MEMORANDUM

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Subject: Presumptive MACT For Continuous Processes At Existing Sources

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To: Miscellaneous Organic NESHAP Project File

The purpose of this memorandum is to identify presumptive MACT for continuous processes at existing sources covered under the Miscellaneous Organic NESHAP (MON). These standards will apply to processes that:

a. emit HAP;
b. are located within a major source;
c. are covered by one of the following SIC codes: 282, 284, 285, 286, 287, 289 or 386; and
d. are not covered by any other MACT standard.

For additional details regarding applicability please refer to 61 FR 57602. The MON rule may be applied to continuous processes such as solvent recovery operations and others that are not directly involved in the manufacture of organic chemicals. Presumptive MACT has not been determined for new sources covered under the MON rule. Interested stakeholders are requested to comment on setting MACT standards for new sources.

Presumptive MACT will be identified separately for batch processes covered under the MON rule at a later date. It is expected that there will be common requirements for storage tanks, equipment leaks, and wastewater among continuous and batch processes.

The following paragraphs provide discussion of presumptive MACT for continuous processes and describe the methodology used in arriving at presumptive MACT. Data used in presumptive MACT analyses are included in the MON database. The MON database includes detailed emissions data for miscellaneous organic processes in the

following seven states: California, Illinois, Louisiana, Missouri, New Jersey, North

Carolina, and Texas. Information for these states was obtained primarily through electronic emission databases maintained by the individual states. Additional details regarding the MON database are documented in a memorandum titled "Description of MON Database" dated July 11, 1996. This memorandum is available through the EPA Bulletin Board.

Continuous Process Vents

The presumptive MACT for continuous process vents is a combustion device for vents with total resource effectiveness (TRE) values less than or equal to 1. TRE will be determined using the equation shown below. This equation, along with associated constants, is identical to the TRE equation in the Hazardous Organic NESHAP (HON) rule. Other HON provisions for process vents may also be adopted for continuous process vents covered under the MON rule because MON processes are similar to HON processes. However, the applicability of process vent standards may not be restricted only to air oxidation, reactor and distillation vents as done in the HON.

The following equation will be used to calculate TRE:

$$TRE = \frac{(a + bQ_s + cH_t + dE_{TOC})}{E_{HAP}}$$

where,

a,b,c,d	=	regression coefficients (see Table 1);
TRE	=	Total Resource Effectiveness;
Q_s	=	vent stream flow rate at a standard temperature of 20^oC (scmm);
H_t	=	vent stream net heating value (MJ/scm);
E_{TOC}	=	hourly emission rate of TOC minus methane and ethane (kg/hr); and
E_{HAP}	=	hourly emission rate of total organic HAP (kg/hr).

The presumptive MACT for continuous process vents is based on the MACT floor. The MACT floor was determined from the central tendency of calculated TRE values for the top 12 percent of process vents. The median was determined to be the best measure of central tendency because outliers led to unreasonable values for the mean, another measure of central tendency. The mean was three orders of magnitude greater than 1, hence deemed unreasonable. A median TRE value of 0.8 was the central tendency of the data set covering vents with all necessary data including flow rate needed to accurately perform TRE calculations. However, flow rate data were available for only 55 percent of the vents. In order to achieve better representation, MACT floor analysis was also performed for all the vents in the database by assuming an average flow rate for vents with no flow rate data. A median TRE value of 1.2 was the central tendency of the data set covering all vents. Therefore, the MACT floor for continuous process vents can be represented by a TRE value between 0.8 and 1.2. For the purpose of arriving at a discrete number, the numbers 0.8 and 1.2 were averaged, and a TRE value of 1.0 was selected as the MACT floor for process vents. An option above the floor was not chosen based on previous decisions for the HON that the costs would be unreasonable. Additional details regarding MACT floor determination for process vents can be obtained from a memorandum titled "MACT Floor Analyses For Continuous Processes" dated January 14, 1997. This memorandum is available through the EPA Bulletin Board.

Table 1. TRE Coefficients Table

Stream Type	Control	a	b	c	d
Nonhalogenated	Flare	1.935	3.66e-01	-7.69e-03	-7.33e-04
	Incin. (0% recovery)	1.492	6.27e-02	3.18e-02	-1.16e-03
	Incin. (70% recovery)	2.519	1.18e-02	1.30e-02	4.79e-02
Halogenated	Incin. with scrubber	3.995	5.20e-02	-1.77e-03	9.70e-04

Storage Tanks

The presumptive MACT for storage tanks is an internal floating roof or a control device with an efficiency ≥ 95 percent along with vapor pressure and size cutoffs indicated in Table 2. The three tank classes shown in Table 2 are identical to those evaluated for the HON. Note that the presumptive MACT for storage tanks may change based on pending review of the MON database by interested stakeholders and additional data being gathered.

Table 2. Presumptive MACT for Storage Tanks

Class	Vapor Pressure Cutoff
(10,000 - 20,000) gallons	1.9 psia
(20,000 - 40,000) gallons	1.7 psia
≥40,000 gallons	0.75 psia

Presumptive MACT for the (10,000 - 20,000) and (20,000 - 40,000) classes is based on the MACT floor. The MACT floor was determined using tank size, vapor pressure, and emission reductions data included in the MON database. The MACT floor for the 40,000 gallons and greater class was determined to be 1.9 psia. For this class, the presumptive MACT was selected to be more stringent than the MACT floor with a vapor pressure cutoff of 0.75 psia. This presumptive MACT is based on the regulatory option selected in the HON. This option was based on incremental cost analyses for going from 1.9 psia to 0.75 psia. The cost impact analyses showed an incremental cost-effectiveness of $ 1,600/Mg which was judged to be reasonable. Also, because the floor analysis for the HON determined the vapor pressure cutoff of 1.9 psia for medium tanks, it is expected that when all data are in, the result will be identical vapor pressure cutoff for medium tanks. This expectation is based on the assumption that availability of better information will lead to a conclusion similar to the HON.

<u>Equipment Leaks</u>

The presumptive MACT for equipment leaks is the HON equipment leak provisions. The HON equipment leak provisions in 40 CFR 63, Subpart H, are based on negotiated rulemaking. The MACT floor for equipment leaks is the Louisiana MACT determination for non-HON sources. The presumptive MACT represents a more stringent option than the MACT floor for equipment leaks. Please refer to Table 3 for leak definitions for the HON and those for the Louisiana program. Monitoring frequencies specified in the Louisiana rule are similar to monitoring frequencies specified in the HON. Details regarding MACT floor determination for equipment leaks can be obtained from a memorandum titled "MACT Floor Analyses For Continuous Processes" dated January 14, 1997. This memorandum is available through the EPA Bulletin Board.

Analyses were performed to determine the incremental impact of HON equipment leak provisions which are more stringent than the Louisiana MACT determination for non-HON sources, the MACT floor. These analyses were performed using equipment leak data gathered for the HON. These data indicate that percent leakers affected by the HON is insignificantly higher than percent leakers affected by the Louisiana rule . This determination was made by performing a paired t-test at a 90 percent confidence level. Therefore, incremental costs which stem from additional repair needs are expected to be negligible because percent leakers affected by the HON is roughly the same as percent leakers affected by the Louisiana rule. However, the HON would lead to higher emission reductions compared to the Louisiana rule due to its more stringent equipment leak definitions as shown in Table 3. For example, leak definitions for a gas valve under the HON and Louisiana programs are 500 ppm and 1,000 ppm, respectively. Therefore, control effectiveness would be higher for HON compared to the Louisiana rule.

Wastewater

The presumptive MACT for wastewater sources is the HON wastewater provisions. The HON wastewater provisions are included in 40 CFR 63, Subpart G. These provisions apply to wastewater streams that either contain 10,000 ppmw or more of volatile HAP's or exceed a flow rate threshold of 10 lpm with a volatile HAP concentration of 1,000 ppmw or more. A list of the volatile HAP's is included in Table 9 of 40 CFR 63, Subpart G. Based on data included in the MON database, there is no MACT floor for wastewater sources. Therefore, presumptive MACT represents a more stringent option. The presumptive MACT is based on cost-effectiveness determination made in the HON rulemaking process. Cost-effectiveness was determined to be $ 430/Mg. Wastewater streams covered under the MON are assumed to be similar to wastewater streams covered by the HON. Therefore, presumptive MACT is the wastewater standards in the HON.

Table 3. HON and Louisiana Non-HON Leak Definitions

Item of Comparison	40 CFR 63 Subpart H Hazardous Organic NESHAP	LAC 33:III Louisiana Non-HON MACT
Stream Applicability	> 5% VHAP by weight; and In Organic HAP service > 300 hrs/yr	5% wt of the sum of Class I and II organic TAPs
Leak Definition	<u>Valves - Gas/LL:</u> Phase I : 10,000 Phase II : 500 Phase III : 500 <u>Valves - HL:</u> No visual/500 <u>Pumps - LL:</u> Phase I : 10,000 Phase II : 5,000 Phase III : 1,000 <u>Pumps - HL:</u> No visual/2,000 <u>Compressors:</u> 500 <u>CVS:</u> 500 <u>PRVs - Gas:</u> 500 <u>PRVs - Liquid:</u> No visual/500 <u>Connectors:</u> 500 <u>Agitators:</u> 10,000 <u>Process Drains, Sampling Points, Surge Vessels:</u> No visual <u>Instrument Systems:</u> No visual/500 <u>Open-Ended Lines:</u> No visual	<u>Valves - Gas/LL:</u> 1,000 <u>Valves - HL:</u> No visual/1,000 <u>Pumps - LL:</u> 2,000 <u>Pumps - HL:</u> No visual/2,000 <u>Compressors:</u> 5,000 <u>CVS:</u> 500 <u>PRVs - Gas:</u> 500 <u>PRVs - Liquid:</u> No visual/1,000 <u>Connectors:</u> 1,000 <u>Agitators:</u> 10,000 <u>Process Drains, Sampling Points, Surge Vessels:</u> No visual <u>Instrument Systems:</u> No visual/1,000 <u>Open-Ended Lines:</u> 1,000