



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

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SUBJECT: Review of "Monitoring Terrestrial Drift and Run-off Zones for Non-target Plant Response to a Label-rate, Pre-emergence Application of Balance WDG Herbicide to Cornfields," MRID 451290-01, 1188 pp., dated April 28, 2000.

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Conclusions

EFED has classified this study as "Supplemental." The data on concentrations of isoxaflutole (Balance) in run-off are usable. However, the portions of the report that deal with observations of plant toxicity are deeply flawed, and probably cannot be used in other than a qualitative way. EFED rejects Aventis's analysis of the phytotoxicity data.

This study demonstrates that isoxaflutole (Balance herbicide) runs off treated fields in peak concentrations in the range of 3,000 to 50,000 parts-per-trillion. These concentrations exceed the EC₂₅ (effective concentration for vegetative vigor) of 22 ppt by factors of 136x to 2,272x.

EFED is still extremely concerned about the great potential for damage to non-target and endangered plants represented by this level of isoxaflutole in run-off.

Phytotoxicity

Illinois. The conclusions that Aventis has reported on plant toxicity are not supported by the data. The extensive statistical analyses do not include critical observations of phytotoxicity on day 5 in the Illinois study. EFED cannot accept any conclusions based on analyses that unjustifiably exclude critical data.

The greatest observed toxicity, 80% bleaching on day 5 after application, in the two quadrats nearest the field and 40% in quadrats 3 to 10, was discounted (p.22, 86) purportedly due to carry-over of herbicide from the previous growing season. The herbicide allegedly responsible for the damage was never named in the report. Comparison of day 5 chlorosis observations to later days is difficult at best, because the criteria for classifying chlorosis were changed by the "Botany Team Leader" after day 5 (p. 62), resulting in much less attribution of observed symptoms to isoxaflutole exposure.

The EFED reviewer contacted Aventis to ascertain what herbicide was believed to have caused the observed phytotoxicity in the Illinois study. Mr. Michael Dobbs of Aventis, in a June 4, 2001 fax, stated that "the chlorosis was indicative of damage due to atrazine holdover based on the botanist's expertise." However, it is stated on p. 51 that the study soils were analyzed for a list of 24 pesticides, including atrazine, and that none were found in the Illinois study plots. Aventis has not submitted any data to substantiate the presence of atrazine at the Illinois site, nor has it explained how isoxaflutole-induced plant bleaching was distinguished from other causes, if any.

Based on the absence of evidence for atrazine hold-over, the fact that isoxaflutole, a known plant bleacher, was sprayed just five days earlier, and the fact that a rainfall simulation was run on day 2 after application (water promotes the formation and transport of the phytotoxic degradate RPA202248), EFED must conclude that the phytotoxicity observed in Illinois was due to isoxaflutole.

Vegetative data collected after day 14 in Illinois are unreliable due to flooding of the rainfall simulation subplots, and trampling of the plots by cattle.

Iowa. Reference subplots were contaminated by runoff on the rainfall simulation plots. This precludes any comparison of treatment plots to reference plots, which was the entire basis of the statistical analysis presented in the report.

To account for contamination of the reference plots, Aventis excluded contaminated reference plots from the statistical analysis. However, because the contamination of the reference subplots was not directly observed, but inferred after the fact, we cannot be sure which subplots were uncontaminated. Thus, the statistical comparison of treatment and reference plots is invalid.

The results of this study confirm EFED's concern that non-target plants can be harmed by run-off from isoxaflutole-treated fields.

Concentrations in Run-off

Two rainfall simulations were conducted in Illinois, and two in Iowa. Three natural rainfalls also occurred in Iowa. The concentrations of isoxaflutole, RPA202248 and RPA203328

in each bucket of run-off water collected are given in Tables 38 to 41 (IL) and 44 to 51 (IA). The data are summarized graphically in Figures 40 to 48.

Illinois. In the first simulated rainfall, 17 buckets of run-off were collected (Table 38). The sum of the two phytotoxic species (isoxaflutole + 202248) was 504 ppt (23x EC₂₅) in the first bucket, and rose steadily to 16,000 ppt (730x EC₂₅) in the last bucket. In the supernatant water (Table 40), the corresponding numbers were 865 ppt in bucket #1 and 21,300 ppt (967x EC₂₅) in bucket #17.

Concentrations in the second rainfall simulation (Table 39) were somewhat lower, but still well over the EC₂₅. Thirty buckets of run-off were collected. In bucket #1, the sum of isoxaflutole + 202248 was 337 ppt (15x EC₂₅). Bucket #30 had the highest sum, at 3,100 ppt (140x EC₂₅). The corresponding concentrations in supernatant water (Table 41) were 429 ppt in bucket #1 and 3,000 ppt in bucket #30.

It is notable that in both simulations, the concentration was highest in the last bucket collected, and was rising at the time the simulation was terminated. Presumably, a high concentration would have been maintained if the simulation had continued.

Iowa. In the first rainfall simulation (Table 44), the sum (isoxaflutole + 202248) reached a peak of 54,300 ppt (2,468x EC₂₅) in bucket #9 of 30. The sum declined to 37,600 ppt (still 1,709x EC₂₅) in bucket #30. The corresponding supernatant water (Table 48) had peak sums in bucket #9 (51,400 ppt) and #12 (50,700 ppt), with 30,400 ppt in bucket #30.

In the second rainfall simulation (Table 47) a peak of 10,800 ppt (490x EC₂₅) was reached in bucket #4 of 30, with 6,600 ppt in the last bucket (#30). The corresponding peaks in the supernatant water (Table 51) were 11,000 ppt in bucket #4 and 7,700 ppt in bucket #15, with 6,500 ppt in bucket #30.

The first natural rainfall in Iowa (Table 45) yielded a peak sum concentration of 52,000 ppt (2,360x EC₂₅) in bucket #9 of 30, with 35,700 ppt in the last bucket (1,620x EC₂₅). The supernatant water (Table 49) had a peak concentration of 54,000 ppt (2,455x EC₂₅) in bucket #9 of 30, with 36,200 ppt (1,645x EC₂₅) in bucket #30.

The second and third natural rainfalls (Table 46) had a peak concentration of 23,800 ppt in bucket #28 (31,600 ppt in supernatant, Table 50).

Summary of Run-off Data

All concentrations of isoxaflutole + 202248 measured were at least 500 ppt in the first bucket of runoff, and as high as 37,000 ppt (Iowa, first natural rainfall). The concentrations rose quickly to exceed 1,000 ppt in all cases, and to exceed 10,000 ppt in most cases, with sustained concentrations at those levels through the end of simulated and natural rainfalls.

The highest sustained concentrations were in excess of 2,000 times the EC_{25} , and at the Illinois site, were rising at the time the simulations were ended. The EC_{25} was exceeded at all times.

These data definitively show that water, contaminated with isoxaflutole residues at concentrations far in excess of that known to cause adverse effects in non-target plants, runs off treated fields. This is entirely in keeping with what EFED knows about the stability and mobility of this chemical and its degradates, and confirms our predictions.

The observed behavior is also consistent with Aventis's claims that rainfall enhances the activity of isoxaflutole against weeds in the field.

Table 38: Analyte recovery from Illinois runoff water samples from the first rainfall simulation.

Event: Simulated Rain #1
 Substrate: Water
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|-------------|------------|-------------|--------------------------------|-----------|--------------|-----------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | IFT, 248, 328 |
| 02-16368-1 | SR-1 | 1 | 0.286 | 0.218 | <LOQ (0.007) | June4 |
| 02-16368-2 | SR-1 | 2 | 0.380 | 0.253 | <LOQ (0.008) | June4 |
| 02-16368-3 | SR-1 | 3 | 0.369 | 0.194 | <LOQ (0.006) | June4 |
| 02-16368-4 | SR-1 | 4 | 0.424 | 0.272 | <LOQ (0.008) | June4 |
| 02-16368-5 | SR-1 | 5 | 0.524 | 0.354 | 0.010 | June4 |
| 02-16368-6 | SR-1 | 6 | 0.757 | 0.461 | 0.015 | June4 |
| 02-16368-7 | SR-1 | 7 | 0.875 | 0.578 | 0.018 | June7 |
| 02-16368-9 | SR-1 | 9 | 0.880 | 0.575 | 0.018 | June7 |
| 02-16368-10 | SR-1 | 10 | 1.080 | 0.700 | 0.018 | June7 |
| 02-16368-11 | SR-1 | 11 | 1.263 | 0.684 | 0.018 | June7 |
| 02-16368-12 | SR-1 | 12 | 3.134 | 1.719 | 0.047 | June7 |
| 02-16368-13 | SR-1 | 13 | 1.950 | 3.534 | 0.088 | June16, June7, June7 |
| 02-16368-14 | SR-1 | 14 | 2.564 | 1.557 | 0.114 | June16, June16, June7 |
| 02-16368-15 | SR-1 | 15 | 5.492 | 3.213 | 0.154 | June16, June16, June7 |
| 02-16368-16 | SR-1 | 16 | 4.407 | 2.898 | 0.159 | June16, June16, June7 |
| 02-16368-17 | SR-1 | 17 | 9.888 | 6.058 | 0.417 | June16, June16, June7 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 39: Analyte recovery from Illinois runoff water samples from the second rainfall simulation.

Event: Simulated Rain #2
Substrate: Water
Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|-------------|------------|-------------|--------------------------------|-----------|-----------|-------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-31 | SR-2 | 1 | 0.039 | 0.298 | 0.039 | June7 |
| 02-16368-32 | SR-2 | 2 | 0.024 | 0.337 | 0.051 | June7 |
| 02-16368-33 | SR-2 | 3 | 0.039 | 0.455 | 0.068 | June7 |
| 02-16368-34 | SR-2 | 4 | 0.040 | 0.577 | 0.084 | June7 |
| 02-16368-35 | SR-2 | 5 | 0.053 | 0.572 | 0.095 | June7 |
| 02-16368-36 | SR-2 | 6 | 0.065 | 0.821 | 0.103 | June7 |
| 02-16368-37 | SR-2 | 7 | 0.071 | 0.882 | 0.118 | June7 |
| 02-16368-38 | SR-2 | 8 | 0.078 | 0.952 | 0.135 | June7 |
| 02-16368-39 | SR-2 | 9 | 0.080 | 1.033 | 0.150 | June7 |
| 02-16368-40 | SR-2 | 10 | 0.079 | 1.145 | 0.166 | June7 |
| 02-16368-41 | SR-2 | 11 | 0.097 | 1.437 | 0.191 | June7 |
| 02-16368-42 | SR-2 | 12 | 0.095 | 1.467 | 0.233 | June7 |
| 02-16368-43 | SR-2 | 13 | 0.110 | 1.685 | 0.287 | June7 |
| 02-16368-44 | SR-2 | 14 | 0.094 | 1.684 | 0.283 | June7 |
| 02-16368-45 | SR-2 | 15 | 0.101 | 1.579 | 0.249 | June7 |
| 02-16368-46 | SR-2 | 16 | 0.099 | 1.793 | 0.305 | June7 |
| 02-16368-47 | SR-2 | 17 | 0.093 | 1.684 | 0.282 | June7 |
| 02-16368-48 | SR-2 | 18 | 0.105 | 1.732 | 0.298 | June7 |
| 02-16368-49 | SR-2 | 19 | 0.103 | 1.698 | 0.305 | June7 |
| 02-16368-50 | SR-2 | 20 | 0.108 | 1.733 | 0.320 | June7 |
| 02-16368-51 | SR-2 | 21 | 0.105 | 1.747 | 0.314 | June7 |
| 02-16368-52 | SR-2 | 22 | 0.110 | 1.745 | 0.334 | June7 |
| 02-16368-53 | SR-2 | 23 | 0.112 | 1.913 | 0.354 | June7 |
| 02-16368-54 | SR-2 | 24 | 0.119 | 1.966 | 0.354 | June7 |
| 02-16368-55 | SR-2 | 25 | 0.105 | 2.002 | 0.369 | June7 |
| 02-16368-56 | SR-2 | 26 | 0.118 | 2.012 | 0.386 | June7 |
| 02-16368-57 | SR-2 | 27 | 0.121 | 2.011 | 0.379 | June7 |
| 02-16368-58 | SR-2 | 28 | 0.114 | 1.861 | 0.363 | June7 |
| 02-16368-59 | SR-2 | 29 | 0.101 | 1.825 | 0.356 | June7 |
| 02-16368-60 | SR-2 | 30 | 0.166 | 2.527 | 0.626 | June7 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 40: Analyte recovery from Illinois runoff supernatant samples from the first rainfall simulation.

Event: Simulated Rain #1
 Substrate: Supernatant
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|---------------|------------|-------------|--------------------------------|-----------|-----------|------------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-1125 | SR-1 | 1 | 0.259 | 0.606 | 0.010 | June4 |
| 02-16368-1126 | SR-1 | 2 | 0.313 | 0.584 | 0.011 | June4 |
| 02-16368-1127 | SR-1 | 3 | 0.282 | 0.665 | 0.012 | June4 |
| 02-16368-1128 | SR-1 | 4 | 0.263 | 0.654 | 0.012 | June4 |
| 02-16368-1129 | SR-1 | 5 | 0.286 | 0.744 | 0.014 | June4 |
| 02-16368-1130 | SR-1 | 6 | 0.415 | 1.101 | 0.020 | June4 |
| 02-16368-1131 | SR-1 | 7 | 0.506 | 1.267 | 0.020 | June10 |
| 02-16368-1133 | SR-1 | 9 | 0.444 | 1.498 | 0.022 | June10 |
| 02-16368-1134 | SR-1 | 10 | 0.523 | 1.478 | 0.023 | June10 |
| 02-16368-1135 | SR-1 | 11 | 0.481 | 1.402 | 0.022 | June10 |
| 02-16368-1136 | SR-1 | 12 | 1.945 | 3.379 | 0.056 | June10 |
| 02-16368-1137 | SR-1 | 13 | 2.825 | 2.320 | 0.106 | June10, June16, June10 |
| 02-16368-1138 | SR-1 | 14 | 2.174 | 3.834 | 0.138 | June16, June16, June10 |
| 02-16368-1139 | SR-1 | 15 | 2.248 | 4.734 | 0.179 | June16, June16, June10 |
| 02-16368-1140 | SR-1 | 16 | 2.979 | 7.131 | 0.147 | June16, June16, June10 |
| 02-16368-1141 | SR-1 | 17 | 9.665 | 11.614 | 0.294 | June16, June16, June10 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 41: Analyte recovery from Illinois runoff supernatant samples from the second rainfall simulation.

Event: Simulated Rain #2
 Substrate: Supernatant
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|---------------|------------|-------------|--------------------------------|-----------|-----------|-------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-1155 | SR-2 | 1 | 0.054 | 0.375 | 0.043 | June10 |
| 02-16368-1156 | SR-2 | 2 | 0.047 | 0.423 | 0.055 | June10 |
| 02-16368-1157 | SR-2 | 3 | 0.031 | 0.552 | 0.074 | June10 |
| 02-16368-1158 | SR-2 | 4 | 0.021 | 0.475 | 0.067 | June10 |
| 02-16368-1159 | SR-2 | 5 | 0.023 | 0.517 | 0.072 | June10 |
| 02-16368-1160 | SR-2 | 6 | 0.021 | 0.490 | 0.070 | June10 |
| 02-16368-1161 | SR-2 | 7 | 0.036 | 0.801 | 0.108 | June10 |
| 02-16368-1162 | SR-2 | 8 | 0.037 | 0.814 | 0.117 | June10 |
| 02-16368-1163 | SR-2 | 9 | 0.036 | 0.813 | 0.115 | June10 |
| 02-16368-1164 | SR-2 | 10 | 0.041 | 0.969 | 0.144 | June10 |
| 02-16368-1165 | SR-2 | 11 | 0.049 | 1.188 | 0.190 | June10 |
| 02-16368-1166 | SR-2 | 12 | 0.059 | 1.295 | 0.211 | June10 |
| 02-16368-1167 | SR-2 | 13 | 0.056 | 1.366 | 0.223 | June10 |
| 02-16368-1168 | SR-2 | 14 | 0.033 | 0.971 | 0.168 | June10 |
| 02-16368-1169 | SR-2 | 15 | 0.041 | 1.227 | 0.215 | June10 |
| 02-16368-1170 | SR-2 | 16 | 0.062 | 1.584 | 0.277 | June10 |
| 02-16368-1171 | SR-2 | 17 | 0.076 | 1.856 | 0.333 | June10 |
| 02-16368-1172 | SR-2 | 18 | 0.077 | 1.770 | 0.320 | June10 |
| 02-16368-1173 | SR-2 | 19 | 0.078 | 1.674 | 0.306 | June10 |
| 02-16368-1174 | SR-2 | 20 | 0.058 | 1.335 | 0.238 | June10 |
| 02-16368-1175 | SR-2 | 21 | 0.049 | 1.303 | 0.248 | June10 |
| 02-16368-1176 | SR-2 | 22 | 0.066 | 1.528 | 0.288 | June10 |
| 02-16368-1177 | SR-2 | 23 | 0.072 | 1.899 | 0.356 | June10 |
| 02-16368-1178 | SR-2 | 24 | 0.077 | 1.926 | 0.358 | June10 |
| 02-16368-1179 | SR-2 | 25 | 0.079 | 1.953 | 0.365 | June10 |
| 02-16368-1180 | SR-2 | 26 | 0.068 | 1.579 | 0.296 | June10 |
| 02-16368-1181 | SR-2 | 27 | 0.057 | 1.407 | 0.263 | June10 |
| 02-16368-1182 | SR-2 | 28 | 0.067 | 1.540 | 0.289 | June10 |
| 02-16368-1183 | SR-2 | 29 | 0.067 | 1.769 | 0.340 | June10 |
| 02-16368-1184 | SR-2 | 30 | 0.140 | 2.869 | 0.562 | June10 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 44. Analyte recovery from Iowa runoff water samples from the first rainfall simulation.

Event: Simulated Rain #1
 Substrate: Water
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|--------------|------------|-------------|--------------------------------|-----------|-----------|----------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | IFT, 248, 328 |
| 02-16368-541 | SR-1 | 1 | 0.540 | 0.995 | 0.035 | July8, July8, June29 |
| 02-16368-542 | SR-1 | 2 | 1.480 | 2.260 | 0.076 | July8, July8, June29 |
| 02-16368-543 | SR-1 | 3 | 3.400 | 5.340 | 0.227 | July8, July8, June29 |
| 02-16368-544 | SR-1 | 4 | 4.400 | 7.900 | 0.325 | July8, July8, June29 |
| 02-16368-545 | SR-1 | 5 | 6.300 | 9.550 | 0.411 | July8, July8, June29 |
| 02-16368-546 | SR-1 | 6 | 14.000 | 22.200 | 1.076 | July8, July8, June29 |
| 02-16368-547 | SR-1 | 7 | 20.800 | 29.400 | 1.353 | July8, July8, June29 |
| 02-16368-548 | SR-1 | 8 | 23.500 | 28.600 | 1.443 | July8, July8, June29 |
| 02-16368-549 | SR-1 | 9 | 24.400 | 29.900 | 1.468 | July8, July8, June29 |
| 02-16368-550 | SR-1 | 10 | 23.500 | 29.200 | 1.458 | July8, July8, June29 |
| 02-16368-551 | SR-1 | 11 | 21.700 | 26.700 | 1.369 | July8, July8, June29 |
| 02-16368-552 | SR-1 | 12 | 18.000 | 20.100 | 0.983 | July8, July8, June29 |
| 02-16368-553 | SR-1 | 13 | 21.800 | 24.200 | 1.249 | July8, July8, June29 |
| 02-16368-554 | SR-1 | 14 | 20.000 | 25.500 | 1.209 | July8, July8, June29 |
| 02-16368-555 | SR-1 | 15 | 17.700 | 20.200 | 0.917 | July8, July8, June29 |
| 02-16368-556 | SR-1 | 16 | 20.300 | 23.900 | 1.129 | July8, July8, June29 |
| 02-16368-557 | SR-1 | 17 | 20.200 | 23.400 | 1.123 | July8, July8, June29 |
| 02-16368-558 | SR-1 | 18 | 20.900 | 22.200 | 1.072 | July8, July8, June29 |
| 02-16368-559 | SR-1 | 19 | 19.100 | 21.600 | 1.017 | July8, July8, June29 |
| 02-16368-560 | SR-1 | 20 | 17.900 | 19.100 | 0.904 | July8, July8, June29 |
| 02-16368-561 | SR-1 | 21 | 17.600 | 18.300 | 0.824 | July8, July8, June29 |
| 02-16368-562 | SR-1 | 22 | 17.100 | 18.000 | 0.773 | July8, July8, June29 |
| 02-16368-563 | SR-1 | 23 | 17.400 | 19.400 | 0.878 | July8, July8, June29 |
| 02-16368-564 | SR-1 | 24 | 17.000 | 19.700 | 0.900 | July8, July8, June29 |
| 02-16368-565 | SR-1 | 25 | 17.400 | 18.000 | 0.777 | July8, July8, June29 |
| 02-16368-566 | SR-1 | 26 | 15.900 | 19.100 | 0.794 | July8, July8, June29 |
| 02-16368-567 | SR-1 | 27 | 17.000 | 18.300 | 0.781 | July8, July8, June29 |
| 02-16368-568 | SR-1 | 28 | 15.900 | 18.500 | 0.747 | July8, July8, June29 |
| 02-16368-569 | SR-1 | 29 | 15.400 | 17.900 | 0.753 | July8, July8, June29 |
| 02-16368-570 | SR-1 | 30 | 18.700 | 18.900 | 0.788 | July8, July8, June29 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 45 Analyte recovery from Iowa runoff water samples from the first natural rainfall event.

Event: Natural Rain
#1
Substrate: Water
Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) IFT, 248, 328 |
|--------------|------------|-------------|--------------------------------|-----------|-----------|------------------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-601 | NR-1 | 1 | 3.428 | 34.090 | 3.273 | July13, July19, July13 |
| 02-16368-602 | NR-1 | 2 | 3.436 | 37.160 | 3.409 | July13, July19, July13 |
| 02-16368-603 | NR-1 | 3 | 3.513 | 37.170 | 3.440 | July13, July19, July13 |
| 02-16368-604 | NR-1 | 4 | 3.534 | 36.980 | 3.359 | July13, July19, July13 |
| 02-16368-605 | NR-1 | 5 | 4.680 | 39.520 | 3.760 | July19, July19, July19 |
| 02-16368-606 | NR-1 | 6 | 4.370 | 40.260 | 3.944 | July19, July19, July13 |
| 02-16368-607 | NR-1 | 7 | 3.752 | 40.140 | 3.791 | July13, July19, July13 |
| 02-16368-608 | NR-1 | 8 | 3.820 | 36.960 | 3.505 | July13, July19, July13 |
| 02-16368-609 | NR-1 | 9 | 4.890 | 47.120 | 4.490 | July19, July19, July19 |
| 02-16368-610 | NR-1 | 10 | 3.781 | 44.680 | 4.100 | July13, July19, July19 |
| 02-16368-611 | NR-1 | 11 | 3.659 | 38.600 | 3.772 | July13, July19, July13 |
| 02-16368-612 | NR-1 | 12 | 3.748 | 38.150 | 3.600 | July13, July19, July13 |
| 02-16368-613 | NR-1 | 13 | 3.242 | 30.040 | 2.898 | July13, July19, July13 |
| 02-16368-614 | NR-1 | 14 | 3.317 | 28.120 | 2.581 | July13, July19, July13 |
| 02-16368-615 | NR-1 | 15 | 3.256 | 26.260 | 2.505 | July13, July19, July13 |
| 02-16368-616 | NR-1 | 16 | 3.143 | 23.600 | 2.275 | July13, July19, July13 |
| 02-16368-617 | NR-1 | 17 | 3.350 | 23.280 | 2.253 | July13, July19, July13 |
| 02-16368-618 | NR-1 | 18 | 3.278 | 24.040 | 2.289 | July13, July19, July13 |
| 02-16368-619 | NR-1 | 19 | 3.683 | 25.770 | 2.503 | July13, July19, July13 |
| 02-16368-620 | NR-1 | 20 | 4.690 | 32.430 | 3.127 | July19, July19, July13 |
| 02-16368-621 | NR-1 | 21 | 4.440 | 39.670 | 3.870 | July19, July19, July13 |
| 02-16368-622 | NR-1 | 22 | 3.802 | 37.990 | 3.569 | July13, July19, July13 |
| 02-16368-623 | NR-1 | 23 | 3.526 | 35.230 | 3.236 | July13, July19, July13 |
| 02-16368-624 | NR-1 | 24 | 3.319 | 38.240 | 3.487 | July13, July19, July13 |
| 02-16368-625 | NR-1 | 25 | 3.799 | 36.050 | 3.374 | July13, July19, July13 |
| 02-16368-626 | NR-1 | 26 | 3.742 | 35.620 | 3.381 | July13, July19, July13 |
| 02-16368-627 | NR-1 | 27 | 3.739 | 35.990 | 3.426 | July13, July19, July13 |
| 02-16368-628 | NR-1 | 28 | 3.657 | 35.520 | 3.430 | July13, July19, July13 |
| 02-16368-629 | NR-1 | 29 | 3.895 | 34.590 | 3.365 | July13, July19, July13 |
| 02-16368-630 | NR-1 | 30 | 3.542 | 32.180 | 3.093 | July13, July19, July13 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 46: Analyte recovery from Iowa runoff water samples from the second and third natural rainfall event.

Event: Natural Rain #2 and 3
Substrate: Water
Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|--------------|------------|-------------|--------------------------------|-----------|-----------|-----------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | IFT, 248, 328 |
| 02-16368-631 | NR-2 | 1 | 0.319 | 5.780 | 0.709 | July27, Aug2a, July27 |
| 02-16368-632 | NR-2 | 2 | 0.785 | 9.640 | 1.150 | July27, Aug2a, July27 |
| 02-16368-633 | NR-2 | 3 | 0.996 | 8.200 | 1.176 | July27, Aug2a, July27 |
| 02-16368-634 | NR-2 | 4 | 0.829 | 8.160 | 0.921 | July27, Aug2a, July27 |
| 02-16368-635 | NR-2 | 5 | 0.717 | 5.960 | 0.825 | July27, Aug2a, July27 |
| 02-16368-636 | NR-2 | 6 | 0.720 | 6.120 | 0.766 | July27, Aug2a, July27 |
| 02-16368-637 | NR-2 | 7 | 0.794 | 5.760 | 0.672 | July27, Aug2a, July27 |
| 02-16368-638 | NR-2 | 8 | 1.029 | 6.200 | 0.765 | July27, Aug2a, July27 |
| 02-16368-639 | NR-2 | 9 | 0.964 | 7.360 | 0.887 | July27, Aug2a, July27 |
| 02-16368-640 | NR-2 | 10 | 0.793 | 10.210 | 0.825 | July27, Aug2a, July27 |
| 02-16368-641 | NR-2 | 11 | 0.892 | 12.960 | 1.243 | July27, Aug2a, July27 |
| 02-16368-642 | NR-2 | 12 | 0.796 | 10.410 | 1.577 | July27, Aug2a, July27 |
| 02-16368-643 | NR-2 | 13 | 0.619 | 7.490 | 1.158 | July27, Aug2a, July27 |
| 02-16368-644 | NR-2 | 14 | 0.417 | 6.390 | 0.571 | July27, Aug2a, July27 |
| 02-16368-645 | NR-2 | 15 | 0.951 | 5.610 | 1.313 | July27, Aug2a, July27 |
| 02-16368-646 | NR-2 | 16 | 0.909 | 6.220 | 1.007 | July27, Aug2a, July27 |
| 02-16368-647 | NR-2 | 17 | 0.524 | 6.160 | 0.627 | July27, Aug2a, July27 |
| 02-16368-648 | NR-2 | 18 | 0.622 | 6.300 | 0.816 | July27, Aug2a, July27 |
| 02-16368-649 | NR-2 | 19 | 0.550 | 5.860 | 0.652 | July27, Aug2a, July27 |
| 02-16368-650 | NR-2 | 20 | 0.670 | 6.900 | 0.774 | July27, Aug2a, July27 |
| 02-16368-651 | NR-2 | 21 | 0.688 | 7.320 | 0.896 | July27, Aug2a, July27 |
| 02-16368-652 | NR-2 | 22 | 1.075 | 8.750 | 1.196 | July27, Aug2a, July27 |
| 02-16368-653 | NR-2 | 23 | 1.007 | 10.820 | 1.434 | July27, Aug2a, July27 |
| 02-16368-654 | NR-2 | 24 | 0.997 | 13.930 | 1.663 | July27, Aug2a, July27 |
| 02-16368-655 | NR-2 | 25 | 1.066 | 13.670 | 1.871 | July27, Aug2a, July27 |
| 02-16368-656 | NR-2 | 26 | 1.023 | 15.990 | 1.630 | July27, Aug2a, July27 |
| 02-16368-657 | NR-2 | 27 | 1.180 | 19.110 | 2.006 | July27, Aug2a, July27 |
| 02-16368-658 | NR-2 | 28 | 1.317 | 22.500 | 2.865 | July27, Aug2a, July27 |
| 02-16368-661 | NR-3 | 1 | 0.271 | 7.410 | 1.830 | July27, Aug2a, Aug2a |
| 02-16368-662 | NR-3 | 2 | 0.115 | 25.090 | 2.068 | July27, Aug2a, July27 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 47: Analyte recovery from Iowa runoff water samples from the second rainfall simulation.

Event: Simulated Rain #2
 Substrate: Water
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|--------------|------------|-------------|--------------------------------|-----------|-----------|--------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | IFT, '248, '328 |
| 02-16368-571 | SR-2 | 1 | 0.054 | 7.410 | 3.247 | Aug2b, Aug5, Aug2b |
| 02-16368-572 | SR-2 | 2 | 0.060 | 6.830 | 2.507 | Aug2b, Aug5, Aug2b |
| 02-16368-573 | SR-2 | 3 | 0.095 | 10.250 | 3.751 | Aug2b, Aug5, Aug2b |
| 02-16368-574 | SR-2 | 4 | 0.108 | 10.750 | 3.753 | Aug2b, Aug5, Aug2b |
| 02-16368-575 | SR-2 | 5 | 0.122 | 10.650 | 3.753 | Aug2b, Aug5, Aug2b |
| 02-16368-576 | SR-2 | 6 | 0.120 | 10.290 | 3.537 | Aug2b, Aug5, Aug2b |
| 02-16368-577 | SR-2 | 7 | 0.120 | 8.000 | 2.621 | Aug2b, Aug5, Aug2b |
| 02-16368-578 | SR-2 | 8 | 0.123 | 8.140 | 2.859 | Aug2b, Aug5, Aug2b |
| 02-16368-579 | SR-2 | 9 | 0.095 | 7.740 | 2.600 | Oct7, Aug5, Aug5 |
| 02-16368-580 | SR-2 | 10 | 0.121 | 8.370 | 3.044 | Aug2b, Aug5, Aug2b |
| 02-16368-581 | SR-2 | 11 | 0.113 | 8.100 | 3.061 | Aug2b, Aug5, Aug2b |
| 02-16368-582 | SR-2 | 12 | 0.105 | 7.730 | 2.885 | Aug2b, Aug5, Aug2b |
| 02-16368-583 | SR-2 | 13 | 0.083 | 8.800 | 2.209 | Aug2b, Oct7, Aug2b |
| 02-16368-584 | SR-2 | 14 | 0.113 | 7.300 | 2.874 | Aug2b, Oct7, Aug2b |
| 02-16368-585 | SR-2 | 15 | 0.099 | 6.890 | 2.551 | Aug2b, Aug5, Aug2b |
| 02-16368-586 | SR-2 | 16 | 0.113 | 7.130 | 2.795 | Aug2b, Aug5, Aug2b |
| 02-16368-587 | SR-2 | 17 | 0.104 | 6.800 | 2.731 | Aug2b, Aug5, Aug2b |
| 02-16368-588 | SR-2 | 18 | 0.104 | 6.700 | 2.600 | Aug2b, Aug5, Aug5 |
| 02-16368-589 | SR-2 | 19 | 0.120 | 6.640 | 2.656 | Aug2b, Aug5, Aug2b |
| 02-16368-590 | SR-2 | 20 | 0.094 | 4.570 | 2.588 | Aug2b, Aug5, Aug2b |
| 02-16368-591 | SR-2 | 21 | 0.108 | 6.330 | 2.490 | Aug2b, Aug5, Aug2b |
| 02-16368-592 | SR-2 | 22 | 0.073 | 6.180 | 1.793 | Aug2b, Aug5, Aug2b |
| 02-16368-593 | SR-2 | 23 | 0.091 | 6.150 | 2.515 | Aug2b, Aug5, Aug2b |
| 02-16368-594 | SR-2 | 24 | 0.103 | 6.100 | 2.481 | Aug2b, Aug5, Aug2b |
| 02-16368-595 | SR-2 | 25 | 0.109 | 5.800 | 2.490 | Aug2b, Aug5, Aug2b |
| 02-16368-596 | SR-2 | 26 | 0.091 | 5.870 | 2.401 | Aug2b, Aug5, Aug2b |
| 02-16368-597 | SR-2 | 27 | 0.103 | 5.760 | 2.374 | Aug2b, Aug5, Aug2b |
| 02-16368-598 | SR-2 | 28 | 0.086 | 5.710 | 2.324 | Aug2b, Aug5, Aug2b |
| 02-16368-599 | SR-2 | 29 | 0.088 | 5.600 | 2.391 | Aug2b, Aug5, Aug2b |
| 02-16368-600 | SR-2 | 30 | 0.098 | 6.500 | 2.695 | Aug2b, Aug5, Aug2b |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 48: Analyte recovery from Iowa runoff supernatant samples from the first rainfall simulation.

Event: Simulated Rain #1
Substrate: Supernatant
Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) |
|---------------|------------|-------------|--------------------------------|-----------|-----------|----------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | IFT, 248, 328 |
| 02-16368-1485 | SR-1 | 1 | 0.360 | 1.080 | 0.035 | July8, July8, June30 |
| 02-16368-1486 | SR-1 | 2 | 0.990 | 2.590 | 0.080 | July8, July8, June30 |
| 02-16368-1487 | SR-1 | 3 | 2.100 | 6.040 | 0.235 | July8, July8, June30 |
| 02-16368-1488 | SR-1 | 4 | 3.050 | 8.600 | 0.333 | July8, July8, June30 |
| 02-16368-1489 | SR-1 | 5 | 4.650 | 11.950 | 0.504 | July8, July8, June30 |
| 02-16368-1490 | SR-1 | 6 | 9.800 | 23.800 | 1.130 | July8, July8, June30 |
| 02-16368-1491 | SR-1 | 7 | 15.800 | 31.700 | 1.464 | July8, July8, June30 |
| 02-16368-1492 | SR-1 | 8 | 16.500 | 33.700 | 1.506 | July8, July8, June30 |
| 02-16368-1493 | SR-1 | 9 | 18.400 | 33.000 | 1.490 | July8, July8, June30 |
| 02-16368-1494 | SR-1 | 10 | 19.500 | 30.800 | 1.423 | July8, July8, June30 |
| 02-16368-1495 | SR-1 | 11 | 18.600 | 31.200 | 1.417 | July8, July8, June30 |
| 02-16368-1496 | SR-1 | 12 | 20.100 | 30.600 | 1.334 | July8, July8, June30 |
| 02-16368-1497 | SR-1 | 13 | 15.700 | 29.300 | 1.311 | July8, July8, Aug28 |
| 02-16368-1498 | SR-1 | 14 | 16.400 | 28.600 | 1.239 | July8, July8, June30 |
| 02-16368-1499 | SR-1 | 15 | 14.900 | 28.800 | 1.216 | July8, July8, June30 |
| 02-16368-1500 | SR-1 | 16 | 15.600 | 24.500 | 1.054 | July8, July8, June30 |
| 02-16368-1501 | SR-1 | 17 | 12.900 | 26.400 | 1.056 | July8, July8, June30 |
| 02-16368-1502 | SR-1 | 18 | 12.400 | 26.600 | 1.060 | July8, July8, June30 |
| 02-16368-1503 | SR-1 | 19 | 14.600 | 24.700 | 1.044 | July8, July8, June30 |
| 02-16368-1504 | SR-1 | 20 | 14.300 | 23.800 | 1.025 | July8, July8, June30 |
| 02-16368-1505 | SR-1 | 21 | 12.900 | 26.500 | 0.983 | July8, July8, June30 |
| 02-16368-1506 | SR-1 | 22 | 11.500 | 25.200 | 0.927 | July8, July8, June30 |
| 02-16368-1507 | SR-1 | 23 | 15.000 | 21.900 | 0.889 | July8, July8, June30 |
| 02-16368-1508 | SR-1 | 24 | 13.600 | 22.700 | 0.887 | July8, July8, June30 |
| 02-16368-1509 | SR-1 | 25 | 14.200 | 22.100 | 0.855 | July8, July8, June30 |
| 02-16368-1510 | SR-1 | 26 | 12.500 | 22.200 | 0.833 | July8, July8, June30 |
| 02-16368-1511 | SR-1 | 27 | 13.000 | 21.500 | 0.848 | July8, July8, June30 |
| 02-16368-1512 | SR-1 | 28 | 13.200 | 20.600 | 0.805 | July8, July8, June30 |
| 02-16368-1513 | SR-1 | 29 | 12.800 | 19.900 | 0.765 | July8, July8, June30 |
| 02-16368-1514 | SR-1 | 30 | 10.200 | 20.200 | 0.893 | July8, July8, June30 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 49: Analyte recovery from Iowa runoff supernatant samples from the first natural rainfall event.

Event: Natural Rain #1
Substrate: Supernatant
Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) IFT, 248, 328 |
|---------------|------------|-------------|--------------------------------|-----------|-----------|------------------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-1545 | NR-1 | 1 | 1.920 | 34.660 | 3.130 | Aug2 |
| 02-16368-1546 | NR-1 | 2 | 1.800 | 33.600 | 3.100 | Aug2 |
| 02-16368-1547 | NR-1 | 3 | 2.530 | 28.970 | 2.600 | Aug2 |
| 02-16368-1548 | NR-1 | 4 | 3.400 | 36.500 | 3.340 | Aug2 |
| 02-16368-1549 | NR-1 | 5 | 3.630 | 38.590 | 3.620 | Aug2 |
| 02-16368-1550 | NR-1 | 6 | 3.690 | 40.780 | 3.980 | Aug2 |
| 02-16368-1551 | NR-1 | 7 | 3.080 | 40.310 | 3.760 | Aug2 |
| 02-16368-1552 | NR-1 | 8 | 3.810 | 40.530 | 3.890 | Aug2 |
| 02-16368-1553 | NR-1 | 9 | 4.720 | 49.450 | 4.580 | Aug2 |
| 02-16368-1554 | NR-1 | 10 | 3.430 | 44.560 | 4.230 | Aug2 |
| 02-16368-1555 | NR-1 | 11 | 3.350 | 41.000 | 3.750 | Aug2 |
| 02-16368-1556 | NR-1 | 12 | 3.700 | 35.630 | 3.320 | Aug2 |
| 02-16368-1557 | NR-1 | 13 | 2.300 | 30.590 | 2.760 | Aug2 |
| 02-16368-1558 | NR-1 | 14 | 2.100 | 27.280 | 2.550 | Aug2 |
| 02-16368-1559 | NR-1 | 15 | 2.660 | 26.900 | 2.530 | Aug2 |
| 02-16368-1560 | NR-1 | 16 | 2.010 | 24.140 | 2.180 | Aug2 |
| 02-16368-1561 | NR-1 | 17 | 1.700 | 18.020 | 1.670 | Aug2 |
| 02-16368-1562 | NR-1 | 18 | 1.830 | 16.850 | 1.520 | Aug2 |
| 02-16368-1563 | NR-1 | 19 | 2.580 | 24.330 | 2.290 | Aug2 |
| 02-16368-1564 | NR-1 | 20 | 3.450 | 33.200 | 3.070 | Aug2 |
| 02-16368-1565 | NR-1 | 21 | 3.860 | 41.260 | 3.600 | Aug2 |
| 02-16368-1566 | NR-1 | 22 | 2.550 | 33.180 | 2.970 | Aug2 |
| 02-16368-1567 | NR-1 | 23 | 2.920 | 32.480 | 2.850 | Aug2 |
| 02-16368-1568 | NR-1 | 24 | 2.960 | 37.960 | 3.400 | Aug2 |
| 02-16368-1569 | NR-1 | 25 | 2.990 | 34.510 | 3.200 | Aug2 |
| 02-16368-1570 | NR-1 | 26 | 3.290 | 36.320 | 3.370 | Aug2 |
| 02-16368-1571 | NR-1 | 27 | 3.090 | 38.690 | 3.460 | Aug2 |
| 02-16368-1572 | NR-1 | 28 | 3.460 | 37.960 | 3.200 | Aug5 |
| 02-16368-1573 | NR-1 | 29 | 2.770 | 33.790 | 2.990 | Aug2 |
| 02-16368-1574 | NR-1 | 30 | 3.150 | 33.050 | 3.030 | Aug2 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 50. Analyte recovery from Iowa runoff supernatant samples from the second and third natural rainfall event.

Event: Natural Rain #2 and 3
 Substrate: Supernatant
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) IFT, 248, 328 |
|---------------|------------|-------------|--------------------------------|-----------|-----------|------------------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-1575 | NR-2 | 1 | 0.232 | 7.302 | 0.734 | Aug30 |
| 02-16368-1576 | NR-2 | 2 | 0.576 | 11.424 | 1.060 | Aug30 |
| 02-16368-1577 | NR-2 | 3 | 0.856 | 12.564 | 1.140 | Aug30 |
| 02-16368-1578 | NR-2 | 4 | 0.532 | 9.396 | 0.846 | Aug30 |
| 02-16368-1579 | NR-2 | 5 | 0.394 | 8.182 | 0.704 | Aug30 |
| 02-16368-1580 | NR-2 | 6 | 0.546 | 8.096 | 0.678 | Aug30 |
| 02-16368-1581 | NR-2 | 7 | 0.628 | 7.746 | 0.664 | Aug30 |
| 02-16368-1582 | NR-2 | 8 | 0.790 | 7.444 | 0.670 | Aug30 |
| 02-16368-1583 | NR-2 | 9 | 0.944 | 10.456 | 1.006 | Aug30 |
| 02-16368-1584 | NR-2 | 10 | 0.968 | 11.808 | 1.224 | Aug30 |
| 02-16368-1585 | NR-2 | 11 | 1.088 | 15.196 | 1.622 | Aug30 |
| 02-16368-1586 | NR-2 | 12 | 0.634 | 12.036 | 1.380 | Aug30 |
| 02-16368-1587 | NR-2 | 13 | 0.524 | 9.306 | 1.002 | Aug30 |
| 02-16368-1588 | NR-2 | 14 | 0.468 | 8.734 | 0.872 | Aug30 |
| 02-16368-1589 | NR-2 | 15 | 0.634 | 8.478 | 0.902 | Aug30 |
| 02-16368-1590 | NR-2 | 16 | 0.524 | 8.832 | 0.854 | Aug30 |
| 02-16368-1591 | NR-2 | 17 | 0.642 | 8.302 | 0.850 | Aug30 |
| 02-16368-1592 | NR-2 | 18 | 0.568 | 8.276 | 0.828 | Aug30 |
| 02-16368-1593 | NR-2 | 19 | 0.616 | 7.876 | 0.808 | Aug30 |
| 02-16368-1594 | NR-2 | 20 | 0.606 | 8.536 | 0.874 | Aug30 |
| 02-16368-1595 | NR-2 | 21 | 0.720 | 8.508 | 0.954 | Aug30 |
| 02-16368-1596 | NR-2 | 22 | 0.938 | 10.088 | 1.146 | Aug30 |
| 02-16368-1597 | NR-2 | 23 | 1.072 | 12.342 | 1.386 | Aug30 |
| 02-16368-1598 | NR-2 | 24 | 1.094 | 15.758 | 1.800 | Aug30 |
| 02-16368-1599 | NR-2 | 25 | 0.978 | 14.972 | 1.710 | Aug30 |
| 02-16368-1600 | NR-2 | 26 | 1.116 | 17.550 | 1.944 | Aug30 |
| 02-16368-1601 | NR-2 | 27 | 1.190 | 21.288 | 2.350 | Aug30 |
| 02-16368-1602 | NR-2 | 28 | 1.454 | 30.230 | 3.374 | Aug30 |
| 02-16368-1605 | NR-3 | 1 | 0.186 | 9.670 | 2.324 | Aug30 |
| 02-16368-1606 | NR-3 | 2 | 0.380 | 28.926 | 6.762 | Aug30 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 51: Analyte recovery from Iowa runoff supernatant samples from the second rainfall simulation.

Event: Simulated Rain #2
 Substrate: Supernatant
 Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) IFT, 248, 328 |
|---------------|------------|-------------|--------------------------------|-----------|-----------|------------------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-1515 | SR-2 | 1 | 0.043 | 7.751 | 3.547 | Aug30 |
| 02-16368-1516 | SR-2 | 2 | 0.049 | 7.334 | 2.611 | Aug30 |
| 02-16368-1517 | SR-2 | 3 | 0.078 | 9.900 | 3.771 | Aug30, Oct7, Aug30 |
| 02-16368-1518 | SR-2 | 4 | 0.094 | 10.900 | 4.134 | Aug30, Oct7, Aug30 |
| 02-16368-1519 | SR-2 | 5 | 0.105 | 9.600 | 3.592 | Aug30, Oct7, Aug30 |
| 02-16368-1520 | SR-2 | 6 | 0.087 | 9.400 | 3.518 | Aug30, Oct7, Aug30 |
| 02-16368-1521 | SR-2 | 7 | 0.095 | 9.100 | 3.288 | Aug30, Oct7, Aug30 |
| 02-16368-1522 | SR-2 | 8 | 0.088 | 9.506 | 3.317 | Aug30 |
| 02-16368-1523 | SR-2 | 9 | 0.084 | 9.251 | 3.159 | Aug30 |
| 02-16368-1524 | SR-2 | 10 | 0.093 | 8.843 | 3.063 | Aug30 |
| 02-16368-1525 | SR-2 | 11 | 0.087 | 8.427 | 3.038 | Aug30 |
| 02-16368-1526 | SR-2 | 12 | 0.088 | 8.266 | 2.894 | Aug30 |
| 02-16368-1527 | SR-2 | 13 | 0.089 | 8.031 | 2.857 | Aug30 |
| 02-16368-1528 | SR-2 | 14 | 0.084 | 7.715 | 2.810 | Aug30 |
| 02-16368-1529 | SR-2 | 15 | 0.107 | 7.611 | 2.788 | Aug30 |
| 02-16368-1530 | SR-2 | 16 | 0.092 | 7.291 | 2.793 | Aug30 |
| 02-16368-1531 | SR-2 | 17 | 0.087 | 7.096 | 2.632 | Aug30 |
| 02-16368-1532 | SR-2 | 18 | 0.092 | 6.935 | 2.664 | Aug30 |
| 02-16368-1533 | SR-2 | 19 | 0.080 | 6.825 | 2.572 | Aug30 |
| 02-16368-1534 | SR-2 | 20 | 0.083 | 6.739 | 2.597 | Aug30 |
| 02-16368-1535 | SR-2 | 21 | 0.088 | 6.659 | 2.567 | Aug30 |
| 02-16368-1536 | SR-2 | 22 | 0.092 | 6.336 | 2.447 | Aug30 |
| 02-16368-1537 | SR-2 | 23 | 0.088 | 6.579 | 2.449 | Aug30 |
| 02-16368-1538 | SR-2 | 24 | 0.088 | 6.428 | 2.484 | Aug30 |
| 02-16368-1539 | SR-2 | 25 | 0.077 | 6.223 | 2.451 | Aug30 |
| 02-16368-1540 | SR-2 | 26 | 0.081 | 6.111 | 2.420 | Aug30 |
| 02-16368-1541 | SR-2 | 27 | 0.078 | 6.163 | 2.403 | Aug30 |
| 02-16368-1542 | SR-2 | 28 | 0.088 | 6.170 | 2.417 | Aug30 |
| 02-16368-1543 | SR-2 | 29 | 0.083 | 5.928 | 2.337 | Aug30 |
| 02-16368-1544 | SR-2 | 30 | 0.092 | 6.418 | 2.601 | Aug30 |

| | | | |
|-------------|-------|-------|-------|
| Analyte LOD | 0.001 | 0.001 | 0.003 |
| Analyte LOQ | 0.010 | 0.010 | 0.010 |

Table 52: Analyte recovery from Iowa runoff soil samples from the first rainfall simulation.

Event: Simulated Rain #1
Substrate: Soil
Study Number: EBA 079811

| Sample ID: | Event No.: | Bucket No.: | Calculated Concentration (ppb) | | | Data Set(s) IFT, 248, 328 |
|---------------|------------|-------------|--------------------------------|-----------|--------------|------------------------------|
| | | | RPA201772 | RPA202248 | RPA203328 | |
| 02-16368-1485 | SR-1 | 1 | 2.402 | 2.393 | ND | July9 |
| 02-16368-1486 | SR-1 | 2 | 6.292 | 5.304 | ND | July9 |
| 02-16368-1487 | SR-1 | 3 | 12.670 | 11.073 | <LOD | July9 |
| 02-16368-1488 | SR-1 | 4 | 18.845 | 15.962 | <LOD | July9 |
| 02-16368-1489 | SR-1 | 5 | 25.393 | 20.453 | <LOD | July9 |
| 02-16368-1490 | SR-1 | 6 | 62.903 | 45.587 | <LOQ (0.783) | July9 |
| 02-16368-1491 | SR-1 | 7 | 89.404 | 57.140 | <LOQ (0.880) | July9 |
| 02-16368-1492 | SR-1 | 8 | 94.891 | 63.483 | <LOQ (0.899) | July9 |
| 02-16368-1493 | SR-1 | 9 | 97.650 | 61.943 | <LOQ (1.09) | July9 |
| 02-16368-1494 | SR-1 | 10 | 98.082 | 63.057 | <LOQ (0.976) | July9 |
| 02-16368-1495 | SR-1 | 11 | 79.338 | 50.161 | <LOQ (0.892) | July9 |
| 02-16368-1496 | SR-1 | 12 | 87.999 | 53.900 | <LOQ (1.040) | July9 |
| 02-16368-1497 | SR-1 | 13 | 68.585 | 40.745 | <LOQ (0.678) | July9 |
| 02-16368-1498 | SR-1 | 14 | 67.882 | 38.449 | <LOQ (0.764) | July9 |
| 02-16368-1499 | SR-1 | 15 | 69.912 | 42.778 | <LOQ (0.743) | July9 |
| 02-16368-1500 | SR-1 | 16 | 66.587 | 38.562 | <LOQ (0.699) | July9 |
| 02-16368-1501 | SR-1 | 17 | 69.600 | 47.949 | <LOQ (0.690) | July9 |
| 02-16368-1502 | SR-1 | 18 | 61.650 | 42.325 | <LOQ (0.619) | July9 |
| 02-16368-1503 | SR-1 | 19 | 79.893 | 43.443 | <LOQ (0.670) | July9 |
| 02-16368-1504 | SR-1 | 20 | 74.399 | 39.900 | <LOQ (0.636) | July9 |
| 02-16368-1505 | SR-1 | 21 | 65.562 | 45.675 | <LOQ (0.646) | July9 |
| 02-16368-1506 | SR-1 | 22 | 63.059 | 44.160 | <LOQ (0.567) | July9 |
| 02-16368-1507 | SR-1 | 23 | 84.467 | 39.670 | <LOQ (0.617) | July9 |
| 02-16368-1508 | SR-1 | 24 | 69.222 | 34.784 | <LOQ (0.457) | July9 |
| 02-16368-1509 | SR-1 | 25 | 44.344 | 24.521 | <LOQ (0.332) | July9 |
| 02-16368-1510 | SR-1 | 26 | 102.619 | 57.621 | <LOQ (0.773) | July9 |
| 02-16368-1511 | SR-1 | 27 | 71.548 | 37.032 | <LOQ (0.436) | July9 |
| 02-16368-1512 | SR-1 | 28 | 66.705 | 35.293 | <LOQ (0.444) | July9 |
| 02-16368-1513 | SR-1 | 29 | 64.638 | 33.331 | <LOQ (0.447) | July9 |
| 02-16368-1514 | SR-1 | 30 | 69.808 | 44.139 | <LOQ (0.537) | July9 |

| | | | |
|-------------|------|------|------|
| Analyte LOD | 0.11 | 0.04 | 0.29 |
| Analyte LOQ | 0.4 | 0.4 | 2.0 |

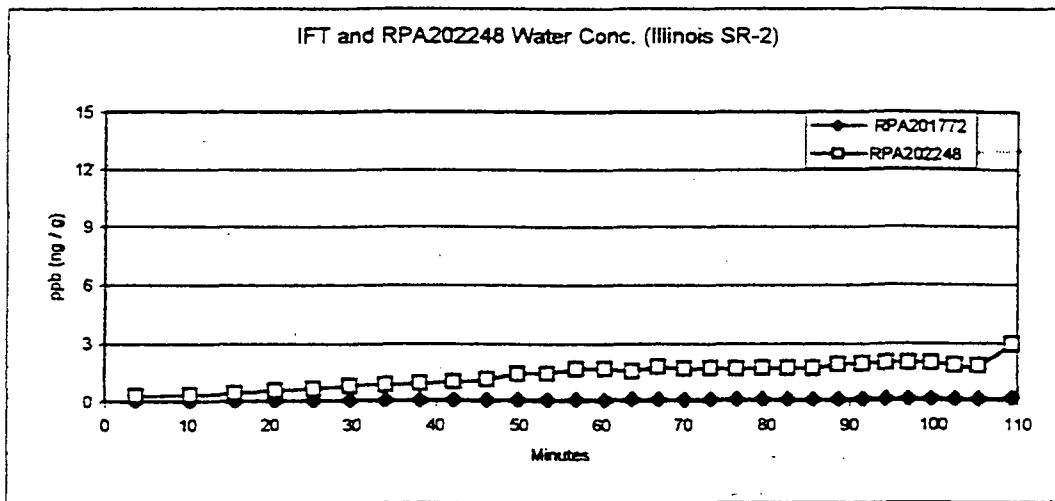
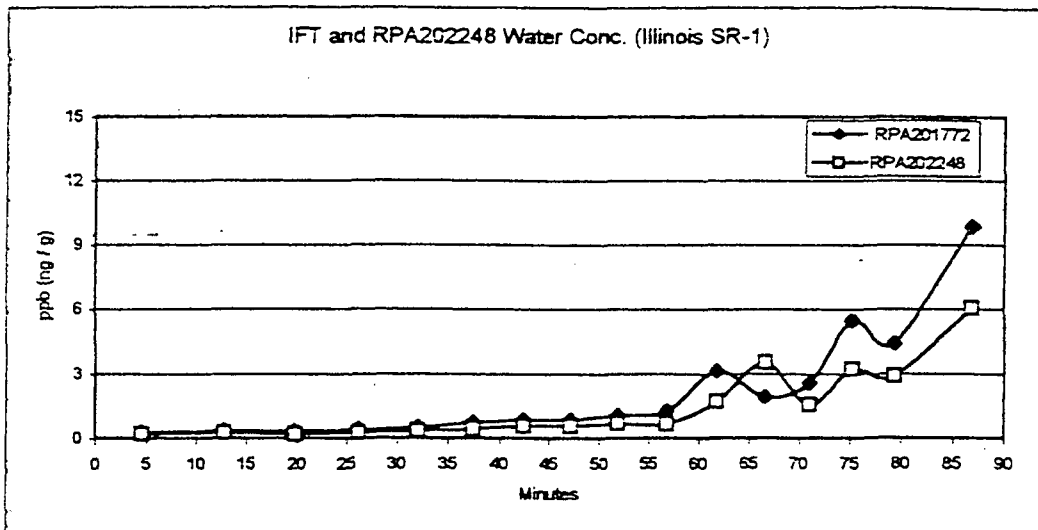


FIGURE 43. ILLINOIS IFT AND RPA202248 CONCENTRATION OVER TIME FOR ILLINOIS SIMULATED RAINFALL I (SR-1) AND SIMULATED RAINFALL 2 (SR-2).

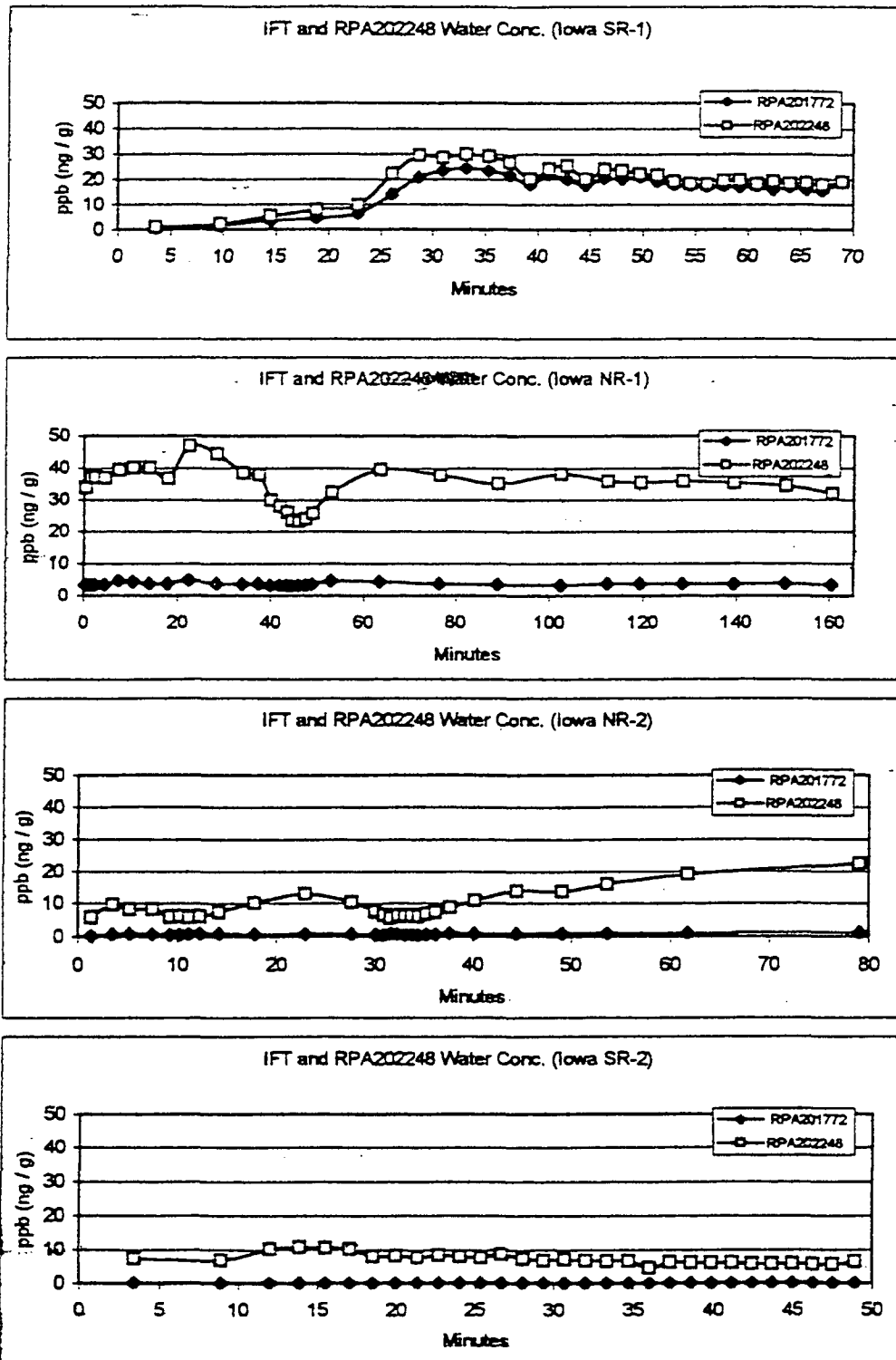


FIGURE 48. IOWA IFT AND RPA202248 CONCENTRATION OVER TIME TIME FOR IOWA SIMULATED RAINFALL I (SR-1), SIMULATED RAINFALL 2 (SR-2), NATURAL RAINFALL 1 (NR-1) AND NATURAL RAINFALL 2 (NR-2).