



**APPENDIX AVAILABLE ON THE HEI WEB SITE**

**Research Report 182**

**Synergistic Effects of Particulate Matter and Substrate Stiffness on  
Epithelial-to-Mesenchymal Transition**

**T. H. Barker et al.**

**Appendix C. Species and Elemental Analysis of PM<sub>2.5</sub>  
from ASACA and GaEPD Monitoring Sites in South DeKalb**

Note: Appendices available only on the Web have been reviewed solely for spelling, grammar, and cross-references to the main text. They have not been formatted or fully edited by HEI.

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Table C.1. ASACA Species and Elemental Analysis<sup>a</sup>

Date	Ammonium ( $\mu\text{g}/\text{m}^3$ )	Calcium ( $\mu\text{g}/\text{m}^3$ )	Potassium ( $\mu\text{g}/\text{m}^3$ )	Sodium ( $\mu\text{g}/\text{m}^3$ )	Acetate ( $\mu\text{g}/\text{m}^3$ )	Chlorine ( $\mu\text{g}/\text{m}^3$ )	Formaldehyde ( $\mu\text{g}/\text{m}^3$ )
03/01/2004	0.58	0.0000	0.038	0.17	0.02	0.144	0.00
03/04/2004	1.20	0.0000	0.095	0.21	0.05	0.074	0.00
03/07/2004	0.40	0.0000	0.022	0.03	0.00	0.140	0.00
03/10/2004	1.85	0.0000	0.022	0.01	0.02	0.000	0.00
03/13/2004	0.87	0.0000	0.032	0.01	0.07	0.000	0.00
03/16/2004	1.06	0.0000	0.051	0.04	0.02	0.059	0.00
03/19/2004	0.91	0.0000	0.026	0.01	0.05	0.000	0.00
03/22/2004	1.40	0.0000	0.034	0.05	0.04	0.000	0.01
03/25/2004	1.12	0.0000	0.059	0.07	0.10	0.000	0.14
03/28/2004	0.87	0.0000	0.022	0.07	0.06	0.000	0.06
03/31/2004	1.09	0.0000	0.040	0.06	0.01	0.009	0.00
04/03/2004	1.32	0.0000	0.023	0.06	0.03	0.000	0.04
04/06/2004	0.38	0.0000	0.014	0.00	0.00	0.007	0.00
04/12/2004	3.43	0.0000	0.054	0.01	0.06	0.000	0.07
04/15/2004	0.71	0.0000	0.024	0.01	0.03	0.000	0.03
04/18/2004	1.48	0.0000	0.082	0.04	0.07	0.000	0.06
04/21/2004	0.78	0.0000	0.043	0.12	0.02	0.000	0.05
04/24/2004	1.54	0.0000	0.079	0.13	0.15	0.000	0.17
04/27/2004	1.06	0.0000	0.024	0.02	0.04	0.000	0.05
04/30/2004	2.57	0.0000	0.055	0.22	0.22	0.000	0.13
05/03/2004	1.32	0.0000	0.000	0.00	0.07	0.000	0.04
05/09/2004	2.25	0.0000	0.053	0.05	0.13	0.000	0.12
05/12/2004	2.35	0.0000	0.025	0.06	0.11	0.000	0.15
05/15/2004	0.93	0.0000	0.019	0.14	0.03	0.000	0.01
05/18/2004	0.89	0.0000	0.044	0.08	0.09	0.000	0.07
05/21/2004	2.40	0.0000	0.018	0.05	0.14	0.000	0.13
05/24/2004	1.82	0.0000	0.034	0.21	0.16	0.000	0.15
05/30/2004	1.34	0.0000	0.090	0.17	0.12	0.000	0.12
<b>Average</b>	<b>1.41</b>	<b>0.0000</b>	<b>0.039</b>	<b>0.08</b>	<b>0.07</b>	<b>0.014</b>	<b>0.06</b>
<b>Standard Deviation</b>	<b>0.69</b>	<b>0</b>	<b>0.023</b>	<b>0.07</b>	<b>0.05</b>	<b>0.038</b>	<b>0.06</b>

<sup>a</sup> EC indicates elemental carbon; OC indicates organic carbon.

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Table C.1 (continued). ASACA Species and Elemental Analysis<sup>a</sup>

Date	Nitrate ( $\mu\text{g}/\text{m}^3$ )	Nitrite ( $\mu\text{g}/\text{m}^3$ )	Oxalate ( $\mu\text{g}/\text{m}^3$ )	Sulfate ( $\mu\text{g}/\text{m}^3$ )	OC ( $\mu\text{g}/\text{m}^3$ )	EC ( $\mu\text{g}/\text{m}^3$ )
03/01/2004	0.52	0.00	0.05	1.9	3.8	0.3
03/04/2004	0.58	0.00	0.19	3.8	10.0	1.6
03/07/2004	0.15	0.00	0.00	1.4	4.1	1.2
03/10/2004	1.42	0.00	0.00	4.6	3.9	0.6
03/13/2004	1.09	0.00	0.02	1.9	5.4	0.3
03/16/2004	0.43	0.00	0.11	3.2	5.2	0.6
03/19/2004	0.56	0.00	0.09	2.9	8.3	2.2
03/22/2004	0.97	0.01	0.05	3.5	1.6	0.2
03/25/2004	0.61	0.07	0.17	3.7	8.9	0.8
03/28/2004	0.59	0.02	0.19	2.7	7.2	1.1
03/31/2004	0.75	0.00	0.05	2.8	1.9	0.5
04/03/2004	0.67	0.02	0.09	3.7	2.8	0.3
04/06/2004	0.30	0.01	0.06	1.5	4.5	1.6
04/12/2004	2.03	0.03	0.21	7.9	4.8	0.3
04/15/2004	0.53	0.01	0.06	2.3	3.7	1.0
04/18/2004	0.57	0.01	0.19	5.0	8.8	1.1
04/21/2004	0.50	0.00	0.14	2.7	4.3	0.5
04/24/2004	0.78	0.37	0.26	4.4	8.1	1.6
04/27/2004	0.48	0.00	0.09	3.1	3.3	0.9
04/30/2004	0.51	0.00	0.19	7.1	2.8	0.1
05/03/2004	0.32	0.00	0.06	3.8	1.8	0.5
05/09/2004	0.80	0.00	0.32	6.4	9.8	0.6
05/12/2004	0.52	0.00	0.15	6.6	3.3	0.1
05/15/2004	0.58	0.00	0.09	3.1	3.4	0.2
05/18/2004	0.49	0.00	0.10	3.1	3.7	0.9
05/21/2004	0.72	0.20	0.20	7.7	8.6	2.0
05/24/2004	0.59	0.00	0.18	6.1	4.9	1.4
05/30/2004	0.61	0.00	0.16	4.9	3.6	0.4
<b>Average</b>	<b>0.66</b>	<b>0.02</b>	<b>0.13</b>	<b>4.2</b>	<b>5.2</b>	<b>0.9</b>
<b>Standard Deviation</b>	<b>0.34</b>	<b>0.07</b>	<b>0.08</b>	<b>1.8</b>	<b>2.5</b>	<b>0.6</b>

Table C.2. GaEPD Species and Elemental Analysis<sup>a</sup>

Date	Mass ( $\mu\text{g}/\text{m}^3$ )	Sulfate ( $\mu\text{g}/\text{m}^3$ )	Nitrate ( $\mu\text{g}/\text{m}^3$ )	Ammonium ( $\mu\text{g}/\text{m}^3$ )	EC ( $\mu\text{g}/\text{m}^3$ )	OC ( $\mu\text{g}/\text{m}^3$ )	Aluminum ( $\mu\text{g}/\text{m}^3$ )	Antimony PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	Bromine ( $\mu\text{g}/\text{m}^3$ )	Calcium ( $\mu\text{g}/\text{m}^3$ )
03/01/2004	10.90	1.72	0.85	0.43	0.59	2.26	0.00	0.01	0.01	0.03
03/04/2004	18.50	3.38	0.85	1.06	2.28	4.70	0.00	0.01	0.01	0.06
03/07/2004	8.50	1.41	0.22	0.34	1.42	1.78	0.06	0.00	0.00	0.05
03/10/2004	13.50	4.41	1.57	1.85	0.96	2.10	0.00	0.01	0.01	0.04
03/13/2004	10.20	1.71	1.04	0.77	0.76	3.92	0.04	0.00	0.00	0.04
03/16/2004	12.30	3.02	0.52	0.98	1.11	3.30	0.02	0.00	0.00	0.03
03/19/2004	15.30	3.06	0.59	1.04	2.93	4.32	0.05	0.00	0.00	0.05
03/22/2004	7.90	2.99	0.98	1.28	0.36	0.92	0.00	0.01	0.00	0.03
03/25/2004	18.00	3.37	0.75	1.23	1.55	5.60	0.11	0.01	0.01	0.07
03/28/2004	13.60	2.24	0.73	0.63	1.79	4.77	0.04	0.00	0.01	0.04
03/31/2004	7.20	2.51	0.81	1.00	0.52	0.59	0.02	0.00	0.00	0.01
04/03/2004	10.60	3.38	0.73	1.13	0.67	1.65	0.00	0.01	0.00	0.05
04/06/2004	9.40	1.37	0.29	0.46	1.91	3.07	0.06	0.00	0.00	0.06
04/12/2004	20.60	7.86	2.13	3.10	0.76	2.83	0.00	0.01	0.00	0.03
04/15/2004	10.10	2.22	0.55	0.78	1.19	2.03	0.00	0.01	0.00	0.04
04/18/2004	18.20	4.50	0.42	1.43	1.73	4.99	0.06	0.00	0.01	0.05
04/21/2004	11.20	2.74	0.67	0.82	1.03	2.57	0.14	0.00	0.00	0.10
04/24/2004	17.70	4.38	0.69	1.33	2.42	4.47	0.07	0.00	0.01	0.06
04/27/2004	11.10	3.23	0.58	0.98	1.37	2.10	0.07	0.00	0.00	0.05
04/30/2004	16.70	6.53	0.75	2.03	0.32	1.90	0.05	0.00	0.01	0.04
05/03/2004	10.50	3.86	0.36	1.21	0.45	0.57	0.01	0.00	0.00	0.01
05/09/2004	23.10	5.90	0.59	2.00	1.07	5.72	0.09	0.01	0.00	0.06
05/12/2004	15.60	6.58	0.69	1.89	0.34	1.93	0.08	0.01	0.00	0.05
05/15/2004	10.10	2.71	0.69	0.72	0.46	1.89	0.04	0.01	0.00	0.06
05/18/2004	11.60	3.28	0.72	0.98	1.40	2.29	0.02	0.01	0.00	0.03
05/21/2004	24.30	7.80	0.52	2.12	2.87	3.94	0.06	0.02	0.00	0.05
05/24/2004	17.90	6.73	0.51	1.55	1.57	2.27	0.00	0.01	0.00	0.03
05/30/2004	14.10	5.31	0.59	1.10	0.62	2.30	0.02	0.00	0.00	0.02
<b>Average</b>	<b>14.25</b>	<b>4.11</b>	<b>0.71</b>	<b>1.26</b>	<b>1.27</b>	<b>2.87</b>	<b>0.04</b>	<b>0.01</b>	<b>0.00</b>	<b>0.04</b>
<b>Standard Deviation</b>	<b>4.91</b>	<b>2.27</b>	<b>0.37</b>	<b>0.63</b>	<b>0.77</b>	<b>1.43</b>	<b>0.04</b>	<b>0.00</b>	<b>0.00</b>	<b>0.02</b>

<sup>a</sup> EC indicates elemental carbon; OC indicates organic carbon.

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Table C.2 (continued). GaEPD Species and Elemental Analysis<sup>a</sup>

Date	Chromium		Copper (µg/m <sup>3</sup> )	Iron (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Magnesium		Mercury		Potassium Ion	
	Chlorine PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )				PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Manganese (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Nickel PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	
03/01/2004	0.09	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.06
03/04/2004	0.02	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.11
03/07/2004	0.00	0.00	0.00	0.12	0.00	0.02	0.00	0.00	0.00	0.00	0.01
03/10/2004	0.00	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.01
03/13/2004	0.00	0.00	0.00	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.01
03/16/2004	0.00	0.00	0.01	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.08
03/19/2004	0.00	0.00	0.01	0.20	0.00	0.01	0.00	0.00	0.00	0.00	0.06
03/22/2004	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04
03/25/2004	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.01
03/28/2004	0.00	0.00	0.01	0.15	0.00	0.01	0.00	0.00	0.00	0.00	0.06
03/31/2004	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.01
04/03/2004	0.00	0.00	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.01
04/06/2004	0.00	0.00	0.00	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.01
04/12/2004	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.01
04/15/2004	0.00	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.01
04/18/2004	0.00	0.00	0.00	0.13	0.01	0.01	0.00	0.00	0.00	0.00	0.01
04/21/2004	0.00	0.00	0.01	0.17	0.00	0.01	0.00	0.00	0.00	0.00	0.06
04/24/2004	0.00	0.00	0.00	0.15	0.00	0.01	0.00	0.00	0.00	0.00	0.10
04/27/2004	0.00	0.00	0.00	0.11	0.00	0.01	0.00	0.00	0.00	0.00	0.04
04/30/2004	0.00	0.00	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.05
05/03/2004	0.00	0.00	0.01	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.01
05/09/2004	0.03	0.00	0.01	0.14	0.00	0.03	0.00	0.00	0.00	0.00	0.04
05/12/2004	0.03	0.00	0.00	0.06	0.00	0.04	0.00	0.00	0.00	0.00	0.04
05/15/2004	0.02	0.00	0.01	0.07	0.00	0.04	0.00	0.00	0.00	0.00	0.01
05/18/2004	0.02	0.00	0.00	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.01
05/21/2004	0.03	0.00	0.02	0.15	0.00	0.05	0.00	0.00	0.00	0.00	0.01
05/24/2004	0.03	0.00	0.00	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.01
05/30/2004	0.00	0.00	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.01
<b>Average</b>	<b>0.01</b>	<b>0.00</b>	<b>0.01</b>	<b>0.09</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.03</b>
<b>Standard Deviation</b>	<b>0.02</b>	<b>0.00</b>	<b>0.00</b>	<b>0.04</b>	<b>0.00</b>	<b>0.02</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.03</b>

<sup>a</sup> EC indicates elemental carbon; OC indicates organic carbon.

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Table C.2 (continued). GaEPD Species and Elemental Analysis<sup>a</sup>

Date	Phosphorus			Sodium			Vanadium			Zinc ( $\mu\text{g}/\text{m}^3$ )
	Potassium ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	Selenium ( $\mu\text{g}/\text{m}^3$ )	Silicon ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	Sulfur PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	Tin PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	Titanium ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	
03/01/2004	0.06	0.00	0.00	0.05	0.04	0.59	0.00	0.00	0.00	0.01
03/04/2004	0.11	0.00	0.00	0.06	0.06	1.13	0.00	0.00	0.00	0.01
03/07/2004	0.05	0.00	0.00	0.23	0.02	0.51	0.01	0.01	0.00	0.01
03/10/2004	0.05	0.00	0.00	0.10	0.01	1.68	0.00	0.01	0.00	0.01
03/13/2004	0.06	0.00	0.00	0.08	0.03	0.52	0.00	0.00	0.00	0.01
03/16/2004	0.08	0.00	0.00	0.09	0.03	1.05	0.01	0.00	0.00	0.01
03/19/2004	0.07	0.00	0.00	0.14	0.02	1.02	0.01	0.01	0.00	0.02
03/22/2004	0.04	0.00	0.00	0.08	0.01	1.00	0.00	0.00	0.00	0.01
03/25/2004	0.08	0.00	0.00	0.19	0.05	1.16	0.00	0.01	0.00	0.01
03/28/2004	0.05	0.00	0.00	0.10	0.19	0.73	0.01	0.01	0.00	0.01
03/31/2004	0.02	0.00	0.00	0.04	0.02	0.79	0.01	0.00	0.00	0.00
04/03/2004	0.05	0.00	0.00	0.09	0.01	1.24	0.00	0.00	0.00	0.01
04/06/2004	0.06	0.00	0.00	0.15	0.02	0.45	0.01	0.01	0.00	0.01
04/12/2004	0.05	0.00	0.00	0.13	0.01	2.64	0.00	0.00	0.00	0.01
04/15/2004	0.05	0.00	0.00	0.11	0.01	0.80	0.00	0.00	0.00	0.01
04/18/2004	0.10	0.00	0.00	0.17	0.02	1.46	0.01	0.01	0.00	0.03
04/21/2004	0.11	0.00	0.00	0.35	0.21	0.86	0.00	0.01	0.00	0.01
04/24/2004	0.12	0.00	0.00	0.16	0.17	1.23	0.00	0.01	0.00	0.02
04/27/2004	0.06	0.00	0.00	0.26	0.02	1.03	0.01	0.01	0.00	0.01
04/30/2004	0.08	0.00	0.00	0.18	0.37	1.85	0.00	0.01	0.00	0.00
05/03/2004	0.02	0.00	0.00	0.03	0.03	1.09	0.00	0.00	0.00	0.01
05/09/2004	0.08	0.04	0.00	0.21	0.03	2.17	0.00	0.01	0.00	0.01
05/12/2004	0.07	0.03	0.00	0.20	0.15	2.23	0.01	0.00	0.00	0.00
05/15/2004	0.07	0.02	0.00	0.18	0.26	0.98	0.00	0.00	0.00	0.00
05/18/2004	0.04	0.02	0.00	0.10	0.14	1.10	0.00	0.00	0.00	0.01
05/21/2004	0.05	0.03	0.00	0.13	0.17	2.86	0.00	0.00	0.00	0.01
05/24/2004	0.04	0.03	0.00	0.08	0.20	2.32	0.00	0.00	0.00	0.01
05/30/2004	0.10	0.00	0.00	0.07	0.09	1.50	0.00	0.00	0.00	0.00
<b>Average</b>	<b>0.07</b>	<b>0.01</b>	<b>0.00</b>	<b>0.14</b>	<b>0.08</b>	<b>1.36</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>	<b>0.01</b>
<b>Standard Deviation</b>	<b>0.03</b>	<b>0.01</b>	<b>0.00</b>	<b>0.07</b>	<b>0.09</b>	<b>0.77</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>

<sup>a</sup> EC indicates elemental carbon; OC indicates organic carbon.