APPROACH FOR MODELING POM

1999 and 2002 NATA Approach

Not all POM reported to EPA's national emission inventory (NEI) are speciated into individual compounds. As a result, we must apply some simplifying assumptions in order to model and assess the risk from the individual pollutants that comprise POM. This involves establishing different POM "groups" and modeling them as separate pollutants. In establishing these groups, we considered the need to provide the most detailed information about risks from the individual pollutants within POM while taking into account the inconsistencies in how much speciation is reported in the inventory. We used a more refined method to establish POM groups for the 1999 and 2002 NATA than we did for the 1996 NATA to reflect improvements in the speciation of POM within the inventory. Specifically, for the 1996 NATA we had two overlapping POM groups and for the 1999 and 2002 NATA we have eight distinct groups. See Table 1 for the bases for determining into which group an individual PAH would fall.

There are three main NEI improvements related to POM. First, a larger quantity of the 1999 and 2002 NEI emissions are speciated into individual POM compounds. Second, double-counting of POM groups from individual stacks in the point source inventory has been eliminated. Third, naphthalene is inventoried as a separate HAP and is not included nor summarized in any PAH group. Different POM were assigned to non-overlapping groups for which we can associate similar inhalation risks based on the unit risk estimate (URE). Unit risk estimates were obtained from the toxicity table found at the website http://www.epa.gov/ttn/atw/toxsource/table1.pdf Table 1 in this document shows the 8 POM groups and the associated URE assignments. The only difference between the list used in the 1999 NATA versus the current list is the addition of more PAHs which were reported to the 2002 NEI.

Table 1. POM groups for the 1999 and 2002 National Scale Air Toxics Assessment

POM GROUP Code	Group Name	Description of Group	URE *	Bases for URE
71002	Group 1:	Contains unspeciated POM; no URE	5.5×10^{-5}	Assume same URE as was assumed for total POM group in NATA 1996: 5% of risk from Benzo(a)pyrene
72002	Group 2	Contains individual POM; no URE	5.5×10^{-5}	Assume same URE as is used for unspeciated POM (71002)
73002	Group 3	Contains individual POM; UREs between: $5 \times 10^{-2} < URE < 5 \times 10^{-1}$	1×10^{-1}	Midpoint of range (100x the BaP URE)
74002	Group 4	Contains individual POM; UREs between: $5 \times 10^{-3} < URE < 5 \times 10^{-2}$	1×10^{-2}	Midpoint of range (10x the BaP URE)
75002	Group 5	Contains individual POM; UREs between: $5 \times 10^{-4} < URE < 5 \times 10^{-3}$	1×10^{-3}	Midpoint of range (equal to BaP URE)
76002	Group 6	Contains individual POM; UREs between: $5 \times 10^{-5} < URE < 5 \times 10^{-4}$	1×10^{-4}	Midpoint of range (0.1x the BaP URE)
77002	Group 7	Contains individual POM; UREs between: $5 \times 10^{-6} < URE < 5 \times 10^{-5}$	1×10^{-5}	Midpoint of range (0.01x the BaP URE)
78002	Group 8	Contains HAPs reported as “7-PAH”	2×10^{-4}	Used URE from 7-PAH in 1996 NATA, (18% of BaP URE)

* These UREs are based on the potency of Benzo-a-pyrene (BaP). Each group represents a different percent of the BaP URE. For example, group 1 has a URE of 5.5×10^{-5} which is 5% of the BaP URE (BaP URE = .0011 X .05 = .000055).

Table 2. List of PAH HAPs included in the 2002 NATA

Group Code	Group Name	Description of Pollutant
71002	Group 1	Benzo(a)anthracene/chrysene
74002	Group 4	1,6-Dinitropyrene
74002	Group 4	1,8-Dinitropyrene
72002	Group 2	12-Methylbenz(a)anthracene
71002	Group 1	15-PAH
71002	Group 1	16-PAH
71002	Group 1	16-PAH with HAPs in 7-PAH group removed
72002	Group 2	1-Methylphenanthrene
72002	Group 2	1-Methylpyrene
77002	Group 7	2-Nitrofluorene
72002	Group 2	2-Chloronaphthalene
72002	Group 2	2-Methylnaphthalene
74002	Group 4	3-Methylcholanthrene
75002	Group 5	5-Methylchrysene
74002	Group 4	6-Nitrochrysene
73002	Group 3	7,12-Dimethylbenz[a]anthracene
78002	Group 8	7-PAH
72002	Group 2	9-Methylbenz(a)anthracene
72002	Group 2	Acenaphthene
72002	Group 2	Acenaphthylene
72002	Group 2	Anthracene
76002	Group 6	Benzo[j]fluoranthene
76002	Group 6	Benz[a]anthracene
72002	Group 2	Benzo(a)fluoranthene
72002	Group 2	Benzo(c)phenanthrene
72002	Group 2	Benzo(g,h,i)fluoranthene
75002	Group 5	Benzo[a]pyrene(7-PAH)
76002	Group 6	Benzo[b]fluoranthene
76002	Group 6	Benzo[b+k]fluoranthene
72002	Group 2	Benzo[e]pyrene
72002	Group 2	Benzo[g,h,i,]perylene
76002	Group 6	Benzo[k]fluoranthene
72002	Group 2	Benzofluoranthenes
77002	Group 7	Chrysene
71002	Group 1	Coal Tar
75002	Group 5	Dibenzo[a,e]Pyrene
75002	Group 5	Dibenzo[a,h]anthracene
74002	Group 4	Dibenzo[a,h]pyrene
74002	Group 4	Dibenzo[a,i]pyrene
76002	Group 6	Dibenzo[a,j]acridine
71002	Group 1	Extractable Organic Matter
72002	Group 2	Fluoranthene
72002	Group 2	Fluorene
76002	Group 6	Indeno[1,2,3-c,d]pyrene
72002	Group 2	Methylanthracene
72002	Group 2	Methylbenzopyrene
75002	Group 5	Methylchrysene
72002	Group 2	Perylene

Group Code	Group Name	Description of Pollutant
72002	Group 2	Phenanthrene
71002	Group 1	Polycyclic Organic Matter
72002	Group 2	Pyrene
71002	Group 1	Total PAH