

## **Appendix B**

### **Supporting Data for Chapter 3**

#### **Bioavailability of As and Cr from Coal Fly Ash**

##### **Contents:**

##### **Experimental Data for each run**

**pH vs. time data**

**Analytical data (flow rate, "Raw" As, Cd, Cr, Pb analytical results)**

**pH vs. time chart**

**Coarse Ash Split XRD spectrum**

**Fine Ash Split XRD spectrum**

FG1 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG1                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:39 a.m. 10/28/97           |                   |
| <b>Stop:</b>     | 1:34 p.m. 10/30/97            |                   |
| <b>Duration:</b> | 2995 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 0                | 6.36                          | 10/28/97 11:39 AM |
| 15               | 6.34                          | 10/28/97 11:54 AM |
| 30               | 6.50                          | 10/28/97 12:09 PM |
| 45               | 6.69                          | 10/28/97 12:24 PM |
| 60               | 6.83                          | 10/28/97 12:39 PM |
| 75               | 6.95                          | 10/28/97 12:54 PM |
| 90               | 7.06                          | 10/28/97 1:09 PM  |
| 105              | 7.15                          | 10/28/97 1:24 PM  |
| 120              | 7.22                          | 10/28/97 1:39 PM  |
| 135              | 7.28                          | 10/28/97 1:54 PM  |
| 150              | 7.33                          | 10/28/97 2:09 PM  |
| 165              | 7.38                          | 10/28/97 2:24 PM  |
| 180              | 7.42                          | 10/28/97 2:39 PM  |
| 195              | 7.46                          | 10/28/97 2:54 PM  |
| 210              | 7.49                          | 10/28/97 3:09 PM  |
| 225              | 7.52                          | 10/28/97 3:24 PM  |
| 240              | 7.55                          | 10/28/97 3:39 PM  |
| 255              | 7.57                          | 10/28/97 3:54 PM  |
| 270              | 7.60                          | 10/28/97 4:09 PM  |
| 285              | 7.62                          | 10/28/97 4:24 PM  |
| 300              | 7.63                          | 10/28/97 4:39 PM  |
| 315              | 7.65                          | 10/28/97 4:54 PM  |
| 330              | 7.66                          | 10/28/97 5:09 PM  |
| 345              | 7.66                          | 10/28/97 5:24 PM  |
| 360              | 7.66                          | 10/28/97 5:39 PM  |
| 375              | 7.67                          | 10/28/97 5:54 PM  |
| 390              | 7.67                          | 10/28/97 6:09 PM  |
| 405              | 7.67                          | 10/28/97 6:24 PM  |
| 420              | 7.67                          | 10/28/97 6:39 PM  |
| 435              | 7.67                          | 10/28/97 6:54 PM  |
| 450              | 7.67                          | 10/28/97 7:09 PM  |
| 465              | 7.67                          | 10/28/97 7:24 PM  |
| 480              | 7.68                          | 10/28/97 7:39 PM  |
| 495              | 7.69                          | 10/28/97 7:54 PM  |
| 510              | 7.69                          | 10/28/97 8:09 PM  |
| 525              | 7.70                          | 10/28/97 8:24 PM  |
| 540              | 7.71                          | 10/28/97 8:39 PM  |
| 555              | 7.71                          | 10/28/97 8:54 PM  |
| 570              | 7.72                          | 10/28/97 9:09 PM  |
| 585              | 7.72                          | 10/28/97 9:24 PM  |
| 600              | 7.73                          | 10/28/97 9:39 PM  |
| 615              | 7.73                          | 10/28/97 9:54 PM  |
| 630              | 7.74                          | 10/28/97 10:09 PM |
| 645              | 7.74                          | 10/28/97 10:24 PM |

FG1 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG1                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:39 a.m. 10/28/97           |                   |
| <b>Stop:</b>     | 1:34 p.m. 10/30/97            |                   |
| <b>Duration:</b> | 2995 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 660              | 7.74                          | 10/28/97 10:39 PM |
| 675              | 7.75                          | 10/28/97 10:54 PM |
| 690              | 7.75                          | 10/28/97 11:09 PM |
| 705              | 7.75                          | 10/28/97 11:24 PM |
| 720              | 7.76                          | 10/28/97 11:39 PM |
| 735              | 7.76                          | 10/28/97 11:54 PM |
| 750              | 7.77                          | 10/29/97 12:09 AM |
| 765              | 7.78                          | 10/29/97 12:24 AM |
| 780              | 7.78                          | 10/29/97 12:39 AM |
| 795              | 7.78                          | 10/29/97 12:54 AM |
| 810              | 7.78                          | 10/29/97 1:09 AM  |
| 825              | 7.78                          | 10/29/97 1:24 AM  |
| 840              | 7.78                          | 10/29/97 1:39 AM  |
| 855              | 7.79                          | 10/29/97 1:54 AM  |
| 870              | 7.79                          | 10/29/97 2:09 AM  |
| 885              | 7.79                          | 10/29/97 2:24 AM  |
| 900              | 7.79                          | 10/29/97 2:39 AM  |
| 915              | 7.79                          | 10/29/97 2:54 AM  |
| 930              | 7.79                          | 10/29/97 3:09 AM  |
| 945              | 7.79                          | 10/29/97 3:24 AM  |
| 960              | 7.79                          | 10/29/97 3:39 AM  |
| 975              | 7.79                          | 10/29/97 3:54 AM  |
| 990              | 7.79                          | 10/29/97 4:09 AM  |
| 1005             | 7.79                          | 10/29/97 4:24 AM  |
| 1020             | 7.78                          | 10/29/97 4:39 AM  |
| 1035             | 7.79                          | 10/29/97 4:54 AM  |
| 1050             | 7.79                          | 10/29/97 5:09 AM  |
| 1065             | 7.79                          | 10/29/97 5:24 AM  |
| 1080             | 7.79                          | 10/29/97 5:39 AM  |
| 1095             | 7.78                          | 10/29/97 5:54 AM  |
| 1110             | 7.78                          | 10/29/97 6:09 AM  |
| 1125             | 7.78                          | 10/29/97 6:24 AM  |
| 1140             | 7.78                          | 10/29/97 6:39 AM  |
| 1155             | 7.77                          | 10/29/97 6:54 AM  |
| 1170             | 7.77                          | 10/29/97 7:09 AM  |
| 1185             | 7.77                          | 10/29/97 7:24 AM  |
| 1200             | 7.78                          | 10/29/97 7:39 AM  |
| 1215             | 7.77                          | 10/29/97 7:54 AM  |
| 1230             | 7.77                          | 10/29/97 8:09 AM  |
| 1245             | 7.77                          | 10/29/97 8:24 AM  |
| 1260             | 7.77                          | 10/29/97 8:39 AM  |
| 1275             | 7.78                          | 10/29/97 8:54 AM  |
| 1290             | 7.78                          | 10/29/97 9:09 AM  |
| 1305             | 7.78                          | 10/29/97 9:24 AM  |

FG1 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG1                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:39 a.m. 10/28/97           |                   |
| <b>Stop:</b>     | 1:34 p.m. 10/30/97            |                   |
| <b>Duration:</b> | 2995 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 1320             | 7.78                          | 10/29/97 9:39 AM  |
| 1335             | 7.78                          | 10/29/97 9:54 AM  |
| 1350             | 7.78                          | 10/29/97 10:09 AM |
| 1365             | 7.78                          | 10/29/97 10:24 AM |
| 1380             | 7.78                          | 10/29/97 10:39 AM |
| 1395             | 7.78                          | 10/29/97 10:54 AM |
| 1410             | 7.78                          | 10/29/97 11:09 AM |
| 1425             | 7.78                          | 10/29/97 11:24 AM |
| 1440             | 7.78                          | 10/29/97 11:39 AM |
| 1455             | 7.77                          | 10/29/97 11:54 AM |
| 1470             | 7.77                          | 10/29/97 12:09 PM |
| 1485             | 7.77                          | 10/29/97 12:24 PM |
| 1500             | 7.77                          | 10/29/97 12:39 PM |
| 1515             | 7.77                          | 10/29/97 12:54 PM |
| 1530             | 7.77                          | 10/29/97 1:09 PM  |
| 1545             | 7.77                          | 10/29/97 1:24 PM  |
| 1560             | 7.76                          | 10/29/97 1:39 PM  |
| 1575             | 7.76                          | 10/29/97 1:54 PM  |
| 1590             | 7.77                          | 10/29/97 2:09 PM  |
| 1605             | 7.77                          | 10/29/97 2:24 PM  |
| 1620             | 7.77                          | 10/29/97 2:39 PM  |
| 1635             | 7.77                          | 10/29/97 2:54 PM  |
| 1650             | 7.77                          | 10/29/97 3:09 PM  |
| 1665             | 7.77                          | 10/29/97 3:24 PM  |
| 1680             | 7.77                          | 10/29/97 3:39 PM  |
| 1695             | 7.77                          | 10/29/97 3:54 PM  |
| 1710             | 7.77                          | 10/29/97 4:09 PM  |
| 1725             | 7.76                          | 10/29/97 4:24 PM  |
| 1740             | 7.76                          | 10/29/97 4:39 PM  |
| 1755             | 7.76                          | 10/29/97 4:54 PM  |
| 1770             | 7.76                          | 10/29/97 5:09 PM  |
| 1785             | 7.76                          | 10/29/97 5:24 PM  |
| 1800             | 7.76                          | 10/29/97 5:39 PM  |
| 1815             | 7.76                          | 10/29/97 5:54 PM  |
| 1830             | 7.76                          | 10/29/97 6:09 PM  |
| 1845             | 7.75                          | 10/29/97 6:24 PM  |
| 1860             | 7.75                          | 10/29/97 6:39 PM  |
| 1875             | 7.76                          | 10/29/97 6:54 PM  |
| 1890             | 7.76                          | 10/29/97 7:09 PM  |
| 1905             | 7.76                          | 10/29/97 7:24 PM  |
| 1920             | 7.76                          | 10/29/97 7:39 PM  |
| 1935             | 7.76                          | 10/29/97 7:54 PM  |
| 1950             | 7.76                          | 10/29/97 8:09 PM  |
| 1965             | 7.76                          | 10/29/97 8:24 PM  |

FG1 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG1                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:39 a.m. 10/28/97           |                   |
| <b>Stop:</b>     | 1:34 p.m. 10/30/97            |                   |
| <b>Duration:</b> | 2995 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 1980             | 7.76                          | 10/29/97 8:39 PM  |
| 1995             | 7.76                          | 10/29/97 8:54 PM  |
| 2010             | 7.76                          | 10/29/97 9:09 PM  |
| 2025             | 7.76                          | 10/29/97 9:24 PM  |
| 2040             | 7.76                          | 10/29/97 9:39 PM  |
| 2055             | 7.76                          | 10/29/97 9:54 PM  |
| 2070             | 7.76                          | 10/29/97 10:09 PM |
| 2085             | 7.76                          | 10/29/97 10:24 PM |
| 2100             | 7.76                          | 10/29/97 10:39 PM |
| 2115             | 7.76                          | 10/29/97 10:54 PM |
| 2130             | 7.76                          | 10/29/97 11:09 PM |
| 2145             | 7.75                          | 10/29/97 11:24 PM |
| 2160             | 7.75                          | 10/29/97 11:39 PM |
| 2175             | 7.75                          | 10/29/97 11:54 PM |
| 2190             | 7.75                          | 10/30/97 12:09 AM |
| 2205             | 7.76                          | 10/30/97 12:24 AM |
| 2220             | 7.76                          | 10/30/97 12:39 AM |
| 2235             | 7.75                          | 10/30/97 12:54 AM |
| 2250             | 7.75                          | 10/30/97 1:09 AM  |
| 2265             | 7.75                          | 10/30/97 1:24 AM  |
| 2280             | 7.75                          | 10/30/97 1:39 AM  |
| 2295             | 7.75                          | 10/30/97 1:54 AM  |
| 2310             | 7.75                          | 10/30/97 2:09 AM  |
| 2325             | 7.75                          | 10/30/97 2:24 AM  |
| 2340             | 7.75                          | 10/30/97 2:39 AM  |
| 2355             | 7.75                          | 10/30/97 2:54 AM  |
| 2370             | 7.75                          | 10/30/97 3:09 AM  |
| 2385             | 7.74                          | 10/30/97 3:24 AM  |
| 2400             | 7.74                          | 10/30/97 3:39 AM  |
| 2415             | 7.74                          | 10/30/97 3:54 AM  |
| 2430             | 7.74                          | 10/30/97 4:09 AM  |
| 2445             | 7.74                          | 10/30/97 4:24 AM  |
| 2460             | 7.74                          | 10/30/97 4:39 AM  |
| 2475             | 7.74                          | 10/30/97 4:54 AM  |
| 2490             | 7.74                          | 10/30/97 5:09 AM  |
| 2505             | 7.74                          | 10/30/97 5:24 AM  |
| 2520             | 7.74                          | 10/30/97 5:39 AM  |
| 2535             | 7.74                          | 10/30/97 5:54 AM  |
| 2550             | 7.73                          | 10/30/97 6:09 AM  |
| 2565             | 7.73                          | 10/30/97 6:24 AM  |
| 2580             | 7.74                          | 10/30/97 6:39 AM  |
| 2595             | 7.73                          | 10/30/97 6:54 AM  |
| 2610             | 7.73                          | 10/30/97 7:09 AM  |
| 2625             | 7.73                          | 10/30/97 7:24 AM  |

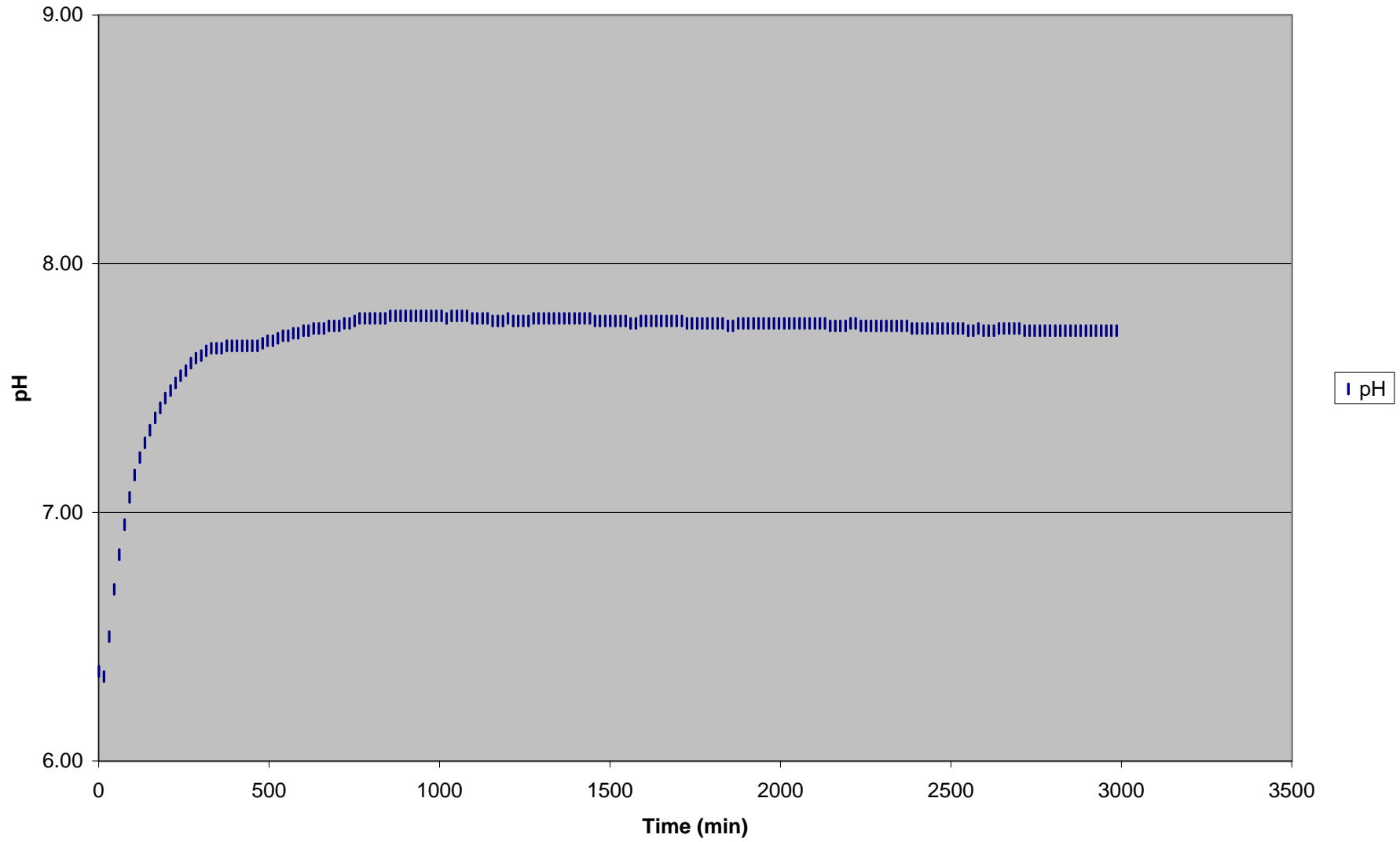
FG1 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG1                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:39 a.m. 10/28/97           |                   |
| <b>Stop:</b>     | 1:34 p.m. 10/30/97            |                   |
| <b>Duration:</b> | 2995 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 2640             | 7.74                          | 10/30/97 7:39 AM  |
| 2655             | 7.74                          | 10/30/97 7:54 AM  |
| 2670             | 7.74                          | 10/30/97 8:09 AM  |
| 2685             | 7.74                          | 10/30/97 8:24 AM  |
| 2700             | 7.74                          | 10/30/97 8:39 AM  |
| 2715             | 7.73                          | 10/30/97 8:54 AM  |
| 2730             | 7.73                          | 10/30/97 9:09 AM  |
| 2745             | 7.73                          | 10/30/97 9:24 AM  |
| 2760             | 7.73                          | 10/30/97 9:39 AM  |
| 2775             | 7.73                          | 10/30/97 9:54 AM  |
| 2790             | 7.73                          | 10/30/97 10:09 AM |
| 2805             | 7.73                          | 10/30/97 10:24 AM |
| 2820             | 7.73                          | 10/30/97 10:39 AM |
| 2835             | 7.73                          | 10/30/97 10:54 AM |
| 2850             | 7.73                          | 10/30/97 11:09 AM |
| 2865             | 7.73                          | 10/30/97 11:24 AM |
| 2880             | 7.73                          | 10/30/97 11:39 AM |
| 2895             | 7.73                          | 10/30/97 11:54 AM |
| 2910             | 7.73                          | 10/30/97 12:09 PM |
| 2925             | 7.73                          | 10/30/97 12:24 PM |
| 2940             | 7.73                          | 10/30/97 12:39 PM |
| 2955             | 7.73                          | 10/30/97 12:54 PM |
| 2970             | 7.73                          | 10/30/97 1:09 PM  |
| 2985             | 7.73                          | 10/30/97 1:24 PM  |

**FG1 Analysis Data**

| <b>Bottle #</b> | <b>Empty Wt (g)</b> | <b>Full Weight (g)</b> | <b>Time to Collect (min)</b> | <b>Flow (g/min)</b> | <b>Start Collect</b> | <b>Finish Collect</b> | <b>As</b> | <b>Cd</b> | <b>Cr</b> | <b>Pb</b> |
|-----------------|---------------------|------------------------|------------------------------|---------------------|----------------------|-----------------------|-----------|-----------|-----------|-----------|
| 1               | 8.248               | 36.825                 | 37.83                        | 0.76                | 1                    | 38                    | 0.129     | 0.044     | 0.083     | -0.047    |
| 2               | 8.215               | 37.857                 | 50.17                        | 0.59                | 40                   | 90                    | 1.224     | 0.066     | 0.156     | -0.056    |
| 3               | 8.246               | 38.461                 | 52.2                         | 0.58                | 91                   | 143                   | 2.552     | 0.115     | 0.110     | -0.041    |
| 4               | 8.373               | 37.049                 | 51.17                        | 0.56                | 144                  | 195                   | 1.968     | 0.082     | 0.067     | -0.018    |
| 5               | 8.165               | 42.588                 | 70                           | 0.49                | 196                  | 266                   | 1.369     | 0.057     | 0.053     | -0.025    |
| 6               | 8.262               | 37.501                 | 63                           | 0.46                | 266                  | 329                   | 1.088     | 0.048     | 0.047     | -0.023    |
| 7               | 8.259               | 37.681                 | 68                           | 0.43                | 330                  | 398                   | 0.863     | 0.037     | 0.043     | -0.028    |
| 8               | 8.268               | 39.481                 | 100                          | 0.31                | 665                  | 765                   | 0.577     | 0.025     | 0.035     | -0.020    |
| 9               | 8.241               | 41.339                 | 155                          | 0.21                | 1461                 | 1616                  | 0.295     | 0.013     | 0.029     | -0.026    |
| 10              | 8.241               | 38.582                 | 189                          | 0.16                | 2001                 | 2190                  | 0.226     | 0.010     | 0.027     | -0.029    |
| 11              | 8.212               | 43.365                 | 355                          | 0.10                | 2640                 | 2995                  | 0.221     | 0.009     | 0.027     | -0.023    |

FG1 pH vs. Time





FG2 pH vs time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FG2                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                  |
| <b>Start:</b>    | 12:12 p.m. 11/1/97            |                  |
| <b>Stop:</b>     | 9:10 a.m. 11/3/97             |                  |
| <b>Duration:</b> | 2700 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 0                | 6.27                          | 11/1/97 12:12 PM |
| 13               | 6.27                          | 11/1/97 12:25 PM |
| 28               | 6.41                          | 11/1/97 12:40 PM |
| 43               | 6.56                          | 11/1/97 12:55 PM |
| 58               | 6.70                          | 11/1/97 1:10 PM  |
| 73               | 6.82                          | 11/1/97 1:25 PM  |
| 88               | 6.92                          | 11/1/97 1:40 PM  |
| 103              | 7.01                          | 11/1/97 1:55 PM  |
| 118              | 7.08                          | 11/1/97 2:10 PM  |
| 133              | 7.13                          | 11/1/97 2:25 PM  |
| 148              | 7.18                          | 11/1/97 2:40 PM  |
| 163              | 7.22                          | 11/1/97 2:55 PM  |
| 178              | 7.25                          | 11/1/97 3:10 PM  |
| 193              | 7.29                          | 11/1/97 3:25 PM  |
| 208              | 7.32                          | 11/1/97 3:40 PM  |
| 223              | 7.35                          | 11/1/97 3:55 PM  |
| 238              | 7.38                          | 11/1/97 4:10 PM  |
| 253              | 7.40                          | 11/1/97 4:25 PM  |
| 268              | 7.43                          | 11/1/97 4:40 PM  |
| 283              | 7.45                          | 11/1/97 4:55 PM  |
| 298              | 7.47                          | 11/1/97 5:10 PM  |
| 313              | 7.49                          | 11/1/97 5:25 PM  |
| 328              | 7.51                          | 11/1/97 5:40 PM  |
| 343              | 7.53                          | 11/1/97 5:55 PM  |
| 358              | 7.55                          | 11/1/97 6:10 PM  |
| 373              | 7.56                          | 11/1/97 6:25 PM  |
| 388              | 7.57                          | 11/1/97 6:40 PM  |
| 403              | 7.58                          | 11/1/97 6:55 PM  |
| 418              | 7.59                          | 11/1/97 7:10 PM  |
| 433              | 7.60                          | 11/1/97 7:25 PM  |
| 448              | 7.61                          | 11/1/97 7:40 PM  |
| 463              | 7.62                          | 11/1/97 7:55 PM  |
| 478              | 7.63                          | 11/1/97 8:10 PM  |
| 493              | 7.63                          | 11/1/97 8:25 PM  |
| 508              | 7.64                          | 11/1/97 8:40 PM  |
| 523              | 7.64                          | 11/1/97 8:55 PM  |
| 538              | 7.64                          | 11/1/97 9:10 PM  |
| 553              | 7.65                          | 11/1/97 9:25 PM  |
| 568              | 7.64                          | 11/1/97 9:40 PM  |
| 583              | 7.64                          | 11/1/97 9:55 PM  |
| 598              | 7.64                          | 11/1/97 10:10 PM |
| 613              | 7.64                          | 11/1/97 10:25 PM |
| 628              | 7.65                          | 11/1/97 10:40 PM |
| 643              | 7.65                          | 11/1/97 10:55 PM |

FG2 pH vs time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FG2                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                  |
| <b>Start:</b>    | 12:12 p.m. 11/1/97            |                  |
| <b>Stop:</b>     | 9:10 a.m. 11/3/97             |                  |
| <b>Duration:</b> | 2700 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 658              | 7.66                          | 11/1/97 11:10 PM |
| 673              | 7.66                          | 11/1/97 11:25 PM |
| 688              | 7.67                          | 11/1/97 11:40 PM |
| 703              | 7.67                          | 11/1/97 11:55 PM |
| 718              | 7.68                          | 11/2/97 12:10 AM |
| 733              | 7.69                          | 11/2/97 12:25 AM |
| 748              | 7.70                          | 11/2/97 12:40 AM |
| 763              | 7.70                          | 11/2/97 12:55 AM |
| 778              | 7.70                          | 11/2/97 1:10 AM  |
| 793              | 7.71                          | 11/2/97 1:25 AM  |
| 808              | 7.71                          | 11/2/97 1:40 AM  |
| 823              | 7.72                          | 11/2/97 1:55 AM  |
| 838              | 7.72                          | 11/2/97 2:10 AM  |
| 853              | 7.72                          | 11/2/97 2:25 AM  |
| 868              | 7.72                          | 11/2/97 2:40 AM  |
| 883              | 7.73                          | 11/2/97 2:55 AM  |
| 898              | 7.73                          | 11/2/97 3:10 AM  |
| 913              | 7.73                          | 11/2/97 3:25 AM  |
| 928              | 7.73                          | 11/2/97 3:40 AM  |
| 943              | 7.73                          | 11/2/97 3:55 AM  |
| 958              | 7.73                          | 11/2/97 4:10 AM  |
| 973              | 7.74                          | 11/2/97 4:25 AM  |
| 988              | 7.74                          | 11/2/97 4:40 AM  |
| 1003             | 7.74                          | 11/2/97 4:55 AM  |
| 1018             | 7.74                          | 11/2/97 5:10 AM  |
| 1033             | 7.74                          | 11/2/97 5:25 AM  |
| 1048             | 7.74                          | 11/2/97 5:40 AM  |
| 1063             | 7.74                          | 11/2/97 5:55 AM  |
| 1078             | 7.75                          | 11/2/97 6:10 AM  |
| 1093             | 7.75                          | 11/2/97 6:25 AM  |
| 1108             | 7.75                          | 11/2/97 6:40 AM  |
| 1123             | 7.75                          | 11/2/97 6:55 AM  |
| 1138             | 7.75                          | 11/2/97 7:10 AM  |
| 1153             | 7.75                          | 11/2/97 7:25 AM  |
| 1168             | 7.75                          | 11/2/97 7:40 AM  |
| 1183             | 7.76                          | 11/2/97 7:55 AM  |
| 1198             | 7.76                          | 11/2/97 8:10 AM  |
| 1213             | 7.76                          | 11/2/97 8:25 AM  |
| 1228             | 7.76                          | 11/2/97 8:40 AM  |
| 1243             | 7.76                          | 11/2/97 8:55 AM  |
| 1258             | 7.76                          | 11/2/97 9:10 AM  |
| 1273             | 7.76                          | 11/2/97 9:25 AM  |
| 1288             | 7.76                          | 11/2/97 9:40 AM  |
| 1303             | 7.76                          | 11/2/97 9:55 AM  |

FG2 pH vs time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FG2                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                  |
| <b>Start:</b>    | 12:12 p.m. 11/1/97            |                  |
| <b>Stop:</b>     | 9:10 a.m. 11/3/97             |                  |
| <b>Duration:</b> | 2700 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 1318             | 7.76                          | 11/2/97 10:10 AM |
| 1333             | 7.76                          | 11/2/97 10:25 AM |
| 1348             | 7.77                          | 11/2/97 10:40 AM |
| 1363             | 7.77                          | 11/2/97 10:55 AM |
| 1378             | 7.77                          | 11/2/97 11:10 AM |
| 1393             | 7.77                          | 11/2/97 11:25 AM |
| 1408             | 7.77                          | 11/2/97 11:40 AM |
| 1423             | 7.77                          | 11/2/97 11:55 AM |
| 1438             | 7.77                          | 11/2/97 12:10 PM |
| 1453             | 7.77                          | 11/2/97 12:25 PM |
| 1468             | 7.78                          | 11/2/97 12:40 PM |
| 1483             | 7.78                          | 11/2/97 12:55 PM |
| 1498             | 7.79                          | 11/2/97 1:10 PM  |
| 1513             | 7.79                          | 11/2/97 1:25 PM  |
| 1528             | 7.79                          | 11/2/97 1:40 PM  |
| 1543             | 7.79                          | 11/2/97 1:55 PM  |
| 1558             | 7.79                          | 11/2/97 2:10 PM  |
| 1573             | 7.79                          | 11/2/97 2:25 PM  |
| 1588             | 7.79                          | 11/2/97 2:40 PM  |
| 1603             | 7.79                          | 11/2/97 2:55 PM  |
| 1618             | 7.79                          | 11/2/97 3:10 PM  |
| 1633             | 7.79                          | 11/2/97 3:25 PM  |
| 1648             | 7.79                          | 11/2/97 3:40 PM  |
| 1663             | 7.79                          | 11/2/97 3:55 PM  |
| 1678             | 7.79                          | 11/2/97 4:10 PM  |
| 1693             | 7.79                          | 11/2/97 4:25 PM  |
| 1708             | 7.79                          | 11/2/97 4:40 PM  |
| 1723             | 7.79                          | 11/2/97 4:55 PM  |
| 1738             | 7.79                          | 11/2/97 5:10 PM  |
| 1753             | 7.79                          | 11/2/97 5:25 PM  |
| 1768             | 7.79                          | 11/2/97 5:40 PM  |
| 1783             | 7.79                          | 11/2/97 5:55 PM  |
| 1798             | 7.79                          | 11/2/97 6:10 PM  |
| 1813             | 7.79                          | 11/2/97 6:25 PM  |
| 1828             | 7.79                          | 11/2/97 6:40 PM  |
| 1843             | 7.79                          | 11/2/97 6:55 PM  |
| 1858             | 7.79                          | 11/2/97 7:10 PM  |
| 1873             | 7.79                          | 11/2/97 7:25 PM  |
| 1888             | 7.79                          | 11/2/97 7:40 PM  |
| 1903             | 7.79                          | 11/2/97 7:55 PM  |
| 1918             | 7.79                          | 11/2/97 8:10 PM  |
| 1933             | 7.79                          | 11/2/97 8:25 PM  |
| 1948             | 7.79                          | 11/2/97 8:40 PM  |
| 1963             | 7.79                          | 11/2/97 8:55 PM  |

FG2 pH vs time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FG2                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                  |
| <b>Start:</b>    | 12:12 p.m. 11/1/97            |                  |
| <b>Stop:</b>     | 9:10 a.m. 11/3/97             |                  |
| <b>Duration:</b> | 2700 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 1978             | 7.79                          | 11/2/97 9:10 PM  |
| 1993             | 7.80                          | 11/2/97 9:25 PM  |
| 2008             | 7.80                          | 11/2/97 9:40 PM  |
| 2023             | 7.80                          | 11/2/97 9:55 PM  |
| 2038             | 7.80                          | 11/2/97 10:10 PM |
| 2053             | 7.80                          | 11/2/97 10:25 PM |
| 2068             | 7.80                          | 11/2/97 10:40 PM |
| 2083             | 7.80                          | 11/2/97 10:55 PM |
| 2098             | 7.85                          | 11/2/97 11:10 PM |
| 2113             | 7.79                          | 11/2/97 11:25 PM |
| 2128             | 7.80                          | 11/2/97 11:40 PM |
| 2143             | 7.80                          | 11/2/97 11:55 PM |
| 2158             | 7.80                          | 11/3/97 12:10 AM |
| 2173             | 7.80                          | 11/3/97 12:25 AM |
| 2188             | 7.81                          | 11/3/97 12:40 AM |
| 2203             | 7.81                          | 11/3/97 12:55 AM |
| 2218             | 7.81                          | 11/3/97 1:10 AM  |
| 2233             | 7.82                          | 11/3/97 1:25 AM  |
| 2248             | 7.82                          | 11/3/97 1:40 AM  |
| 2263             | 7.82                          | 11/3/97 1:55 AM  |
| 2278             | 7.82                          | 11/3/97 2:10 AM  |
| 2293             | 7.82                          | 11/3/97 2:25 AM  |
| 2308             | 7.82                          | 11/3/97 2:40 AM  |
| 2323             | 7.82                          | 11/3/97 2:55 AM  |
| 2338             | 7.82                          | 11/3/97 3:10 AM  |
| 2353             | 7.82                          | 11/3/97 3:25 AM  |
| 2368             | 7.81                          | 11/3/97 3:40 AM  |
| 2383             | 7.82                          | 11/3/97 3:55 AM  |
| 2398             | 7.81                          | 11/3/97 4:10 AM  |
| 2413             | 7.81                          | 11/3/97 4:25 AM  |
| 2428             | 7.81                          | 11/3/97 4:40 AM  |
| 2443             | 7.81                          | 11/3/97 4:55 AM  |
| 2458             | 7.81                          | 11/3/97 5:10 AM  |
| 2473             | 7.81                          | 11/3/97 5:25 AM  |
| 2488             | 7.81                          | 11/3/97 5:40 AM  |
| 2503             | 7.81                          | 11/3/97 5:55 AM  |
| 2518             | 7.81                          | 11/3/97 6:10 AM  |
| 2533             | 7.81                          | 11/3/97 6:25 AM  |
| 2548             | 7.81                          | 11/3/97 6:40 AM  |
| 2563             | 7.81                          | 11/3/97 6:55 AM  |
| 2578             | 7.81                          | 11/3/97 7:10 AM  |
| 2593             | 7.81                          | 11/3/97 7:25 AM  |
| 2608             | 7.81                          | 11/3/97 7:40 AM  |
| 2623             | 7.81                          | 11/3/97 7:55 AM  |

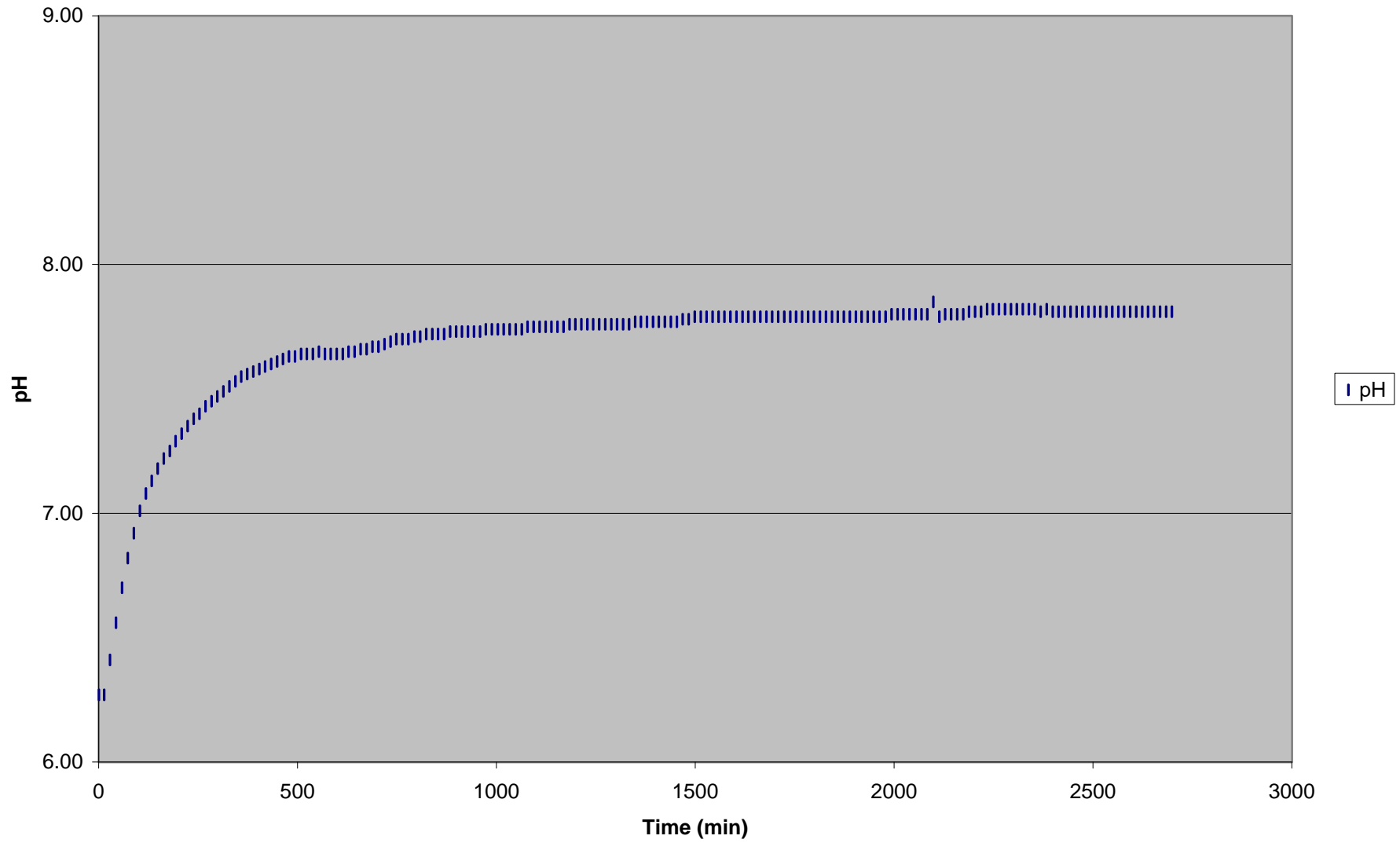
**FG2 pH vs time**

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FG2                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                  |
| <b>Start:</b>    | 12:12 p.m. 11/1/97            |                  |
| <b>Stop:</b>     | 9:10 a.m. 11/3/97             |                  |
| <b>Duration:</b> | 2700 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 2638             | 7.81                          | 11/3/97 8:10 AM  |
| 2653             | 7.81                          | 11/3/97 8:25 AM  |
| 2668             | 7.81                          | 11/3/97 8:40 AM  |
| 2683             | 7.81                          | 11/3/97 8:55 AM  |
| 2698             | 7.81                          | 11/3/97 9:10 AM  |

FG2 Analysis Data

| Bottle # | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As    | Cd    | Cr    | Pb     |
|----------|--------------|-----------------|-----------------------|--------------|---------------|----------------|-------|-------|-------|--------|
| 1        | 11.107       | 41.558          | 51                    | 0.60         | 1             | 52             | 0.186 | 0.051 | 0.087 | -0.026 |
| 2        | 11.081       | 43.640          | 70                    | 0.47         | 53            | 123            | 1.693 | 0.088 | 0.153 | -0.048 |
| 3        | 10.959       | 42.263          | 88                    | 0.36         | 124           | 212            | 2.686 | 0.117 | 0.117 | -0.024 |
| 4        | 11.089       | 47.608          | 114                   | 0.32         | 213           | 327            | 1.801 | 0.079 | 0.079 | -0.028 |
| 5        | 10.794       | 44.390          | 120                   | 0.28         | 328           | 448            | 1.255 | 0.052 | 0.062 | -0.003 |
| 6        | 11.085       | 46.800          | 134                   | 0.27         | 450           | 584            | 0.879 | 0.042 | 0.052 | -0.032 |
| 7        | 11.036       | 43.853          | 134                   | 0.24         | 585           | 719            | 0.738 | 0.035 | 0.048 | 0.001  |
| 8        | 11.046       | 42.265          | 169                   | 0.18         | 1286          | 1455           | 0.275 | 0.015 | 0.035 | -0.014 |
| 9        | 11.191       | 39.068          | 180                   | 0.15         | 1908          | 2088           | 0.200 | 0.010 | 0.031 | -0.027 |
| 10       | 11.172       | 43.675          | 244                   | 0.13         | 2456          | 2700           | 0.159 | 0.009 | 0.029 | -0.002 |

FG2 pH vs. Time Curve



FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 0                | 6.36                          | 11/17/97 11:37 AM |
| 15               | 6.25                          | 11/17/97 11:52 AM |
| 30               | 6.38                          | 11/17/97 12:07 PM |
| 45               | 6.52                          | 11/17/97 12:22 PM |
| 60               | 6.64                          | 11/17/97 12:37 PM |
| 75               | 6.70                          | 11/17/97 12:52 PM |
| 90               | 6.77                          | 11/17/97 1:07 PM  |
| 105              | 6.83                          | 11/17/97 1:22 PM  |
| 120              | 6.88                          | 11/17/97 1:37 PM  |
| 135              | 6.93                          | 11/17/97 1:52 PM  |
| 150              | 6.97                          | 11/17/97 2:07 PM  |
| 165              | 7.01                          | 11/17/97 2:22 PM  |
| 180              | 7.05                          | 11/17/97 2:37 PM  |
| 195              | 7.08                          | 11/17/97 2:52 PM  |
| 210              | 7.11                          | 11/17/97 3:07 PM  |
| 225              | 7.14                          | 11/17/97 3:22 PM  |
| 240              | 7.17                          | 11/17/97 3:37 PM  |
| 255              | 7.20                          | 11/17/97 3:52 PM  |
| 270              | 7.22                          | 11/17/97 4:07 PM  |
| 285              | 7.24                          | 11/17/97 4:22 PM  |
| 300              | 7.27                          | 11/17/97 4:37 PM  |
| 315              | 7.29                          | 11/17/97 4:52 PM  |
| 330              | 7.31                          | 11/17/97 5:07 PM  |
| 345              | 7.33                          | 11/17/97 5:22 PM  |
| 360              | 7.35                          | 11/17/97 5:37 PM  |
| 375              | 7.38                          | 11/17/97 5:52 PM  |
| 390              | 7.39                          | 11/17/97 6:07 PM  |
| 405              | 7.41                          | 11/17/97 6:22 PM  |
| 420              | 7.43                          | 11/17/97 6:37 PM  |
| 435              | 7.44                          | 11/17/97 6:52 PM  |
| 450              | 7.45                          | 11/17/97 7:07 PM  |
| 465              | 7.47                          | 11/17/97 7:22 PM  |
| 480              | 7.48                          | 11/17/97 7:37 PM  |
| 495              | 7.50                          | 11/17/97 7:52 PM  |
| 510              | 7.51                          | 11/17/97 8:07 PM  |
| 525              | 7.53                          | 11/17/97 8:22 PM  |
| 540              | 7.54                          | 11/17/97 8:37 PM  |
| 555              | 7.56                          | 11/17/97 8:52 PM  |
| 570              | 7.57                          | 11/17/97 9:07 PM  |
| 585              | 7.58                          | 11/17/97 9:22 PM  |
| 600              | 7.59                          | 11/17/97 9:37 PM  |
| 615              | 7.61                          | 11/17/97 9:52 PM  |
| 630              | 7.61                          | 11/17/97 10:07 PM |
| 645              | 7.63                          | 11/17/97 10:22 PM |



FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 660              | 7.64                          | 11/17/97 10:37 PM |
| 675              | 7.64                          | 11/17/97 10:52 PM |
| 690              | 7.66                          | 11/17/97 11:07 PM |
| 705              | 7.67                          | 11/17/97 11:22 PM |
| 720              | 7.67                          | 11/17/97 11:37 PM |
| 735              | 7.68                          | 11/17/97 11:52 PM |
| 750              | 7.69                          | 11/18/97 12:07 AM |
| 765              | 7.70                          | 11/18/97 12:22 AM |
| 780              | 7.70                          | 11/18/97 12:37 AM |
| 795              | 7.82                          | 11/18/97 12:52 AM |
| 810              | 7.83                          | 11/18/97 1:07 AM  |
| 825              | 7.71                          | 11/18/97 1:22 AM  |
| 840              | 7.74                          | 11/18/97 1:37 AM  |
| 855              | 7.76                          | 11/18/97 1:52 AM  |
| 870              | 7.77                          | 11/18/97 2:07 AM  |
| 885              | 7.77                          | 11/18/97 2:22 AM  |
| 900              | 7.78                          | 11/18/97 2:37 AM  |
| 915              | 7.78                          | 11/18/97 2:52 AM  |
| 930              | 7.80                          | 11/18/97 3:07 AM  |
| 945              | 7.79                          | 11/18/97 3:22 AM  |
| 960              | 7.79                          | 11/18/97 3:37 AM  |
| 975              | 7.79                          | 11/18/97 3:52 AM  |
| 990              | 7.80                          | 11/18/97 4:07 AM  |
| 1005             | 7.80                          | 11/18/97 4:22 AM  |
| 1020             | 7.80                          | 11/18/97 4:37 AM  |
| 1035             | 7.80                          | 11/18/97 4:52 AM  |
| 1050             | 7.79                          | 11/18/97 5:07 AM  |
| 1065             | 7.79                          | 11/18/97 5:22 AM  |
| 1080             | 7.79                          | 11/18/97 5:37 AM  |
| 1095             | 7.79                          | 11/18/97 5:52 AM  |
| 1110             | 7.81                          | 11/18/97 6:07 AM  |
| 1125             | 7.78                          | 11/18/97 6:22 AM  |
| 1140             | 7.79                          | 11/18/97 6:37 AM  |
| 1155             | 7.79                          | 11/18/97 6:52 AM  |
| 1170             | 7.79                          | 11/18/97 7:07 AM  |
| 1185             | 7.79                          | 11/18/97 7:22 AM  |
| 1200             | 7.78                          | 11/18/97 7:37 AM  |
| 1215             | 7.78                          | 11/18/97 7:52 AM  |
| 1230             | 7.78                          | 11/18/97 8:07 AM  |
| 1245             | 7.77                          | 11/18/97 8:22 AM  |
| 1260             | 7.77                          | 11/18/97 8:37 AM  |
| 1275             | 7.76                          | 11/18/97 8:52 AM  |
| 1290             | 7.76                          | 11/18/97 9:07 AM  |
| 1305             | 7.76                          | 11/18/97 9:22 AM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 1320             | 7.85                          | 11/18/97 9:37 AM  |
| 1335             | 7.74                          | 11/18/97 9:52 AM  |
| 1350             | 7.75                          | 11/18/97 10:07 AM |
| 1365             | 7.76                          | 11/18/97 10:22 AM |
| 1380             | 7.76                          | 11/18/97 10:37 AM |
| 1395             | 7.77                          | 11/18/97 10:52 AM |
| 1410             | 7.77                          | 11/18/97 11:07 AM |
| 1425             | 7.78                          | 11/18/97 11:22 AM |
| 1440             | 7.78                          | 11/18/97 11:37 AM |
| 1455             | 7.78                          | 11/18/97 11:52 AM |
| 1470             | 7.78                          | 11/18/97 12:07 PM |
| 1485             | 7.79                          | 11/18/97 12:22 PM |
| 1500             | 7.79                          | 11/18/97 12:37 PM |
| 1515             | 7.79                          | 11/18/97 12:52 PM |
| 1530             | 7.80                          | 11/18/97 1:07 PM  |
| 1545             | 7.80                          | 11/18/97 1:22 PM  |
| 1560             | 7.80                          | 11/18/97 1:37 PM  |
| 1575             | 7.80                          | 11/18/97 1:52 PM  |
| 1590             | 7.80                          | 11/18/97 2:07 PM  |
| 1605             | 7.81                          | 11/18/97 2:22 PM  |
| 1620             | 7.81                          | 11/18/97 2:37 PM  |
| 1635             | 7.81                          | 11/18/97 2:52 PM  |
| 1650             | 7.81                          | 11/18/97 3:07 PM  |
| 1665             | 7.81                          | 11/18/97 3:22 PM  |
| 1680             | 7.81                          | 11/18/97 3:37 PM  |
| 1695             | 7.81                          | 11/18/97 3:52 PM  |
| 1710             | 7.81                          | 11/18/97 4:07 PM  |
| 1725             | 7.81                          | 11/18/97 4:22 PM  |
| 1740             | 7.80                          | 11/18/97 4:37 PM  |
| 1755             | 7.80                          | 11/18/97 4:52 PM  |
| 1770             | 7.81                          | 11/18/97 5:07 PM  |
| 1785             | 7.80                          | 11/18/97 5:22 PM  |
| 1800             | 7.81                          | 11/18/97 5:37 PM  |
| 1815             | 7.81                          | 11/18/97 5:52 PM  |
| 1830             | 7.81                          | 11/18/97 6:07 PM  |
| 1845             | 7.81                          | 11/18/97 6:22 PM  |
| 1860             | 7.81                          | 11/18/97 6:37 PM  |
| 1875             | 7.82                          | 11/18/97 6:52 PM  |
| 1890             | 7.82                          | 11/18/97 7:07 PM  |
| 1905             | 7.82                          | 11/18/97 7:22 PM  |
| 1920             | 7.82                          | 11/18/97 7:37 PM  |
| 1935             | 7.82                          | 11/18/97 7:52 PM  |
| 1950             | 7.82                          | 11/18/97 8:07 PM  |
| 1965             | 7.83                          | 11/18/97 8:22 PM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 1980             | 7.83                          | 11/18/97 8:37 PM  |
| 1995             | 7.83                          | 11/18/97 8:52 PM  |
| 2010             | 7.83                          | 11/18/97 9:07 PM  |
| 2025             | 7.83                          | 11/18/97 9:22 PM  |
| 2040             | 7.83                          | 11/18/97 9:37 PM  |
| 2055             | 7.83                          | 11/18/97 9:52 PM  |
| 2070             | 7.84                          | 11/18/97 10:07 PM |
| 2085             | 7.84                          | 11/18/97 10:22 PM |
| 2100             | 7.84                          | 11/18/97 10:37 PM |
| 2115             | 7.84                          | 11/18/97 10:52 PM |
| 2130             | 7.86                          | 11/18/97 11:07 PM |
| 2145             | 7.82                          | 11/18/97 11:22 PM |
| 2160             | 7.83                          | 11/18/97 11:37 PM |
| 2175             | 7.83                          | 11/18/97 11:52 PM |
| 2190             | 7.83                          | 11/19/97 12:07 AM |
| 2205             | 7.83                          | 11/19/97 12:22 AM |
| 2220             | 7.83                          | 11/19/97 12:37 AM |
| 2235             | 7.83                          | 11/19/97 12:52 AM |
| 2250             | 7.83                          | 11/19/97 1:07 AM  |
| 2265             | 7.82                          | 11/19/97 1:22 AM  |
| 2280             | 7.84                          | 11/19/97 1:37 AM  |
| 2295             | 7.82                          | 11/19/97 1:52 AM  |
| 2310             | 7.84                          | 11/19/97 2:07 AM  |
| 2325             | 7.84                          | 11/19/97 2:22 AM  |
| 2340             | 7.84                          | 11/19/97 2:37 AM  |
| 2355             | 7.84                          | 11/19/97 2:52 AM  |
| 2370             | 7.84                          | 11/19/97 3:07 AM  |
| 2385             | 7.84                          | 11/19/97 3:22 AM  |
| 2400             | 7.84                          | 11/19/97 3:37 AM  |
| 2415             | 7.84                          | 11/19/97 3:52 AM  |
| 2430             | 7.83                          | 11/19/97 4:07 AM  |
| 2445             | 7.84                          | 11/19/97 4:22 AM  |
| 2460             | 7.83                          | 11/19/97 4:37 AM  |
| 2475             | 7.83                          | 11/19/97 4:52 AM  |
| 2490             | 7.84                          | 11/19/97 5:07 AM  |
| 2505             | 7.83                          | 11/19/97 5:22 AM  |
| 2520             | 7.83                          | 11/19/97 5:37 AM  |
| 2535             | 7.83                          | 11/19/97 5:52 AM  |
| 2550             | 7.82                          | 11/19/97 6:07 AM  |
| 2565             | 7.82                          | 11/19/97 6:22 AM  |
| 2580             | 7.82                          | 11/19/97 6:37 AM  |
| 2595             | 7.82                          | 11/19/97 6:52 AM  |
| 2610             | 7.82                          | 11/19/97 7:07 AM  |
| 2625             | 7.82                          | 11/19/97 7:22 AM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 2640             | 7.82                          | 11/19/97 7:37 AM  |
| 2655             | 7.82                          | 11/19/97 7:52 AM  |
| 2670             | 7.82                          | 11/19/97 8:07 AM  |
| 2685             | 7.82                          | 11/19/97 8:22 AM  |
| 2700             | 7.82                          | 11/19/97 8:37 AM  |
| 2715             | 7.82                          | 11/19/97 8:52 AM  |
| 2730             | 7.82                          | 11/19/97 9:07 AM  |
| 2745             | 7.82                          | 11/19/97 9:22 AM  |
| 2760             | 7.82                          | 11/19/97 9:37 AM  |
| 2775             | 7.82                          | 11/19/97 9:52 AM  |
| 2790             | 7.82                          | 11/19/97 10:07 AM |
| 2805             | 7.83                          | 11/19/97 10:22 AM |
| 2820             | 7.82                          | 11/19/97 10:37 AM |
| 2835             | 7.82                          | 11/19/97 10:52 AM |
| 2850             | 7.82                          | 11/19/97 11:07 AM |
| 2865             | 7.82                          | 11/19/97 11:22 AM |
| 2880             | 7.82                          | 11/19/97 11:37 AM |
| 2895             | 7.82                          | 11/19/97 11:52 AM |
| 2910             | 7.83                          | 11/19/97 12:07 PM |
| 2925             | 7.82                          | 11/19/97 12:22 PM |
| 2940             | 7.83                          | 11/19/97 12:37 PM |
| 2955             | 7.82                          | 11/19/97 12:52 PM |
| 2970             | 7.82                          | 11/19/97 1:07 PM  |
| 2985             | 7.82                          | 11/19/97 1:22 PM  |
| 3000             | 7.83                          | 11/19/97 1:37 PM  |
| 3015             | 7.83                          | 11/19/97 1:52 PM  |
| 3030             | 7.83                          | 11/19/97 2:07 PM  |
| 3084             | 7.80                          | 11/19/97 3:01 PM  |
| 3099             | 7.80                          | 11/19/97 3:16 PM  |
| 3114             | 7.79                          | 11/19/97 3:31 PM  |
| 3129             | 7.78                          | 11/19/97 3:46 PM  |
| 3144             | 7.77                          | 11/19/97 4:01 PM  |
| 3159             | 7.77                          | 11/19/97 4:16 PM  |
| 3174             | 7.76                          | 11/19/97 4:31 PM  |
| 3189             | 7.76                          | 11/19/97 4:46 PM  |
| 3204             | 7.77                          | 11/19/97 5:01 PM  |
| 3219             | 7.77                          | 11/19/97 5:16 PM  |
| 3234             | 7.77                          | 11/19/97 5:31 PM  |
| 3249             | 7.78                          | 11/19/97 5:46 PM  |
| 3264             | 7.79                          | 11/19/97 6:01 PM  |
| 3279             | 7.79                          | 11/19/97 6:16 PM  |
| 3294             | 7.80                          | 11/19/97 6:31 PM  |
| 3309             | 7.80                          | 11/19/97 6:46 PM  |
| 3324             | 7.80                          | 11/19/97 7:01 PM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 3339             | 7.80                          | 11/19/97 7:16 PM  |
| 3354             | 7.80                          | 11/19/97 7:31 PM  |
| 3369             | 7.80                          | 11/19/97 7:46 PM  |
| 3384             | 7.80                          | 11/19/97 8:01 PM  |
| 3399             | 7.80                          | 11/19/97 8:16 PM  |
| 3414             | 7.81                          | 11/19/97 8:31 PM  |
| 3429             | 7.81                          | 11/19/97 8:46 PM  |
| 3444             | 7.81                          | 11/19/97 9:01 PM  |
| 3459             | 7.81                          | 11/19/97 9:16 PM  |
| 3474             | 7.81                          | 11/19/97 9:31 PM  |
| 3489             | 7.80                          | 11/19/97 9:46 PM  |
| 3504             | 7.81                          | 11/19/97 10:01 PM |
| 3519             | 7.81                          | 11/19/97 10:16 PM |
| 3534             | 7.81                          | 11/19/97 10:31 PM |
| 3549             | 7.81                          | 11/19/97 10:46 PM |
| 3564             | 7.81                          | 11/19/97 11:01 PM |
| 3579             | 7.79                          | 11/19/97 11:16 PM |
| 3594             | 7.79                          | 11/19/97 11:31 PM |
| 3609             | 7.79                          | 11/19/97 11:46 PM |
| 3624             | 7.79                          | 11/20/97 12:01 AM |
| 3639             | 7.79                          | 11/20/97 12:16 AM |
| 3654             | 7.79                          | 11/20/97 12:31 AM |
| 3669             | 7.79                          | 11/20/97 12:46 AM |
| 3684             | 7.80                          | 11/20/97 1:01 AM  |
| 3699             | 7.80                          | 11/20/97 1:16 AM  |
| 3714             | 7.80                          | 11/20/97 1:31 AM  |
| 3729             | 7.80                          | 11/20/97 1:46 AM  |
| 3744             | 7.80                          | 11/20/97 2:01 AM  |
| 3759             | 7.80                          | 11/20/97 2:16 AM  |
| 3774             | 7.80                          | 11/20/97 2:31 AM  |
| 3789             | 7.80                          | 11/20/97 2:46 AM  |
| 3804             | 7.80                          | 11/20/97 3:01 AM  |
| 3819             | 7.80                          | 11/20/97 3:16 AM  |
| 3834             | 7.81                          | 11/20/97 3:31 AM  |
| 3849             | 7.80                          | 11/20/97 3:46 AM  |
| 3864             | 7.80                          | 11/20/97 4:01 AM  |
| 3879             | 7.80                          | 11/20/97 4:16 AM  |
| 3894             | 7.80                          | 11/20/97 4:31 AM  |
| 3909             | 7.80                          | 11/20/97 4:46 AM  |
| 3924             | 7.80                          | 11/20/97 5:01 AM  |
| 3939             | 7.80                          | 11/20/97 5:16 AM  |
| 3954             | 7.80                          | 11/20/97 5:31 AM  |
| 3969             | 7.79                          | 11/20/97 5:46 AM  |
| 3984             | 7.79                          | 11/20/97 6:01 AM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 3999             | 7.79                          | 11/20/97 6:16 AM  |
| 4014             | 7.79                          | 11/20/97 6:31 AM  |
| 4029             | 7.79                          | 11/20/97 6:46 AM  |
| 4044             | 7.79                          | 11/20/97 7:01 AM  |
| 4059             | 7.79                          | 11/20/97 7:16 AM  |
| 4074             | 7.79                          | 11/20/97 7:31 AM  |
| 4089             | 7.79                          | 11/20/97 7:46 AM  |
| 4104             | 7.79                          | 11/20/97 8:01 AM  |
| 4119             | 7.79                          | 11/20/97 8:16 AM  |
| 4134             | 7.79                          | 11/20/97 8:31 AM  |
| 4149             | 7.79                          | 11/20/97 8:46 AM  |
| 4164             | 7.79                          | 11/20/97 9:01 AM  |
| 4179             | 7.79                          | 11/20/97 9:16 AM  |
| 4194             | 7.79                          | 11/20/97 9:31 AM  |
| 4209             | 7.79                          | 11/20/97 9:46 AM  |
| 4224             | 7.79                          | 11/20/97 10:01 AM |
| 4239             | 7.79                          | 11/20/97 10:16 AM |
| 4254             | 7.79                          | 11/20/97 10:31 AM |
| 4269             | 7.79                          | 11/20/97 10:46 AM |
| 4284             | 7.79                          | 11/20/97 11:01 AM |
| 4299             | 7.79                          | 11/20/97 11:16 AM |
| 4314             | 7.79                          | 11/20/97 11:31 AM |
| 4329             | 7.79                          | 11/20/97 11:46 AM |
| 4344             | 7.79                          | 11/20/97 12:01 PM |
| 4359             | 7.79                          | 11/20/97 12:16 PM |
| 4374             | 7.79                          | 11/20/97 12:31 PM |
| 4389             | 7.79                          | 11/20/97 12:46 PM |
| 4404             | 7.79                          | 11/20/97 1:01 PM  |
| 4419             | 7.79                          | 11/20/97 1:16 PM  |
| 4434             | 7.79                          | 11/20/97 1:31 PM  |
| 4449             | 7.79                          | 11/20/97 1:46 PM  |
| 4464             | 7.79                          | 11/20/97 2:01 PM  |
| 4479             | 7.79                          | 11/20/97 2:16 PM  |
| 4494             | 7.79                          | 11/20/97 2:31 PM  |
| 4509             | 7.79                          | 11/20/97 2:46 PM  |
| 4524             | 7.79                          | 11/20/97 3:01 PM  |
| 4539             | 7.79                          | 11/20/97 3:16 PM  |
| 4554             | 7.80                          | 11/20/97 3:31 PM  |
| 4569             | 7.79                          | 11/20/97 3:46 PM  |
| 4584             | 7.79                          | 11/20/97 4:01 PM  |
| 4599             | 7.80                          | 11/20/97 4:16 PM  |
| 4614             | 7.79                          | 11/20/97 4:31 PM  |
| 4629             | 7.79                          | 11/20/97 4:46 PM  |
| 4644             | 7.79                          | 11/20/97 5:01 PM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 4659             | 7.79                          | 11/20/97 5:16 PM  |
| 4674             | 7.79                          | 11/20/97 5:31 PM  |
| 4689             | 7.79                          | 11/20/97 5:46 PM  |
| 4704             | 7.79                          | 11/20/97 6:01 PM  |
| 4719             | 7.79                          | 11/20/97 6:16 PM  |
| 4734             | 7.79                          | 11/20/97 6:31 PM  |
| 4749             | 7.79                          | 11/20/97 6:46 PM  |
| 4764             | 7.79                          | 11/20/97 7:01 PM  |
| 4779             | 7.79                          | 11/20/97 7:16 PM  |
| 4794             | 7.79                          | 11/20/97 7:31 PM  |
| 4809             | 7.79                          | 11/20/97 7:46 PM  |
| 4824             | 7.79                          | 11/20/97 8:01 PM  |
| 4839             | 7.79                          | 11/20/97 8:16 PM  |
| 4854             | 7.79                          | 11/20/97 8:31 PM  |
| 4869             | 7.79                          | 11/20/97 8:46 PM  |
| 4884             | 7.79                          | 11/20/97 9:01 PM  |
| 4899             | 7.79                          | 11/20/97 9:16 PM  |
| 4914             | 7.79                          | 11/20/97 9:31 PM  |
| 4929             | 7.79                          | 11/20/97 9:46 PM  |
| 4944             | 7.79                          | 11/20/97 10:01 PM |
| 4959             | 7.79                          | 11/20/97 10:16 PM |
| 4974             | 7.79                          | 11/20/97 10:31 PM |
| 4989             | 7.79                          | 11/20/97 10:46 PM |
| 5004             | 7.79                          | 11/20/97 11:01 PM |
| 5019             | 7.79                          | 11/20/97 11:16 PM |
| 5034             | 7.79                          | 11/20/97 11:31 PM |
| 5049             | 7.79                          | 11/20/97 11:46 PM |
| 5064             | 7.79                          | 11/21/97 12:01 AM |
| 5079             | 7.79                          | 11/21/97 12:16 AM |
| 5094             | 7.79                          | 11/21/97 12:31 AM |
| 5109             | 7.80                          | 11/21/97 12:46 AM |
| 5124             | 7.79                          | 11/21/97 1:01 AM  |
| 5139             | 7.79                          | 11/21/97 1:16 AM  |
| 5154             | 7.80                          | 11/21/97 1:31 AM  |
| 5169             | 7.80                          | 11/21/97 1:46 AM  |
| 5184             | 7.80                          | 11/21/97 2:01 AM  |
| 5199             | 7.80                          | 11/21/97 2:16 AM  |
| 5214             | 7.80                          | 11/21/97 2:31 AM  |
| 5229             | 7.80                          | 11/21/97 2:46 AM  |
| 5244             | 7.80                          | 11/21/97 3:01 AM  |
| 5259             | 7.80                          | 11/21/97 3:16 AM  |
| 5274             | 7.80                          | 11/21/97 3:31 AM  |
| 5289             | 7.80                          | 11/21/97 3:46 AM  |
| 5304             | 7.80                          | 11/21/97 4:01 AM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 5319             | 7.80                          | 11/21/97 4:16 AM  |
| 5334             | 7.80                          | 11/21/97 4:31 AM  |
| 5349             | 7.80                          | 11/21/97 4:46 AM  |
| 5364             | 7.81                          | 11/21/97 5:01 AM  |
| 5379             | 7.81                          | 11/21/97 5:16 AM  |
| 5394             | 7.80                          | 11/21/97 5:31 AM  |
| 5409             | 7.80                          | 11/21/97 5:46 AM  |
| 5424             | 7.80                          | 11/21/97 6:01 AM  |
| 5439             | 7.80                          | 11/21/97 6:16 AM  |
| 5454             | 7.80                          | 11/21/97 6:31 AM  |
| 5469             | 7.80                          | 11/21/97 6:46 AM  |
| 5484             | 7.80                          | 11/21/97 7:01 AM  |
| 5499             | 7.80                          | 11/21/97 7:16 AM  |
| 5514             | 7.80                          | 11/21/97 7:31 AM  |
| 5529             | 7.80                          | 11/21/97 7:46 AM  |
| 5544             | 7.80                          | 11/21/97 8:01 AM  |
| 5559             | 7.80                          | 11/21/97 8:16 AM  |
| 5574             | 7.80                          | 11/21/97 8:31 AM  |
| 5589             | 7.80                          | 11/21/97 8:46 AM  |
| 5604             | 7.80                          | 11/21/97 9:01 AM  |
| 5619             | 7.80                          | 11/21/97 9:16 AM  |
| 5634             | 7.80                          | 11/21/97 9:31 AM  |
| 5649             | 7.80                          | 11/21/97 9:46 AM  |
| 5664             | 7.80                          | 11/21/97 10:01 AM |
| 5679             | 7.80                          | 11/21/97 10:16 AM |
| 5694             | 7.80                          | 11/21/97 10:31 AM |
| 5709             | 7.80                          | 11/21/97 10:46 AM |
| 5724             | 7.80                          | 11/21/97 11:01 AM |
| 5739             | 7.80                          | 11/21/97 11:16 AM |
| 5754             | 7.80                          | 11/21/97 11:31 AM |
| 5769             | 7.80                          | 11/21/97 11:46 AM |
| 5784             | 7.80                          | 11/21/97 12:01 PM |
| 5799             | 7.80                          | 11/21/97 12:16 PM |
| 5814             | 7.80                          | 11/21/97 12:31 PM |
| 5829             | 7.80                          | 11/21/97 12:46 PM |
| 5844             | 7.80                          | 11/21/97 1:01 PM  |
| 5859             | 7.80                          | 11/21/97 1:16 PM  |
| 5874             | 7.80                          | 11/21/97 1:31 PM  |
| 5889             | 7.80                          | 11/21/97 1:46 PM  |
| 5904             | 7.81                          | 11/21/97 2:01 PM  |
| 5919             | 7.81                          | 11/21/97 2:16 PM  |
| 5934             | 7.81                          | 11/21/97 2:31 PM  |
| 5949             | 7.81                          | 11/21/97 2:46 PM  |
| 5964             | 7.81                          | 11/21/97 3:01 PM  |



FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 5979             | 7.80                          | 11/21/97 3:16 PM  |
| 5994             | 7.81                          | 11/21/97 3:31 PM  |
| 6009             | 7.80                          | 11/21/97 3:46 PM  |
| 6024             | 7.81                          | 11/21/97 4:01 PM  |
| 6039             | 7.81                          | 11/21/97 4:16 PM  |
| 6054             | 7.80                          | 11/21/97 4:31 PM  |
| 6069             | 7.80                          | 11/21/97 4:46 PM  |
| 6084             | 7.80                          | 11/21/97 5:01 PM  |
| 6099             | 7.80                          | 11/21/97 5:16 PM  |
| 6114             | 7.80                          | 11/21/97 5:31 PM  |
| 6129             | 7.80                          | 11/21/97 5:46 PM  |
| 6144             | 7.80                          | 11/21/97 6:01 PM  |
| 6159             | 7.80                          | 11/21/97 6:16 PM  |
| 6174             | 7.80                          | 11/21/97 6:31 PM  |
| 6189             | 7.81                          | 11/21/97 6:46 PM  |
| 6204             | 7.81                          | 11/21/97 7:01 PM  |
| 6219             | 7.81                          | 11/21/97 7:16 PM  |
| 6234             | 7.81                          | 11/21/97 7:31 PM  |
| 6249             | 7.82                          | 11/21/97 7:46 PM  |
| 6264             | 7.81                          | 11/21/97 8:01 PM  |
| 6279             | 7.81                          | 11/21/97 8:16 PM  |
| 6294             | 7.81                          | 11/21/97 8:31 PM  |
| 6309             | 7.81                          | 11/21/97 8:46 PM  |
| 6324             | 7.82                          | 11/21/97 9:01 PM  |
| 6339             | 7.82                          | 11/21/97 9:16 PM  |
| 6354             | 7.82                          | 11/21/97 9:31 PM  |
| 6369             | 7.82                          | 11/21/97 9:46 PM  |
| 6384             | 7.82                          | 11/21/97 10:01 PM |
| 6399             | 7.82                          | 11/21/97 10:16 PM |
| 6414             | 7.82                          | 11/21/97 10:31 PM |
| 6429             | 7.82                          | 11/21/97 10:46 PM |
| 6444             | 7.82                          | 11/21/97 11:01 PM |
| 6459             | 7.82                          | 11/21/97 11:16 PM |
| 6474             | 7.82                          | 11/21/97 11:31 PM |
| 6489             | 7.82                          | 11/21/97 11:46 PM |
| 6504             | 7.82                          | 11/22/97 12:01 AM |
| 6519             | 7.82                          | 11/22/97 12:16 AM |
| 6534             | 7.82                          | 11/22/97 12:31 AM |
| 6549             | 7.82                          | 11/22/97 12:46 AM |
| 6564             | 7.82                          | 11/22/97 1:01 AM  |
| 6579             | 7.82                          | 11/22/97 1:16 AM  |
| 6594             | 7.82                          | 11/22/97 1:31 AM  |
| 6609             | 7.81                          | 11/22/97 1:46 AM  |
| 6624             | 7.82                          | 11/22/97 2:01 AM  |

FG3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FG3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                   |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                   |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                   |
| <b>Duration:</b> | 7500 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 6639             | 7.81                          | 11/22/97 2:16 AM  |
| 6654             | 7.82                          | 11/22/97 2:31 AM  |
| 6669             | 7.81                          | 11/22/97 2:46 AM  |
| 6684             | 7.81                          | 11/22/97 3:01 AM  |
| 6699             | 7.82                          | 11/22/97 3:16 AM  |
| 6714             | 7.82                          | 11/22/97 3:31 AM  |
| 6729             | 7.82                          | 11/22/97 3:46 AM  |
| 6744             | 7.82                          | 11/22/97 4:01 AM  |
| 6759             | 7.82                          | 11/22/97 4:16 AM  |
| 6774             | 7.82                          | 11/22/97 4:31 AM  |
| 6789             | 7.82                          | 11/22/97 4:46 AM  |
| 6804             | 7.82                          | 11/22/97 5:01 AM  |
| 6819             | 7.81                          | 11/22/97 5:16 AM  |
| 6834             | 7.81                          | 11/22/97 5:31 AM  |
| 6849             | 7.80                          | 11/22/97 5:46 AM  |
| 6864             | 7.80                          | 11/22/97 6:01 AM  |
| 6879             | 7.80                          | 11/22/97 6:16 AM  |
| 6894             | 7.80                          | 11/22/97 6:31 AM  |
| 6909             | 7.80                          | 11/22/97 6:46 AM  |
| 6924             | 7.80                          | 11/22/97 7:01 AM  |
| 6939             | 7.80                          | 11/22/97 7:16 AM  |
| 6954             | 7.80                          | 11/22/97 7:31 AM  |
| 6969             | 7.81                          | 11/22/97 7:46 AM  |
| 6984             | 7.81                          | 11/22/97 8:01 AM  |
| 6999             | 7.81                          | 11/22/97 8:16 AM  |
| 7014             | 7.81                          | 11/22/97 8:31 AM  |
| 7029             | 7.84                          | 11/22/97 8:46 AM  |
| 7044             | 7.80                          | 11/22/97 9:01 AM  |
| 7059             | 7.80                          | 11/22/97 9:16 AM  |
| 7074             | 7.80                          | 11/22/97 9:31 AM  |
| 7089             | 7.80                          | 11/22/97 9:46 AM  |
| 7104             | 7.80                          | 11/22/97 10:01 AM |
| 7119             | 7.80                          | 11/22/97 10:16 AM |
| 7134             | 7.81                          | 11/22/97 10:31 AM |
| 7149             | 7.81                          | 11/22/97 10:46 AM |
| 7164             | 7.81                          | 11/22/97 11:01 AM |
| 7179             | 7.81                          | 11/22/97 11:16 AM |
| 7194             | 7.81                          | 11/22/97 11:31 AM |
| 7209             | 7.81                          | 11/22/97 11:46 AM |
| 7224             | 7.81                          | 11/22/97 12:01 PM |
| 7239             | 7.81                          | 11/22/97 12:16 PM |
| 7254             | 7.81                          | 11/22/97 12:31 PM |
| 7269             | 7.79                          | 11/22/97 12:46 PM |
| 7284             | 7.79                          | 11/22/97 1:01 PM  |

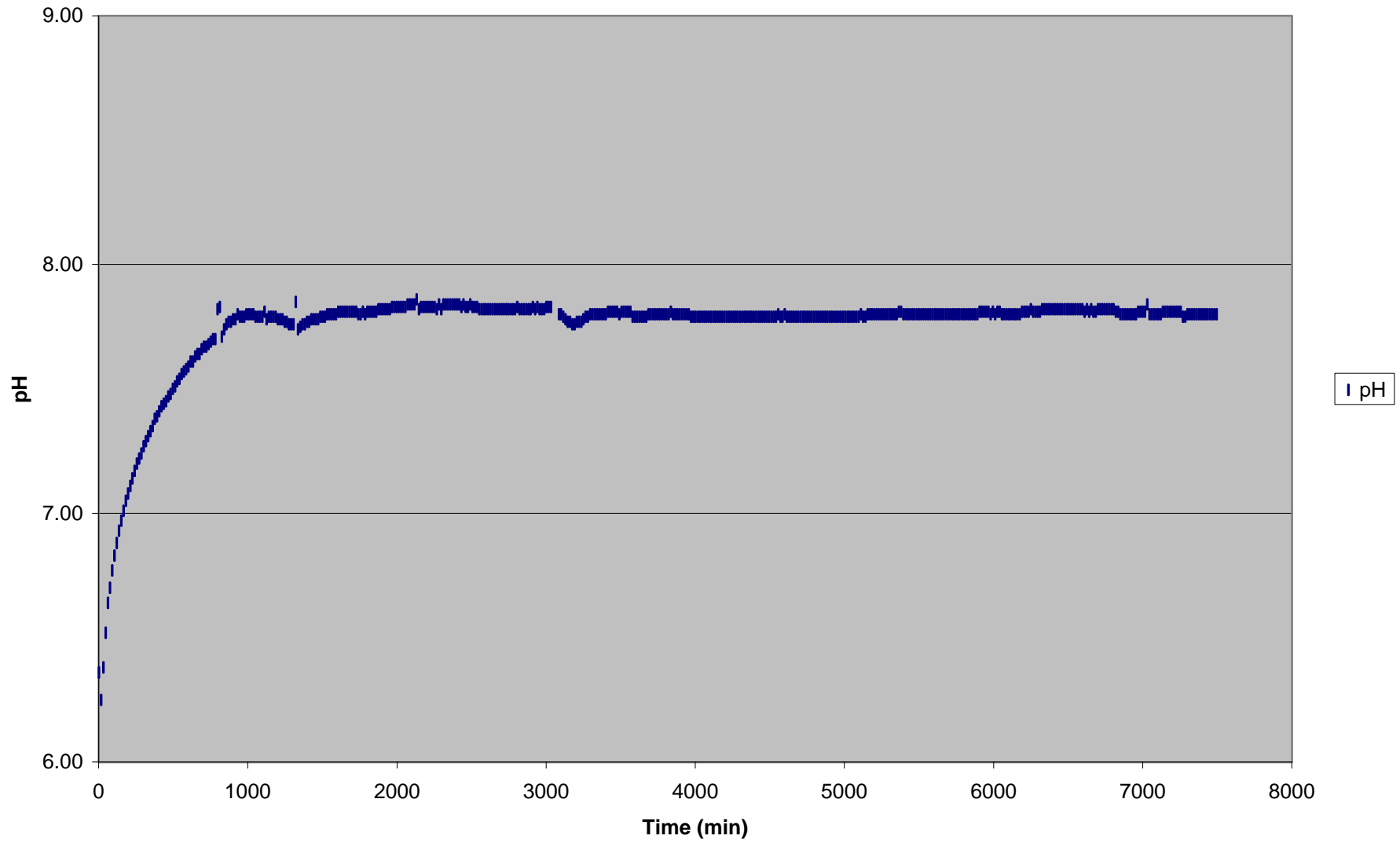
**FG3 pH vs. time**

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FG3                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | Gambles Solution + Albumen    |                  |
| <b>Start:</b>    | 11:37 a.m. 11/17/97           |                  |
| <b>Stop:</b>     | 4:31 p.m. 11/22/97            |                  |
| <b>Duration:</b> | 7500 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 7299             | 7.80                          | 11/22/97 1:16 PM |
| 7314             | 7.80                          | 11/22/97 1:31 PM |
| 7329             | 7.80                          | 11/22/97 1:46 PM |
| 7344             | 7.80                          | 11/22/97 2:01 PM |
| 7359             | 7.80                          | 11/22/97 2:16 PM |
| 7374             | 7.80                          | 11/22/97 2:31 PM |
| 7389             | 7.80                          | 11/22/97 2:46 PM |
| 7404             | 7.80                          | 11/22/97 3:01 PM |
| 7419             | 7.80                          | 11/22/97 3:16 PM |
| 7434             | 7.80                          | 11/22/97 3:31 PM |
| 7449             | 7.80                          | 11/22/97 3:46 PM |
| 7464             | 7.80                          | 11/22/97 4:01 PM |
| 7479             | 7.80                          | 11/22/97 4:16 PM |
| 7494             | 7.80                          | 11/22/97 4:31 PM |

FG3 Analysis Data

| Bottle #   | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As    | Cd    | Cr    | Pb     |  |
|--|--------------|-----------------|-----------------------|--------------|---------------|----------------|-------|-------|-------|--------|--|
| 1  | 10.872       | 42.179          | 109                   | 0.29         | 2             | 111            | 0.151 | 0.047 | 0.041 | -0.021 |  |
| 2  | 11.066       | 47.442          | 166                   | 0.22         | 113           | 279            | 1.657 | 0.105 | 0.128 | 0.031  |  |
| 3  | 10.947       | 38.995          | 139                   | 0.20         | 280           | 419            | 1.819 | 0.091 | 0.084 | 0.011  |  |
| 4  | 11.062       | 45.238          | 183                   | 0.19         | 420           | 603            | 1.213 | 0.060 | 0.061 | 0.018  |  |
| 5  | 10.651       | 42.286          | 180                   | 0.18         | 604           | 784            | 0.804 | 0.042 | 0.047 | 0.025  |  |
| 6  | 11.071       | 48.017          | 260                   | 0.14         | 1047          | 1307           | 0.315 | 0.025 | 0.033 | -0.001 |  |
| 7  | 10.803       | 39.818          | 250                   | 0.12         | 1869          | 2119           | 0.215 | 0.017 | 0.024 | 0.016  |  |
| 8  | 11.030       | 41.532          | 320                   | 0.10         | 2489          | 2809           | 0.197 | 0.015 | 0.035 | 0.019  |  |
| 9 <sup>A</sup>   | 10.921       | 42.331          | 352                   | 0.09         | 3189          | 3541           | 0.193 | 0.012 | 0.035 | 0.033  |  |
| 10   | 11.052       | 41.636          | 363                   | 0.08         | 3848          | 4211           | 0.079 | 0.007 | 0.014 | 0.019  |  |
| 11   | 10.976       | 44.096          | 420                   | 0.08         | 4736          | 5156           | 0.078 | 0.006 | 0.010 | 0.001  |  |
| 12   | 11.042       | 41.712          | 426                   | 0.07         | 6133          | 6559           | 0.070 | 0.004 | 0.008 | 0.017  |  |
| 13   | 11.066       | 44.786          | 475                   | 0.07         | 7025          | 7500           | 0.081 | 0.005 | 0.006 | 0.000  |  |
| <u>Notes</u>   |              |                 |                       |              |               |                |       |       |       |        |  |
| 1) Slight early breakthrough of very fine material noted early in run.   |              |                 |                       |              |               |                |       |       |       |        |  |
| 2) Possible breakthrough cleared by collection of sample #3  |              |                 |                       |              |               |                |       |       |       |        |  |
| 3) Power failure @ 2:22 p.m. 11/19. pH meter recalibrated and on line by 3: 01 p.m. 11/19  |              |                 |                       |              |               |                |       |       |       |        |  |
| <sup>A</sup> Some possible fines noted in flow through cell. 0.2 µm syringe filter installed in line prior to flow through cell. |              |                 |                       |              |               |                |       |       |       |        |  |

FG3 pH vs. Time



FA1 pH vs. time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FA1                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | pH 2 HCl solution             |                  |
| <b>Start:</b>    | 10:41 a.m. 12/2/97            |                  |
| <b>Stop:</b>     | 12:11 a.m. 12/3/97            |                  |
| <b>Duration:</b> | 810 min.                      |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 0                | 2.92                          | 12/2/97 10:41 AM |
| 10               | 3.61                          | 12/2/97 10:51 AM |
| 20               | 4.03                          | 12/2/97 11:01 AM |
| 30               | 4.03                          | 12/2/97 11:11 AM |
| 40               | 4.01                          | 12/2/97 11:21 AM |
| 50               | 3.92                          | 12/2/97 11:31 AM |
| 60               | 3.90                          | 12/2/97 11:41 AM |
| 70               | 3.86                          | 12/2/97 11:51 AM |
| 80               | 3.88                          | 12/2/97 12:01 PM |
| 90               | 3.84                          | 12/2/97 12:11 PM |
| 100              | 3.80                          | 12/2/97 12:21 PM |
| 110              | 3.77                          | 12/2/97 12:31 PM |
| 120              | 3.73                          | 12/2/97 12:41 PM |
| 130              | 3.65                          | 12/2/97 12:51 PM |
| 140              | 3.64                          | 12/2/97 1:01 PM  |
| 150              | 3.57                          | 12/2/97 1:11 PM  |
| 160              | 3.54                          | 12/2/97 1:21 PM  |
| 170              | 3.52                          | 12/2/97 1:31 PM  |
| 180              | 3.50                          | 12/2/97 1:41 PM  |
| 190              | 3.47                          | 12/2/97 1:51 PM  |
| 200              | 3.46                          | 12/2/97 2:01 PM  |
| 210              | 3.45                          | 12/2/97 2:11 PM  |
| 220              | 3.43                          | 12/2/97 2:21 PM  |
| 230              | 3.46                          | 12/2/97 2:31 PM  |
| 240              | 3.45                          | 12/2/97 2:41 PM  |
| 250              | 3.44                          | 12/2/97 2:51 PM  |
| 260              | 3.43                          | 12/2/97 3:01 PM  |
| 270              | 3.42                          | 12/2/97 3:11 PM  |
| 280              | 3.41                          | 12/2/97 3:21 PM  |
| 290              | 3.39                          | 12/2/97 3:31 PM  |
| 300              | 3.38                          | 12/2/97 3:41 PM  |
| 310              | 3.37                          | 12/2/97 3:51 PM  |
| 320              | 3.36                          | 12/2/97 4:01 PM  |
| 330              | 3.35                          | 12/2/97 4:11 PM  |
| 340              | 3.32                          | 12/2/97 4:21 PM  |
| 350              | 3.30                          | 12/2/97 4:31 PM  |
| 360              | 3.27                          | 12/2/97 4:41 PM  |
| 370              | 3.25                          | 12/2/97 4:51 PM  |
| 380              | 3.23                          | 12/2/97 5:01 PM  |
| 390              | 3.21                          | 12/2/97 5:11 PM  |
| 400              | 3.18                          | 12/2/97 5:21 PM  |
| 410              | 3.16                          | 12/2/97 5:31 PM  |
| 420              | 3.13                          | 12/2/97 5:41 PM  |
| 430              | 3.11                          | 12/2/97 5:51 PM  |

FA1 pH vs. time

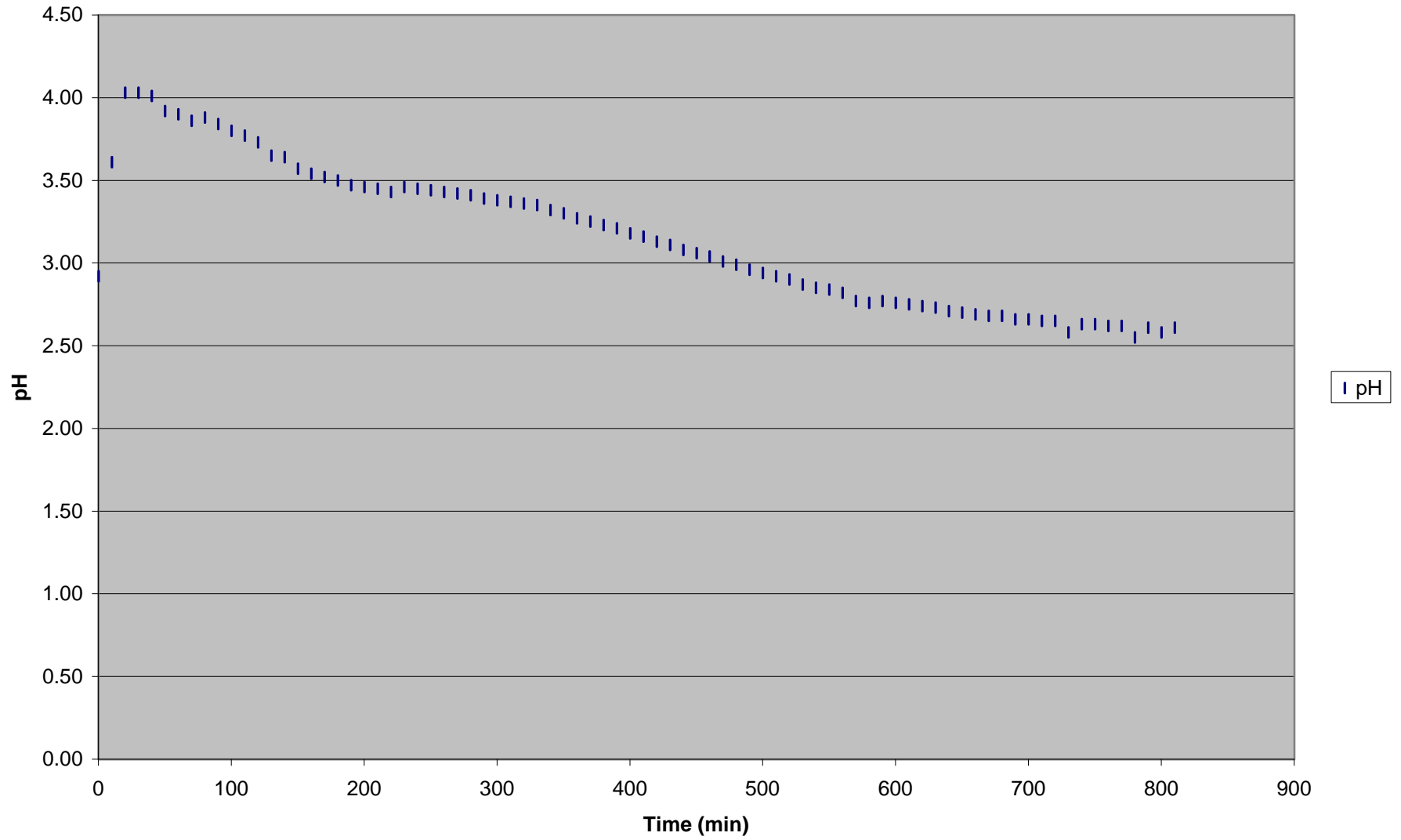
|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FA1                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | pH 2 HCl solution             |                  |
| <b>Start:</b>    | 10:41 a.m. 12/2/97            |                  |
| <b>Stop:</b>     | 12:11 a.m. 12/3/97            |                  |
| <b>Duration:</b> | 810 min.                      |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 440              | 3.08                          | 12/2/97 6:01 PM  |
| 450              | 3.06                          | 12/2/97 6:11 PM  |
| 460              | 3.04                          | 12/2/97 6:21 PM  |
| 470              | 3.01                          | 12/2/97 6:31 PM  |
| 480              | 2.99                          | 12/2/97 6:41 PM  |
| 490              | 2.96                          | 12/2/97 6:51 PM  |
| 500              | 2.94                          | 12/2/97 7:01 PM  |
| 510              | 2.92                          | 12/2/97 7:11 PM  |
| 520              | 2.90                          | 12/2/97 7:21 PM  |
| 530              | 2.87                          | 12/2/97 7:31 PM  |
| 540              | 2.85                          | 12/2/97 7:41 PM  |
| 550              | 2.84                          | 12/2/97 7:51 PM  |
| 560              | 2.82                          | 12/2/97 8:01 PM  |
| 570              | 2.77                          | 12/2/97 8:11 PM  |
| 580              | 2.76                          | 12/2/97 8:21 PM  |
| 590              | 2.77                          | 12/2/97 8:31 PM  |
| 600              | 2.76                          | 12/2/97 8:41 PM  |
| 610              | 2.75                          | 12/2/97 8:51 PM  |
| 620              | 2.74                          | 12/2/97 9:01 PM  |
| 630              | 2.73                          | 12/2/97 9:11 PM  |
| 640              | 2.71                          | 12/2/97 9:21 PM  |
| 650              | 2.70                          | 12/2/97 9:31 PM  |
| 660              | 2.69                          | 12/2/97 9:41 PM  |
| 670              | 2.68                          | 12/2/97 9:51 PM  |
| 680              | 2.68                          | 12/2/97 10:01 PM |
| 690              | 2.66                          | 12/2/97 10:11 PM |
| 700              | 2.66                          | 12/2/97 10:21 PM |
| 710              | 2.65                          | 12/2/97 10:31 PM |
| 720              | 2.65                          | 12/2/97 10:41 PM |
| 730              | 2.58                          | 12/2/97 10:51 PM |
| 740              | 2.63                          | 12/2/97 11:01 PM |
| 750              | 2.63                          | 12/2/97 11:11 PM |
| 760              | 2.62                          | 12/2/97 11:21 PM |
| 770              | 2.62                          | 12/2/97 11:31 PM |
| 780              | 2.55                          | 12/2/97 11:41 PM |
| 790              | 2.61                          | 12/2/97 11:51 PM |
| 800              | 2.58                          | 12/3/97 12:01 AM |
| 810              | 2.61                          | 12/3/97 12:11 AM |

FA1 Analysis Data

| Bottle #   | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As     | Cd     | Cr     | Pb     |
|--|--------------|-----------------|-----------------------|--------------|---------------|----------------|--------|--------|--------|--------|
| 1  | 8.273        | 39.736          | 36.5                  | 0.86         | 0             | 37             | -0.011 | 0.056  | 0.934  | -0.331 |
| 2  | 8.274        | 37.585          | 37.5                  | 0.78         | 37            | 75             | -0.047 | -0.010 | 0.273  | -0.173 |
| 3  | 8.211        | 38.174          | 37                    | 0.81         | 76            | 113            | -0.016 | -0.021 | 0.230  | -0.177 |
| 4  | 8.229        | 38.953          | 38.5                  | 0.80         | 113           | 152            | -0.026 | -0.020 | 0.217  | -0.166 |
| 5  | 8.225        | 40.630          | 40                    | 0.81         | 152           | 192            | 0.022  | -0.019 | 0.158  | -0.141 |
| 6  | 8.152        | 40.362          | 40                    | 0.81         | 192           | 232            | 0.013  | -0.020 | 0.116  | -0.131 |
| 7  | 8.326        | 40.400          | 40                    | 0.80         | 232           | 272            | 0.003  | -0.019 | 0.094  | -0.142 |
| 8  | 8.250        | 40.353          | 40                    | 0.80         | 272           | 312            | -0.024 | -0.022 | 0.082  | -0.138 |
| 9  | 8.189        | 39.702          | 40                    | 0.79         | 312           | 352            | -0.021 | -0.021 | 0.074  | -0.097 |
| 10   | 8.294        | 39.785          | 40                    | 0.79         | 352           | 392            | -0.059 | -0.020 | 0.070  | -0.110 |
| 11   | 8.264        | 39.765          | 40                    | 0.79         | 704           | 744            | -0.031 | -0.024 | -0.018 | -0.023 |
| <u>Notes</u>   |              |                 |                       |              |               |                |        |        |        |        |
| Added coiled PTFE thread to feed side @ membrane filter to limit feed breakthrough |              |                 |                       |              |               |                |        |        |        |        |
| Wrist action shaker broke down at 12:10 a.m. 12/3/97                               |              |                 |                       |              |               |                |        |        |        |        |



FA1 pH vs. Time



FA2 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA2                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 10:57 a.m. 12/26/97           |                   |
| <b>Stop:</b>     | 12:11 a.m. 12/3/97            |                   |
| <b>Duration:</b> | 1410 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 0                | 3.99                          | 12/26/97 10:57 AM |
| 10               | 3.93                          | 12/26/97 11:07 AM |
| 20               | 3.96                          | 12/26/97 11:17 AM |
| 30               | 3.97                          | 12/26/97 11:27 AM |
| 40               | 3.94                          | 12/26/97 11:37 AM |
| 50               | 3.90                          | 12/26/97 11:47 AM |
| 60               | 3.84                          | 12/26/97 11:57 AM |
| 70               | 3.78                          | 12/26/97 12:07 PM |
| 80               | 3.75                          | 12/26/97 12:17 PM |
| 90               | 3.67                          | 12/26/97 12:27 PM |
| 100              | 3.56                          | 12/26/97 12:37 PM |
| 110              | 3.49                          | 12/26/97 12:47 PM |
| 120              | 3.48                          | 12/26/97 12:57 PM |
| 130              | 3.42                          | 12/26/97 1:07 PM  |
| 140              | 3.38                          | 12/26/97 1:17 PM  |
| 150              | 3.33                          | 12/26/97 1:27 PM  |
| 160              | 3.30                          | 12/26/97 1:37 PM  |
| 170              | 3.29                          | 12/26/97 1:47 PM  |
| 180              | 3.26                          | 12/26/97 1:57 PM  |
| 190              | 3.25                          | 12/26/97 2:07 PM  |
| 200              | 3.24                          | 12/26/97 2:17 PM  |
| 210              | 3.25                          | 12/26/97 2:27 PM  |
| 220              | 3.21                          | 12/26/97 2:37 PM  |
| 230              | 3.19                          | 12/26/97 2:47 PM  |
| 240              | 3.17                          | 12/26/97 2:57 PM  |
| 250              | 3.13                          | 12/26/97 3:07 PM  |
| 260              | 3.08                          | 12/26/97 3:17 PM  |
| 270              | 3.10                          | 12/26/97 3:27 PM  |
| 280              | 3.08                          | 12/26/97 3:37 PM  |
| 290              | 3.07                          | 12/26/97 3:47 PM  |
| 300              | 3.05                          | 12/26/97 3:57 PM  |
| 310              | 3.04                          | 12/26/97 4:07 PM  |
| 320              | 3.04                          | 12/26/97 4:17 PM  |
| 330              | 3.01                          | 12/26/97 4:27 PM  |
| 340              | 2.93                          | 12/26/97 4:37 PM  |
| 350              | 2.66                          | 12/26/97 4:47 PM  |
| 360              | 2.77                          | 12/26/97 4:57 PM  |
| 370              | 2.84                          | 12/26/97 5:07 PM  |
| 380              | 2.94                          | 12/26/97 5:17 PM  |
| 390              | 2.94                          | 12/26/97 5:27 PM  |
| 400              | 2.96                          | 12/26/97 5:37 PM  |
| 410              | 2.91                          | 12/26/97 5:47 PM  |
| 420              | 2.85                          | 12/26/97 5:57 PM  |
| 430              | 2.82                          | 12/26/97 6:07 PM  |

FA2 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA2                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 10:57 a.m. 12/26/97           |                   |
| <b>Stop:</b>     | 12:11 a.m. 12/3/97            |                   |
| <b>Duration:</b> | 1410 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 440              | 2.79                          | 12/26/97 6:17 PM  |
| 450              | 2.77                          | 12/26/97 6:27 PM  |
| 460              | 2.77                          | 12/26/97 6:37 PM  |
| 470              | 2.75                          | 12/26/97 6:47 PM  |
| 480              | 2.74                          | 12/26/97 6:57 PM  |
| 490              | 2.73                          | 12/26/97 7:07 PM  |
| 500              | 2.71                          | 12/26/97 7:17 PM  |
| 510              | 2.70                          | 12/26/97 7:27 PM  |
| 520              | 2.69                          | 12/26/97 7:37 PM  |
| 530              | 2.66                          | 12/26/97 7:47 PM  |
| 540              | 2.66                          | 12/26/97 7:57 PM  |
| 550              | 2.65                          | 12/26/97 8:07 PM  |
| 560              | 2.64                          | 12/26/97 8:17 PM  |
| 570              | 2.63                          | 12/26/97 8:27 PM  |
| 580              | 2.62                          | 12/26/97 8:37 PM  |
| 590              | 2.61                          | 12/26/97 8:47 PM  |
| 600              | 2.60                          | 12/26/97 8:57 PM  |
| 610              | 2.59                          | 12/26/97 9:07 PM  |
| 620              | 2.58                          | 12/26/97 9:17 PM  |
| 630              | 2.57                          | 12/26/97 9:27 PM  |
| 640              | 2.56                          | 12/26/97 9:37 PM  |
| 650              | 2.55                          | 12/26/97 9:47 PM  |
| 660              | 2.55                          | 12/26/97 9:57 PM  |
| 670              | 2.54                          | 12/26/97 10:07 PM |
| 680              | 2.53                          | 12/26/97 10:17 PM |
| 690              | 2.53                          | 12/26/97 10:27 PM |
| 700              | 2.52                          | 12/26/97 10:37 PM |
| 710              | 2.51                          | 12/26/97 10:47 PM |
| 720              | 2.50                          | 12/26/97 10:57 PM |
| 730              | 2.45                          | 12/26/97 11:07 PM |
| 740              | 2.48                          | 12/26/97 11:17 PM |
| 750              | 2.49                          | 12/26/97 11:27 PM |
| 760              | 2.48                          | 12/26/97 11:37 PM |
| 770              | 2.42                          | 12/26/97 11:47 PM |
| 780              | 2.42                          | 12/26/97 11:57 PM |
| 790              | 2.42                          | 12/27/97 12:07 AM |
| 800              | 2.42                          | 12/27/97 12:17 AM |
| 810              | 2.42                          | 12/27/97 12:27 AM |
| 820              | 2.42                          | 12/27/97 12:37 AM |
| 830              | 2.42                          | 12/27/97 12:47 AM |
| 840              | 2.42                          | 12/27/97 12:57 AM |
| 850              | 2.41                          | 12/27/97 1:07 AM  |
| 860              | 2.42                          | 12/27/97 1:17 AM  |
| 870              | 2.48                          | 12/27/97 1:27 AM  |

FA2 pH vs. time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FA2                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | pH 2 HCl solution             |                  |
| <b>Start:</b>    | 10:57 a.m. 12/26/97           |                  |
| <b>Stop:</b>     | 12:11 a.m. 12/3/97            |                  |
| <b>Duration:</b> | 1410 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 880              | 2.47                          | 12/27/97 1:37 AM |
| 890              | 2.41                          | 12/27/97 1:47 AM |
| 900              | 2.39                          | 12/27/97 1:57 AM |
| 910              | 2.45                          | 12/27/97 2:07 AM |
| 920              | 2.39                          | 12/27/97 2:17 AM |
| 930              | 2.44                          | 12/27/97 2:27 AM |
| 940              | 2.43                          | 12/27/97 2:37 AM |
| 950              | 2.44                          | 12/27/97 2:47 AM |
| 960              | 2.43                          | 12/27/97 2:57 AM |
| 970              | 2.44                          | 12/27/97 3:07 AM |
| 980              | 2.45                          | 12/27/97 3:17 AM |
| 990              | 2.46                          | 12/27/97 3:27 AM |
| 1000             | 2.46                          | 12/27/97 3:37 AM |
| 1010             | 2.47                          | 12/27/97 3:47 AM |
| 1020             | 2.48                          | 12/27/97 3:57 AM |
| 1030             | 2.50                          | 12/27/97 4:07 AM |
| 1040             | 2.52                          | 12/27/97 4:17 AM |
| 1050             | 2.54                          | 12/27/97 4:27 AM |
| 1060             | 2.56                          | 12/27/97 4:37 AM |
| 1070             | 2.57                          | 12/27/97 4:47 AM |
| 1080             | 2.58                          | 12/27/97 4:57 AM |
| 1090             | 2.59                          | 12/27/97 5:07 AM |
| 1100             | 2.61                          | 12/27/97 5:17 AM |
| 1110             | 2.61                          | 12/27/97 5:27 AM |
| 1120             | 2.62                          | 12/27/97 5:37 AM |
| 1130             | 2.63                          | 12/27/97 5:47 AM |
| 1140             | 2.64                          | 12/27/97 5:57 AM |
| 1150             | 2.64                          | 12/27/97 6:07 AM |
| 1160             | 2.65                          | 12/27/97 6:17 AM |
| 1170             | 2.66                          | 12/27/97 6:27 AM |
| 1180             | 2.67                          | 12/27/97 6:37 AM |
| 1190             | 2.68                          | 12/27/97 6:47 AM |
| 1200             | 2.69                          | 12/27/97 6:57 AM |
| 1210             | 2.70                          | 12/27/97 7:07 AM |
| 1220             | 2.71                          | 12/27/97 7:17 AM |
| 1230             | 2.72                          | 12/27/97 7:27 AM |
| 1240             | 2.72                          | 12/27/97 7:37 AM |
| 1250             | 2.90                          | 12/27/97 7:47 AM |
| 1260             | 2.99                          | 12/27/97 7:57 AM |
| 1270             | 2.99                          | 12/27/97 8:07 AM |
| 1280             | 3.00                          | 12/27/97 8:17 AM |
| 1290             | 3.00                          | 12/27/97 8:27 AM |
| 1300             | 3.00                          | 12/27/97 8:37 AM |
| 1310             | 3.00                          | 12/27/97 8:47 AM |

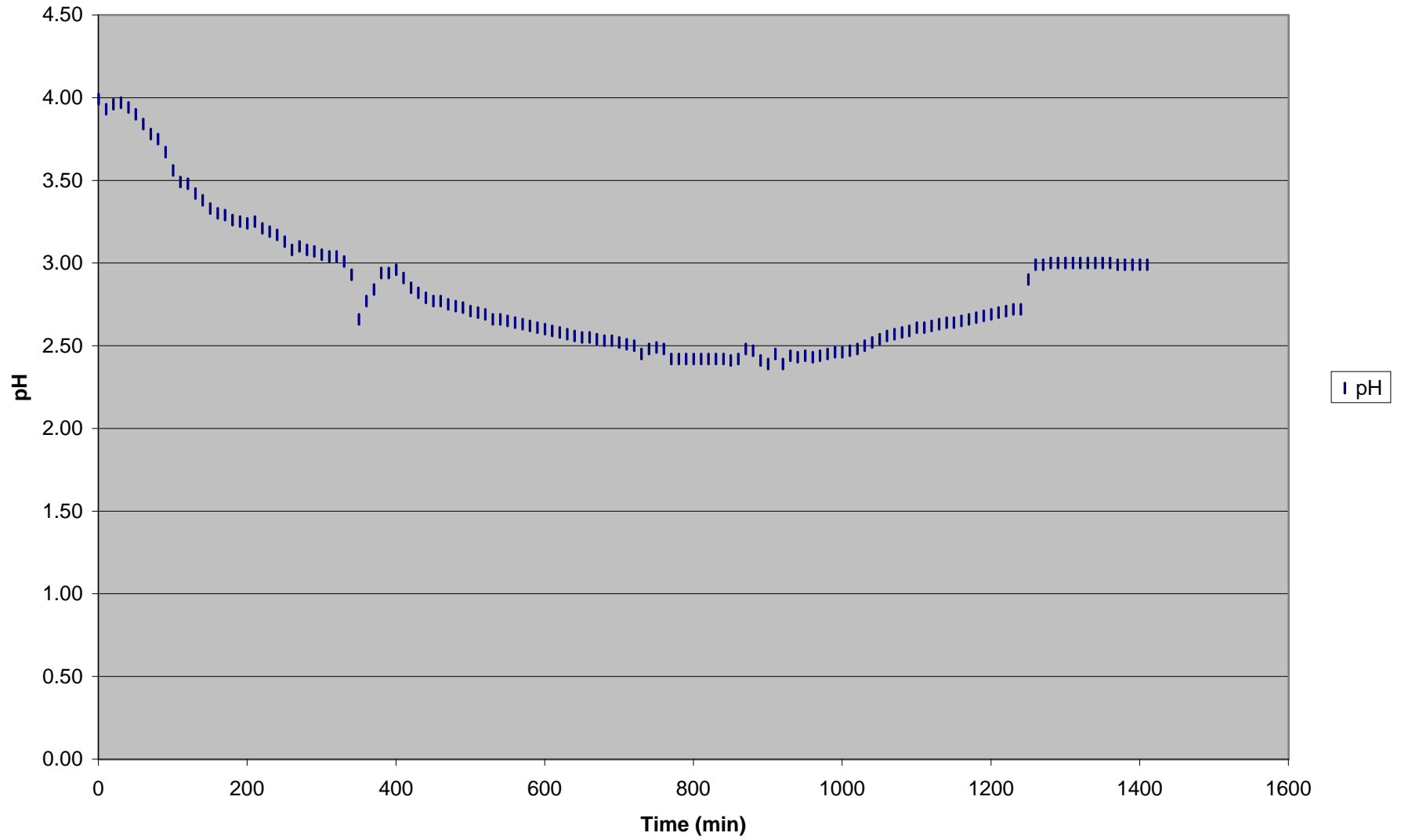
**FA2 pH vs. time**

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA2                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 10:57 a.m. 12/26/97           |                   |
| <b>Stop:</b>     | 12:11 a.m. 12/3/97            |                   |
| <b>Duration:</b> | 1410 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 1320             | 3.00                          | 12/27/97 8:57 AM  |
| 1330             | 3.00                          | 12/27/97 9:07 AM  |
| 1340             | 3.00                          | 12/27/97 9:17 AM  |
| 1350             | 3.00                          | 12/27/97 9:27 AM  |
| 1360             | 3.00                          | 12/27/97 9:37 AM  |
| 1370             | 2.99                          | 12/27/97 9:47 AM  |
| 1380             | 2.99                          | 12/27/97 9:57 AM  |
| 1390             | 2.99                          | 12/27/97 10:07 AM |
| 1400             | 2.99                          | 12/27/97 10:17 AM |
| 1410             | 2.99                          | 12/27/97 10:27 AM |

FA2 Analysis Data

| Bottle #   | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As     | Cd     | Cr    | Pb     |
|--|--------------|-----------------|-----------------------|--------------|---------------|----------------|--------|--------|-------|--------|
| 1  | 8.239        | 37.665          | 43.5                  | 0.68         | 1             | 45             | -0.101 | 0.058  | 1.295 | -0.313 |
| 2  | 8.285        | 37.607          | 43                    | 0.68         | 45            | 88             | -0.050 | -0.001 | 0.410 | -0.188 |
| 3  | 8.213        | 39.163          | 43                    | 0.72         | 88            | 131            | -0.030 | -0.013 | 0.225 | -0.165 |
| 4  | 8.247        | 40.607          | 43                    | 0.75         | 132           | 175            | -0.004 | -0.017 | 0.175 | -0.141 |
| 5  | 8.217        | 39.908          | 43                    | 0.74         | 175           | 218            | 0.000  | -0.020 | 0.130 | -0.167 |
| 6  | 8.251        | 42.705          | 43                    | 0.80         | 218           | 261            | -0.004 | -0.020 | 0.098 | -0.139 |
| 7  | 8.263        | 41.400          | 40                    | 0.83         | 261           | 301            | -0.037 | -0.022 | 0.073 | -0.149 |
| 8  | 8.815        | 38.861          | 40                    | 0.75         | 301           | 341            | -0.045 | -0.022 | 0.060 | -0.103 |
| 9  | 8.279        | 37.949          | 47.25                 | 0.63         | 341           | 388            | -0.004 | -0.021 | 0.050 | -0.073 |
| 10   | 8.236        | 42.443          | 41.75                 | 0.82         | 389           | 431            | -0.042 | -0.023 | 0.050 | -0.083 |
| 11   | 8.209        | 40.132          | 39.5                  | 0.81         | 711           | 751            | -0.041 | -0.022 | 0.032 | 0.014  |
| <u>Notes</u>   |              |                 |                       |              |               |                |        |        |       |        |
| Added coiled PTFE thread to feed side @ membrane filter to limit feed breakthrough |              |                 |                       |              |               |                |        |        |       |        |
| Wrist action shaker broke down at 12:10 a.m. 12/3/97                               |              |                 |                       |              |               |                |        |        |       |        |

FA2 pH vs. Time



FA3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 4:48 p.m. 12/27/97            |                   |
| <b>Stop:</b>     | 7:48 a.m. 12/29/97            |                   |
| <b>Duration:</b> | 2347 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 0                | 3.80                          | 12/27/97 4:38 PM  |
| 10               | 3.86                          | 12/27/97 4:48 PM  |
| 20               | 3.93                          | 12/27/97 4:58 PM  |
| 30               | 3.98                          | 12/27/97 5:08 PM  |
| 40               | 3.98                          | 12/27/97 5:18 PM  |
| 50               | 3.94                          | 12/27/97 5:28 PM  |
| 60               | 3.88                          | 12/27/97 5:38 PM  |
| 70               | 3.80                          | 12/27/97 5:48 PM  |
| 80               | 3.75                          | 12/27/97 5:58 PM  |
| 90               | 3.67                          | 12/27/97 6:08 PM  |
| 100              | 3.63                          | 12/27/97 6:18 PM  |
| 110              | 3.56                          | 12/27/97 6:28 PM  |
| 120              | 3.49                          | 12/27/97 6:38 PM  |
| 130              | 3.46                          | 12/27/97 6:48 PM  |
| 140              | 3.42                          | 12/27/97 6:58 PM  |
| 150              | 3.38                          | 12/27/97 7:08 PM  |
| 160              | 3.34                          | 12/27/97 7:18 PM  |
| 170              | 3.32                          | 12/27/97 7:28 PM  |
| 180              | 3.29                          | 12/27/97 7:38 PM  |
| 190              | 3.27                          | 12/27/97 7:48 PM  |
| 200              | 3.24                          | 12/27/97 7:58 PM  |
| 210              | 3.22                          | 12/27/97 8:08 PM  |
| 220              | 3.17                          | 12/27/97 8:18 PM  |
| 230              | 3.19                          | 12/27/97 8:28 PM  |
| 240              | 3.16                          | 12/27/97 8:38 PM  |
| 250              | 3.16                          | 12/27/97 8:48 PM  |
| 260              | 3.15                          | 12/27/97 8:58 PM  |
| 270              | 3.13                          | 12/27/97 9:08 PM  |
| 280              | 3.12                          | 12/27/97 9:18 PM  |
| 290              | 3.10                          | 12/27/97 9:28 PM  |
| 300              | 3.09                          | 12/27/97 9:38 PM  |
| 310              | 3.08                          | 12/27/97 9:48 PM  |
| 320              | 3.07                          | 12/27/97 9:58 PM  |
| 330              | 3.06                          | 12/27/97 10:08 PM |
| 340              | 3.05                          | 12/27/97 10:18 PM |
| 350              | 3.04                          | 12/27/97 10:28 PM |
| 360              | 3.03                          | 12/27/97 10:38 PM |
| 370              | 3.02                          | 12/27/97 10:48 PM |
| 380              | 3.01                          | 12/27/97 10:58 PM |
| 390              | 2.99                          | 12/27/97 11:08 PM |
| 400              | 2.98                          | 12/27/97 11:18 PM |
| 410              | 2.92                          | 12/27/97 11:28 PM |
| 420              | 2.96                          | 12/27/97 11:38 PM |
| 430              | 2.94                          | 12/27/97 11:48 PM |



FA3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 4:48 p.m. 12/27/97            |                   |
| <b>Stop:</b>     | 7:48 a.m. 12/29/97            |                   |
| <b>Duration:</b> | 2347 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 440              | 2.93                          | 12/27/97 11:58 PM |
| 450              | 2.92                          | 12/28/97 12:08 AM |
| 460              | 2.91                          | 12/28/97 12:18 AM |
| 470              | 2.88                          | 12/28/97 12:28 AM |
| 480              | 2.88                          | 12/28/97 12:38 AM |
| 490              | 2.87                          | 12/28/97 12:48 AM |
| 500              | 2.81                          | 12/28/97 12:58 AM |
| 510              | 2.85                          | 12/28/97 1:08 AM  |
| 520              | 2.82                          | 12/28/97 1:18 AM  |
| 530              | 2.83                          | 12/28/97 1:28 AM  |
| 540              | 2.82                          | 12/28/97 1:38 AM  |
| 550              | 2.81                          | 12/28/97 1:48 AM  |
| 560              | 2.77                          | 12/28/97 1:58 AM  |
| 570              | 2.79                          | 12/28/97 2:08 AM  |
| 580              | 2.78                          | 12/28/97 2:18 AM  |
| 590              | 2.71                          | 12/28/97 2:28 AM  |
| 600              | 2.76                          | 12/28/97 2:38 AM  |
| 610              | 2.75                          | 12/28/97 2:48 AM  |
| 620              | 2.74                          | 12/28/97 2:58 AM  |
| 630              | 2.73                          | 12/28/97 3:08 AM  |
| 640              | 2.72                          | 12/28/97 3:18 AM  |
| 650              | 2.71                          | 12/28/97 3:28 AM  |
| 660              | 2.71                          | 12/28/97 3:38 AM  |
| 670              | 2.69                          | 12/28/97 3:48 AM  |
| 680              | 2.69                          | 12/28/97 3:58 AM  |
| 690              | 2.68                          | 12/28/97 4:08 AM  |
| 700              | 2.68                          | 12/28/97 4:18 AM  |
| 710              | 2.67                          | 12/28/97 4:28 AM  |
| 720              | 2.67                          | 12/28/97 4:38 AM  |
| 730              | 2.66                          | 12/28/97 4:48 AM  |
| 740              | 2.65                          | 12/28/97 4:58 AM  |
| 750              | 2.65                          | 12/28/97 5:08 AM  |
| 760              | 2.64                          | 12/28/97 5:18 AM  |
| 770              | 2.56                          | 12/28/97 5:28 AM  |
| 780              | 2.55                          | 12/28/97 5:38 AM  |
| 790              | 2.54                          | 12/28/97 5:48 AM  |
| 800              | 2.53                          | 12/28/97 5:58 AM  |
| 810              | 2.52                          | 12/28/97 6:08 AM  |
| 820              | 2.52                          | 12/28/97 6:18 AM  |
| 830              | 2.51                          | 12/28/97 6:28 AM  |
| 840              | 2.50                          | 12/28/97 6:38 AM  |
| 850              | 2.50                          | 12/28/97 6:48 AM  |
| 860              | 2.49                          | 12/28/97 6:58 AM  |
| 870              | 2.49                          | 12/28/97 7:08 AM  |

FA3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 4:48 p.m. 12/27/97            |                   |
| <b>Stop:</b>     | 7:48 a.m. 12/29/97            |                   |
| <b>Duration:</b> | 2347 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 880              | 2.48                          | 12/28/97 7:18 AM  |
| 890              | 2.47                          | 12/28/97 7:28 AM  |
| 900              | 2.47                          | 12/28/97 7:38 AM  |
| 910              | 2.46                          | 12/28/97 7:48 AM  |
| 920              | 2.46                          | 12/28/97 7:58 AM  |
| 930              | 2.46                          | 12/28/97 8:08 AM  |
| 940              | 2.46                          | 12/28/97 8:18 AM  |
| 950              | 2.45                          | 12/28/97 8:28 AM  |
| 960              | 2.45                          | 12/28/97 8:38 AM  |
| 970              | 2.45                          | 12/28/97 8:48 AM  |
| 980              | 2.44                          | 12/28/97 8:58 AM  |
| 990              | 2.44                          | 12/28/97 9:08 AM  |
| 1000             | 2.44                          | 12/28/97 9:18 AM  |
| 1010             | 2.44                          | 12/28/97 9:28 AM  |
| 1020             | 2.44                          | 12/28/97 9:38 AM  |
| 1030             | 2.44                          | 12/28/97 9:48 AM  |
| 1040             | 2.43                          | 12/28/97 9:58 AM  |
| 1050             | 2.43                          | 12/28/97 10:08 AM |
| 1060             | 2.42                          | 12/28/97 10:18 AM |
| 1070             | 2.42                          | 12/28/97 10:28 AM |
| 1080             | 2.42                          | 12/28/97 10:38 AM |
| 1090             | 2.42                          | 12/28/97 10:48 AM |
| 1100             | 2.42                          | 12/28/97 10:58 AM |
| 1110             | 2.41                          | 12/28/97 11:08 AM |
| 1120             | 2.41                          | 12/28/97 11:18 AM |
| 1130             | 2.41                          | 12/28/97 11:28 AM |
| 1140             | 2.41                          | 12/28/97 11:38 AM |
| 1150             | 2.41                          | 12/28/97 11:48 AM |
| 1160             | 2.40                          | 12/28/97 11:58 AM |
| 1170             | 2.40                          | 12/28/97 12:08 PM |
| 1180             | 2.40                          | 12/28/97 12:18 PM |
| 1190             | 2.39                          | 12/28/97 12:28 PM |
| 1200             | 2.39                          | 12/28/97 12:38 PM |
| 1210             | 2.38                          | 12/28/97 12:48 PM |
| 1220             | 2.38                          | 12/28/97 12:58 PM |
| 1230             | 2.38                          | 12/28/97 1:08 PM  |
| 1240             | 2.38                          | 12/28/97 1:18 PM  |
| 1250             | 2.38                          | 12/28/97 1:28 PM  |
| 1260             | 2.38                          | 12/28/97 1:38 PM  |
| 1270             | 2.38                          | 12/28/97 1:48 PM  |
| 1280             | 2.37                          | 12/28/97 1:58 PM  |
| 1290             | 2.37                          | 12/28/97 2:08 PM  |
| 1300             | 2.37                          | 12/28/97 2:18 PM  |
| 1310             | 2.37                          | 12/28/97 2:28 PM  |

FA3 pH vs. time

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FA3                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | pH 2 HCl solution             |                  |
| <b>Start:</b>    | 4:48 p.m. 12/27/97            |                  |
| <b>Stop:</b>     | 7:48 a.m. 12/29/97            |                  |
| <b>Duration:</b> | 2347 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 1320             | 2.36                          | 12/28/97 2:38 PM |
| 1330             | 2.36                          | 12/28/97 2:48 PM |
| 1340             | 2.36                          | 12/28/97 2:58 PM |
| 1350             | 2.36                          | 12/28/97 3:08 PM |
| 1360             | 2.36                          | 12/28/97 3:18 PM |
| 1370             | 2.36                          | 12/28/97 3:28 PM |
| 1380             | 2.35                          | 12/28/97 3:38 PM |
| 1390             | 2.35                          | 12/28/97 3:48 PM |
| 1400             | 2.35                          | 12/28/97 3:58 PM |
| 1410             | 2.35                          | 12/28/97 4:08 PM |
| 1420             | 2.34                          | 12/28/97 4:18 PM |
| 1430             | 2.34                          | 12/28/97 4:28 PM |
| 1440             | 2.34                          | 12/28/97 4:38 PM |
| 1450             | 2.34                          | 12/28/97 4:48 PM |
| 1460             | 2.34                          | 12/28/97 4:58 PM |
| 1470             | 2.34                          | 12/28/97 5:08 PM |
| 1480             | 2.35                          | 12/28/97 5:18 PM |
| 1490             | 2.34                          | 12/28/97 5:28 PM |
| 1500             | 2.34                          | 12/28/97 5:38 PM |
| 1510             | 2.34                          | 12/28/97 5:48 PM |
| 1520             | 2.34                          | 12/28/97 5:58 PM |
| 1530             | 2.34                          | 12/28/97 6:08 PM |
| 1540             | 2.35                          | 12/28/97 6:18 PM |
| 1550             | 2.34                          | 12/28/97 6:28 PM |
| 1560             | 2.34                          | 12/28/97 6:38 PM |
| 1570             | 2.34                          | 12/28/97 6:48 PM |
| 1580             | 2.33                          | 12/28/97 6:58 PM |
| 1590             | 2.33                          | 12/28/97 7:08 PM |
| 1600             | 2.33                          | 12/28/97 7:18 PM |
| 1610             | 2.33                          | 12/28/97 7:28 PM |
| 1620             | 2.33                          | 12/28/97 7:38 PM |
| 1630             | 2.33                          | 12/28/97 7:48 PM |
| 1640             | 2.32                          | 12/28/97 7:58 PM |
| 1650             | 2.32                          | 12/28/97 8:08 PM |
| 1660             | 2.32                          | 12/28/97 8:18 PM |
| 1670             | 2.32                          | 12/28/97 8:28 PM |
| 1680             | 2.32                          | 12/28/97 8:38 PM |
| 1690             | 2.31                          | 12/28/97 8:48 PM |
| 1700             | 2.32                          | 12/28/97 8:58 PM |
| 1710             | 2.31                          | 12/28/97 9:08 PM |
| 1720             | 2.31                          | 12/28/97 9:18 PM |
| 1730             | 2.31                          | 12/28/97 9:28 PM |
| 1740             | 2.31                          | 12/28/97 9:38 PM |
| 1750             | 2.31                          | 12/28/97 9:48 PM |

FA3 pH vs. time

|                  |                               |                   |
|------------------|-------------------------------|-------------------|
| <b>Run ID:</b>   | FA3                           |                   |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                   |
| <b>Solvent:</b>  | pH 2 HCl solution             |                   |
| <b>Start:</b>    | 4:48 p.m. 12/27/97            |                   |
| <b>Stop:</b>     | 7:48 a.m. 12/29/97            |                   |
| <b>Duration:</b> | 2347 min.                     |                   |
|                  |                               |                   |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b>  |
| 1760             | 2.32                          | 12/28/97 9:58 PM  |
| 1770             | 2.31                          | 12/28/97 10:08 PM |
| 1780             | 2.31                          | 12/28/97 10:18 PM |
| 1790             | 2.31                          | 12/28/97 10:28 PM |
| 1800             | 2.31                          | 12/28/97 10:38 PM |
| 1810             | 2.31                          | 12/28/97 10:48 PM |
| 1820             | 2.31                          | 12/28/97 10:58 PM |
| 1830             | 2.31                          | 12/28/97 11:08 PM |
| 1840             | 2.39                          | 12/28/97 11:18 PM |
| 1850             | 2.40                          | 12/28/97 11:28 PM |
| 1860             | 2.40                          | 12/28/97 11:38 PM |
| 1870             | 2.41                          | 12/28/97 11:48 PM |
| 1880             | 2.41                          | 12/28/97 11:58 PM |
| 1890             | 2.41                          | 12/29/97 12:08 AM |
| 1900             | 2.41                          | 12/29/97 12:18 AM |
| 1910             | 2.41                          | 12/29/97 12:28 AM |
| 1920             | 2.41                          | 12/29/97 12:38 AM |
| 1930             | 2.41                          | 12/29/97 12:48 AM |
| 1940             | 2.41                          | 12/29/97 12:58 AM |
| 1950             | 2.41                          | 12/29/97 1:08 AM  |
| 1960             | 2.41                          | 12/29/97 1:18 AM  |
| 1970             | 2.41                          | 12/29/97 1:28 AM  |
| 1980             | 2.41                          | 12/29/97 1:38 AM  |
| 1990             | 2.41                          | 12/29/97 1:48 AM  |
| 2000             | 2.41                          | 12/29/97 1:58 AM  |
| 2010             | 2.41                          | 12/29/97 2:08 AM  |
| 2020             | 2.41                          | 12/29/97 2:18 AM  |
| 2030             | 2.41                          | 12/29/97 2:28 AM  |
| 2040             | 2.41                          | 12/29/97 2:38 AM  |
| 2050             | 2.41                          | 12/29/97 2:48 AM  |
| 2060             | 2.41                          | 12/29/97 2:58 AM  |
| 2070             | 2.41                          | 12/29/97 3:08 AM  |
| 2080             | 2.41                          | 12/29/97 3:18 AM  |
| 2090             | 2.41                          | 12/29/97 3:28 AM  |
| 2100             | 2.41                          | 12/29/97 3:38 AM  |
| 2110             | 2.40                          | 12/29/97 3:48 AM  |
| 2120             | 2.32                          | 12/29/97 3:58 AM  |
| 2130             | 2.32                          | 12/29/97 4:08 AM  |
| 2140             | 2.32                          | 12/29/97 4:18 AM  |
| 2150             | 2.32                          | 12/29/97 4:28 AM  |
| 2160             | 2.32                          | 12/29/97 4:38 AM  |
| 2170             | 2.32                          | 12/29/97 4:48 AM  |
| 2180             | 2.31                          | 12/29/97 4:58 AM  |
| 2190             | 2.31                          | 12/29/97 5:08 AM  |

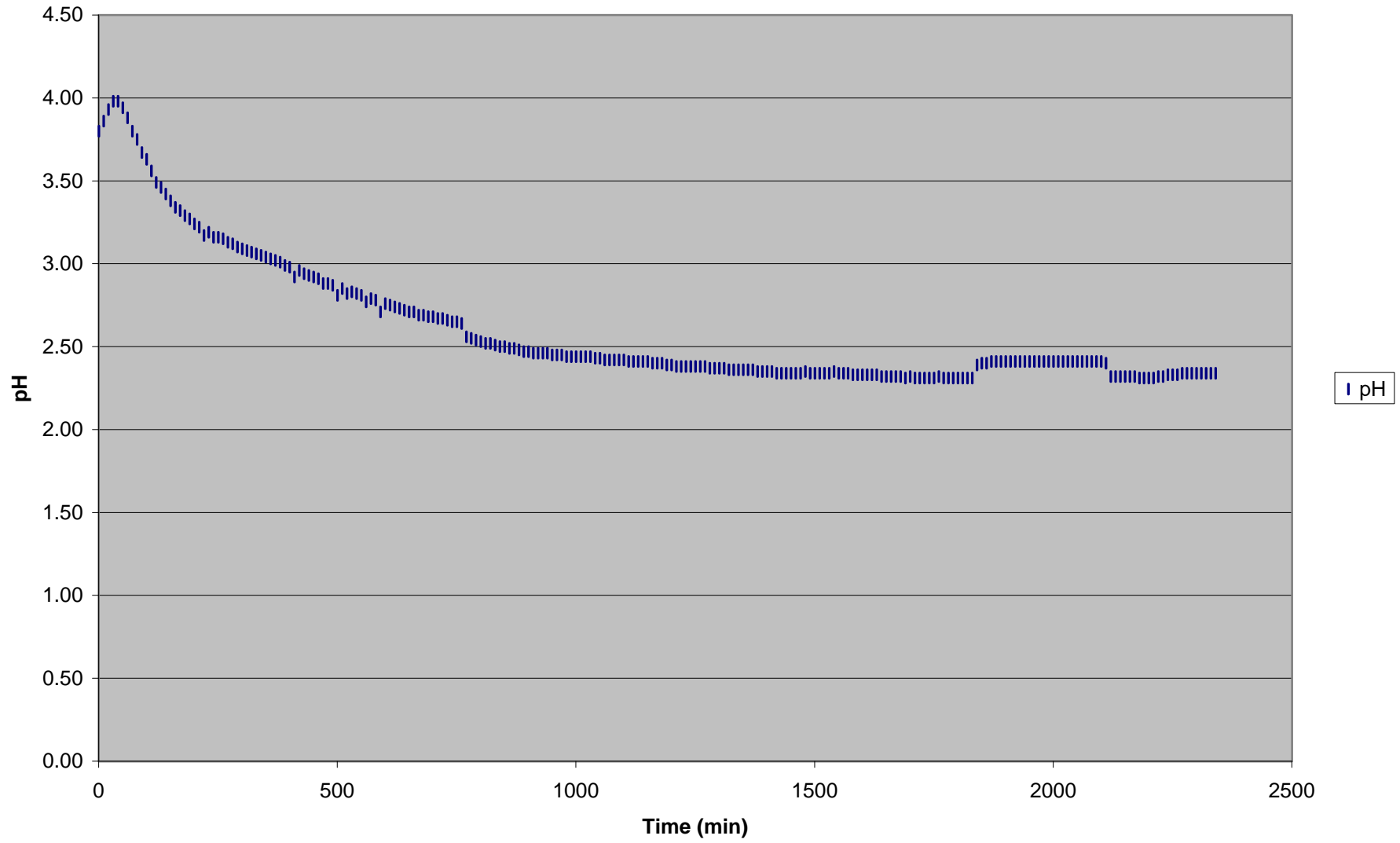
**FA3 pH vs. time**

|                  |                               |                  |
|------------------|-------------------------------|------------------|
| <b>Run ID:</b>   | FA3                           |                  |
| <b>Solids:</b>   | 10 g Test 3 Fine Coal Fly Ash |                  |
| <b>Solvent:</b>  | pH 2 HCl solution             |                  |
| <b>Start:</b>    | 4:48 p.m. 12/27/97            |                  |
| <b>Stop:</b>     | 7:48 a.m. 12/29/97            |                  |
| <b>Duration:</b> | 2347 min.                     |                  |
|                  |                               |                  |
| <b>Time</b>      | <b>pH</b>                     | <b>Date/Time</b> |
| 2200             | 2.31                          | 12/29/97 5:18 AM |
| 2210             | 2.31                          | 12/29/97 5:28 AM |
| 2220             | 2.32                          | 12/29/97 5:38 AM |
| 2230             | 2.32                          | 12/29/97 5:48 AM |
| 2240             | 2.33                          | 12/29/97 5:58 AM |
| 2250             | 2.33                          | 12/29/97 6:08 AM |
| 2260             | 2.33                          | 12/29/97 6:18 AM |
| 2270             | 2.34                          | 12/29/97 6:28 AM |
| 2280             | 2.34                          | 12/29/97 6:38 AM |
| 2290             | 2.34                          | 12/29/97 6:48 AM |
| 2300             | 2.34                          | 12/29/97 6:58 AM |
| 2310             | 2.34                          | 12/29/97 7:08 AM |
| 2320             | 2.34                          | 12/29/97 7:18 AM |
| 2330             | 2.34                          | 12/29/97 7:28 AM |
| 2340             | 2.34                          | 12/29/97 7:38 AM |

FA3 Analysis Data

| Bottle #                                     | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As     | Cd     | Cr    | Pb     |
|--|--------------|-----------------|-----------------------|--------------|---------------|----------------|--------|--------|-------|--------|
| 1  | 11.133       | 40.171          | 50                    | 0.58         | 3             | 53             | -0.050 | 0.056  | 1.289 | -0.341 |
| 2  | 11.033       | 44.434          | 50                    | 0.67         | 53            | 103            | -0.023 | -0.002 | 0.338 | -0.180 |
| 3  | 10.684       | 45.510          | 50                    | 0.70         | 103           | 153            | -0.002 | -0.017 | 0.213 | -0.148 |
| 4  | 11.009       | 43.220          | 45                    | 0.72         | 153           | 198            | -0.004 | -0.018 | 0.180 | -0.138 |
| 5  | 10.760       | 47.920          | 50                    | 0.74         | 198           | 248            | -0.019 | -0.021 | 0.141 | -0.133 |
| 6  | 10.975       | 44.229          | 45                    | 0.74         | 248           | 293            | -0.026 | -0.021 | 0.107 | -0.148 |
| 7  | 10.994       | 44.245          | 45                    | 0.74         | 293           | 338            | -0.024 | -0.021 | 0.084 | -0.158 |
| 8  | 10.059       | 44.453          | 45                    | 0.76         | 339           | 384            | -0.014 | -0.019 | 0.072 | -0.123 |
| 9  | 10.642       | 44.523          | 45                    | 0.75         | 384           | 429            | -0.029 | -0.021 | 0.062 | -0.108 |
| 10   | 11.056       | 45.325          | 45                    | 0.76         | 429           | 474            | -0.029 | -0.020 | 0.054 | -0.108 |
| 11 <sup>A</sup>                              | 10.653       | 47.161          | 50                    | 0.73         | 926           | 976            | -0.059 | -0.023 | 0.031 | 0.007  |
| 12 <sup>B</sup>                              | 10.952       | 48.460          | 50                    | 0.75         | 1310          | 1360           | -0.040 | -0.024 | 0.019 | 0.007  |
|  | 10.772       | 44.446          | 45                    | 0.75         | 1789          | 1834           | -0.044 | -0.025 | 0.010 | 0.016  |
| 14   | 10.717       | 47.097          | 50                    | 0.73         | 2297          | 2347           | -0.033 | -0.023 | 0.002 | -0.016 |
| <u>Notes</u>                                 |              |                 |                       |              |               |                |        |        |       |        |
| A Light grey color noted on syringe filter   |              |                 |                       |              |               |                |        |        |       |        |
| B Diffuse fines collecting on syringe filter |              |                 |                       |              |               |                |        |        |       |        |
| C Replaced syringe filter                    |              |                 |                       |              |               |                |        |        |       |        |

FA3 pH vs. Time



## CG1 pH vs. time

|                  |                                 |                  |  |
|------------------|---------------------------------|------------------|--|
| <b>Run ID:</b>   | CG1                             |                  |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                  |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                  |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                  |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                  |  |
| <b>Duration:</b> | 5152 min                        |                  |  |
|                  |                                 |                  |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b> |  |
| 0                | 7.77                            | 10/8/97 8:18 PM  |  |
| 1                | 7.78                            | 10/8/97 8:19 PM  |  |
| 2                | 7.78                            | 10/8/97 8:20 PM  |  |
| 3                | 7.79                            | 10/8/97 8:21 PM  |  |
| 4                | 7.79                            | 10/8/97 8:22 PM  |  |
| 5                | 7.79                            | 10/8/97 8:23 PM  |  |
| 6                | 7.80                            | 10/8/97 8:24 PM  |  |
| 7                | 7.81                            | 10/8/97 8:25 PM  |  |
| 8                | 7.81                            | 10/8/97 8:26 PM  |  |
| 9                | 7.82                            | 10/8/97 8:27 PM  |  |
| 10               | 7.83                            | 10/8/97 8:28 PM  |  |
| 11               | 7.84                            | 10/8/97 8:29 PM  |  |
| 12               | 7.85                            | 10/8/97 8:30 PM  |  |
| 13               | 7.86                            | 10/8/97 8:31 PM  |  |
| 14               | 7.86                            | 10/8/97 8:32 PM  |  |
| 15               | 7.88                            | 10/8/97 8:33 PM  |  |
| 16               | 7.89                            | 10/8/97 8:34 PM  |  |
| 17               | 7.90                            | 10/8/97 8:34 PM  |  |
| 27               | 8.00                            | 10/8/97 8:44 PM  |  |
| 37               | 8.11                            | 10/8/97 8:54 PM  |  |
| 47               | 8.20                            | 10/8/97 9:04 PM  |  |
| 57               | 8.26                            | 10/8/97 9:14 PM  |  |
| 67               | 8.30                            | 10/8/97 9:24 PM  |  |
| 77               | 8.33                            | 10/8/97 9:34 PM  |  |
| 82               | 8.33                            | 10/8/97 9:39 PM  |  |
| 97               | 8.36                            | 10/8/97 9:54 PM  |  |
| 112              | 8.37                            | 10/8/97 10:09 PM |  |
| 127              | 8.37                            | 10/8/97 10:24 PM |  |
| 142              | 8.36                            | 10/8/97 10:39 PM |  |
| 157              | 8.35                            | 10/8/97 10:54 PM |  |
| 172              | 8.35                            | 10/8/97 11:09 PM |  |
| 187              | 8.34                            | 10/8/97 11:24 PM |  |
| 202              | 8.34                            | 10/8/97 11:39 PM |  |
| 217              | 8.33                            | 10/8/97 11:54 PM |  |
| 232              | 8.32                            | 10/9/97 12:09 AM |  |
| 247              | 8.30                            | 10/9/97 12:24 AM |  |
| 262              | 8.29                            | 10/9/97 12:39 AM |  |
| 277              | 8.28                            | 10/9/97 12:54 AM |  |
| 292              | 8.27                            | 10/9/97 1:09 AM  |  |
| 307              | 8.27                            | 10/9/97 1:24 AM  |  |
| 322              | 8.26                            | 10/9/97 1:39 AM  |  |
| 337              | 8.25                            | 10/9/97 1:54 AM  |  |
| 352              | 8.25                            | 10/9/97 2:09 AM  |  |
| 367              | 8.24                            | 10/9/97 2:24 AM  |  |



## CG1 pH vs. time

|                  |                                 |                  |  |
|------------------|---------------------------------|------------------|--|
| <b>Run ID:</b>   | CG1                             |                  |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                  |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                  |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                  |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                  |  |
| <b>Duration:</b> | 5152 min                        |                  |  |
|                  |                                 |                  |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b> |  |
| 382              | 8.24                            | 10/9/97 2:39 AM  |  |
| 397              | 8.23                            | 10/9/97 2:54 AM  |  |
| 412              | 8.22                            | 10/9/97 3:09 AM  |  |
| 427              | 8.22                            | 10/9/97 3:24 AM  |  |
| 442              | 8.21                            | 10/9/97 3:39 AM  |  |
| 457              | 8.21                            | 10/9/97 3:54 AM  |  |
| 472              | 8.20                            | 10/9/97 4:09 AM  |  |
| 487              | 8.19                            | 10/9/97 4:24 AM  |  |
| 502              | 8.19                            | 10/9/97 4:39 AM  |  |
| 517              | 8.18                            | 10/9/97 4:54 AM  |  |
| 532              | 8.17                            | 10/9/97 5:09 AM  |  |
| 547              | 8.16                            | 10/9/97 5:24 AM  |  |
| 562              | 8.15                            | 10/9/97 5:39 AM  |  |
| 577              | 8.14                            | 10/9/97 5:54 AM  |  |
| 592              | 8.12                            | 10/9/97 6:09 AM  |  |
| 607              | 8.11                            | 10/9/97 6:24 AM  |  |
| 622              | 8.10                            | 10/9/97 6:39 AM  |  |
| 637              | 8.09                            | 10/9/97 6:54 AM  |  |
| 652              | 8.08                            | 10/9/97 7:09 AM  |  |
| 667              | 8.07                            | 10/9/97 7:24 AM  |  |
| 682              | 8.06                            | 10/9/97 7:39 AM  |  |
| 697              | 8.04                            | 10/9/97 7:54 AM  |  |
| 712              | 8.03                            | 10/9/97 8:09 AM  |  |
| 727              | 8.02                            | 10/9/97 8:24 AM  |  |
| 742              | 8.01                            | 10/9/97 8:39 AM  |  |
| 757              | 7.99                            | 10/9/97 8:54 AM  |  |
| 772              | 7.98                            | 10/9/97 9:09 AM  |  |
| 787              | 7.97                            | 10/9/97 9:24 AM  |  |
| 802              | 7.96                            | 10/9/97 9:39 AM  |  |
| 817              | 7.95                            | 10/9/97 9:54 AM  |  |
| 832              | 7.94                            | 10/9/97 10:09 AM |  |
| 847              | 7.93                            | 10/9/97 10:24 AM |  |
| 862              | 7.92                            | 10/9/97 10:39 AM |  |
| 877              | 7.91                            | 10/9/97 10:54 AM |  |
| 892              | 7.90                            | 10/9/97 11:09 AM |  |
| 907              | 7.89                            | 10/9/97 11:24 AM |  |
| 922              | 7.88                            | 10/9/97 11:39 AM |  |
| 937              | 7.87                            | 10/9/97 11:54 AM |  |
| 952              | 7.86                            | 10/9/97 12:09 PM |  |
| 967              | 7.86                            | 10/9/97 12:24 PM |  |
| 982              | 7.84                            | 10/9/97 12:39 PM |  |
| 997              | 7.83                            | 10/9/97 12:54 PM |  |
| 1012             | 7.82                            | 10/9/97 1:09 PM  |  |
| 1027             | 7.81                            | 10/9/97 1:24 PM  |  |

## CG1 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 1042             | 7.80                            | 10/9/97 1:39 PM   |  |
| 1057             | 7.80                            | 10/9/97 1:54 PM   |  |
| 1072             | 7.80                            | 10/9/97 2:09 PM   |  |
| 1087             | 7.79                            | 10/9/97 2:24 PM   |  |
| 1102             | 7.79                            | 10/9/97 2:39 PM   |  |
| 1117             | 7.79                            | 10/9/97 2:54 PM   |  |
| 1132             | 7.79                            | 10/9/97 3:09 PM   |  |
| 1147             | 7.79                            | 10/9/97 3:24 PM   |  |
| 1162             | 7.79                            | 10/9/97 3:39 PM   |  |
| 1177             | 7.79                            | 10/9/97 3:54 PM   |  |
| 1192             | 7.79                            | 10/9/97 4:09 PM   |  |
| 1207             | 7.79                            | 10/9/97 4:24 PM   |  |
| 1222             | 7.79                            | 10/9/97 4:39 PM   |  |
| 1237             | 7.79                            | 10/9/97 4:54 PM   |  |
| 1252             | 7.79                            | 10/9/97 5:09 PM   |  |
| 1267             | 7.79                            | 10/9/97 5:24 PM   |  |
| 1282             | 7.80                            | 10/9/97 5:39 PM   |  |
| 1297             | 7.80                            | 10/9/97 5:54 PM   |  |
| 1312             | 7.81                            | 10/9/97 6:09 PM   |  |
| 1327             | 7.81                            | 10/9/97 6:24 PM   |  |
| 1342             | 7.81                            | 10/9/97 6:39 PM   |  |
| 1357             | 7.81                            | 10/9/97 6:54 PM   |  |
| 1372             | 7.82                            | 10/9/97 7:09 PM   |  |
| 1387             | 7.82                            | 10/9/97 7:24 PM   |  |
| 1402             | 7.83                            | 10/9/97 7:39 PM   |  |
| 1417             | 7.84                            | 10/9/97 7:54 PM   |  |
| 1432             | 7.85                            | 10/9/97 8:09 PM   |  |
| 1447             | 7.84                            | 10/9/97 8:24 PM   |  |
| 1462             | 7.84                            | 10/9/97 8:39 PM   |  |
| 1477             | 7.84                            | 10/9/97 8:54 PM   |  |
| 1492             | 7.84                            | 10/9/97 9:09 PM   |  |
| 1507             | 7.84                            | 10/9/97 9:24 PM   |  |
| 1522             | 7.84                            | 10/9/97 9:39 PM   |  |
| 1537             | 7.85                            | 10/9/97 9:54 PM   |  |
| 1552             | 7.85                            | 10/9/97 10:09 PM  |  |
| 1567             | 7.85                            | 10/9/97 10:24 PM  |  |
| 1582             | 7.85                            | 10/9/97 10:39 PM  |  |
| 1597             | 7.85                            | 10/9/97 10:54 PM  |  |
| 1612             | 7.85                            | 10/9/97 11:09 PM  |  |
| 1627             | 7.85                            | 10/9/97 11:24 PM  |  |
| 1642             | 7.85                            | 10/9/97 11:39 PM  |  |
| 1657             | 7.85                            | 10/9/97 11:54 PM  |  |
| 1672             | 7.85                            | 10/10/97 12:09 AM |  |
| 1687             | 7.85                            | 10/10/97 12:24 AM |  |

## CG1 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 1702             | 7.85                            | 10/10/97 12:39 AM |  |
| 1717             | 7.86                            | 10/10/97 12:54 AM |  |
| 1732             | 7.86                            | 10/10/97 1:09 AM  |  |
| 1747             | 7.86                            | 10/10/97 1:24 AM  |  |
| 1762             | 7.86                            | 10/10/97 1:39 AM  |  |
| 1777             | 7.86                            | 10/10/97 1:54 AM  |  |
| 1792             | 7.86                            | 10/10/97 2:09 AM  |  |
| 1807             | 7.86                            | 10/10/97 2:24 AM  |  |
| 1822             | 7.86                            | 10/10/97 2:39 AM  |  |
| 1837             | 7.86                            | 10/10/97 2:54 AM  |  |
| 1852             | 7.86                            | 10/10/97 3:09 AM  |  |
| 1867             | 7.86                            | 10/10/97 3:24 AM  |  |
| 1882             | 7.86                            | 10/10/97 3:39 AM  |  |
| 1897             | 7.86                            | 10/10/97 3:54 AM  |  |
| 1912             | 7.86                            | 10/10/97 4:09 AM  |  |
| 1927             | 7.86                            | 10/10/97 4:24 AM  |  |
| 1942             | 7.86                            | 10/10/97 4:39 AM  |  |
| 1957             | 7.86                            | 10/10/97 4:54 AM  |  |
| 1972             | 7.86                            | 10/10/97 5:09 AM  |  |
| 1987             | 7.86                            | 10/10/97 5:24 AM  |  |
| 2002             | 7.86                            | 10/10/97 5:39 AM  |  |
| 2017             | 7.86                            | 10/10/97 5:54 AM  |  |
| 2032             | 7.86                            | 10/10/97 6:09 AM  |  |
| 2047             | 7.86                            | 10/10/97 6:24 AM  |  |
| 2062             | 7.86                            | 10/10/97 6:39 AM  |  |
| 2077             | 7.86                            | 10/10/97 6:54 AM  |  |
| 2092             | 7.86                            | 10/10/97 7:09 AM  |  |
| 2107             | 7.86                            | 10/10/97 7:24 AM  |  |
| 2122             | 7.86                            | 10/10/97 7:39 AM  |  |
| 2137             | 7.86                            | 10/10/97 7:54 AM  |  |
| 2152             | 7.86                            | 10/10/97 8:09 AM  |  |
| 2167             | 7.86                            | 10/10/97 8:24 AM  |  |
| 2182             | 7.86                            | 10/10/97 8:39 AM  |  |
| 2197             | 7.86                            | 10/10/97 8:54 AM  |  |
| 2212             | 7.86                            | 10/10/97 9:09 AM  |  |
| 2227             | 7.86                            | 10/10/97 9:24 AM  |  |
| 2242             | 7.86                            | 10/10/97 9:39 AM  |  |
| 2257             | 7.86                            | 10/10/97 9:54 AM  |  |
| 2272             | 7.86                            | 10/10/97 10:09 AM |  |
| 2287             | 7.86                            | 10/10/97 10:24 AM |  |
| 2302             | 7.86                            | 10/10/97 10:39 AM |  |
| 2317             | 7.86                            | 10/10/97 10:54 AM |  |
| 2332             | 7.86                            | 10/10/97 11:09 AM |  |
| 2347             | 7.86                            | 10/10/97 11:24 AM |  |

## CG1 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 2362             | 7.85                            | 10/10/97 11:39 AM |  |
| 2377             | 7.85                            | 10/10/97 11:54 AM |  |
| 2392             | 7.85                            | 10/10/97 12:09 PM |  |
| 2407             | 7.85                            | 10/10/97 12:24 PM |  |
| 2422             | 7.85                            | 10/10/97 12:39 PM |  |
| 2437             | 7.85                            | 10/10/97 12:54 PM |  |
| 2452             | 7.85                            | 10/10/97 1:09 PM  |  |
| 2467             | 7.85                            | 10/10/97 1:24 PM  |  |
| 2482             | 7.85                            | 10/10/97 1:39 PM  |  |
| 2497             | 7.85                            | 10/10/97 1:54 PM  |  |
| 2512             | 7.85                            | 10/10/97 2:09 PM  |  |
| 2527             | 7.85                            | 10/10/97 2:24 PM  |  |
| 2542             | 7.85                            | 10/10/97 2:39 PM  |  |
| 2557             | 7.85                            | 10/10/97 2:54 PM  |  |
| 2572             | 7.85                            | 10/10/97 3:09 PM  |  |
| 2587             | 7.85                            | 10/10/97 3:24 PM  |  |
| 2602             | 7.85                            | 10/10/97 3:39 PM  |  |
| 2617             | 7.85                            | 10/10/97 3:54 PM  |  |
| 2632             | 7.85                            | 10/10/97 4:09 PM  |  |
| 2647             | 7.85                            | 10/10/97 4:24 PM  |  |
| 2662             | 7.85                            | 10/10/97 4:39 PM  |  |
| 2677             | 7.85                            | 10/10/97 4:54 PM  |  |
| 2692             | 7.85                            | 10/10/97 5:09 PM  |  |
| 2707             | 7.85                            | 10/10/97 5:24 PM  |  |
| 2722             | 7.85                            | 10/10/97 5:39 PM  |  |
| 2737             | 7.85                            | 10/10/97 5:54 PM  |  |
| 2752             | 7.85                            | 10/10/97 6:09 PM  |  |
| 2767             | 7.85                            | 10/10/97 6:24 PM  |  |
| 2782             | 7.84                            | 10/10/97 6:39 PM  |  |
| 2797             | 7.85                            | 10/10/97 6:54 PM  |  |
| 2812             | 7.85                            | 10/10/97 7:09 PM  |  |
| 2827             | 7.84                            | 10/10/97 7:24 PM  |  |
| 2842             | 7.84                            | 10/10/97 7:39 PM  |  |
| 2857             | 7.84                            | 10/10/97 7:54 PM  |  |
| 2872             | 7.84                            | 10/10/97 8:09 PM  |  |
| 2887             | 7.84                            | 10/10/97 8:24 PM  |  |
| 2902             | 7.84                            | 10/10/97 8:39 PM  |  |
| 2917             | 7.84                            | 10/10/97 8:54 PM  |  |
| 2932             | 7.84                            | 10/10/97 9:09 PM  |  |
| 2947             | 7.84                            | 10/10/97 9:24 PM  |  |
| 2962             | 7.84                            | 10/10/97 9:39 PM  |  |
| 2977             | 7.84                            | 10/10/97 9:54 PM  |  |
| 2992             | 7.84                            | 10/10/97 10:09 PM |  |
| 3007             | 7.84                            | 10/10/97 10:24 PM |  |

## CG1 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 3022             | 7.84                            | 10/10/97 10:39 PM |  |
| 3037             | 7.84                            | 10/10/97 10:54 PM |  |
| 3052             | 7.84                            | 10/10/97 11:09 PM |  |
| 3067             | 7.84                            | 10/10/97 11:24 PM |  |
| 3082             | 7.84                            | 10/10/97 11:39 PM |  |
| 3097             | 7.84                            | 10/10/97 11:54 PM |  |
| 3112             | 7.84                            | 10/11/97 12:09 AM |  |
| 3127             | 7.84                            | 10/11/97 12:24 AM |  |
| 3142             | 7.84                            | 10/11/97 12:39 AM |  |
| 3157             | 7.84                            | 10/11/97 12:54 AM |  |
| 3172             | 7.84                            | 10/11/97 1:09 AM  |  |
| 3187             | 7.83                            | 10/11/97 1:24 AM  |  |
| 3202             | 7.83                            | 10/11/97 1:39 AM  |  |
| 3217             | 7.83                            | 10/11/97 1:54 AM  |  |
| 3232             | 7.83                            | 10/11/97 2:09 AM  |  |
| 3247             | 7.84                            | 10/11/97 2:24 AM  |  |
| 3262             | 7.83                            | 10/11/97 2:39 AM  |  |
| 3277             | 7.83                            | 10/11/97 2:54 AM  |  |
| 3292             | 7.83                            | 10/11/97 3:09 AM  |  |
| 3307             | 7.83                            | 10/11/97 3:24 AM  |  |
| 3322             | 7.83                            | 10/11/97 3:39 AM  |  |
| 3337             | 7.83                            | 10/11/97 3:54 AM  |  |
| 3352             | 7.83                            | 10/11/97 4:09 AM  |  |
| 3367             | 7.83                            | 10/11/97 4:24 AM  |  |
| 3382             | 7.83                            | 10/11/97 4:39 AM  |  |
| 3397             | 7.83                            | 10/11/97 4:54 AM  |  |
| 3412             | 7.83                            | 10/11/97 5:09 AM  |  |
| 3427             | 7.83                            | 10/11/97 5:24 AM  |  |
| 3442             | 7.83                            | 10/11/97 5:39 AM  |  |
| 3457             | 7.83                            | 10/11/97 5:54 AM  |  |
| 3472             | 7.83                            | 10/11/97 6:09 AM  |  |
| 3487             | 7.83                            | 10/11/97 6:24 AM  |  |
| 3502             | 7.83                            | 10/11/97 6:39 AM  |  |
| 3517             | 7.83                            | 10/11/97 6:54 AM  |  |
| 3532             | 7.83                            | 10/11/97 7:09 AM  |  |
| 3547             | 7.83                            | 10/11/97 7:24 AM  |  |
| 3562             | 7.83                            | 10/11/97 7:39 AM  |  |
| 3577             | 7.83                            | 10/11/97 7:54 AM  |  |
| 3592             | 7.83                            | 10/11/97 8:09 AM  |  |
| 3607             | 7.83                            | 10/11/97 8:24 AM  |  |
| 3622             | 7.83                            | 10/11/97 8:39 AM  |  |
| 3637             | 7.83                            | 10/11/97 8:54 AM  |  |
| 3652             | 7.83                            | 10/11/97 9:09 AM  |  |
| 3667             | 7.83                            | 10/11/97 9:24 AM  |  |

## CG1 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 3682             | 7.83                            | 10/11/97 9:39 AM  |  |
| 3697             | 7.83                            | 10/11/97 9:54 AM  |  |
| 3712             | 7.83                            | 10/11/97 10:09 AM |  |
| 3727             | 7.83                            | 10/11/97 10:24 AM |  |
| 3742             | 7.83                            | 10/11/97 10:39 AM |  |
| 3757             | 7.83                            | 10/11/97 10:54 AM |  |
| 3772             | 7.83                            | 10/11/97 11:09 AM |  |
| 3787             | 7.83                            | 10/11/97 11:24 AM |  |
| 3802             | 7.83                            | 10/11/97 11:39 AM |  |
| 3817             | 7.83                            | 10/11/97 11:54 AM |  |
| 3832             | 7.83                            | 10/11/97 12:09 PM |  |
| 3847             | 7.83                            | 10/11/97 12:24 PM |  |
| 3862             | 7.83                            | 10/11/97 12:39 PM |  |
| 3877             | 7.83                            | 10/11/97 12:54 PM |  |
| 3892             | 7.83                            | 10/11/97 1:09 PM  |  |
| 3907             | 7.82                            | 10/11/97 1:24 PM  |  |
| 3922             | 7.83                            | 10/11/97 1:39 PM  |  |
| 3937             | 7.82                            | 10/11/97 1:54 PM  |  |
| 3952             | 7.83                            | 10/11/97 2:09 PM  |  |
| 3967             | 7.82                            | 10/11/97 2:24 PM  |  |
| 3982             | 7.82                            | 10/11/97 2:39 PM  |  |
| 3997             | 7.82                            | 10/11/97 2:54 PM  |  |
| 4012             | 7.82                            | 10/11/97 3:09 PM  |  |
| 4027             | 7.83                            | 10/11/97 3:24 PM  |  |
| 4042             | 7.83                            | 10/11/97 3:39 PM  |  |
| 4057             | 7.83                            | 10/11/97 3:54 PM  |  |
| 4072             | 7.82                            | 10/11/97 4:09 PM  |  |
| 4087             | 7.82                            | 10/11/97 4:24 PM  |  |
| 4102             | 7.82                            | 10/11/97 4:39 PM  |  |
| 4117             | 7.82                            | 10/11/97 4:54 PM  |  |
| 4132             | 7.82                            | 10/11/97 5:09 PM  |  |
| 4147             | 7.82                            | 10/11/97 5:24 PM  |  |
| 4162             | 7.82                            | 10/11/97 5:39 PM  |  |
| 4177             | 7.82                            | 10/11/97 5:54 PM  |  |
| 4192             | 7.82                            | 10/11/97 6:09 PM  |  |
| 4207             | 7.82                            | 10/11/97 6:24 PM  |  |
| 4222             | 7.82                            | 10/11/97 6:39 PM  |  |
| 4237             | 7.82                            | 10/11/97 6:54 PM  |  |
| 4252             | 7.82                            | 10/11/97 7:09 PM  |  |
| 4267             | 7.82                            | 10/11/97 7:24 PM  |  |
| 4282             | 7.82                            | 10/11/97 7:39 PM  |  |
| 4297             | 7.82                            | 10/11/97 7:54 PM  |  |
| 4312             | 7.82                            | 10/11/97 8:09 PM  |  |
| 4327             | 7.82                            | 10/11/97 8:24 PM  |  |

## CG1 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 4342             | 7.82                            | 10/11/97 8:39 PM  |  |
| 4357             | 7.82                            | 10/11/97 8:54 PM  |  |
| 4372             | 7.82                            | 10/11/97 9:09 PM  |  |
| 4387             | 7.82                            | 10/11/97 9:24 PM  |  |
| 4402             | 7.82                            | 10/11/97 9:39 PM  |  |
| 4417             | 7.82                            | 10/11/97 9:54 PM  |  |
| 4432             | 7.82                            | 10/11/97 10:09 PM |  |
| 4447             | 7.82                            | 10/11/97 10:24 PM |  |
| 4462             | 7.82                            | 10/11/97 10:39 PM |  |
| 4477             | 7.82                            | 10/11/97 10:54 PM |  |
| 4492             | 7.82                            | 10/11/97 11:09 PM |  |
| 4507             | 7.82                            | 10/11/97 11:24 PM |  |
| 4522             | 7.82                            | 10/11/97 11:39 PM |  |
| 4537             | 7.82                            | 10/11/97 11:54 PM |  |
| 4552             | 7.82                            | 10/12/97 12:09 AM |  |
| 4567             | 7.82                            | 10/12/97 12:24 AM |  |
| 4582             | 7.82                            | 10/12/97 12:39 AM |  |
| 4597             | 7.82                            | 10/12/97 12:54 AM |  |
| 4612             | 7.82                            | 10/12/97 1:09 AM  |  |
| 4627             | 7.82                            | 10/12/97 1:24 AM  |  |
| 4642             | 7.82                            | 10/12/97 1:39 AM  |  |
| 4657             | 7.82                            | 10/12/97 1:54 AM  |  |
| 4672             | 7.82                            | 10/12/97 2:09 AM  |  |
| 4687             | 7.82                            | 10/12/97 2:24 AM  |  |
| 4702             | 7.82                            | 10/12/97 2:39 AM  |  |
| 4717             | 7.82                            | 10/12/97 2:54 AM  |  |
| 4732             | 7.82                            | 10/12/97 3:09 AM  |  |
| 4747             | 7.82                            | 10/12/97 3:24 AM  |  |
| 4762             | 7.82                            | 10/12/97 3:39 AM  |  |
| 4777             | 7.82                            | 10/12/97 3:54 AM  |  |
| 4792             | 7.82                            | 10/12/97 4:09 AM  |  |
| 4807             | 7.82                            | 10/12/97 4:24 AM  |  |
| 4822             | 7.82                            | 10/12/97 4:39 AM  |  |
| 4837             | 7.82                            | 10/12/97 4:54 AM  |  |
| 4852             | 7.82                            | 10/12/97 5:09 AM  |  |
| 4867             | 7.82                            | 10/12/97 5:24 AM  |  |
| 4882             | 7.82                            | 10/12/97 5:39 AM  |  |
| 4897             | 7.82                            | 10/12/97 5:54 AM  |  |
| 4912             | 7.82                            | 10/12/97 6:09 AM  |  |
| 4927             | 7.82                            | 10/12/97 6:24 AM  |  |
| 4942             | 7.82                            | 10/12/97 6:39 AM  |  |
| 4957             | 7.82                            | 10/12/97 6:54 AM  |  |
| 4972             | 7.82                            | 10/12/97 7:09 AM  |  |
| 4987             | 7.82                            | 10/12/97 7:24 AM  |  |

**CG1 pH vs. time**

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 8:18 p.m. 10/8/97               |                   |  |
| <b>Stop:</b>     | 10:16 a.m. 10/12/97             |                   |  |
| <b>Duration:</b> | 5152 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 5002             | 7.82                            | 10/12/97 7:39 AM  |  |
| 5017             | 7.82                            | 10/12/97 7:54 AM  |  |
| 5032             | 7.82                            | 10/12/97 8:09 AM  |  |
| 5047             | 7.82                            | 10/12/97 8:24 AM  |  |
| 5062             | 7.82                            | 10/12/97 8:39 AM  |  |
| 5077             | 7.82                            | 10/12/97 8:54 AM  |  |
| 5092             | 7.82                            | 10/12/97 9:09 AM  |  |
| 5107             | 7.82                            | 10/12/97 9:24 AM  |  |
| 5122             | 7.82                            | 10/12/97 9:39 AM  |  |
| 5137             | 7.82                            | 10/12/97 9:54 AM  |  |
| 5152             | 7.82                            | 10/12/97 10:09 AM |  |

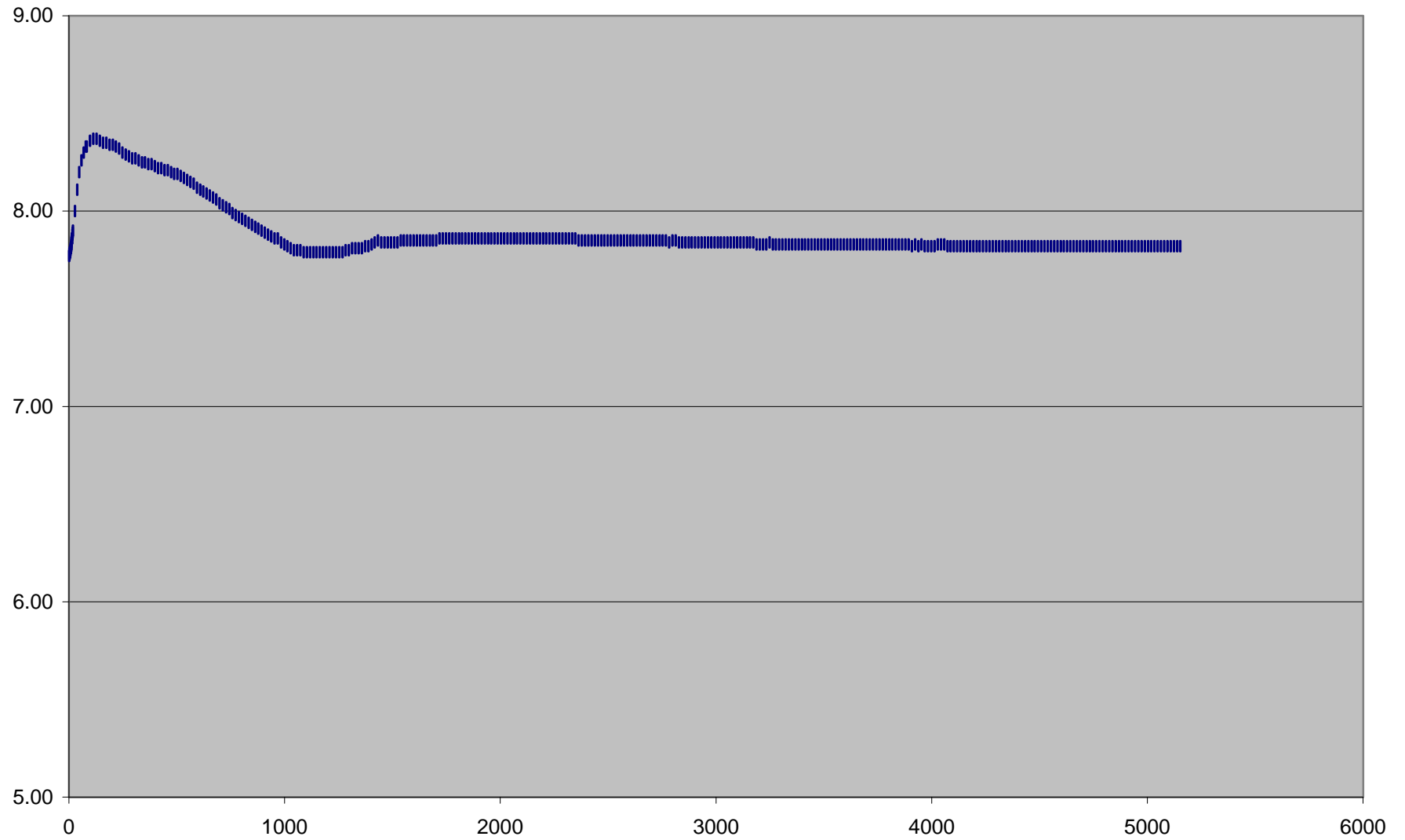


CG1 Analysis Data

|          |              |                 |                       |              |               |                | Concentrations (ppm) Raw Data (no |       |       |        |  |
|----------|--------------|-----------------|-----------------------|--------------|---------------|----------------|-----------------------------------|-------|-------|--------|--|
| Bottle # | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As                                | Cd    | Cr    | Pb     |  |
| 1        | 10.975       | 40.606          | 130                   | 0.23         | 0             | 130            | 0.483                             | 0.025 | 0.086 | -0.005 |  |
| 2        | 10.958       | 35.583          | 142                   | 0.17         | 135           | 277            | 0.341                             | 0.016 | 0.039 | 0.011  |  |
| 3        | 11.100       | 36.599          | 391                   | 0.07         | 706           | 1097           | 0.136                             | 0.008 | 0.029 | 0.019  |  |
| 4        | 11.016       | 41.501          | 573                   | 0.05         | 1099          | 1672           | 0.126                             | 0.005 | 0.028 | 0.020  |  |
| 5        | 10.705       | 36.337          | 563                   | 0.05         | 1672          | 2235           | 0.112                             | 0.009 | 0.028 | 0.015  |  |
| 6        | 11.052       | 40.188          | 732                   | 0.04         | 2236          | 2968           | 0.072                             | 0.002 | 0.027 | -0.006 |  |
| 7        | 11.108       | 49.052          | 1213                  | 0.03         | 2971          | 4184           | 0.019                             | 0.003 | 0.024 | -0.007 |  |
| 8        | 11.047       | 39.930          | 963                   | 0.03         | 4184          | 5147           | -0.003                            | 0.004 | 0.024 | 0.000  |  |

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CG1 pH vs. Time



## CG2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 12:12 a.m. 10/13/97             |                   |  |
| <b>Stop:</b>     | 7:42 a.m. 10/15/97              |                   |  |
| <b>Duration:</b> | 3330 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 0                | 8.21                            | 10/13/97 12:12 AM |  |
| 15               | 8.28                            | 10/13/97 12:27 AM |  |
| 30               | 8.32                            | 10/13/97 12:42 AM |  |
| 45               | 8.34                            | 10/13/97 12:57 AM |  |
| 60               | 8.35                            | 10/13/97 1:12 AM  |  |
| 75               | 8.36                            | 10/13/97 1:27 AM  |  |
| 90               | 8.36                            | 10/13/97 1:42 AM  |  |
| 105              | 8.36                            | 10/13/97 1:57 AM  |  |
| 120              | 8.36                            | 10/13/97 2:12 AM  |  |
| 135              | 8.36                            | 10/13/97 2:27 AM  |  |
| 150              | 8.35                            | 10/13/97 2:42 AM  |  |
| 165              | 8.35                            | 10/13/97 2:57 AM  |  |
| 180              | 8.35                            | 10/13/97 3:12 AM  |  |
| 195              | 8.35                            | 10/13/97 3:27 AM  |  |
| 210              | 8.35                            | 10/13/97 3:42 AM  |  |
| 225              | 8.35                            | 10/13/97 3:57 AM  |  |
| 240              | 8.34                            | 10/13/97 4:12 AM  |  |
| 255              | 8.34                            | 10/13/97 4:27 AM  |  |
| 270              | 8.34                            | 10/13/97 4:42 AM  |  |
| 285              | 8.33                            | 10/13/97 4:57 AM  |  |
| 300              | 8.33                            | 10/13/97 5:12 AM  |  |
| 315              | 8.32                            | 10/13/97 5:27 AM  |  |
| 330              | 8.32                            | 10/13/97 5:42 AM  |  |
| 345              | 8.32                            | 10/13/97 5:57 AM  |  |
| 360              | 8.32                            | 10/13/97 6:12 AM  |  |
| 375              | 8.32                            | 10/13/97 6:27 AM  |  |
| 390              | 8.32                            | 10/13/97 6:42 AM  |  |
| 405              | 8.31                            | 10/13/97 6:57 AM  |  |
| 420              | 8.31                            | 10/13/97 7:12 AM  |  |
| 435              | 8.31                            | 10/13/97 7:27 AM  |  |
| 450              | 8.31                            | 10/13/97 7:42 AM  |  |
| 465              | 8.32                            | 10/13/97 7:57 AM  |  |
| 480              | 8.32                            | 10/13/97 8:12 AM  |  |
| 495              | 8.33                            | 10/13/97 8:27 AM  |  |
| 510              | 8.32                            | 10/13/97 8:42 AM  |  |
| 525              | 8.32                            | 10/13/97 8:57 AM  |  |
| 540              | 8.31                            | 10/13/97 9:12 AM  |  |
| 555              | 8.30                            | 10/13/97 9:27 AM  |  |
| 570              | 8.30                            | 10/13/97 9:42 AM  |  |
| 585              | 8.30                            | 10/13/97 9:57 AM  |  |
| 600              | 8.29                            | 10/13/97 10:12 AM |  |
| 615              | 8.28                            | 10/13/97 10:27 AM |  |
| 630              | 8.26                            | 10/13/97 10:42 AM |  |
| 645              | 8.24                            | 10/13/97 10:57 AM |  |

## CG2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 12:12 a.m. 10/13/97             |                   |  |
| <b>Stop:</b>     | 7:42 a.m. 10/15/97              |                   |  |
| <b>Duration:</b> | 3330 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 660              | 8.22                            | 10/13/97 11:12 AM |  |
| 675              | 8.20                            | 10/13/97 11:27 AM |  |
| 690              | 8.16                            | 10/13/97 11:42 AM |  |
| 705              | 8.13                            | 10/13/97 11:57 AM |  |
| 720              | 8.10                            | 10/13/97 12:12 PM |  |
| 735              | 8.12                            | 10/13/97 12:27 PM |  |
| 750              | 8.12                            | 10/13/97 12:42 PM |  |
| 765              | 8.09                            | 10/13/97 12:57 PM |  |
| 780              | 8.03                            | 10/13/97 1:12 PM  |  |
| 795              | 7.96                            | 10/13/97 1:27 PM  |  |
| 810              | 7.91                            | 10/13/97 1:42 PM  |  |
| 825              | 7.87                            | 10/13/97 1:57 PM  |  |
| 840              | 7.83                            | 10/13/97 2:12 PM  |  |
| 855              | 7.81                            | 10/13/97 2:27 PM  |  |
| 870              | 7.78                            | 10/13/97 2:42 PM  |  |
| 885              | 7.75                            | 10/13/97 2:57 PM  |  |
| 900              | 7.73                            | 10/13/97 3:12 PM  |  |
| 915              | 7.72                            | 10/13/97 3:27 PM  |  |
| 930              | 7.70                            | 10/13/97 3:42 PM  |  |
| 945              | 7.68                            | 10/13/97 3:57 PM  |  |
| 960              | 7.66                            | 10/13/97 4:12 PM  |  |
| 975              | 7.64                            | 10/13/97 4:27 PM  |  |
| 990              | 7.63                            | 10/13/97 4:42 PM  |  |
| 1005             | 7.61                            | 10/13/97 4:57 PM  |  |
| 1020             | 7.59                            | 10/13/97 5:12 PM  |  |
| 1035             | 7.57                            | 10/13/97 5:27 PM  |  |
| 1050             | 7.57                            | 10/13/97 5:42 PM  |  |
| 1065             | 7.57                            | 10/13/97 5:57 PM  |  |
| 1080             | 7.58                            | 10/13/97 6:12 PM  |  |
| 1095             | 7.59                            | 10/13/97 6:27 PM  |  |
| 1110             | 7.59                            | 10/13/97 6:42 PM  |  |
| 1125             | 7.60                            | 10/13/97 6:57 PM  |  |
| 1140             | 7.60                            | 10/13/97 7:12 PM  |  |
| 1155             | 7.61                            | 10/13/97 7:27 PM  |  |
| 1170             | 7.61                            | 10/13/97 7:42 PM  |  |
| 1185             | 7.62                            | 10/13/97 7:57 PM  |  |
| 1200             | 7.62                            | 10/13/97 8:12 PM  |  |
| 1215             | 7.63                            | 10/13/97 8:27 PM  |  |
| 1230             | 7.63                            | 10/13/97 8:42 PM  |  |
| 1245             | 7.64                            | 10/13/97 8:57 PM  |  |
| 1260             | 7.64                            | 10/13/97 9:12 PM  |  |
| 1275             | 7.65                            | 10/13/97 9:27 PM  |  |
| 1290             | 7.65                            | 10/13/97 9:42 PM  |  |
| 1305             | 7.65                            | 10/13/97 9:57 PM  |  |

## CG2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 12:12 a.m. 10/13/97             |                   |  |
| <b>Stop:</b>     | 7:42 a.m. 10/15/97              |                   |  |
| <b>Duration:</b> | 3330 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 1320             | 7.66                            | 10/13/97 10:12 PM |  |
| 1335             | 7.66                            | 10/13/97 10:27 PM |  |
| 1350             | 7.67                            | 10/13/97 10:42 PM |  |
| 1365             | 7.66                            | 10/13/97 10:57 PM |  |
| 1380             | 7.66                            | 10/13/97 11:12 PM |  |
| 1395             | 7.67                            | 10/13/97 11:27 PM |  |
| 1410             | 7.67                            | 10/13/97 11:42 PM |  |
| 1425             | 7.67                            | 10/13/97 11:57 PM |  |
| 1440             | 7.67                            | 10/14/97 12:12 AM |  |
| 1455             | 7.67                            | 10/14/97 12:27 AM |  |
| 1470             | 7.67                            | 10/14/97 12:42 AM |  |
| 1485             | 7.67                            | 10/14/97 12:57 AM |  |
| 1500             | 7.68                            | 10/14/97 1:12 AM  |  |
| 1515             | 7.68                            | 10/14/97 1:27 AM  |  |
| 1530             | 7.68                            | 10/14/97 1:42 AM  |  |
| 1545             | 7.68                            | 10/14/97 1:57 AM  |  |
| 1560             | 7.68                            | 10/14/97 2:12 AM  |  |
| 1575             | 7.68                            | 10/14/97 2:27 AM  |  |
| 1590             | 7.68                            | 10/14/97 2:42 AM  |  |
| 1605             | 7.68                            | 10/14/97 2:57 AM  |  |
| 1620             | 7.68                            | 10/14/97 3:12 AM  |  |
| 1635             | 7.69                            | 10/14/97 3:27 AM  |  |
| 1650             | 7.69                            | 10/14/97 3:42 AM  |  |
| 1665             | 7.69                            | 10/14/97 3:57 AM  |  |
| 1680             | 7.69                            | 10/14/97 4:12 AM  |  |
| 1695             | 7.69                            | 10/14/97 4:27 AM  |  |
| 1710             | 7.69                            | 10/14/97 4:42 AM  |  |
| 1725             | 7.69                            | 10/14/97 4:57 AM  |  |
| 1740             | 7.69                            | 10/14/97 5:12 AM  |  |
| 1755             | 7.69                            | 10/14/97 5:27 AM  |  |
| 1770             | 7.69                            | 10/14/97 5:42 AM  |  |
| 1785             | 7.69                            | 10/14/97 5:57 AM  |  |
| 1800             | 7.69                            | 10/14/97 6:12 AM  |  |
| 1815             | 7.69                            | 10/14/97 6:27 AM  |  |
| 1830             | 7.69                            | 10/14/97 6:42 AM  |  |
| 1845             | 7.69                            | 10/14/97 6:57 AM  |  |
| 1860             | 7.69                            | 10/14/97 7:12 AM  |  |
| 1875             | 7.69                            | 10/14/97 7:27 AM  |  |
| 1890             | 7.69                            | 10/14/97 7:42 AM  |  |
| 1905             | 7.70                            | 10/14/97 7:57 AM  |  |
| 1920             | 7.70                            | 10/14/97 8:12 AM  |  |
| 1935             | 7.70                            | 10/14/97 8:27 AM  |  |
| 1950             | 7.70                            | 10/14/97 8:42 AM  |  |
| 1965             | 7.70                            | 10/14/97 8:57 AM  |  |

## CG2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 12:12 a.m. 10/13/97             |                   |  |
| <b>Stop:</b>     | 7:42 a.m. 10/15/97              |                   |  |
| <b>Duration:</b> | 3330 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 1980             | 7.70                            | 10/14/97 9:12 AM  |  |
| 1995             | 7.70                            | 10/14/97 9:27 AM  |  |
| 2010             | 7.70                            | 10/14/97 9:42 AM  |  |
| 2025             | 7.70                            | 10/14/97 9:57 AM  |  |
| 2040             | 7.70                            | 10/14/97 10:12 AM |  |
| 2055             | 7.70                            | 10/14/97 10:27 AM |  |
| 2070             | 7.69                            | 10/14/97 10:42 AM |  |
| 2085             | 7.69                            | 10/14/97 10:57 AM |  |
| 2100             | 7.69                            | 10/14/97 11:12 AM |  |
| 2115             | 7.69                            | 10/14/97 11:27 AM |  |
| 2130             | 7.69                            | 10/14/97 11:42 AM |  |
| 2145             | 7.69                            | 10/14/97 11:57 AM |  |
| 2160             | 7.69                            | 10/14/97 12:12 PM |  |
| 2175             | 7.69                            | 10/14/97 12:27 PM |  |
| 2190             | 7.69                            | 10/14/97 12:42 PM |  |
| 2205             | 7.69                            | 10/14/97 12:57 PM |  |
| 2220             | 7.69                            | 10/14/97 1:12 PM  |  |
| 2235             | 7.69                            | 10/14/97 1:27 PM  |  |
| 2250             | 7.69                            | 10/14/97 1:42 PM  |  |
| 2265             | 7.69                            | 10/14/97 1:57 PM  |  |
| 2280             | 7.69                            | 10/14/97 2:12 PM  |  |
| 2295             | 7.69                            | 10/14/97 2:27 PM  |  |
| 2310             | 7.69                            | 10/14/97 2:42 PM  |  |
| 2325             | 7.69                            | 10/14/97 2:57 PM  |  |
| 2340             | 7.69                            | 10/14/97 3:12 PM  |  |
| 2355             | 7.69                            | 10/14/97 3:27 PM  |  |
| 2370             | 7.69                            | 10/14/97 3:42 PM  |  |
| 2385             | 7.69                            | 10/14/97 3:57 PM  |  |
| 2400             | 7.69                            | 10/14/97 4:12 PM  |  |
| 2415             | 7.69                            | 10/14/97 4:27 PM  |  |
| 2430             | 7.69                            | 10/14/97 4:42 PM  |  |
| 2445             | 7.69                            | 10/14/97 4:57 PM  |  |
| 2460             | 7.69                            | 10/14/97 5:12 PM  |  |
| 2475             | 7.68                            | 10/14/97 5:27 PM  |  |
| 2490             | 7.69                            | 10/14/97 5:42 PM  |  |
| 2505             | 7.68                            | 10/14/97 5:57 PM  |  |
| 2520             | 7.68                            | 10/14/97 6:12 PM  |  |
| 2535             | 7.68                            | 10/14/97 6:27 PM  |  |
| 2550             | 7.68                            | 10/14/97 6:42 PM  |  |
| 2565             | 7.68                            | 10/14/97 6:57 PM  |  |
| 2580             | 7.68                            | 10/14/97 7:12 PM  |  |
| 2595             | 7.68                            | 10/14/97 7:27 PM  |  |
| 2610             | 7.68                            | 10/14/97 7:42 PM  |  |
| 2625             | 7.68                            | 10/14/97 7:57 PM  |  |

## CG2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 12:12 a.m. 10/13/97             |                   |  |
| <b>Stop:</b>     | 7:42 a.m. 10/15/97              |                   |  |
| <b>Duration:</b> | 3330 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 2640             | 7.68                            | 10/14/97 8:12 PM  |  |
| 2655             | 7.67                            | 10/14/97 8:27 PM  |  |
| 2670             | 7.67                            | 10/14/97 8:42 PM  |  |
| 2685             | 7.67                            | 10/14/97 8:57 PM  |  |
| 2700             | 7.67                            | 10/14/97 9:12 PM  |  |
| 2715             | 7.67                            | 10/14/97 9:27 PM  |  |
| 2730             | 7.66                            | 10/14/97 9:42 PM  |  |
| 2745             | 7.66                            | 10/14/97 9:57 PM  |  |
| 2760             | 7.66                            | 10/14/97 10:12 PM |  |
| 2775             | 7.66                            | 10/14/97 10:27 PM |  |
| 2790             | 7.66                            | 10/14/97 10:42 PM |  |
| 2805             | 7.66                            | 10/14/97 10:57 PM |  |
| 2820             | 7.66                            | 10/14/97 11:12 PM |  |
| 2835             | 7.65                            | 10/14/97 11:27 PM |  |
| 2850             | 7.65                            | 10/14/97 11:42 PM |  |
| 2865             | 7.65                            | 10/14/97 11:57 PM |  |
| 2880             | 7.65                            | 10/15/97 12:12 AM |  |
| 2895             | 7.65                            | 10/15/97 12:27 AM |  |
| 2910             | 7.65                            | 10/15/97 12:42 AM |  |
| 2925             | 7.65                            | 10/15/97 12:57 AM |  |
| 2940             | 7.65                            | 10/15/97 1:12 AM  |  |
| 2955             | 7.65                            | 10/15/97 1:27 AM  |  |
| 2970             | 7.65                            | 10/15/97 1:42 AM  |  |
| 2985             | 7.65                            | 10/15/97 1:57 AM  |  |
| 3000             | 7.65                            | 10/15/97 2:12 AM  |  |
| 3015             | 7.66                            | 10/15/97 2:27 AM  |  |
| 3030             | 7.66                            | 10/15/97 2:42 AM  |  |
| 3045             | 7.66                            | 10/15/97 2:57 AM  |  |
| 3060             | 7.67                            | 10/15/97 3:12 AM  |  |
| 3075             | 7.67                            | 10/15/97 3:27 AM  |  |
| 3090             | 7.67                            | 10/15/97 3:42 AM  |  |
| 3105             | 7.67                            | 10/15/97 3:57 AM  |  |
| 3120             | 7.67                            | 10/15/97 4:12 AM  |  |
| 3135             | 7.67                            | 10/15/97 4:27 AM  |  |
| 3150             | 7.67                            | 10/15/97 4:42 AM  |  |
| 3165             | 7.68                            | 10/15/97 4:57 AM  |  |
| 3180             | 7.68                            | 10/15/97 5:12 AM  |  |
| 3195             | 7.68                            | 10/15/97 5:27 AM  |  |
| 3210             | 7.68                            | 10/15/97 5:42 AM  |  |
| 3225             | 7.68                            | 10/15/97 5:57 AM  |  |
| 3240             | 7.69                            | 10/15/97 6:12 AM  |  |
| 3255             | 7.69                            | 10/15/97 6:27 AM  |  |
| 3270             | 7.69                            | 10/15/97 6:42 AM  |  |
| 3285             | 7.69                            | 10/15/97 6:57 AM  |  |



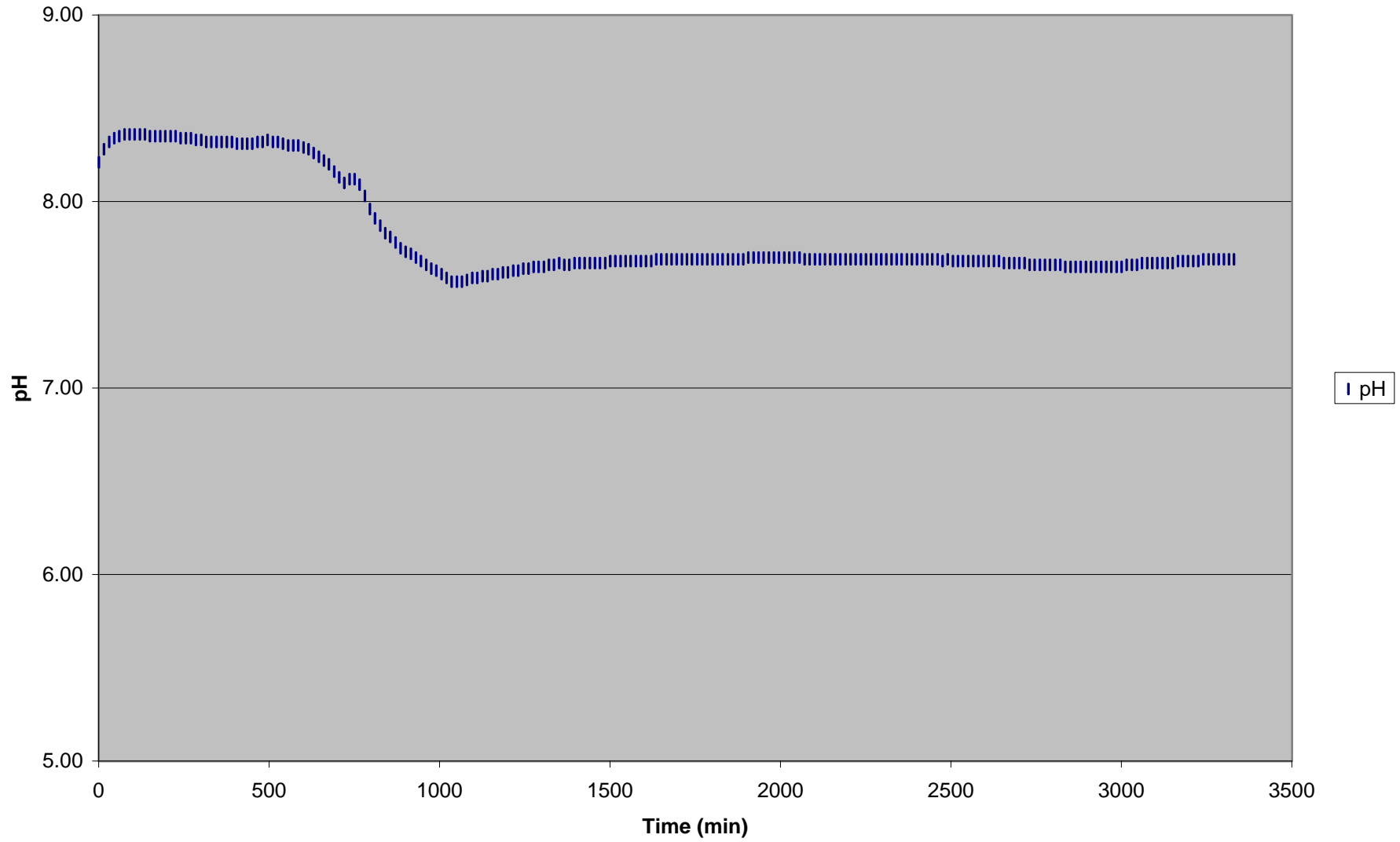
**CG2 pH vs. time**

|                  |                                 |                  |  |
|------------------|---------------------------------|------------------|--|
| <b>Run ID:</b>   | CG2                             |                  |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                  |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                  |  |
| <b>Start:</b>    | 12:12 a.m. 10/13/97             |                  |  |
| <b>Stop:</b>     | 7:42 a.m. 10/15/97              |                  |  |
| <b>Duration:</b> | 3330 min                        |                  |  |
|                  |                                 |                  |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b> |  |
| 3300             | 7.69                            | 10/15/97 7:12 AM |  |
| 3315             | 7.69                            | 10/15/97 7:27 AM |  |
| 3330             | 7.69                            | 10/15/97 7:42 AM |  |

CG2 Analysis Data

| Bottle #  | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As      | Cd      | Cr     | Pb      |
|---|--------------|-----------------|-----------------------|--------------|---------------|----------------|---------|---------|--------|---------|
| 1   | 11.0402      | 40.4694         | 127                   | 0.23         | 1             | 128            | 0.4906  | 0.0198  | 0.0702 | 0.0025  |
| 2   | 11.149       | 39.6234         | 146                   | 0.20         | 130           | 276            | 0.2924  | 0.013   | 0.0422 | 0.0374  |
| 3   | 10.9548      | 47.2119         | 233                   | 0.16         | 278           | 511            | 0.1237  | 0.0068  | 0.0335 | -0.0098 |
| 4   | 11.0277      | 40.6929         | 258                   | 0.11         | 511           | 769            | 0.0106  | 0.0027  | 0.0302 | 0.0239  |
| 5   | 10.6228      | 43.4338         | 345                   | 0.10         | 770           | 1115           | -0.0309 | 0.0009  | 0.0291 | 0.015   |
| 6   | 11.0487      | 48.6738         | 479                   | 0.08         | 1115          | 1594           | -0.0106 | 0.0028  | 0.0282 | -0.0053 |
| 7   | 11.0225      | 40.9175         | 429                   | 0.07         | 1594          | 2023           | -0.0209 | 0.0008  | 0.0235 | 0       |
| 8   | 11.1811      | 48.7736         | 619                   | 0.06         | 2025          | 2644           | -0.008  | -0.0007 | 0.0221 | -0.0134 |
| 9 <sup>A</sup>  | 11.0272      | 30.392          | 695                   | 0.03         | 2649          | 3344           | -0.0193 | 0.0041  | 0.0206 | 0.0302  |
| <sup>A</sup> Peristaltic tubing broke over the night. Flow estimate is low. |              |                 |                       |              |               |                |         |         |        |         |

CG2 pH vs. Time



## CG3 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG3                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 2:19 p.m. 10/26/97              |                   |  |
| <b>Stop:</b>     | 8:34 a.m. 10/28/97              |                   |  |
| <b>Duration:</b> | 2535 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 0                | 7.34                            | 10/26/97 2:19 PM  |  |
| 15               | 7.93                            | 10/26/97 2:34 PM  |  |
| 30               | 7.96                            | 10/26/97 2:49 PM  |  |
| 45               | 7.99                            | 10/26/97 3:04 PM  |  |
| 60               | 8.00                            | 10/26/97 3:19 PM  |  |
| 75               | 8.00                            | 10/26/97 3:34 PM  |  |
| 90               | 7.98                            | 10/26/97 3:49 PM  |  |
| 105              | 7.97                            | 10/26/97 4:04 PM  |  |
| 120              | 7.97                            | 10/26/97 4:19 PM  |  |
| 135              | 7.96                            | 10/26/97 4:34 PM  |  |
| 150              | 7.96                            | 10/26/97 4:49 PM  |  |
| 165              | 7.95                            | 10/26/97 5:04 PM  |  |
| 180              | 7.94                            | 10/26/97 5:19 PM  |  |
| 195              | 7.93                            | 10/26/97 5:34 PM  |  |
| 210              | 7.91                            | 10/26/97 5:49 PM  |  |
| 225              | 7.90                            | 10/26/97 6:04 PM  |  |
| 240              | 7.89                            | 10/26/97 6:19 PM  |  |
| 255              | 7.88                            | 10/26/97 6:34 PM  |  |
| 270              | 7.87                            | 10/26/97 6:49 PM  |  |
| 285              | 7.86                            | 10/26/97 7:04 PM  |  |
| 300              | 7.85                            | 10/26/97 7:19 PM  |  |
| 315              | 7.83                            | 10/26/97 7:34 PM  |  |
| 330              | 7.82                            | 10/26/97 7:49 PM  |  |
| 345              | 7.81                            | 10/26/97 8:04 PM  |  |
| 360              | 7.81                            | 10/26/97 8:19 PM  |  |
| 375              | 7.80                            | 10/26/97 8:34 PM  |  |
| 390              | 7.79                            | 10/26/97 8:49 PM  |  |
| 405              | 7.78                            | 10/26/97 9:04 PM  |  |
| 420              | 7.77                            | 10/26/97 9:19 PM  |  |
| 435              | 7.77                            | 10/26/97 9:34 PM  |  |
| 450              | 7.77                            | 10/26/97 9:49 PM  |  |
| 465              | 7.77                            | 10/26/97 10:04 PM |  |
| 480              | 7.78                            | 10/26/97 10:19 PM |  |
| 495              | 7.78                            | 10/26/97 10:34 PM |  |
| 510              | 7.79                            | 10/26/97 10:49 PM |  |
| 525              | 7.79                            | 10/26/97 11:04 PM |  |
| 540              | 7.79                            | 10/26/97 11:19 PM |  |
| 555              | 7.79                            | 10/26/97 11:34 PM |  |
| 570              | 7.79                            | 10/26/97 11:49 PM |  |
| 585              | 7.79                            | 10/27/97 12:04 AM |  |
| 600              | 7.79                            | 10/27/97 12:19 AM |  |
| 615              | 7.79                            | 10/27/97 12:34 AM |  |
| 630              | 7.79                            | 10/27/97 12:49 AM |  |
| 645              | 7.78                            | 10/27/97 1:04 AM  |  |

## CG3 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG3                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 2:19 p.m. 10/26/97              |                   |  |
| <b>Stop:</b>     | 8:34 a.m. 10/28/97              |                   |  |
| <b>Duration:</b> | 2535 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 660              | 7.78                            | 10/27/97 1:19 AM  |  |
| 675              | 7.78                            | 10/27/97 1:34 AM  |  |
| 690              | 7.78                            | 10/27/97 1:49 AM  |  |
| 705              | 7.78                            | 10/27/97 2:04 AM  |  |
| 720              | 7.77                            | 10/27/97 2:19 AM  |  |
| 735              | 7.77                            | 10/27/97 2:34 AM  |  |
| 750              | 7.77                            | 10/27/97 2:49 AM  |  |
| 765              | 7.76                            | 10/27/97 3:04 AM  |  |
| 780              | 7.76                            | 10/27/97 3:19 AM  |  |
| 795              | 7.76                            | 10/27/97 3:34 AM  |  |
| 810              | 7.76                            | 10/27/97 3:49 AM  |  |
| 825              | 7.76                            | 10/27/97 4:04 AM  |  |
| 840              | 7.75                            | 10/27/97 4:19 AM  |  |
| 855              | 7.75                            | 10/27/97 4:34 AM  |  |
| 870              | 7.75                            | 10/27/97 4:49 AM  |  |
| 885              | 7.75                            | 10/27/97 5:04 AM  |  |
| 900              | 7.75                            | 10/27/97 5:19 AM  |  |
| 915              | 7.75                            | 10/27/97 5:34 AM  |  |
| 930              | 7.75                            | 10/27/97 5:49 AM  |  |
| 945              | 7.75                            | 10/27/97 6:04 AM  |  |
| 960              | 7.74                            | 10/27/97 6:19 AM  |  |
| 975              | 7.74                            | 10/27/97 6:34 AM  |  |
| 990              | 7.74                            | 10/27/97 6:49 AM  |  |
| 1005             | 7.74                            | 10/27/97 7:04 AM  |  |
| 1020             | 7.74                            | 10/27/97 7:19 AM  |  |
| 1035             | 7.74                            | 10/27/97 7:34 AM  |  |
| 1050             | 7.74                            | 10/27/97 7:49 AM  |  |
| 1065             | 7.74                            | 10/27/97 8:04 AM  |  |
| 1080             | 7.74                            | 10/27/97 8:19 AM  |  |
| 1095             | 7.73                            | 10/27/97 8:34 AM  |  |
| 1110             | 7.73                            | 10/27/97 8:49 AM  |  |
| 1125             | 7.73                            | 10/27/97 9:04 AM  |  |
| 1140             | 7.73                            | 10/27/97 9:19 AM  |  |
| 1155             | 7.72                            | 10/27/97 9:34 AM  |  |
| 1170             | 7.72                            | 10/27/97 9:49 AM  |  |
| 1185             | 7.72                            | 10/27/97 10:04 AM |  |
| 1200             | 7.72                            | 10/27/97 10:19 AM |  |
| 1215             | 7.72                            | 10/27/97 10:34 AM |  |
| 1230             | 7.72                            | 10/27/97 10:49 AM |  |
| 1245             | 7.72                            | 10/27/97 11:04 AM |  |
| 1260             | 7.71                            | 10/27/97 11:19 AM |  |
| 1275             | 7.71                            | 10/27/97 11:34 AM |  |
| 1290             | 7.71                            | 10/27/97 11:49 AM |  |
| 1305             | 7.71                            | 10/27/97 12:04 PM |  |

## CG3 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG3                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 2:19 p.m. 10/26/97              |                   |  |
| <b>Stop:</b>     | 8:34 a.m. 10/28/97              |                   |  |
| <b>Duration:</b> | 2535 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 1320             | 7.71                            | 10/27/97 12:19 PM |  |
| 1335             | 7.71                            | 10/27/97 12:34 PM |  |
| 1350             | 7.71                            | 10/27/97 12:49 PM |  |
| 1365             | 7.71                            | 10/27/97 1:04 PM  |  |
| 1380             | 7.71                            | 10/27/97 1:19 PM  |  |
| 1395             | 7.71                            | 10/27/97 1:34 PM  |  |
| 1410             | 7.70                            | 10/27/97 1:49 PM  |  |
| 1425             | 7.70                            | 10/27/97 2:04 PM  |  |
| 1440             | 7.70                            | 10/27/97 2:19 PM  |  |
| 1455             | 7.70                            | 10/27/97 2:34 PM  |  |
| 1470             | 7.70                            | 10/27/97 2:49 PM  |  |
| 1485             | 7.70                            | 10/27/97 3:04 PM  |  |
| 1500             | 7.70                            | 10/27/97 3:19 PM  |  |
| 1515             | 7.70                            | 10/27/97 3:34 PM  |  |
| 1530             | 7.70                            | 10/27/97 3:49 PM  |  |
| 1545             | 7.70                            | 10/27/97 4:04 PM  |  |
| 1560             | 7.70                            | 10/27/97 4:19 PM  |  |
| 1575             | 7.70                            | 10/27/97 4:34 PM  |  |
| 1590             | 7.70                            | 10/27/97 4:49 PM  |  |
| 1605             | 7.70                            | 10/27/97 5:04 PM  |  |
| 1620             | 7.70                            | 10/27/97 5:19 PM  |  |
| 1635             | 7.69                            | 10/27/97 5:34 PM  |  |
| 1650             | 7.70                            | 10/27/97 5:49 PM  |  |
| 1665             | 7.70                            | 10/27/97 6:04 PM  |  |
| 1680             | 7.70                            | 10/27/97 6:19 PM  |  |
| 1695             | 7.70                            | 10/27/97 6:34 PM  |  |
| 1710             | 7.70                            | 10/27/97 6:49 PM  |  |
| 1725             | 7.70                            | 10/27/97 7:04 PM  |  |
| 1740             | 7.69                            | 10/27/97 7:19 PM  |  |
| 1755             | 7.69                            | 10/27/97 7:34 PM  |  |
| 1770             | 7.69                            | 10/27/97 7:49 PM  |  |
| 1785             | 7.69                            | 10/27/97 8:04 PM  |  |
| 1800             | 7.69                            | 10/27/97 8:19 PM  |  |
| 1815             | 7.69                            | 10/27/97 8:34 PM  |  |
| 1830             | 7.69                            | 10/27/97 8:49 PM  |  |
| 1845             | 7.69                            | 10/27/97 9:04 PM  |  |
| 1860             | 7.69                            | 10/27/97 9:19 PM  |  |
| 1875             | 7.69                            | 10/27/97 9:34 PM  |  |
| 1890             | 7.69                            | 10/27/97 9:49 PM  |  |
| 1905             | 7.69                            | 10/27/97 10:04 PM |  |
| 1920             | 7.69                            | 10/27/97 10:19 PM |  |
| 1935             | 7.69                            | 10/27/97 10:34 PM |  |
| 1950             | 7.69                            | 10/27/97 10:49 PM |  |
| 1965             | 7.69                            | 10/27/97 11:04 PM |  |

## CG3 pH vs. time

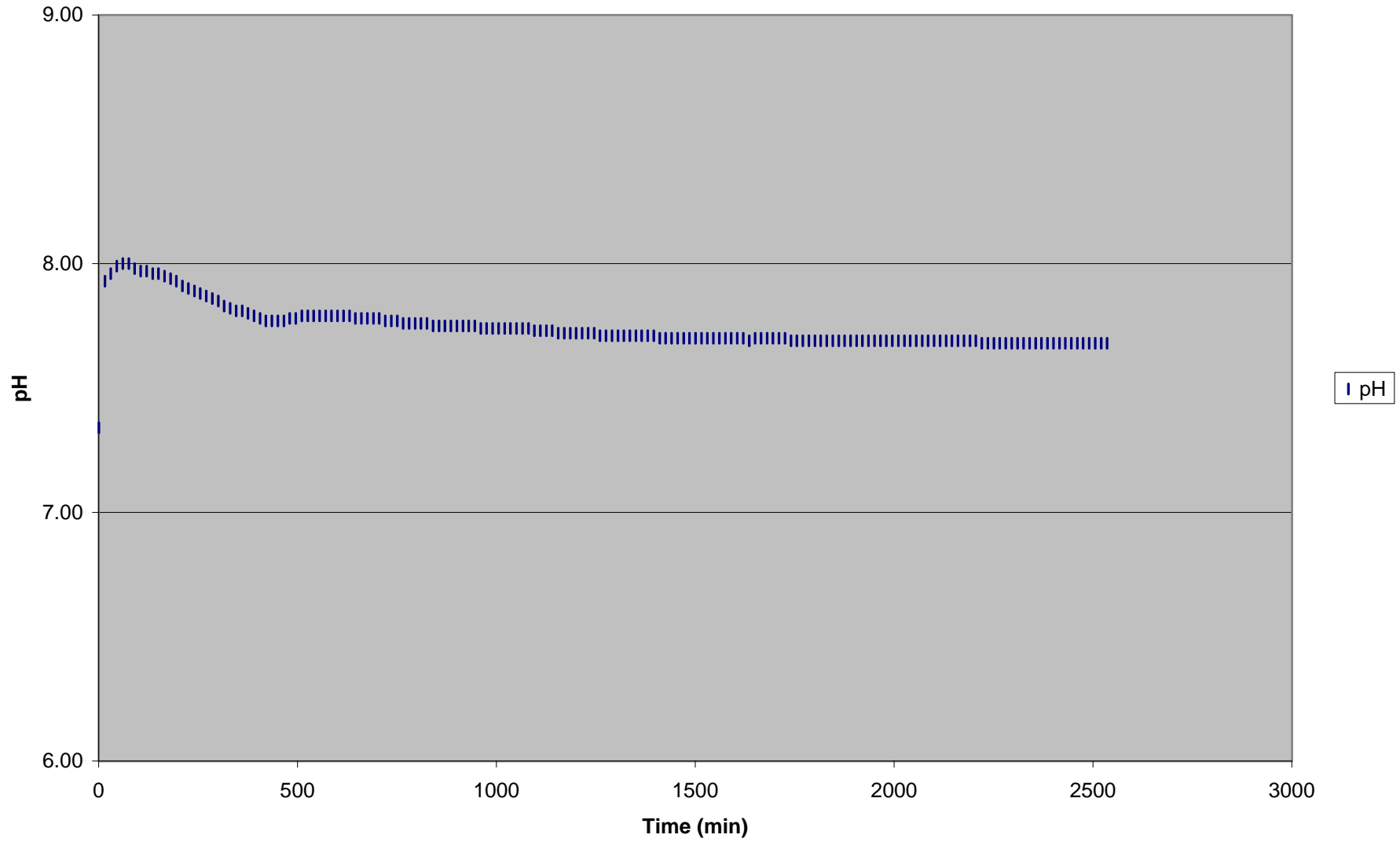
|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CG3                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | Gambles Solution + Albumen      |                   |  |
| <b>Start:</b>    | 2:19 p.m. 10/26/97              |                   |  |
| <b>Stop:</b>     | 8:34 a.m. 10/28/97              |                   |  |
| <b>Duration:</b> | 2535 min                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 1980             | 7.69                            | 10/27/97 11:19 PM |  |
| 1995             | 7.69                            | 10/27/97 11:34 PM |  |
| 2010             | 7.69                            | 10/27/97 11:49 PM |  |
| 2025             | 7.69                            | 10/28/97 12:04 AM |  |
| 2040             | 7.69                            | 10/28/97 12:19 AM |  |
| 2055             | 7.69                            | 10/28/97 12:34 AM |  |
| 2070             | 7.69                            | 10/28/97 12:49 AM |  |
| 2085             | 7.69                            | 10/28/97 1:04 AM  |  |
| 2100             | 7.69                            | 10/28/97 1:19 AM  |  |
| 2115             | 7.69                            | 10/28/97 1:34 AM  |  |
| 2130             | 7.69                            | 10/28/97 1:49 AM  |  |
| 2145             | 7.69                            | 10/28/97 2:04 AM  |  |
| 2160             | 7.69                            | 10/28/97 2:19 AM  |  |
| 2175             | 7.69                            | 10/28/97 2:34 AM  |  |
| 2190             | 7.69                            | 10/28/97 2:49 AM  |  |
| 2205             | 7.69                            | 10/28/97 3:04 AM  |  |
| 2220             | 7.68                            | 10/28/97 3:19 AM  |  |
| 2235             | 7.68                            | 10/28/97 3:34 AM  |  |
| 2250             | 7.68                            | 10/28/97 3:49 AM  |  |
| 2265             | 7.68                            | 10/28/97 4:04 AM  |  |
| 2280             | 7.68                            | 10/28/97 4:19 AM  |  |
| 2295             | 7.68                            | 10/28/97 4:34 AM  |  |
| 2310             | 7.68                            | 10/28/97 4:49 AM  |  |
| 2325             | 7.68                            | 10/28/97 5:04 AM  |  |
| 2340             | 7.68                            | 10/28/97 5:19 AM  |  |
| 2355             | 7.68                            | 10/28/97 5:34 AM  |  |
| 2370             | 7.68                            | 10/28/97 5:49 AM  |  |
| 2385             | 7.68                            | 10/28/97 6:04 AM  |  |
| 2400             | 7.68                            | 10/28/97 6:19 AM  |  |
| 2415             | 7.68                            | 10/28/97 6:34 AM  |  |
| 2430             | 7.68                            | 10/28/97 6:49 AM  |  |
| 2445             | 7.68                            | 10/28/97 7:04 AM  |  |
| 2460             | 7.68                            | 10/28/97 7:19 AM  |  |
| 2475             | 7.68                            | 10/28/97 7:34 AM  |  |
| 2490             | 7.68                            | 10/28/97 7:49 AM  |  |
| 2505             | 7.68                            | 10/28/97 8:04 AM  |  |
| 2520             | 7.68                            | 10/28/97 8:19 AM  |  |
| 2535             | 7.68                            | 10/28/97 8:34 AM  |  |

CG3 Analysis Data

| Bottle #                                | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As     | Cd    | Cr    | Pb     |
|---|--------------|-----------------|-----------------------|--------------|---------------|----------------|--------|-------|-------|--------|
| 1                                       | 11.084       | 42.450          | 23.75                 | 1.32         | 2             | 26             | 0.096  | 0.008 | 0.038 | -0.005 |
| 2                                       | 11.035       | 49.187          | 63                    | 0.61         | 27            | 90             | 0.024  | 0.004 | 0.018 | -0.013 |
| 3                                       | 11.027       | 36.956          | 42.5                  | 0.61         | 93            | 136            | 0.074  | 0.007 | 0.016 | 0.019  |
| 4                                       | 11.099       | 48.860          | 152                   | 0.25         | 137           | 289            | -0.005 | 0.000 | 0.015 | 0.000  |
| 5                                       | 11.018       | 38.190          | 56.75                 | 0.48         | 289           | 346            | 0.001  | 0.000 | 0.015 | 0.008  |
| 6                                       | 10.911       | 42.893          | 98                    | 0.33         | 349           | 447            | -0.019 | 0.001 | 0.018 | 0.015  |
| 7                                       | 10.731       | 49.805          | 128                   | 0.31         | 448           | 576            | 0.021  | 0.002 | 0.025 | 0.012  |
| 8                                       | 11.056       | 39.933          | 92                    | 0.31         | 992           | 1084           | -0.004 | 0.002 | 0.021 | 0.012  |
| 9                                       | 11.082       | 47.438          | 116                   | 0.31         | 1789          | 1905           | -0.023 | 0.001 | 0.017 | 0.013  |
| 10                                      | 10.955       | 42.837          | 99                    | 0.32         | 2440          | 2539           | 0.005  | 0.002 | 0.014 | -0.001 |
| <u>Notes</u>                            |              |                 |                       |              |               |                |        |       |       |        |
| Later samples have stronger brown color |              |                 |                       |              |               |                |        |       |       |        |
| Raw solvent density 1.02 g/ml           |              |                 |                       |              |               |                |        |       |       |        |



CG3 pH vs. Time



## CA1pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CA1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                   |  |
| <b>Start:</b>    | 12:33 p.m. 11/26/97             |                   |  |
| <b>Stop:</b>     | 6:33 a.m. 11/27/97              |                   |  |
| <b>Duration:</b> | 1085 min.                       |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 0                | 2.53                            | 11/26/97 12:33 PM |  |
| 15               | 2.50                            | 11/26/97 12:48 PM |  |
| 30               | 2.56                            | 11/26/97 1:03 PM  |  |
| 45               | 2.51                            | 11/26/97 1:18 PM  |  |
| 60               | 2.33                            | 11/26/97 1:33 PM  |  |
| 75               | 2.22                            | 11/26/97 1:48 PM  |  |
| 90               | 2.21                            | 11/26/97 2:03 PM  |  |
| 105              | 2.10                            | 11/26/97 2:18 PM  |  |
| 120              | 2.07                            | 11/26/97 2:33 PM  |  |
| 135              | 2.11                            | 11/26/97 2:48 PM  |  |
| 150              | 2.03                            | 11/26/97 3:03 PM  |  |
| 165              | 2.01                            | 11/26/97 3:18 PM  |  |
| 180              | 1.99                            | 11/26/97 3:33 PM  |  |
| 195              | 1.98                            | 11/26/97 3:48 PM  |  |
| 210              | 1.96                            | 11/26/97 4:03 PM  |  |
| 225              | 1.96                            | 11/26/97 4:18 PM  |  |
| 240              | 1.94                            | 11/26/97 4:33 PM  |  |
| 255              | 1.93                            | 11/26/97 4:48 PM  |  |
| 270              | 1.99                            | 11/26/97 5:03 PM  |  |
| 285              | 1.91                            | 11/26/97 5:18 PM  |  |
| 300              | 1.91                            | 11/26/97 5:33 PM  |  |
| 315              | 1.91                            | 11/26/97 5:48 PM  |  |
| 330              | 1.99                            | 11/26/97 6:03 PM  |  |
| 345              | 1.98                            | 11/26/97 6:18 PM  |  |
| 360              | 1.97                            | 11/26/97 6:33 PM  |  |
| 375              | 1.97                            | 11/26/97 6:48 PM  |  |
| 390              | 1.97                            | 11/26/97 7:03 PM  |  |
| 405              | 1.95                            | 11/26/97 7:18 PM  |  |
| 420              | 1.93                            | 11/26/97 7:33 PM  |  |
| 435              | 1.93                            | 11/26/97 7:48 PM  |  |
| 450              | 1.86                            | 11/26/97 8:03 PM  |  |
| 465              | 1.92                            | 11/26/97 8:18 PM  |  |
| 480              | 1.92                            | 11/26/97 8:33 PM  |  |
| 495              | 1.93                            | 11/26/97 8:48 PM  |  |
| 510              | 1.90                            | 11/26/97 9:03 PM  |  |
| 525              | 1.89                            | 11/26/97 9:18 PM  |  |
| 540              | 1.90                            | 11/26/97 9:33 PM  |  |
| 555              | 1.90                            | 11/26/97 9:48 PM  |  |
| 570              | 1.94                            | 11/26/97 10:03 PM |  |
| 585              | 1.93                            | 11/26/97 10:18 PM |  |
| 600              | 1.83                            | 11/26/97 10:33 PM |  |
| 615              | 1.83                            | 11/26/97 10:48 PM |  |
| 630              | 1.83                            | 11/26/97 11:03 PM |  |
| 645              | 1.83                            | 11/26/97 11:18 PM |  |

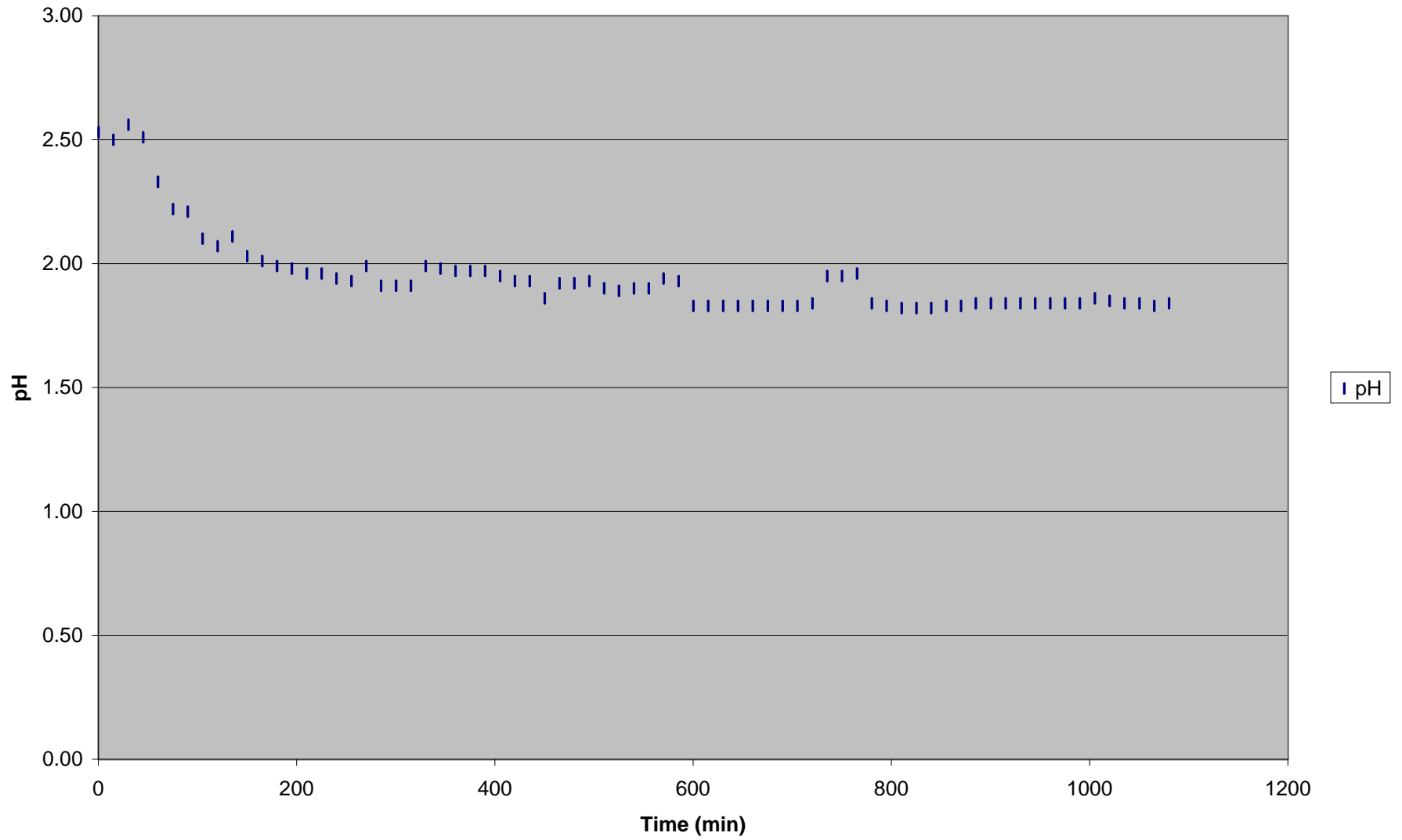
## CA1pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CA1                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                   |  |
| <b>Start:</b>    | 12:33 p.m. 11/26/97             |                   |  |
| <b>Stop:</b>     | 6:33 a.m. 11/27/97              |                   |  |
| <b>Duration:</b> | 1085 min.                       |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 660              | 1.83                            | 11/26/97 11:33 PM |  |
| 675              | 1.83                            | 11/26/97 11:48 PM |  |
| 690              | 1.83                            | 11/27/97 12:03 AM |  |
| 705              | 1.83                            | 11/27/97 12:18 AM |  |
| 720              | 1.84                            | 11/27/97 12:33 AM |  |
| 735              | 1.95                            | 11/27/97 12:48 AM |  |
| 750              | 1.95                            | 11/27/97 1:03 AM  |  |
| 765              | 1.96                            | 11/27/97 1:18 AM  |  |
| 780              | 1.84                            | 11/27/97 1:33 AM  |  |
| 795              | 1.83                            | 11/27/97 1:48 AM  |  |
| 810              | 1.82                            | 11/27/97 2:03 AM  |  |
| 825              | 1.82                            | 11/27/97 2:18 AM  |  |
| 840              | 1.82                            | 11/27/97 2:33 AM  |  |
| 855              | 1.83                            | 11/27/97 2:48 AM  |  |
| 870              | 1.83                            | 11/27/97 3:03 AM  |  |
| 885              | 1.84                            | 11/27/97 3:18 AM  |  |
| 900              | 1.84                            | 11/27/97 3:33 AM  |  |
| 915              | 1.84                            | 11/27/97 3:48 AM  |  |
| 930              | 1.84                            | 11/27/97 4:03 AM  |  |
| 945              | 1.84                            | 11/27/97 4:18 AM  |  |
| 960              | 1.84                            | 11/27/97 4:33 AM  |  |
| 975              | 1.84                            | 11/27/97 4:48 AM  |  |
| 990              | 1.84                            | 11/27/97 5:03 AM  |  |
| 1005             | 1.86                            | 11/27/97 5:18 AM  |  |
| 1020             | 1.85                            | 11/27/97 5:33 AM  |  |
| 1035             | 1.84                            | 11/27/97 5:48 AM  |  |
| 1050             | 1.84                            | 11/27/97 6:03 AM  |  |
| 1065             | 1.83                            | 11/27/97 6:18 AM  |  |
| 1080             | 1.84                            | 11/27/97 6:33 AM  |  |

CA1 Analysis Data

| Bottle # | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As    | Cd    | Cr    | Pb     |
|----------|--------------|-----------------|-----------------------|--------------|---------------|----------------|-------|-------|-------|--------|
| 1        | 8.233        | 38.501          | 42                    | 0.72         | 0             | 42             | 0.421 | 0.082 | 0.239 | 0.037  |
| 2        | 8.295        | 42.692          | 47                    | 0.73         | 43            | 90             | 0.309 | 0.041 | 0.159 | -0.025 |
| 3        | 8.200        | 40.695          | 44.6667               | 0.73         | 90            | 135            | 0.165 | 0.018 | 0.090 | -0.038 |
| 4        | 8.296        | 42.524          | 53.3333               | 0.64         | 135           | 188            | 0.155 | 0.016 | 0.066 | -0.015 |
| 5        | 8.255        | 36.944          | 38.8333               | 0.74         | 188           | 227            | 0.087 | 0.009 | 0.051 | 0.002  |
| 6        | 8.185        | 38.897          | 43.75                 | 0.70         | 227           | 271            | 0.120 | 0.007 | 0.042 | 0.010  |
| 7        | 8.278        | 37.160          | 39.06667              | 0.74         | 272           | 311            | 0.080 | 0.002 | 0.034 | 0.009  |
| 8        | 8.249        | 41.374          | 45.41667              | 0.73         | 539           | 584            | 0.059 | 0.001 | 0.020 | -0.005 |
| 9        | 8.223        | 38.387          | 89.3333               | 0.34         | 996           | 1085           | 0.041 | 0.000 | 0.013 | 0.011  |
| Notes    |              |                 |                       |              |               |                |       |       |       |        |

CA1 pH vs. Time



## CA2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CA2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                   |  |
| <b>Start:</b>    | 10:00 a.m. 11/27/97             |                   |  |
| <b>Stop:</b>     | 1:20 a.m. 11/28/97              |                   |  |
| <b>Duration:</b> | 924 min.                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 0                | 2.95                            | 11/27/97 10:00 AM |  |
| 15               | 2.90                            | 11/27/97 10:15 AM |  |
| 30               | 2.88                            | 11/27/97 10:30 AM |  |
| 45               | 2.74                            | 11/27/97 10:45 AM |  |
| 60               | 2.60                            | 11/27/97 11:00 AM |  |
| 70               | 2.53                            | 11/27/97 11:10 AM |  |
| 80               | 2.46                            | 11/27/97 11:20 AM |  |
| 90               | 2.41                            | 11/27/97 11:30 AM |  |
| 100              | 2.37                            | 11/27/97 11:40 AM |  |
| 110              | 2.32                            | 11/27/97 11:50 AM |  |
| 120              | 2.29                            | 11/27/97 12:00 PM |  |
| 130              | 2.27                            | 11/27/97 12:10 PM |  |
| 140              | 2.25                            | 11/27/97 12:20 PM |  |
| 150              | 2.24                            | 11/27/97 12:30 PM |  |
| 160              | 2.22                            | 11/27/97 12:40 PM |  |
| 170              | 2.20                            | 11/27/97 12:50 PM |  |
| 180              | 2.17                            | 11/27/97 1:00 PM  |  |
| 190              | 2.15                            | 11/27/97 1:10 PM  |  |
| 200              | 2.13                            | 11/27/97 1:20 PM  |  |
| 210              | 2.11                            | 11/27/97 1:30 PM  |  |
| 220              | 2.10                            | 11/27/97 1:40 PM  |  |
| 230              | 2.09                            | 11/27/97 1:50 PM  |  |
| 240              | 2.09                            | 11/27/97 2:00 PM  |  |
| 250              | 2.08                            | 11/27/97 2:10 PM  |  |
| 260              | 2.06                            | 11/27/97 2:20 PM  |  |
| 270              | 2.06                            | 11/27/97 2:30 PM  |  |
| 280              | 2.06                            | 11/27/97 2:40 PM  |  |
| 290              | 2.05                            | 11/27/97 2:50 PM  |  |
| 300              | 2.05                            | 11/27/97 3:00 PM  |  |
| 310              | 2.05                            | 11/27/97 3:10 PM  |  |
| 320              | 2.04                            | 11/27/97 3:20 PM  |  |
| 330              | 2.04                            | 11/27/97 3:30 PM  |  |
| 340              | 2.03                            | 11/27/97 3:40 PM  |  |
| 350              | 2.03                            | 11/27/97 3:50 PM  |  |
| 360              | 2.02                            | 11/27/97 4:00 PM  |  |
| 370              | 2.02                            | 11/27/97 4:10 PM  |  |
| 380              | 2.01                            | 11/27/97 4:20 PM  |  |
| 390              | 2.01                            | 11/27/97 4:30 PM  |  |
| 400              | 2.01                            | 11/27/97 4:40 PM  |  |
| 410              | 2.01                            | 11/27/97 4:50 PM  |  |
| 420              | 2.00                            | 11/27/97 5:00 PM  |  |
| 430              | 2.00                            | 11/27/97 5:10 PM  |  |
| 440              | 2.00                            | 11/27/97 5:20 PM  |  |
| 450              | 2.00                            | 11/27/97 5:30 PM  |  |

CA2 pH vs. time

|                  |                                 |                   |  |
|------------------|---------------------------------|-------------------|--|
| <b>Run ID:</b>   | CA2                             |                   |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                   |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                   |  |
| <b>Start:</b>    | 10:00 a.m. 11/27/97             |                   |  |
| <b>Stop:</b>     | 1:20 a.m. 11/28/97              |                   |  |
| <b>Duration:</b> | 924 min.                        |                   |  |
|                  |                                 |                   |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b>  |  |
| 460              | 2.00                            | 11/27/97 5:40 PM  |  |
| 470              | 2.00                            | 11/27/97 5:50 PM  |  |
| 480              | 2.00                            | 11/27/97 6:00 PM  |  |
| 490              | 2.00                            | 11/27/97 6:10 PM  |  |
| 500              | 2.00                            | 11/27/97 6:20 PM  |  |
| 510              | 2.00                            | 11/27/97 6:30 PM  |  |
| 520              | 2.00                            | 11/27/97 6:40 PM  |  |
| 530              | 1.99                            | 11/27/97 6:50 PM  |  |
| 540              | 1.99                            | 11/27/97 7:00 PM  |  |
| 550              | 1.99                            | 11/27/97 7:10 PM  |  |
| 560              | 1.99                            | 11/27/97 7:20 PM  |  |
| 570              | 1.98                            | 11/27/97 7:30 PM  |  |
| 580              | 1.98                            | 11/27/97 7:40 PM  |  |
| 590              | 1.98                            | 11/27/97 7:50 PM  |  |
| 600              | 1.98                            | 11/27/97 8:00 PM  |  |
| 610              | 1.98                            | 11/27/97 8:10 PM  |  |
| 620              | 1.98                            | 11/27/97 8:20 PM  |  |
| 630              | 1.98                            | 11/27/97 8:30 PM  |  |
| 640              | 1.98                            | 11/27/97 8:40 PM  |  |
| 650              | 1.98                            | 11/27/97 8:50 PM  |  |
| 660              | 1.98                            | 11/27/97 9:00 PM  |  |
| 670              | 1.98                            | 11/27/97 9:10 PM  |  |
| 680              | 1.97                            | 11/27/97 9:20 PM  |  |
| 690              | 1.97                            | 11/27/97 9:30 PM  |  |
| 700              | 1.97                            | 11/27/97 9:40 PM  |  |
| 710              | 1.97                            | 11/27/97 9:50 PM  |  |
| 720              | 1.97                            | 11/27/97 10:00 PM |  |
| 730              | 1.97                            | 11/27/97 10:10 PM |  |
| 740              | 1.97                            | 11/27/97 10:20 PM |  |
| 750              | 1.97                            | 11/27/97 10:30 PM |  |
| 760              | 1.97                            | 11/27/97 10:40 PM |  |
| 770              | 1.97                            | 11/27/97 10:50 PM |  |
| 780              | 1.97                            | 11/27/97 11:00 PM |  |
| 790              | 1.97                            | 11/27/97 11:10 PM |  |
| 800              | 1.97                            | 11/27/97 11:20 PM |  |
| 810              | 1.97                            | 11/27/97 11:30 PM |  |
| 820              | 1.97                            | 11/27/97 11:40 PM |  |
| 830              | 1.97                            | 11/27/97 11:50 PM |  |
| 840              | 1.97                            | 11/28/97 12:00 AM |  |
| 850              | 1.97                            | 11/28/97 12:10 AM |  |
| 860              | 1.96                            | 11/28/97 12:20 AM |  |
| 870              | 1.96                            | 11/28/97 12:30 AM |  |
| 880              | 1.96                            | 11/28/97 12:40 AM |  |
| 890              | 1.96                            | 11/28/97 12:50 AM |  |

**CA2 pH vs. time**

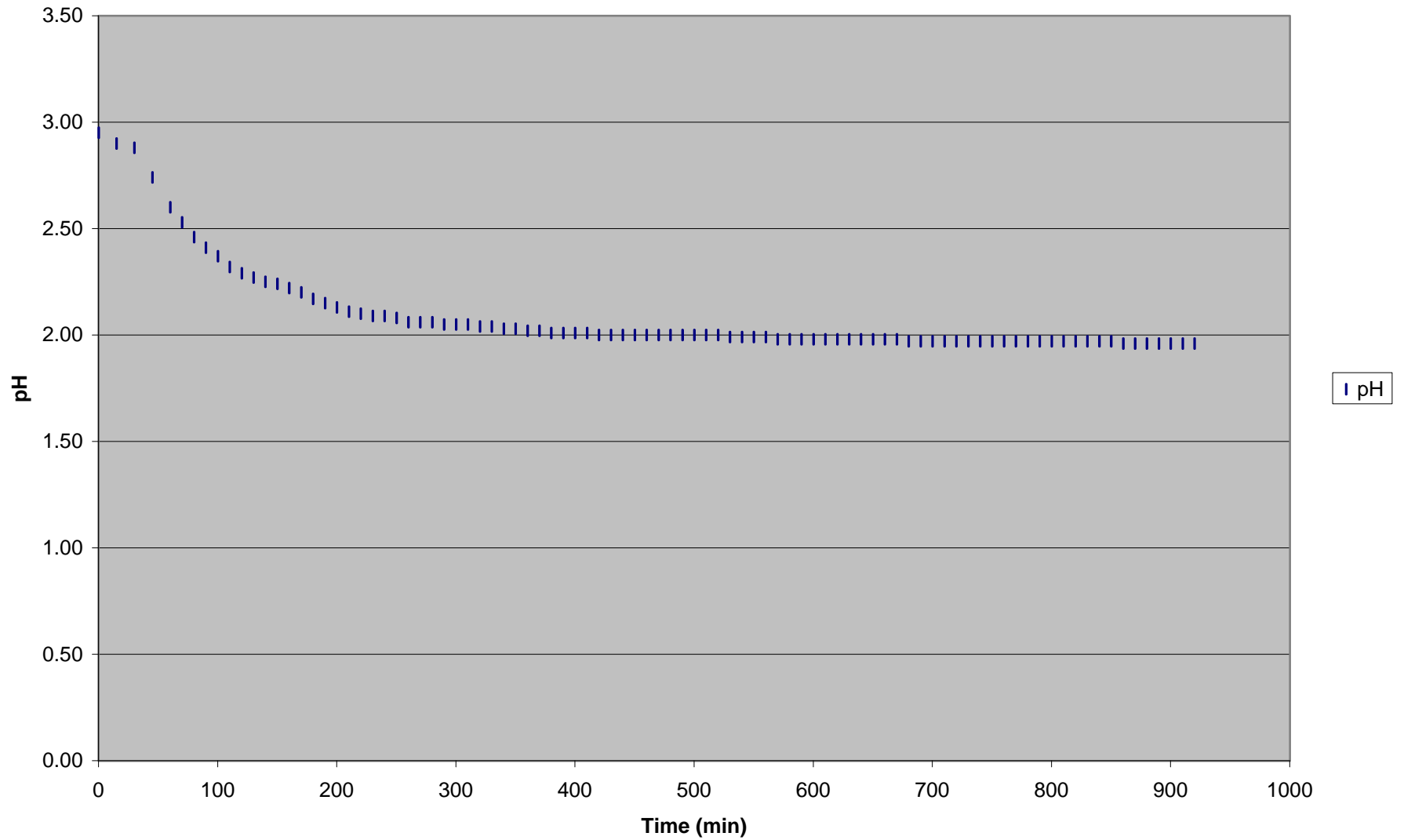
|                  |                                 |                  |  |
|------------------|---------------------------------|------------------|--|
| <b>Run ID:</b>   | CA2                             |                  |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                  |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                  |  |
| <b>Start:</b>    | 10:00 a.m. 11/27/97             |                  |  |
| <b>Stop:</b>     | 1:20 a.m. 11/28/97              |                  |  |
| <b>Duration:</b> | 924 min.                        |                  |  |
|                  |                                 |                  |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b> |  |
| 900              | 1.96                            | 11/28/97 1:00 AM |  |
| 910              | 1.96                            | 11/28/97 1:10 AM |  |
| 920              | 1.96                            | 11/28/97 1:20 AM |  |



CA2 Analysis Data

| Bottle #  | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As    | Cd     | Cr    | Pb     |
|---|--------------|-----------------|-----------------------|--------------|---------------|----------------|-------|--------|-------|--------|
| 1   | 8.293        | 38.039          | 41.75                 | 0.71         | 1             | 43             | 0.152 | 0.009  | 0.129 | -0.019 |
| 2   | 8.205        | 38.083          | 41.75                 | 0.72         | 44            | 86             | 0.253 | 0.012  | 0.110 | -0.044 |
| 3   | 8.257        | 38.219          | 41.75                 | 0.72         | 86            | 128            | 0.174 | 0.004  | 0.075 | -0.053 |
| 4   | 8.378        | 39.383          | 41.75                 | 0.74         | 128           | 170            | 0.102 | 0.003  | 0.050 | -0.028 |
| 5   | 8.383        | 41.347          | 41.75                 | 0.79         | 170           | 212            | 0.065 | 0.004  | 0.035 | -0.031 |
| 6 <sup>A</sup>  | 8.200        | 40.102          | 40                    | 0.80         | 212           | 252            | 0.041 | 0.001  | 0.024 | -0.017 |
| 7   | 8.208        | 40.353          | 40                    | 0.80         | 253           | 293            | 0.049 | 0.000  | 0.018 | -0.012 |
| 8 <sup>B,C</sup>  | 8.159        | 40.526          | 40                    | 0.81         | 293           | 333            | 0.035 | -0.003 | 0.013 | -0.014 |
| 9   | 8.253        | 39.549          | 40                    | 0.78         | 459           | 499            | 0.033 | -0.003 | 0.008 | 0.016  |
| 10  | 8.228        | 37.317          | 38.5                  | 0.76         | 885           | 924            | 0.020 | -0.002 | 0.003 | 0.015  |
| <u>Notes</u>  |              |                 |                       |              |               |                |       |        |       |        |
| <sup>A</sup> No breakthrough noted on effluent side                               |              |                 |                       |              |               |                |       |        |       |        |
| <sup>B</sup> No evidence of effluent breakthrough                                 |              |                 |                       |              |               |                |       |        |       |        |
| <sup>C</sup> Light grey color noted on syringe filter at end of sample collection |              |                 |                       |              |               |                |       |        |       |        |

CA2 pH vs. Time Curve



## CA3 pH vs. time

|                  |                                 |                  |  |
|------------------|---------------------------------|------------------|--|
| <b>Run ID:</b>   | CA3                             |                  |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                  |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                  |  |
| <b>Start:</b>    | 9:44 a.m. 12/01/97              |                  |  |
| <b>Stop:</b>     | 10:44 p.m. 12/1/97              |                  |  |
| <b>Duration:</b> | 780 min.                        |                  |  |
|                  |                                 |                  |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b> |  |
| 0                | 2.95                            | 12/1/97 9:44 AM  |  |
| 10               | 3.26                            | 12/1/97 9:54 AM  |  |
| 20               | 3.13                            | 12/1/97 10:04 AM |  |
| 30               | 2.90                            | 12/1/97 10:14 AM |  |
| 40               | 2.79                            | 12/1/97 10:24 AM |  |
| 50               | 2.69                            | 12/1/97 10:34 AM |  |
| 60               | 2.57                            | 12/1/97 10:44 AM |  |
| 70               | 2.53                            | 12/1/97 10:54 AM |  |
| 80               | 2.50                            | 12/1/97 11:04 AM |  |
| 90               | 2.45                            | 12/1/97 11:14 AM |  |
| 100              | 2.42                            | 12/1/97 11:24 AM |  |
| 110              | 2.35                            | 12/1/97 11:34 AM |  |
| 120              | 2.38                            | 12/1/97 11:44 AM |  |
| 130              | 2.36                            | 12/1/97 11:54 AM |  |
| 140              | 2.31                            | 12/1/97 12:04 PM |  |
| 150              | 2.29                            | 12/1/97 12:14 PM |  |
| 160              | 2.32                            | 12/1/97 12:24 PM |  |
| 170              | 2.30                            | 12/1/97 12:34 PM |  |
| 180              | 2.29                            | 12/1/97 12:44 PM |  |
| 190              | 2.27                            | 12/1/97 12:54 PM |  |
| 200              | 2.26                            | 12/1/97 1:04 PM  |  |
| 210              | 2.25                            | 12/1/97 1:14 PM  |  |
| 220              | 2.24                            | 12/1/97 1:24 PM  |  |
| 230              | 2.24                            | 12/1/97 1:34 PM  |  |
| 240              | 2.24                            | 12/1/97 1:44 PM  |  |
| 250              | 2.23                            | 12/1/97 1:54 PM  |  |
| 260              | 2.18                            | 12/1/97 2:04 PM  |  |
| 270              | 2.20                            | 12/1/97 2:14 PM  |  |
| 280              | 2.22                            | 12/1/97 2:24 PM  |  |
| 290              | 2.22                            | 12/1/97 2:34 PM  |  |
| 300              | 2.20                            | 12/1/97 2:44 PM  |  |
| 310              | 2.18                            | 12/1/97 2:54 PM  |  |
| 320              | 2.21                            | 12/1/97 3:04 PM  |  |
| 330              | 2.21                            | 12/1/97 3:14 PM  |  |
| 340              | 2.21                            | 12/1/97 3:24 PM  |  |
| 350              | 2.21                            | 12/1/97 3:34 PM  |  |
| 360              | 2.18                            | 12/1/97 3:44 PM  |  |
| 370              | 2.20                            | 12/1/97 3:54 PM  |  |
| 380              | 2.20                            | 12/1/97 4:04 PM  |  |
| 390              | 2.20                            | 12/1/97 4:14 PM  |  |
| 400              | 2.20                            | 12/1/97 4:24 PM  |  |
| 410              | 2.17                            | 12/1/97 4:34 PM  |  |
| 420              | 2.14                            | 12/1/97 4:44 PM  |  |
| 430              | 2.12                            | 12/1/97 4:54 PM  |  |

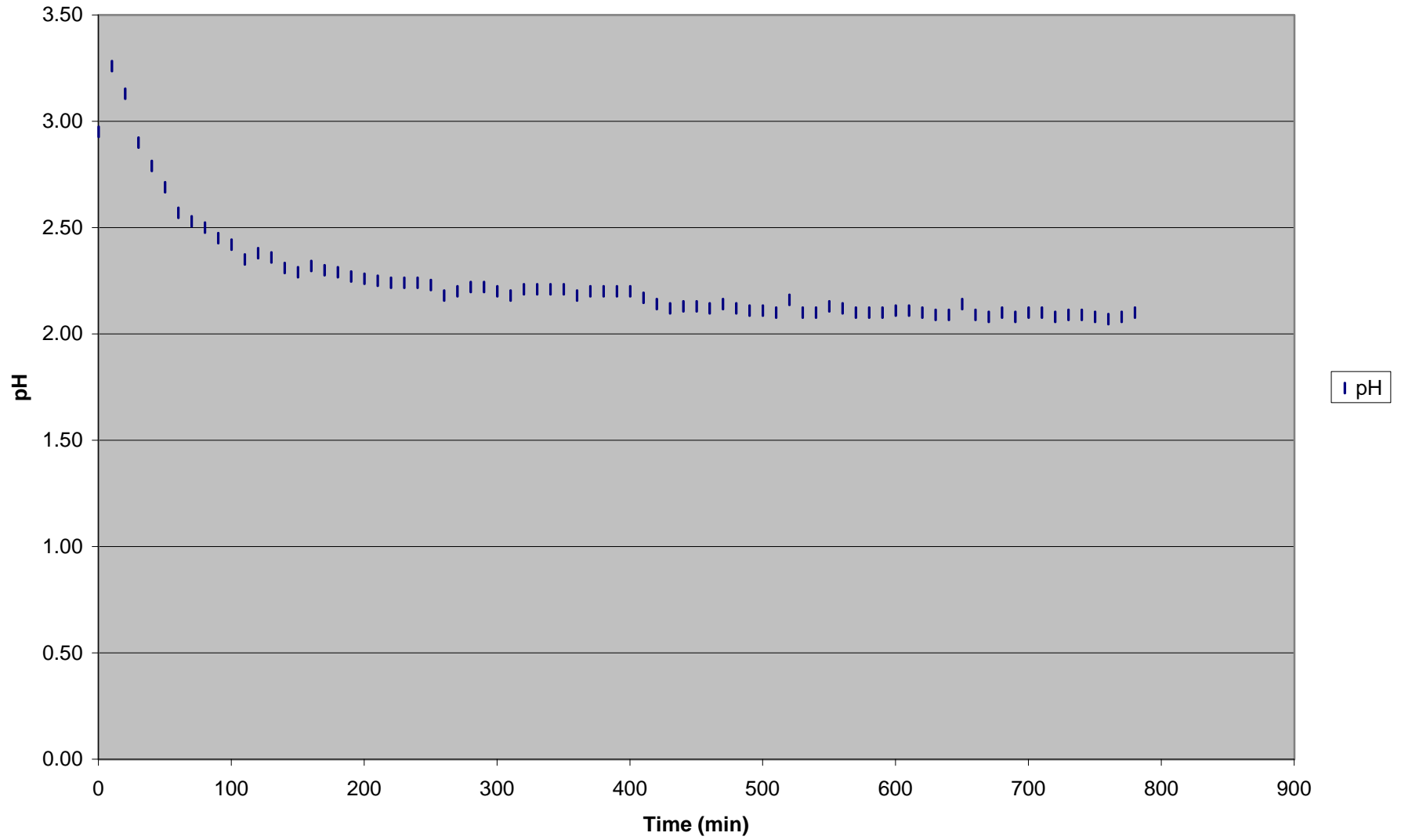
## CA3 pH vs. time

|                  |                                 |                  |  |
|------------------|---------------------------------|------------------|--|
| <b>Run ID:</b>   | CA3                             |                  |  |
| <b>Solids:</b>   | 10 g Test 9 Coarse Coal Fly Ash |                  |  |
| <b>Solvent:</b>  | pH 2 HCl solution               |                  |  |
| <b>Start:</b>    | 9:44 a.m. 12/01/97              |                  |  |
| <b>Stop:</b>     | 10:44 p.m. 12/1/97              |                  |  |
| <b>Duration:</b> | 780 min.                        |                  |  |
|                  |                                 |                  |  |
| <b>Time</b>      | <b>pH</b>                       | <b>Date/Time</b> |  |
| 440              | 2.13                            | 12/1/97 5:04 PM  |  |
| 450              | 2.13                            | 12/1/97 5:14 PM  |  |
| 460              | 2.12                            | 12/1/97 5:24 PM  |  |
| 470              | 2.14                            | 12/1/97 5:34 PM  |  |
| 480              | 2.12                            | 12/1/97 5:44 PM  |  |
| 490              | 2.11                            | 12/1/97 5:54 PM  |  |
| 500              | 2.11                            | 12/1/97 6:04 PM  |  |
| 510              | 2.10                            | 12/1/97 6:14 PM  |  |
| 520              | 2.16                            | 12/1/97 6:24 PM  |  |
| 530              | 2.10                            | 12/1/97 6:34 PM  |  |
| 540              | 2.10                            | 12/1/97 6:44 PM  |  |
| 550              | 2.13                            | 12/1/97 6:54 PM  |  |
| 560              | 2.12                            | 12/1/97 7:04 PM  |  |
| 570              | 2.10                            | 12/1/97 7:14 PM  |  |
| 580              | 2.10                            | 12/1/97 7:24 PM  |  |
| 590              | 2.10                            | 12/1/97 7:34 PM  |  |
| 600              | 2.11                            | 12/1/97 7:44 PM  |  |
| 610              | 2.11                            | 12/1/97 7:54 PM  |  |
| 620              | 2.10                            | 12/1/97 8:04 PM  |  |
| 630              | 2.09                            | 12/1/97 8:14 PM  |  |
| 640              | 2.09                            | 12/1/97 8:24 PM  |  |
| 650              | 2.14                            | 12/1/97 8:34 PM  |  |
| 660              | 2.09                            | 12/1/97 8:44 PM  |  |
| 670              | 2.08                            | 12/1/97 8:54 PM  |  |
| 680              | 2.10                            | 12/1/97 9:04 PM  |  |
| 690              | 2.08                            | 12/1/97 9:14 PM  |  |
| 700              | 2.10                            | 12/1/97 9:24 PM  |  |
| 710              | 2.10                            | 12/1/97 9:34 PM  |  |
| 720              | 2.08                            | 12/1/97 9:44 PM  |  |
| 730              | 2.09                            | 12/1/97 9:54 PM  |  |
| 740              | 2.09                            | 12/1/97 10:04 PM |  |
| 750              | 2.08                            | 12/1/97 10:14 PM |  |
| 760              | 2.07                            | 12/1/97 10:24 PM |  |
| 770              | 2.08                            | 12/1/97 10:34 PM |  |
| 780              | 2.10                            | 12/1/97 10:44 PM |  |

CA3 Analysis Data

| Bottle #   | Empty Wt (g) | Full Weight (g) | Time to Collect (min) | Flow (g/min) | Start Collect | Finish Collect | As    | Cd     | Cr     | Pb     |
|--|--------------|-----------------|-----------------------|--------------|---------------|----------------|-------|--------|--------|--------|
| 1  | 10.572       | 43.152          | 40                    | 0.81         | 1             | 41             | 0.182 | 0.014  | 0.142  | -0.027 |
| 2  | 10.706       | 42.612          | 40                    | 0.80         | 41            | 81             | 0.285 | -0.002 | 0.096  | -0.061 |
| 3  | 10.766       | 42.575          | 40                    | 0.80         | 81            | 121            | 0.190 | -0.007 | 0.054  | -0.060 |
| 4  | 10.981       | 42.814          | 40                    | 0.80         | 121           | 161            | 0.113 | -0.012 | 0.032  | -0.047 |
| 5  | 11.005       | 43.051          | 40                    | 0.80         | 161           | 201            | 0.047 | -0.014 | 0.022  | -0.054 |
| 6  | 10.986       | 44.855          | 42.5                  | 0.80         | 201           | 244            | 0.063 | -0.014 | 0.013  | -0.033 |
| 7  | 10.988       | 42.780          | 40                    | 0.79         | 244           | 284            | 0.067 | -0.019 | 0.008  | -0.038 |
| 8  | 11.116       | 42.955          | 40                    | 0.80         | 284           | 324            | 0.036 | -0.020 | 0.001  | -0.038 |
| 9  | 10.765       | 42.659          | 40                    | 0.80         | 324           | 364            | 0.043 | -0.018 | -0.002 | -0.032 |
| 10 <sup>A</sup>  | 11.063       | 45.073          | 43                    | 0.79         | 736           | 779            | 0.010 | -0.022 | -0.013 | -0.039 |
| <u>Notes</u>   |              |                 |                       |              |               |                |       |        |        |        |
| <sup>A</sup> Some minor accumulation noted on the syringe filter |              |                 |                       |              |               |                |       |        |        |        |

CA3 pH vs. Time



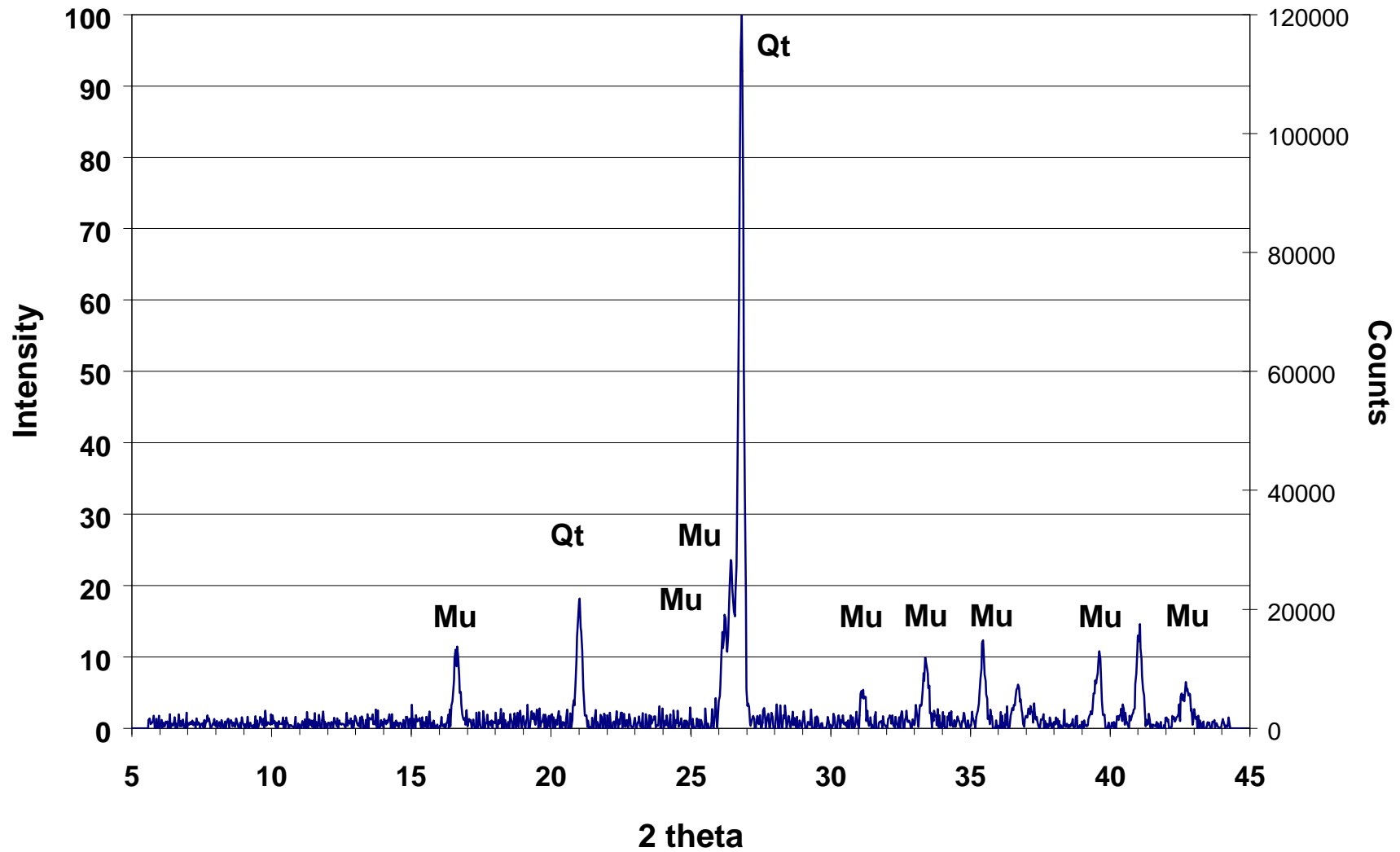


Figure B-1: XRD diffraction pattern of the coarse ash fraction. The coarse fraction of ash contained quartz (Qt) and mullite (Mu). The relative proportion of quartz was greater in the coarse fraction compared with the fine fraction. The y-axis values are presented both as relative peak intensity (left vertical axis) and as raw count data (right vertical axis).

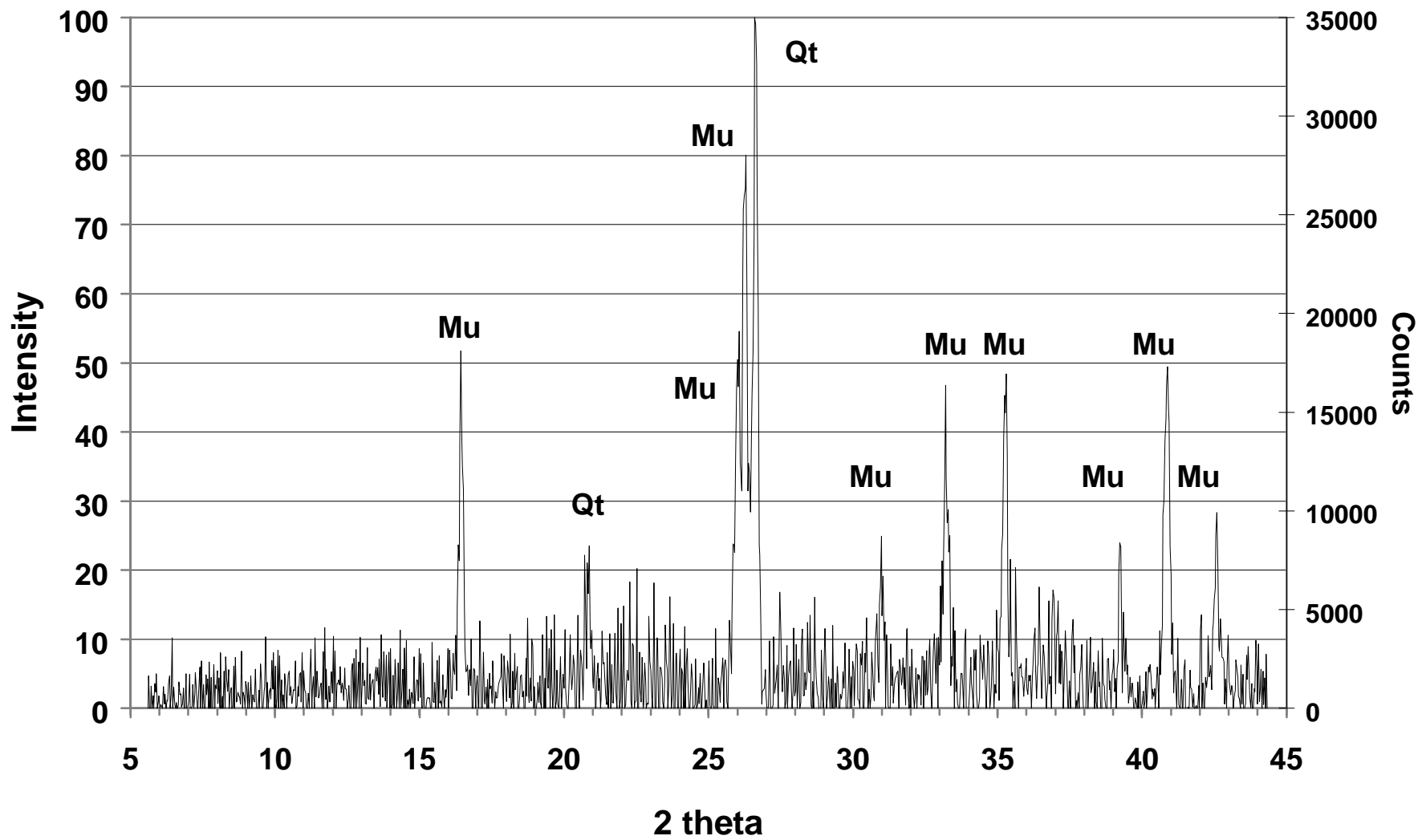


Figure B-2: XRD diffraction pattern of the fine ash fraction. The fine fraction of ash contained quartz (Qt) and mullite (Mu). The relative proportion of mullite was greater in the fine fraction compared with the coarse fraction. The y-axis values are presented both as relative peak intensity (left vertical axis) and as raw count data (right vertical axis).