

**Table 2-16 (page 1 of 3). Respirable coal mine dust: Geometric mean exposures and percent exceeding designated occupational exposure limits by MSHA coal mine district and state, MSHA inspector and mine operator samples, 1979-1999**

MSHA Coal Mine District	All years		1979 – 1989			1990 – 1994			1995 - 1999 NIOSH REL = 1.0 mg/m <sup>3</sup> MRE			
	No. of Samples	GM (mg/m <sup>3</sup> )	No. of Samples	GM (mg/m <sup>3</sup> )	% > PEL	No. of Samples	GM (mg/m <sup>3</sup> )	% > PEL	No. of Samples	GM (mg/m <sup>3</sup> )	% > PEL	% > REL
<b>District 1</b> (Anthracite coal mining regions in Pennsylvania)	<b>40,660</b>	<b>0.203</b>	<b>22,717</b>	<b>0.219</b>	<b>2.7</b>	<b>9,277</b>	<b>0.184</b>	<b>2.4</b>	<b>8,666</b>	<b>0.186</b>	<b>2.6</b>	<b>8.9</b>
<b>District 2</b> (Bituminous coal mining regions in Pennsylvania)	<b>289,781</b>	<b>0.512</b>	<b>208,709</b>	<b>0.515</b>	<b>9.8</b>	<b>40,164</b>	<b>0.564</b>	<b>9.5</b>	<b>40,908</b>	<b>0.451</b>	<b>5.8</b>	<b>23.9</b>
<b>District 3</b>	<b>258,453</b>	<b>0.558</b>	<b>184,655</b>	<b>0.590</b>	<b>12.7</b>	<b>38,816</b>	<b>0.531</b>	<b>7.5</b>	<b>34,982</b>	<b>0.436</b>	<b>5.2</b>	<b>23.3</b>
Maryland	9,818	0.621	5,668	0.674	13.1	1,501	0.614	6.9	2,649	0.523	6.1	32.3
Ohio	85,691	0.606	66,440	0.672	16.3	9,792	0.479	6.0	9,459	0.372	4.7	22.5
Northern West Virginia	162,944	0.531	112,547	0.543	10.5	27,523	0.547	8.1	22,874	0.457	5.4	22.5
<b>District 4</b> (Southern West Virginia)	<b>451,111</b>	<b>0.551</b>	<b>306,083</b>	<b>0.572</b>	<b>14.6</b>	<b>76,284</b>	<b>0.531</b>	<b>10.6</b>	<b>68,744</b>	<b>0.485</b>	<b>9.0</b>	<b>27.4</b>
<b>District 5</b> (Virginia)	<b>287,317</b>	<b>0.467</b>	<b>189,909</b>	<b>0.465</b>	<b>9.3</b>	<b>55,143</b>	<b>0.512</b>	<b>8.4</b>	<b>42,265</b>	<b>0.421</b>	<b>5.9</b>	<b>20.7</b>
<b>District 6</b> (Eastern Kentucky)	<b>266,705</b>	<b>0.415</b>	<b>154,093</b>	<b>0.392</b>	<b>7.0</b>	<b>56,560</b>	<b>0.467</b>	<b>8.3</b>	<b>56,052</b>	<b>0.433</b>	<b>6.6</b>	<b>22.4</b>
<b>District 7</b>	<b>262,223</b>	<b>0.449</b>	<b>143,987</b>	<b>0.444</b>	<b>7.2</b>	<b>63,635</b>	<b>0.483</b>	<b>7.0</b>	<b>54,601</b>	<b>0.423</b>	<b>6.2</b>	<b>21.2</b>
Central Kentucky	216,315	0.457	112,157	0.453	7.5	54,830	0.492	7.2	49,328	0.430	6.3	21.4
North Carolina	9	0.147	6	0.159	0.0	3	0.126	0.0	0	-	-	-
South Carolina	0	-	0	-	-	0	-	-	0	-	-	-
Tennessee	45,870	0.411	31,795	0.413	6.5	8,802	0.432	6.0	5,273	0.366	6.1	19.2
Northern Georgia	29	0.328	29	0.328	0.0	0	-	-	0	-	-	-
<b>District 8</b>	<b>146,515</b>	<b>0.743</b>	<b>99,969</b>	<b>0.681</b>	<b>14.7</b>	<b>26,146</b>	<b>0.899</b>	<b>14.3</b>	<b>20,400</b>	<b>0.891</b>	<b>15.5</b>	<b>50.5</b>
Illinois	131,785	0.794	90,886	0.731	15.6	23,477	0.974	15.0	17,422	0.934	15.4	52.0
Indiana	13,033	0.424	7,575	0.342	5.2	2,514	0.459	8.6	2,944	0.687	16.6	42.8
Iowa	886	0.384	813	0.388	5.3	73	0.344	0.0	0	-	-	-
Michigan	0	-	0	-	-	0	-	-	0	-	-	-
Minnesota	0	-	0	-	-	0	-	-	0	-	-	-
Northern Missouri	811	0.249	695	0.260	1.7	82	0.240	2.4	34	0.107	0.0	0.0
Wisconsin	0	-	0	-	-	0	-	-	0	-	-	-

See footnotes at end of table.

**Table 2-16 (page 2 of 3). Respirable coal mine dust: Geometric mean exposures and percent exceeding designated occupational exposure limits by MSHA coal mine district and state, MSHA inspector and mine operator samples, 1979-1999**

MSHA Coal Mine District	All years		1979 – 1989			1990 – 1994			1995 - 1999 NIOSH REL = 1.0 mg/m <sup>3</sup> MRE			
	No. of Samples	GM (mg/m <sup>3</sup> )	No. of Samples	GM (mg/m <sup>3</sup> )	% > PEL	No. of Samples	GM (mg/m <sup>3</sup> )	% > PEL	No. of Samples	GM (mg/m <sup>3</sup> )	% > PEL	% > REL
<b>District 9</b>	<b>120,599</b>	<b>0.683</b>	<b>78,749</b>	<b>0.696</b>	<b>19.8</b>	<b>22,044</b>	<b>0.759</b>	<b>15.0</b>	<b>19,806</b>	<b>0.565</b>	<b>9.3</b>	<b>33.8</b>
Alaska	246	0.338	181	0.408	6.6	48	0.237	2.1	17	0.123	0.0	0.0
Arizona	913	0.252	484	0.310	5.0	201	0.308	4.5	228	0.136	1.3	1.9
Arkansas	311	0.172	238	0.205	2.5	37	0.149	2.7	36	0.064	0.0	0.0
California	12	0.218	0	-	-	1	0.400	0.0	11	0.206	0.0	9.1
Colorado	38,040	0.844	25,744	0.845	24.1	6,616	0.915	16.4	5,680	0.765	10.4	40.7
Hawaii	0	-	0	-	-	0	-	-	0	-	-	-
Idaho	0	-	0	-	-	0	-	-	0	-	-	-
Kansas	510	0.216	383	0.235	2.6	49	0.190	0.0	78	0.152	1.3	1.4
Louisiana	105	0.186	14	0.163	0.0	39	0.228	0.0	52	0.165	0.0	0.0
Southern Missouri	647	0.236	453	0.255	2.0	56	0.160	0.0	138	0.216	1.4	7.0
Montana	1,720	0.296	1,096	0.368	7.2	213	0.250	2.8	411	0.181	2.7	5.6
Nebraska	0	-	0	-	-	0	-	-	0	-	-	-
Nevada	0	-	0	-	-	0	-	-	0	-	-	-
New Mexico	5,222	0.615	3,535	0.767	23.7	876	0.753	20.2	811	0.188	3.5	6.2
North Dakota	1,345	0.187	1,029	0.221	1.9	163	0.157	0.6	153	0.073	0.0	0.0
Oklahoma	4,857	0.331	2,972	0.345	6.9	985	0.325	6.7	900	0.297	3.4	9.8
Oregon	0	-	0	-	-	0	-	-	0	-	-	-
Texas	4,005	0.179	2,740	0.194	1.4	664	0.198	3.9	601	0.109	1.0	3.5
Utah	52,952	0.852	34,017	0.834	21.8	10,277	0.928	16.4	8,658	0.834	12.1	43.6
Washington	346	0.178	124	0.166	0.0	74	0.257	2.7	148	0.158	0.7	4.3
Wyoming	9,368	0.463	5,739	0.479	12.5	1,745	0.569	14.1	1,884	0.345	7.0	21.9

See footnotes at end of table.

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<b>District 10</b> (Western Kentucky)	<b>77,891</b>	<b>0.676</b>	<b>50,923</b>	<b>0.603</b>	<b>12.1</b>	<b>14,282</b>	<b>0.847</b>	<b>14.8</b>	<b>12,686</b>	<b>0.829</b>	<b>14.2</b>	<b>48.4</b>
<b>District 11</b>	<b>85,776</b>	<b>0.686</b>	<b>52,600</b>	<b>0.714</b>	<b>15.7</b>	<b>18,307</b>	<b>0.724</b>	<b>10.7</b>	<b>14,869</b>	<b>0.556</b>	<b>6.6</b>	<b>29.8</b>
Alabama	85,776	0.686	52,600	0.714	15.7	18,307	0.724	10.7	14,869	0.556	6.6	29.8
Central and Southern Georgia	0	-	0	-	-	0	-	-	0	-	-	-
Florida	0	-	0	-	-	0	-	-	0	-	-	-
Mississippi	0	-	0	-	-	0	-	-	0	-	-	-
Puerto Rico	0	-	0	-	-	0	-	-	0	-	-	-
Virgin Islands	0	-	0	-	-	0	-	-	0	-	-	-
<b>TOTAL</b>	<b>2,287,031</b>	<b>0.520</b>	<b>1,492,394</b>	<b>0.526</b>	<b>11.6</b>	<b>420,658</b>	<b>0.545</b>	<b>9.5</b>	<b>373,979</b>	<b>0.472</b>	<b>7.5</b>	<b>26.2</b>

- indicates incalculable field      PEL - permissible exposure limit      REL - recommended exposure limit      GM - geometric mean      mg/m<sup>3</sup> - milligrams per cubic meter  
MRE - Mining Research Establishment

NOTE: In coal mining, for respirable dust containing less than 5% quartz, the MSHA PEL is 2 mg/m<sup>3</sup> MRE; for respirable dust containing greater than 5% quartz, the MSHA PEL is [(10 mg/m<sup>3</sup> MRE) / (% quartz)]. The NIOSH REL of 1 mg/m<sup>3</sup> MRE for respirable coal mine dust was adopted in September of 1995. Geometric means are reported in MRE equivalent. All samples are compared to the MSHA PEL for respirable coal mine dust containing less than 5% quartz, regardless of actual quartz content. See appendices for source description, methods, and agents.

SOURCE: Mine Safety and Health Administration (MSHA) coal mine inspector and mine operator dust data.