**EPA ICR No. 1365.11; OMB Control No. 2070-0091**

**Attachment E**

**Worksheet A-1: Annual Recordkeeping Burden, by School Type and Asbestos Type**

**Worksheet A-2: Annual Recordkeeping Cost, by School Type and Asbestos Type.**

The worksheets A-1 and A-2 have been revised from the previous ICR renewal supporting materials. The number schools with Friable ACM (SM &TSI and TSI) were recalculated starting from the year 1 of the program. It was assumed that number of schools with Friable material follow a decay exponential function with a arte of decay equal of 6%. In addition, it was considered that the life spam of school buildings is 85 years old. Therefore, the number of schools with friable ACM approaches asymptotically to zero when the AHERA program approaches year 85[[1]](#footnote-1). Consistent with previous ICR renewals supporting materials the numbers of public primary and secondary schools, and private schools from the Dept. of Education’s National Center for Education Statistics (NCES) were used to estimate the number of schools with non-friable (NFACM). NCES data for 20013-2014 (the latest available data) were used for the current ICR renewal. The number of schools with NFACM includes schools from the 1984 survey that have moved from friable to non-friable ACM category but also includes new school buildings. As result the burden for schools in the NFACM may be overestimated. Tables A1-A4 shows the data used on worksheets A1 and A2.

**Worksheet A-1: Annual Recordkeeping Burden, by School Type and Asbestos Type**

| Worksheet A-1. Annual Recordkeeping Burden, by School Type and Asbestos Type |
| --- |
| Year | ACM Type | Previous YearRemovals | SchoolCounts | Public Primary | Public Secondary | Private | TotalHours | AnnualTotal Hours |
| No. ofSchools | Hours/School | No. ofSchools | Hours/School | No. ofSchools | Hours/School |
| 29 | SM & TSI |  | 6,321 | 2,997 | 35 | 1,792 | 58 | 1,531 | 35 | 262,416 |  |
| TSI | - | 1,988 | 956 | 35 | 555 | 58 | 476 | 35 | 82,310 |
| NFACM |  | 123,583 | 64,060 | 15 | 27,911 | 28 | 31,612 | 15 | 2,162,588 | 2,507,314 |
| 30 | SM & TSI | 368 | 5,953 | 2,823 | 35 | 1,688 | 58 | 1,442 | 35 | 247,179 |  |
| TSI | 116 | 1,872 | 901 | 35 | 523 | 58 | 448 | 35 | 77,549 |
| NFACM |  | 124,065 | 64,289 | 15 | 28.047 | 28 | 31,729 | 15 | 2,225,586 | 2,550,314 |
| 31 | SM&TSI | 347 | 5,606 | 2,658 | 35 | 1,590 | 58 | 1,358 | 35 | 232,780 | 2,539,914 |
| TSI | 109 | 1,763 | 848 | 35 | 493 | 58 | 422 | 35 | 73,044 |
| NFACM |  | 124,521 | 64,507 | 15 | 28,175 | 28 | 31,839 | 15 | 2,234,090 |
|  |  |  |  |  |
| Total Hoursfor Years 29-31 |  |  |  | 7,597,542 |
| Average Hours Per Year for Years 29-31 |  |  |  | 2,532,514 |
| SM = surfacing material; TSI = thermal systems insulation. Both are friable ACM. NFACM = nonfriable ACM.Sources: AHERA RIA (EPA, 1987c), Table 4 and Appendix G, Tables 6a and 6b Appendix J; Addendum to ICR #2070-0091 Asbestos in Schools Rule (EPA, 1987a)(1) On year 30 Friable and non-Friable ACM will have been removed from the 106,984 schools surveyed according to the AHERA RIA (EPA, 1987c). |

**Worksheet A-2:**  **Annual Recordkeeping Cost, by School Type and Asbestos Type**

| Worksheet A-2: Annual Recordkeeping Cost, by School Type and Asbestos Type[[2]](#footnote-2) |
| --- |
| Year | ACM Type | SchoolCounts | Public Primary | Public Secondary | Private | TotalCost ($) | AnnualTotal Cost ($) |
| No. ofSchools | $ perSchool | No. ofSchools | $ perSchool | No. of Schools | $ perSchool |
| 29 | SM & TSI | 6321 | 2,997 | $1,258 | 1,792 | $1,985 | 1,531 | $1,285 | $9,294,681 |  |
| TSI | 1,988 | 956 | $1,258 | 555 | $1,985 | 476 | $1,285 | $2,915983 |
| NFACM | 123,583 | 64,060 | $595 | 27,911 | $984 | 31,612 | $595 | $84,389,264 | $96,599,928 |
| 30 | SM & TSI | 5,953 | 2,823 | $1,258 | 1,688 | $1,985 | 1,442 | $1,285 | $8,754,984 |  |
| TSI | 1,872 | 901 | $1,258 | 523 | $1,985 | 448 | $1,285 | $2,747,293 |
| NFACM | 124,065 | 64,289 | $595 | 28,047 | $984 | 31,729 | $595 | $84,728,958 | $96,231,235 |
| 31 | SM&TSI | 5,606 | 2,658 | $1,258 | 1,590 | $1,985 | 1,358 | $1,285 | $8,244,944 | $95,882,673 |
| TSI | 1,763 | 848 | $1,258 | 493 | $1,985 | 422 | $1,285 | $2,587,659 |
| NFACM | 124,521 | 64,507 | $595 | 28,175 | $984 | 31,839 | $595 | 85,050,070 |
| Total Cost for Years 29-31 |  |  |  | $288,713,836 |
| Average Cost per Year for Years 29-31 |  |  |  | $96,237,945 |
| SM = surfacing material; TSI = thermal systems insulation. Both are friable ACM. NFACM = non-friable ACM. |
| Sources: AHERA RIA (EPA, 1987c), Table 4, Appendix G and J; Addendum to ICR #2070-0091, Asbestos in Schools Rule (EPA, 1987a) |
| Wage rates have been updated as described in the text. |

**Table A-1: Number of Schools with Friable ACM (SM&TSI)**

|  |
| --- |
| Number of Schools with SM&TSI |
| **Year** | **Public** **Primary** | **Public** **secondary** | **Private** **Private**  | **Total** |
|  1 |  16082 |  9617 |  8216 |  33915 |
| 2 | 15145 | 9057 | 7737 | 31940 |
| 3 | 14263 | 8529 | 7287 | 30080 |
| 4 | 13433 | 8033 | 6863 | 28328 |
| 5 | 12650 | 7565 | 6463 | 26678 |
| 6 | 11914 | 7124 | 6086 | 25125 |
| 7 | 11220 | 6710 | 5732 | 23662 |
| 8 | 10567 | 6319 | 5398 | 22284 |
| 9 | 9951 | 5951 | 5084 | 20986 |
| 10 | 9372 | 5604 | 4788 | 19764 |
| 11 | 8826 | 5278 | 4509 | 18613 |
| 12 | 8312 | 4970 | 4246 | 17529 |
| 13 | 7828 | 4681 | 3999 | 16508 |
| 14 | 7372 | 4408 | 3766 | 15547 |
| 15 | 6943 | 4152 | 3547 | 14641 |
| 16 | 6538 | 3910 | 3340 | 13789 |
| 17 | 6158 | 3682 | 3146 | 12986 |
| 18 | 5799 | 3468 | 2962 | 12229 |
| 19 | 5461 | 3266 | 2790 | 11517 |
| 20 | 5143 | 3076 | 2628 | 10847 |
| 21 | 4844 | 2897 | 2475 | 10215 |
| 22 | 4562 | 2728 | 2331 | 9620 |
| 23 | 4296 | 2569 | 2195 | 9060 |
| 24 | 4046 | 2419 | 2067 | 8532 |
| 25 | 3810 | 2278 | 1946 | 8035 |
| 26 | 3588 | 2146 | 1833 | 7567 |
| 27 | 3379 | 2021 | 1726 | 7127 |
| 28 | 3182 | 1903 | 1626 | 6712 |
| 29 | 2997 | 1792 | 1531 | 6321 |
| 30 | 2823 | 1688 | 1442 | 5953 |
| 31 | 2658 | 1590 | 1358 | 5606 |
| 32 | 2503 | 1497 | 1279 | 5280 |
| 33 | 2358 | 1410 | 1204 | 4972 |
| 34 | 2220 | 1328 | 1134 | 4682 |
| 35 | 2091 | 1250 | 1068 | 4410 |
| 36 | 1969 | 1178 | 1006 | 4153 |
| 37 | 1855 | 1109 | 947 | 3911 |
| 38 | 1747 | 1044 | 892 | 3683 |
| 39 | 1645 | 983 | 840 | 3469 |
| 40 | 1549 | 926 | 791 | 3267 |
| 41 | 1459 | 872 | 745 | 3077 |
| 42 | 1374 | 822 | 702 | 2897 |
| 43 | 1294 | 774 | 661 | 2729 |
| 44 | 1218 | 729 | 622 | 2570 |
| 45 | 1148 | 686 | 586 | 2420 |
| 46 | 1081 | 646 | 552 | 2279 |
| 47 | 1018 | 609 | 520 | 2146 |
| 48 | 958 | 573 | 490 | 2021 |
| 49 | 903 | 540 | 461 | 1904 |
| 50 | 850 | 508 | 434 | 1793 |
| 51 | 801 | 479 | 409 | 1688 |
| 52 | 754 | 451 | 385 | 1590 |
| 53 | 710 | 425 | 363 | 1497 |
| 54 | 669 | 400 | 342 | 1410 |
| 55 | 630 | 377 | 322 | 1328 |
| 56 | 593 | 355 | 303 | 1251 |
| 57 | 559 | 334 | 285 | 1178 |
| 58 | 526 | 314 | 269 | 1109 |
| 59 | 495 | 296 | 253 | 1045 |
|  60 | 466 | 279 | 238 | 984 |
| 61 | 439. | 263 | 224 | 927 |
| 62 | 414 | 247 | 211 | 873 |
| 63 | 390 | 233 | 199 | 822 |
| 64 | 367 | 219 | 187 | 774 |
| 65 | 345 | 207 | 176 | 729 |
| 66 | 325 | 195 | 166 | 686 |
| 67 | 306 | 183 | 157 | 646 |
| 68 | 289 | 173 | 147 | 609 |
| 69 | 272 | 162 | 139 | 573 |
| 70 | 256 | 153 | 131 | 540 |
| 71 | 241 | 144 | 123 | 508 |
| 72 | 227 | 136 | 116 | 479 |
| 73 | 214 | 128 | 109 | 451 |
| 74 | 201 | 120 | 103 | 425 |
| 75 | 190 | 113 | 97 | 400 |
|  76 | 179 | 107 | 91 | 377 |
| 77 | 168 | 101 | 86 | 355 |
| 78 | 158 | 95 | 81 | 334 |
| 79 | 149 | 89 | 76 | 315 |
| 80 | 140 | 84 | 72 | 296 |
| 81 | 132 | 79 | 68 | 279 |
| 82 | 125 | 74 | 64 | 263 |
| 83 | 117 | 70 | 60 | 247 |
| 84 | 110 | 66 | 56 | 233 |
| 85 | 104 | 62 | 53 | 219 |

**Graph A-1: Number of Schools with Friable ACM (SM&TSI)**

**Table A-2: Number of Schools with Friable ACM (TSI)**

|  |
| --- |
| Number of schools with TSI |
| **Year** | **primary** | **secondary** | **private** | **Total** |
|  1 |  5132 |  2891 |  2554 |  10667 |
| 2 | 4833 | 2807 | 2405 | 10046 |
| 3 | 4551 | 2643 | 2265 | 9461 |
| 4 | 4287 | 2490 | 2133 | 8910 |
| 5 | 4037 | 2345 | 2009 | 8391 |
| 6 | 3802 | 2208 | 1892 | 7902 |
| 7 | 3580 | 2079 | 1782 | 7442 |
| 8 | 3372 | 1959 | 1678 | 7009 |
| 9 | 3175 | 1844 | 1580 | 6600 |
| 10 | 2991 | 1737 | 1488 | 6216 |
| 11 | 2816 | 1636 | 1402 | 5854 |
| 12 | 2652 | 1541 | 1320 | 5513 |
| 13 | 2498 | 1451 | 1243 | 5192 |
| 14 | 2352 | 1366 | 1171 | 4889 |
| 15 | 2215 | 1287 | 1102 | 4605 |
| 16 | 2086 | 1212 | 1038 | 4337 |
| 17 | 1965 | 1141 | 978 | 4084 |
| 18 | 1850 | 1075 | 921 | 3846 |
| 19 | 1743 | 1012 | 867 | 3622 |
| 20 | 1641 | 953 | 817 | 3411 |
| 21 | 1546 | 898 | 769 | 3213 |
| 22 | 1456 | 845 | 724 | 3026 |
| 23 | 1371 | 796 | 682 | 2849 |
| 24 | 1291 | 750 | 642 | 2683 |
| 25 | 1216 | 706 | 605 | 2527 |
| 26 | 1145 | 665 | 570 | 2380 |
| 27 | 1078 | 626 | 537 | 2241 |
| 28 | 1016 | 590 | 505 | 2111 |
| 29 | 956 | 555 | 476 | 1988 |
| 30 | 901 | 523 | 448 | 1872 |
| 31 | 848 | 493 | 422 | 1763 |
| 32 | 799 | 464 | 397 | 1660 |
| 33 | 752 | 437 | 374 | 1564 |
| 34 | 708 | 411 | 353 | 1473 |
| 35 | 667 | 388 | 332 | 1387 |
| 36 | 628 | 365 | 313 | 1306 |
| 37 | 592 | 344 | 294 | 1230 |
| 38 | 557 | 324 | 277 | 1158 |
| 39 | 525 | 305 | 261 | 1091 |
| 40 | 494 | 287 | 246 | 1027 |
| 41 | 465 | 270 | 232 | 968 |
| 42 | 438 | 255 | 218 | 911 |
| 43 | 413 | 240 | 205 | 858 |
| 44 | 389 | 226 | 193 | 808 |
| 45 | 366 | 213 | 182 | 761 |
| 46 | 345 | 200 | 172 | 717 |
| 47 | 325 | 189 | 161 | 675 |
| 48 | 306 | 178 | 152 | 636 |
| 49 | 288 | 167 | 143 | 599 |
| 50 | 271 | 157 | 135 | 564 |
| 51 | 255 | 148 | 127 | 531 |
| 52 | 241 | 140 | 120 | 500 |
| 53 | 227 | 132 | 113 | 471 |
| 54 | 213 | 124 | 106 | 443 |
| 55 | 201 | 117 | 100. | 418 |
| 56 | 189 | 110 | 94 | 393 |
| 57 | 178 | 103 | 89 | 370 |
| 58 | 168 | 97 | 83 | 349 |
| 59 | 158 | 92 | 79 | 329 |
| 60 | 149 | 86 | 74 | 309 |
| 61 | 140 | 81 | 69. | 291 |
| 62 | 132 | 77 | 66 | 274 |
| 63 | 124 | 72 | 62 | 258 |
| 64 | 117 | 68 | 58 | 243 |
| 65 | 110 | 64 | 55 | 229 |
| 66 | 104 | 60 | 52 | 216 |
| 67 | 98 | 57 | 49 | 203 |
| 68 | 92 | 53 | 46 | 191 |
| 69 | 87 | 50 | 43 | 180 |
| 70 | 82 | 47 | 41 | 170 |
| 71 | 77 | 45 | 38 | 160 |
| 72 | 72 | 42 | 36 | 151 |
| 73 | 68 | 40 | 34 | 142 |
| 74 | 64 | 37 | 31 | 134 |
| 75 | 61 | 35 | 30 | 126 |
| 76 | 57 | 33 | 28 | 118 |
| 77 | 54 | 31 | 27 | 111 |
| 78 | 50 | 29 | 25 | 105 |
| 79 | 48 | 28 | 23 | 99 |
| 80 | 45 | 26 | 22 | 93 |
| 81 | 42 | 24 | 21 | 88 |
| 82 | 40 | 23 | 20 | 83 |
| 83 | 37 | 21 | 19 | 78 |
| 84 | 35 | 20 | 17 | 73 |
| 85 | 33 | 19 | 16 | 69 |

**Graph A-2: Number of Schools with Friable ACM (TSI)**

**Table A-3: Number of Schools with Non-Friable ACM (NFACM)**

Number of schools with NFACM

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Primary** | **Secondary** | **Private** | **Total** |
| 29 | 64060 | 27911 | 31612 | 123,583 |
| 30 | 64289 | 28047 | 31729 | 124,065 |
| 31 | 64507 | 28175 | 31839 | 124,521 |

**Table A-4: Estimated Life Spam of Public Schools.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Estimated Lifespan of Public Schools** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|   | **Midpoint** | **Age in 1996** | **Percent** |   |   |   |   |
| Before 1950 |  --- |  --- | 28% |   |   |   |   |
| 1950 - 1969 | 1964 | 32 | 45% |   |   |   |   |
| 1970 - 1984 | 1977 | 19 | 17% |   |   |   |   |
| 1985 - 1996 | 1991 | 5.5 | 10% |   |   |   |   |
|   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |
| **Mean age** |   | 42 |   |   |   |   |   |
|  |   |   |   |   |   |   |   |
| Source: "How Old Are America's Public Schools?", NCES 1999-048, National Center for Education Statistics, U.S. Dept. of Education, January 1999. based on data from National Center on Education Statistics, "Survey on Advanced Telecommunications in U.S. Public Schools, Fall 1996", FRSS 61, 1996. |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|   |   |   |   |   |   |  |  |
| **Average age of pre-1950 schools** | **85** | **years old** |   |  |  |
|   |   |   |   |   |   |  |  |

1. Exponential Decay Function:

$$y\left(t\right)=Ae^{-kt}$$

Where *k = 0.03* is the rate of decay, and *t = 1,…,85* and A is the number of schools with Friable ACM on year 1 of the AHERA program. [↑](#footnote-ref-1)
2. Totals may not match totals in Section 6 worksheets due to rounding. [↑](#footnote-ref-2)