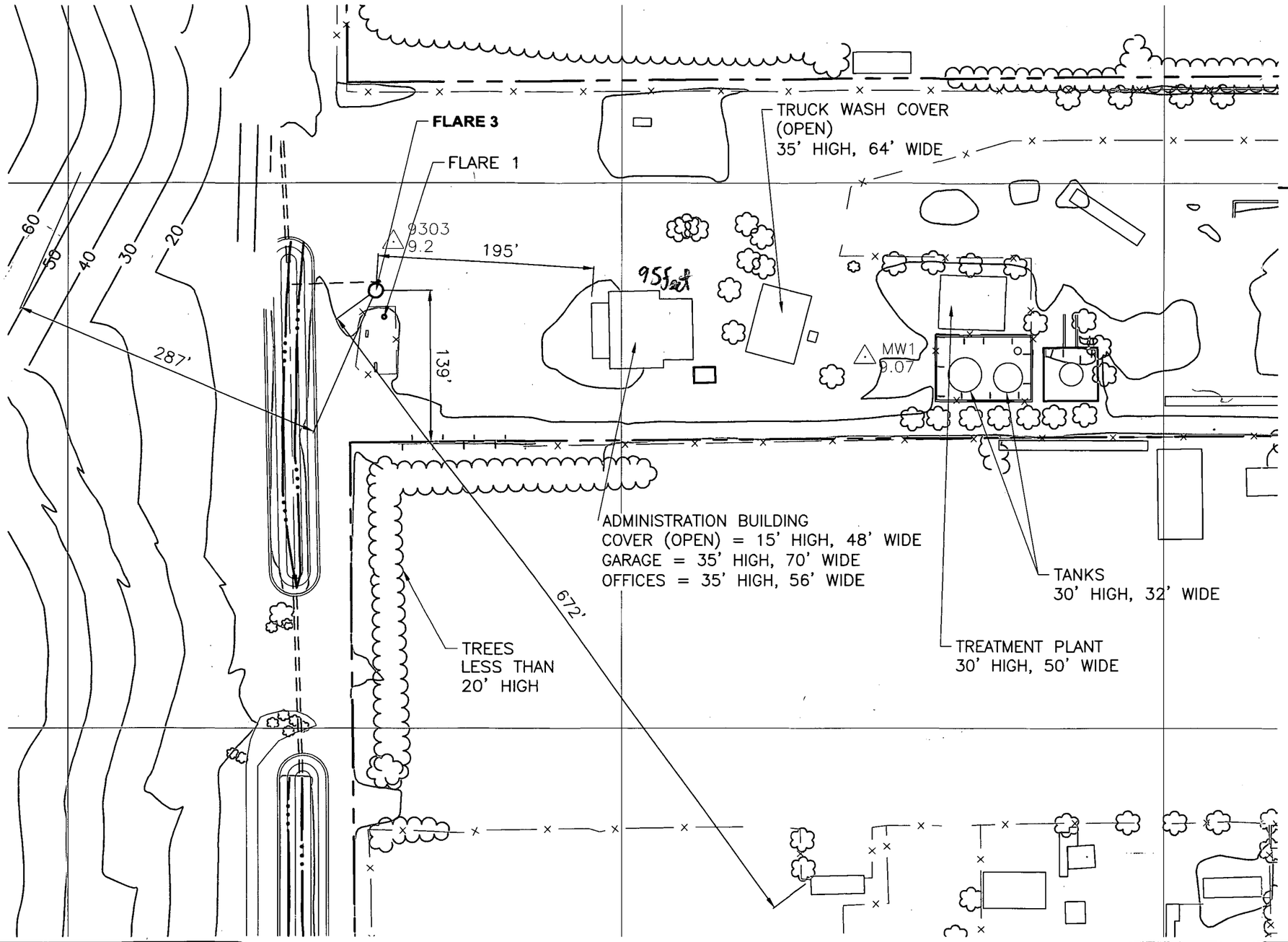
L - lesser of height or maximum projected width

[a]Dimensions measured from: *Figure 2, Nearby Buildings and Dimensions*, EMCON/OWT, Inc. January 2003.

[b]measurements are approximate

[c]A stack would have to be at least this height to escape the aerodynamic influence of this building/structure (for modeling purposes)

[d]Measured from center of flare to nearest edge



LEGEND

80 — FINAL COVER GRADE CONTOURS

EXISTING PROPERTY LINE

FLARE SYSTEM:

FLARE 1 IS 30' TALL, 14" DIAMETER (EXISTING UTILITY FLARE)

FLARE 3 (PROPOSED) WILL BE 55' TALL, 13' DIAMETER (ENCLOSED FLARE)

NOTES:

1. NEAREST PROPERTY LINES ARE 110' SOUTH OF FLARE 1 AND FLARE 3.
2. ADMINISTRATION BUILDING IS 205' EAST OF FLARES.
3. NEAREST BUILDING SOUTH BEYOND FENCE LINE IS 635' SOUTHWEST.
4. BUILDING HEIGHTS AND WIDTHS MARKED IN FEET.

This map compiled by photogrammetric methods from aerial photography dated 09-05-99 Vertical datum based on NGS Mean Sea Level Contour interval 2 ft Grid based on Florida State Plane Coordinate System South Zone NAD 1927.

Shaw™ EMCON/OWT, Inc.

0 100 200
SCALE IN FEET

FOR PERMITTING ONLY

DATE 1/3/03
DWN J.O'D.
APP
REV
PROJECT NO.
840138

FIGURE 2
WASTE MANAGEMENT, INC.
MEDLEY LANDFILL
MEDLEY, FLORIDA
NEARBY BUILDINGS AND DIMENSIONS

1" 1/2" 0" 1"
XREF Files: PERM-CON anmebd01 Property IMAGE Files:
File: N:\dwg\medley\anmef-02.dwg Layout: Layout1 User: jodonnell Jan 03, 2003 - 1:52pm

Shaw™ Environment, Inc.

3 Riverside Drive
Andover, MA 01810-1141
Phone: 978-682-1980
Fax: 978-975-2065

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