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Via Electronic Transmission: driscoll.tom@epa.gov

Mr. Thomas A. Driscoll
USEPA/OAQPS/SPPD
Measurement Policy Group, Room D221D
109 TW Alexander Drive (D243-05)
Research Triangle Park, NC 27711

Re: Proposed Revisions to AP-42 Chapter 2.4

Dear Mr. Driscoll:

The Solid Waste Association of North America and the National Solid Wastes Management Association are pleased to offer the following comments on the United States Environmental Protection Agency's (EPA) proposed revisions to *AP-42, Fifth Edition, Volume I, Chapter 2.4 Municipal Solid Waste Landfills* (EPA 2008a) and the *Background Information Document for Updating AP-42 Section 2.4 for Estimating Emissions from Municipal Solid Waste Landfills* (EPA 2008b). The National Solid Wastes Management Association (NSWMA) and the Solid Waste Association of North America (SWANA) represent companies, municipalities, and professionals in the solid waste management industry. NSWMA is a not-for-profit trade association representing private solid waste collection, disposal, and recycling companies. SWANA is a professional education association in the solid waste management field with members from both the public and private sectors.

Our two associations are committed to working with EPA to ensure that the final published emission factors are of high quality and truly represent the municipal solid waste landfill industries' emissions. Our comments are divided into two sections: general comments and specific comments.

GENERAL COMMENTS

Omission of Data Obtained with Federally-Approved Test Methods

We have serious concerns with EPA's rejection of non-methane organic compounds (NMOC) concentration data derived from NSPS/EG Tier 2 studies using the geoprobe method. The MSW landfill industry previously submitted (WIAC 2000) 144 Tier 2 study reports based primarily on

this method (attached). This report and the respective NMOC values lend substantial statistical validity to EPA's AP-42 database as well as provide better geographical coverage of landfills across the U.S. than had been previously achieved. However, the majority of these data were rejected without any valid scientific or regulatory reason to do, but because the data were obtained using the geoprobe method.

The Tier 2 geoprobe method was developed by EPA and is an approved EPA Method under 25C. EPA's approved method contains a specific methodology for determining the placement and number of sampling locations, extracting samples, and conducting laboratory analyses to ensure the data obtained are representative of the average concentration of NMOCs in landfill gas (LFG) at the site. Further, the data derived from these geoprobe studies are considered acceptable for determining regulatory applicability under the landfill NSPS/EG, a federal Clean Air Act (CAA) program.

In a previous submittal to EPA (WIAC 2000), NMOC data were provided for 144 landfills in the U.S. and Puerto Rico that were conducting Tier 2 analyses under the NSPS/EG for MSW landfills. The results of the NMOC data survey are summarized in Table 1 of the WIAC letter attached to our comments. The average NMOC concentration across all regions was 457 parts per million by volume (ppmv), as hexane, which is approximately 24 percent less than the original AP-42 default of 595 ppmv and approximately 83 percent of the proposed new AP-42 default of 838 ppmv. Only 18 of 144 landfills in the WIAC study reported an NMOC concentration above the proposed default of 838 ppmv, making this proposed value highly questionable. Also, the average NMOC concentration for Southwest landfills was greater than the average value for all other regions. One explanation for this is that in wetter climates LFG generation and flow rates are typically higher, which may dilute the NMOCs, thus reducing the measured NMOC concentrations in LFG.

The NMOC data survey supplied in the WIAC study also set out to establish whether NMOC concentrations varied depending on the method used to collect the data. NSPS/EG Tier 2 methodologies allow determination of site-specific NMOC concentrations by either geoprobing through the cover of the landfill or obtaining samples directly from an existing LFG collection and control system (GCCS). Based on this survey, the average NMOC concentration was statistically the same regardless of what method of sampling was selected, as shown in the following Table.

Comparison of Tier 2 Sampling Methods

Sample Location	# of Sites Reporting	Average C_{NMOC} (ppmv-H)
Active	33	447
Probe	114	469

These data call into strong question EPA's new proposed default value for NMOCs since 144 data points across the country, all from post-1992 analyses, would suggest EPA's proposed default value is almost twice as high as it should be. Further, this increase in NMOC concentrations over time, which we would have to believe if EPA's change from 595 ppmv to 838 ppmv is accurate, is inconsistent with the overall reduction in individual organic compound concentrations seen in EPA's own study and as reflected in the proposed new AP-42 values for organic compounds.

Moreover, the WIAC data also show that there was not a statistical difference in Tier 2 NMOC data derived from geoprobe studies or GCCS samples, which refutes EPA's position that geoprobe data are not representative. We believe the previously submitted data provides an accurate picture of average NMOC concentrations, however, EPA should compile additional NMOC data as well as accept data from the Tier 2 geoprobe method before it can accurately propose a representative value for NMOC in landfill gas. Finally, consideration should be given for providing default NMOC concentrations for wet and dry climate landfills.

Data Used for Revising NMOC Emission Factors

We appreciate EPA's willingness to meet with us on February 4, 2009 to discuss the existing data. However, the question as to why some data we submitted was rejected by EPA in the AP-42 revision and Background Information Document (EPA 2008b), has never been fully answered. This data was submitted to EPA in the 2000 and 2001 timeframe, but we were not notified until 2009 that the data was inadequate. Since the revised AP-42 is supposed to be a living document that will be continually updated if the data meets EPA's completeness criteria, we expect that the newly supplied data to be reviewed and incorporated into the emission factor database.

Lastly, numerous peer-reviewed studies have been published that are directly related to key factors used in the draft AP-42 update including, L_0 , k for wet landfills, soil oxidation of methane and organics, and optical remote sensing. Attached is a list of published technical literature for EPA review. We suggest that EPA revise the draft AP-42 and BID accordingly.

SPECIFIC COMMENTS

Page 2.4-7 and TABLE 2.4-1: NMOC and VOC Default Concentrations

EPA proposes to revise the default NMOC concentration of 838 ppmv for post-1992 landfills, while the pre-1992 landfills remain at 595 ppmv. We have already raised concerns with the exclusion of punch probe sampling data (please refer to above discussion). In addition, we are concerned that the NMOC default value is biased because of the presence of an outlier. As EPA mentions, the outlier is attributed to the use of contaminated soils as alternate daily cover at the MSW landfill. This practice is not an industry standard and therefore, is not representative of national conditions. Limited review of a draft of the test report revealed that three samples were taken to generate this data point. There was not a consistent sampling procedure used for sample collection (one sample was collected using a flowmeter and the others were not) and the three samples showed large variability, ranging from 3,650 ppmv to 9,330 ppmv. Unfortunately, the complete final test report was not made available for review. The BID acknowledges that outlier points were present and included in the calculations, "... because no datum should be rejected solely on the basis of statistical tests since there is a risk of rejecting an emission rate that represents actual emissions." While this statement may be warranted if the data was truly valid, problems associated with the sampling indicate that the outlier point may not represent actual emissions. Therefore the outlier should be removed from the data set or a new and separate

emission factor should be developed for sites that use contaminated soils as alternative daily cover (ADC) similar to the NMOC emission factor established for codisposal sites.

In general, treatment of the NMOC and VOC test data is not consistent with the EPA practices described in the previous version of AP-42 section 2.4 (EPA 1997). For example, several test reports from one site were included as discrete tests when they should have been averaged. Averaging the test reports will remove some of the bias present from individual sites, such as the Bradley landfill, which has six data points included in determining the NMOC concentration.

Appendix 1 (attached) shows the data for the 165 LFG constituents included in AP-42. Several of these have negligible photochemical reactivity per 40 CFR 51 (as noted). The BID estimates the VOC fraction of NMOC is 99.7 percent. Appendix 1 shows that the sum of the constituents as hexane is far below the NMOC emission factor (161 ppmv versus 838 ppmv). The VOC fraction of NMOC is not determined by summation, but by subtracting the compounds with negligible photochemical reactivity. It is unclear how the NMOC emission factor would increase substantially, with the percent VOC increasing, while the concentration of individual components decrease or remains the same (2-propanol, ethyl mercaptan, and ethane decrease by greater than one order of magnitude). Further investigation is needed to determine an appropriate percentage of NMOC to be considered VOC.

Page 2.4-21: Control Device Emission Factors - Flares

We cannot completely respond to the proposed emission factors for flares as the test reports for the flares have not been made available. The EPA Technology Transfer Network (TTN) web site states that the test reports are to be posted on line for review. However, to date, the test reports used to establish the revised emission factors have not been posted, and consequently the public has not been given the opportunity to review the basis for the proposed revisions. We do have some specific concerns, as detailed below.

We are concerned with the carbon monoxide (CO) emission factor, which is significantly lower than what current LFG flare manufacturers will guarantee. In fact, it is our understanding that flare manufacturers cannot guarantee this proposed low emission rate based on current technology.

The proposed control efficiency for flares listed at 97.7 percent also is very concerning and we request that EPA provide the justification and analysis behind this proposed factor. Our concern is that the basis for this factor was developed on old test data within a small geographical area and is not representative. In addition, given that the NSPS/EG rules refer to a 98 percent destruction efficiency for the control equipment, we would recommend that the AP-42 adopt this factor to be consistent.

We are also extremely concerned with EPA's publication of the proposed dioxins/furans emission factor for flares. It is disturbing that EPA established an emission factor based on only one of three Method 23 sampling runs. EPA admits in the BID that the one test report "does not represent a random sample of LFG flares." In review of the BID referenced document number TR-273, EPA, or its contractors, performed three Method 23 sampling runs. However, as a cost

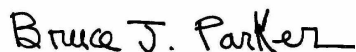
saving measure, only the samples from one run (Run 3) were analyzed. In addition to being very expensive, testing and analyzing compounds that are in the range of nanograms is highly variable and subject to error. Given that the emission factors established by EPA in AP-42 are meant to represent national conditions, one test run conducted on one flare does not represent national conditions.

We also noted in review of the BID reference document number TR-287, that EPA elected not to collect samples of dioxins/furans at the enclosed flare. According to the EPA test report, the flare demonstrated “high gas temperatures (>1400°F) at the sampling location near the flare stack exit” which “rendered the presence of dioxins and furans improbable. Formation of dioxins and furans is favored within the temperature window between 500 and 700°F. The flare system did not provide for the gases to be cooled to these temperatures before the gases are emitted into the atmosphere.” We believe this is a serious breach of the EPA’s own data quality guidelines and respectfully request that the agency remove this emission factor from the guidance.

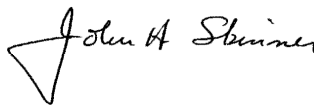
We believe the proposed nitrogen oxide emission factors of engines are very high, increasing nearly threefold from the current emission factor. Landfill gas-fired IC engines have improved design and operation such that emissions of nitrogen oxides have decreased. In addition, other regulatory drivers are also pushing emissions lower. The BID indicates a bias to older tests. Seven of the nine tests evaluated (78%) were completed 11 to 21 years ago. Of the two newer tests, one is a significant high outlier. EPA failed to use the data that the agency already had and reviewed for the development of the NSPS, Subpart JJJJ. Another indication that the emission factors are not appropriate is that the nitrogen oxide emission factor is higher than will be allowed under Subpart JJJJ (for engines manufactured after July 1, 2010). These factors are clearly inadequate and should be determined using engines that meet more current standards promulgated by EPA.

In closing, we appreciate the opportunity to provide comments on this proposed guidance and look forward to working with EPA as this process moves forward. SWANA and NSWMA appreciate your prompt attention to this request and look forward to your response. Please contact John Skinner of SWANA at 301-585-2898 or jskinner@swana.org or Bruce Parker of NSWMA at 202-364-3720 or bparker@envasns.org.

Sincerely,



Bruce J. Parker
President and CEO
NSWMA



John H. Skinner, Ph.D.
Executive Director and CEO
SWANA

**Appendix 1: Landfill Gas Constituents
Summation as Hexane**

Compound	Mean (ppm)	Mean as Hexane (ppm)
1,1,1-Trichloroethane	2.43E-04	0.0001
1,1,2,2-Tetrachloroethane	4.17E-01	0.1390
1,1,2,3,4,4-Hexachloro-1,3-butadiene	3.83E-03	0.0019
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	6.72E-02	0.0224
1,1,2-Trichloroethane	1.58E-01	0.0527
1,1-Dichloroethane	2.08E+00	0.6933
1,1-Dichloroethene (1,1-Dichloroethylene)	1.60E-01	0.0533
1,2,3-Trimethylbenzene	3.59E-01	0.5385
1,2,4-Trichlorobenzene	5.51E-03	0.0055
1,2,4-Trimethylbenzene	1.37E+00	2.0550
1,2-Dibromoethane (Ethylene dibromide)	4.80E-03	0.0016
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	1.06E-01	0.0353
1,2-Dichloroethane (Ethylene dichloride)	1.59E-01	0.0530
1,2-Dichloroethene	1.14E+01	3.8000
1,2-Dichloropropane	5.20E-02	0.0260
1,2-Diethylbenzene	1.99E-02	0.0332
1,3,5-Trimethylbenzene	6.23E-01	0.9345
1,3-Butadiene (Vinyl ethylene)	1.66E-01	0.1107
1,3-Diethylbenzene	6.55E-02	0.1092
1,4-Diethylbenzene	2.62E-01	0.4367
1,4-Dioxane (1,4-Diethylene dioxide)	8.29E-03	0.0055
1-Butene / 2-Methylbutene	1.22E+00	0.8133
1-Butene / 2-Methylpropene	1.10E+00	0.7333
1-Ethyl-4-methylbenzene (4-Ethyl toluene)	9.89E-01	1.4835
1-Ethyl-4-methylbenzene (4-Ethyl toluene) + 1,3,5-Trimethylbenzene	5.79E-01	0.8685
1-Heptene	6.25E-01	0.7292
1-Hexene / 2-Methyl-1-pentene	8.88E-02	0.0888
1-Methylcyclohexene	2.27E-02	0.0265
1-Methylcyclopentene	2.52E-02	0.0252
1-Pentene	2.20E-01	0.1833
1-Propanethiol (n-Propyl mercaptan)	1.25E-01	0.0625
2,2,3-Trimethylbutane	9.19E-03	0.0107
2,2,4-Trimethylpentane	6.14E-01	0.8187
2,2,5-Trimethylhexane	1.56E-01	0.2340
2,2-Dimethylbutane	1.56E-01	0.1300
2,2-Dimethylpentane	6.08E-02	0.0709
2,2-Dimethylpropane	2.74E-02	0.0228
2,3,4-Trimethylpentane	3.12E-01	0.4160
2,3-Dimethylbutane	1.67E-01	0.1670
2,3-Dimethylpentane	3.10E-01	0.3617

Compound	Mean (ppm)	Mean as Hexane (ppm)
2,4-Dimethylhexane	2.22E-01	0.2960
2,4-Dimethylpentane	1.00E-01	0.1167
2,5-Dimethylhexane	1.66E-01	0.2213
2,5-Dimethylthiophene	6.44E-02	0.0644
2-Butanone (Methyl ethyl ketone)	4.01E+00	2.6733
2-Ethyl-1-butene	1.77E-02	0.0177
2-Ethylthiophene	6.29E-02	0.0629
2-Ethyltoluene	3.23E-01	0.4845
2-Hexanone (Methyl butyl ketone)	6.13E-01	0.6130
2-Methyl-1-butene	1.79E-01	0.1492
2-Methyl-1-propanethiol (Isobutyl mercaptan)	1.70E-01	0.1133
2-Methyl-2-butene	3.03E-01	0.2525
2-Methyl-2-propanethiol (tert-butylmercaptan)	3.25E-01	0.2167
2-Methylbutane	2.26E+00	1.8833
2-Methylheptane	7.16E-01	0.9547
2-Methylhexane	8.16E-01	0.9520
2-Methylpentane	6.88E-01	0.6880
2-Propanol (Isopropyl alcohol)	1.80E+00	0.9000
3,6-Dimethyloctane	7.85E-01	1.3083
3-Ethyltoluene	7.80E-01	1.1700
3-Methyl-1-pentene	6.99E-03	0.0070
3-Methylheptane	7.63E-01	1.0173
3-Methylhexane	1.13E+00	1.3183
3-Methylpentane	7.40E-01	0.7400
3-Methylthiophene	9.25E-02	0.0771
4-Methyl-1-pentene	2.33E-02	0.0233
4-Methyl-2-pentanone (MIBK)	8.83E-01	0.8830
4-Methylheptane	2.49E-01	0.3320
Acetaldehyde	7.74E-02	0.0258
Acetone	6.70E+00	3.3500
Acetonitrile	5.56E-01	0.1853
Acrylonitrile		0.0000
Benzene	2.40E+00	2.4000
Benzyl chloride	1.81E-02	0.0211
Bromodichloromethane	8.78E-03	0.0015
Bromomethane (Methyl bromide)	2.10E-02	0.0035
Butane	6.22E+00	4.1467
Carbon disulfide	1.47E-01	0.0245
Carbon tetrachloride	7.98E-03	0.0013
Carbon tetrafluoride (Freon 14)	1.51E-01	0.0252
Carbonyl sulfide (Carbon oxysulfide)	1.22E-01	0.0203
Chlorobenzene	4.84E-01	0.4840
Chlorodifluoromethane (Freon 22)	7.96E-01	0.1327
Chloroethane (Ethyl chloride)	3.95E+00	1.3167
Chloromethane (Methyl chloride)	2.44E-01	0.0407
cis-1,2-Dichloroethene	1.24E+00	0.4133
cis-1,2-Dimethylcyclohexane	8.10E-02	0.1080
cis-1,3-Dichloropropene	3.03E-03	0.0015
cis-1,3-Dimethylcyclohexane	5.01E-01	0.6680

Compound	Mean (ppm)	Mean as Hexane (ppm)
cis-1,4-Dimethylcyclohexane/ trans-1,3-Dimethylcyclohexane	2.48E-01	0.3307
cis-2-Butene	1.05E-01	0.0700
cis-2-Heptene	2.45E-02	0.0286
cis-2-Hexene	1.72E-02	0.0172
cis-2-Octene	2.20E-01	0.2933
cis-2-Pentene	4.79E-02	0.0399
cis-3-Methyl-2-pentene	1.79E-02	0.0179
CO	2.44E+01	4.0667
Cyclohexane	1.01E+00	1.0100
Cyclohexene	1.84E-02	0.0184
Cyclopentane	2.21E-02	0.0184
Cyclopentene	1.21E-02	0.0101
Decane	3.80E+00	6.3333
Dibromochloromethane	1.51E-02	0.0025
Dibromomethane (Methylene dibromide)	8.35E-04	0.0001
Dichlorobenzene	9.40E-01	0.9400
Dichlorodifluoromethane (Freon 12)	1.18E+00	0.1967
Dichloromethane (Methylene chloride)	6.15E+00	1.0250
Diethyl sulfide	8.62E-02	0.0575
Dimethyl disulfide	1.37E-01	0.0457
Dimethyl sulfide	5.66E+00	1.8867
Dodecane (n-Dodecane)	2.21E-01	0.4420
Ethane	9.05E+00	3.0167
Ethanol	2.30E-01	0.0767
Ethyl acetate	1.88E+00	1.2533
Ethyl mercaptan (Ethanediol)	1.98E-01	0.0660
Ethyl methyl sulfide	3.67E-02	0.0184
Ethylbenzene	4.86E+00	6.4800
Formaldehyde	1.17E-02	0.0020
Heptane	1.34E+00	1.5633
Hexane	3.10E+00	3.1000
Hydrogen sulfide	3.20E+01	0.0000
Indan (2,3-Dihydroindene)	6.66E-02	0.0999
Isobutane (2-Methylpropane)	8.16E+00	5.4400
Isobutylbenzene	4.07E-02	0.0678
Isoprene (2-Methyl-1,3-butadiene)	1.65E-02	0.0138
Isopropyl mercaptan	1.75E-01	0.0875
Isopropylbenzene (Cumene)	4.30E-01	0.6450
Methanethiol (Methyl mercaptan)	1.37E+00	0.2283
Methyl tert-butyl ether (MTBE)	1.18E-01	0.0983
Methylcyclohexane	1.29E+00	1.5050
Methylcyclopentane	6.50E-01	0.6500
Naphthalene	1.07E-01	0.1783
n-Butylbenzene	6.80E-02	0.1133
Nonane	2.37E+00	3.5550
n-Propylbenzene (Propylbenzene)	4.13E-01	0.6195
Octane	1.08E+00	1.4400

Compound	Mean (ppm)	Mean as Hexane (ppm)
p-Cymene (1-Methyl-4-Isopropylbenzene)	3.58E+00	5.9667
Pentane	4.46E+00	3.7167
Propane	1.55E+01	7.7500
Propene	3.32E+00	1.6600
Propyne	3.80E-02	0.0190
sec-Butylbenzene	6.75E-02	0.1125
Styrene (Vinylbenzene)	4.11E-01	0.5480
Tetrachloroethylene (Perchloroethylene)	2.03E+00	0.6767
Tetrahydrofuran (Diethylene oxide)	9.69E-01	0.6460
Thiophene	3.49E-01	0.2327
Toluene (Methyl benzene)	2.95E+01	34.4167
trans-1,2-Dichloroethene	2.87E+00	0.9567
trans-1,2-Dimethylcyclohexane	4.04E-01	0.5387
trans-1,3-Dichloropropene	9.43E-03	0.0047
trans-1,4-Dimethylcyclohexane	2.05E-01	0.2733
trans-2-Butene	1.04E-01	0.0693
trans-2-Heptene	2.50E-03	0.0029
trans-2-Hexene	2.06E-02	0.0206
trans-2-Octene	2.41E-01	0.3213
trans-2-Pentene	3.47E-02	0.0289
trans-3-Methyl-2-pentene	1.55E-02	0.0155
Tribromomethane (bromoform)	1.24E-02	0.0021
Trichloroethylene (trichloroethene)	8.28E-01	0.2760
Trichlorofluoromethane (Freon 11)	2.48E-01	0.0413
Trichloromethane (Chloroform)	7.08E-02	0.0118
Undecane	1.67E+00	3.0617
Vinyl acetate	2.48E-01	0.1653
Vinyl chloride (Chloroethene)	1.42E+00	0.4733
Xylenes (o-, m-, p-, mixtures)	9.23E+00	12.3067
SUM	237	161

Highlighted cells are non photoreactive VOCs.
These quantities have been removed from the sum.
Including them results in a sum value of 169 ppm.
Acrylonitrile tests were below detection limit.

References

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