

CRAWFORD HYDROLOGY LAB *

* Hydrogeologists, Geologists, Environmental Scientists
 * Karst Groundwater Investigations * Fluorescent Dye Analysis

Western Kentucky University

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LABORATORY REPORT SHEET
FLUORIMETRIC ANALYSIS RESULTS

FLUORESCEN
 Color Index:
 Acid Yellow 73
 Dye Receptor:
 Activated Charcoal
 Analysis by:
 Spectrophotometer

Pond Dye Test

Analysis requested by:

Grant Burroughs- Big Sky Water & Sewer District

| WATER SAMPLES | |
|-------------------------|--|
| FLUORESCEN | |
| PQL in Eluent: 0.05 ppb | |
| PQL in Water: 0.010 ppb | |
| A in Eluent: 517.2 nm | |
| A in Water: 510.6 nm | |

| Lab ID | Event | Date Collected | Feature Name | TIME | Peak Off | Results | Conc in ppb | Peak Center (nm) | Comments |
|-------------|-------|----------------|-------------------------------|------|----------|---------|-------------|------------------|--|
| WL-001-0 | BG1 | 07/13/21 | STA 101 | 1110 | ND | | | | WFG-POWER LINES |
| WL-001-0 | 03 | 07/20/21 | STA 101 | 1016 | ND | | | | WFG-POWER LINES |
| WL-001-0 | 04 | 07/27/21 | STA 101 | 910 | ND | | | | WFG-POWER LINES |
| WL-001-1 | 06 | 08/06/21 | STA 101 | 920 | ND | | | | WFG-POWER LINES |
| WL-001-0 | 08 | 08/12/21 | STA 101 | 935 | ND | | | | WFG-POWER LINES |
| WL-002-0 | BG1 | 07/13/21 | STA 102 | 1140 | ND | | | | WFG-POWER STATION |
| WL-002-0 | 03 | 07/20/21 | STA 102 | 1025 | ND | | | | WFG-POWER STATION |
| WL-002-0 | 04 | 07/27/21 | STA 102 | 923 | ND | | | | WFG-POWER STATION |
| WL-002-1 | 06 | 08/06/21 | STA 102 | 935 | ND | | | | WFG-POWER STATION |
| WL-002-0 | 08 | 08/12/21 | STA 102 | 950 | ND | | | | WFG-POWER STATION |
| WL-003-0 | BG1 | 07/13/21 | STA 103 | 1200 | ND | | | | WFT-100YARDS DOWNSTREAM |
| WL-003-0 | 03 | 07/20/21 | STA 103 | 1049 | ND | | | | WFT-100YARDS DOWNSTREAM |
| WL-003-0 | 04 | 07/27/21 | STA 103 | 949 | ND | | | | WFT-100YARDS DOWNSTREAM |
| WL-003-1 | 06 | 08/06/21 | STA 103 | 1005 | ND | | | | WFT-100YARDS DOWNSTREAM |
| WL-003-0 | 08 | 08/12/21 | STA 103 | 1005 | ND | | | | WFT-100YARDS DOWNSTREAM |
| WL-004-0 | BG1 | 07/13/21 | STA 104 | 1213 | ND | | | | WFG-PIPELINE |
| WL-004-0 | 03 | 07/20/21 | STA 104 | 1059 | ND | | | | WFG-PIPELINE |
| WL-004-0 | 04 | 07/27/21 | STA 104 | 953 | ND | | | | WFG-PIPELINE |
| WL-004-1 | 06 | 08/06/21 | STA 104 | 1025 | ND | | | | WFG-PIPELINE |
| WL-004-0 | 08 | 08/12/21 | STA 104 | 1015 | ND | | | | WFG-PIPELINE |
| WL-005-0 | BG1 | 07/13/21 | STA 105 | 1240 | ND | | | | UNDERDRAIN STREAM |
| WL-005-0 | 03 | 07/20/21 | STA 105 | 1120 | ND | | | | UNDERDRAIN STREAM |
| WL-005-0 | 04 | 07/27/21 | STA 105 | 1000 | ND | | | | UNDERDRAIN STREAM |
| WL-005-1 | 06 | 08/06/21 | STA 105 | 1040 | ND | | | | UNDERDRAIN STREAM |
| WL-005-0 | 08 | 08/12/21 | STA 105 | 1035 | ND | | | | UNDERDRAIN STREAM |
| WL-006-0 | BG1 | 07/13/21 | STA 106 | 1242 | ND | | | | UNDERDRAIN RUNOFF |
| WL-006-1 | 03 | 07/20/21 | STA 106 | 1120 | B | 0.010 | 510.0 | | UNDERDRAIN RUNOFF |
| WL-006-1 | 04 | 07/27/21 | STA 106 | 1005 | ND | | | | UNDERDRAIN RUNOFF |
| WL-006-2 | 06 | 08/06/21 | STA 106 | 1035 | ND | | | | UNDERDRAIN RUNOFF |
| WL-006-0 | 08 | 08/12/21 | STA 106 | 1030 | ND | | | | UNDERDRAIN RUNOFF |
| WL-007-0 | 02 | 07/17/21 | STA 107 | 1313 | ND | | | | WFG-JUNIPER 100 YRDS DOWNSTREAM |
| WL-007-1 | 03 | 07/20/21 | STA 107 | 1210 | ND | | | | WFG-JUNIPER 100 YRDS DOWNSTREAM |
| WL-007-0 | 04 | 07/27/21 | STA 107 | 1007 | ND | | | | WFG-JUNIPER 100 YRDS DOWNSTREAM |
| WL-007-2 | 06 | 08/06/21 | STA 107 | 1115 | ND | | | | WFG-JUNIPER 100 YRDS DOWNSTREAM |
| WL-007-0 | 08 | 08/12/21 | STA 107 | 1055 | ND | | | | WFG-JUNIPER 100 YRDS DOWNSTREAM |
| WL-008-0 | BG1 | 07/13/21 | STA 108 | 1322 | ND | | | | WFG- AT LITTLE COYOTE RD |
| WL-008-0 | 03 | 07/20/21 | STA 108 | 1220 | ND | | | | WFG- AT LITTLE COYOTE RD |
| WL-008-0 | 04 | 07/27/21 | STA 108 | 1017 | ND | | | | WFG- AT LITTLE COYOTE RD |
| WL-008-1 | 06 | 08/06/21 | STA 108 | 1120 | ND | | | | WFG- AT LITTLE COYOTE RD |
| WL-008-0 | 08 | 08/12/21 | STA 108 | 1100 | ND | | | | WFG- AT LITTLE COYOTE RD |
| WL-009-0 | BG1 | 07/13/21 | STA 109 | 1520 | ND | | | | CHAPEL SPRINGS |
| WL-009-0 | 03 | 07/20/21 | STA 109 | 1230 | ND | | | | CHAPEL SPRINGS |
| WL-009-0 | 04 | 07/27/21 | STA 109 | 1033 | ND | | | | CHAPEL SPRINGS |
| WL-009-1 | 06 | 08/06/21 | STA 109 | 1140 | ND | | | | CHAPEL SPRINGS |
| WL-009-0 | 08 | 08/12/21 | STA 109 | 1110 | ND | | | | CHAPEL SPRINGS |
| WL-010-0 | BG1 | 07/13/21 | STA 110 | 1541 | ND | | | | WFG-AT TWO MOONS RD |
| WL-010-0 | 03 | 07/20/21 | STA 110 | 1248 | ND | | | | WFG-AT TWO MOONS RD |
| WL-010-0 | 04 | 07/27/21 | STA 110 | 1045 | ND | | | | WFG-AT TWO MOONS RD |
| WL-010-1 | 06 | 08/06/21 | STA 110 | 1155 | ND | | | | WFG-AT TWO MOONS RD |
| WL-010-0 | 08 | 08/12/21 | STA 110 | 1120 | ND | | | | WFG-AT TWO MOONS RD |
| WH-011-0 | 02 | 07/15/21 | UNDERDRAIN MH-1 | 1230 | +? | 0.232 | 510.8 | | |
| WL-011-1 | 03 | 07/20/21 | UNDERDRAIN MH-1 | 1520 | B | 0.011 | 510.2 | | |
| WL-011-1 | 04 | 07/27/21 | UNDERDRAIN MH-1 | 1410 | ND | | | | |
| WL-011-0 | 05 | 08/03/21 | UNDERDRAIN MH-1 | 1340 | ND | | | | |
| WL-011-0 | 07 | 08/10/21 | UNDERDRAIN MH-1 | 1507 | ND | | | | |
| WL-012-1 | 03 | 07/20/21 | MIDDLE FORK ABOVE GOLF COURSE | 1432 | ND | | | | NO BACKGROUND MONITORING CONDUCTED |
| WL-013-1 | 03 | 07/20/21 | MIDDLE FORK BELOW GOLF COURSE | 1444 | ND | | | | NO BACKGROUND MONITORING CONDUCTED |
| WL-014-1 | 03 | 07/20/21 | MIDDLE FORK BELOW MEADOW | 1453 | ND | | | | NO BACKGROUND MONITORING CONDUCTED |
| WH-015-0-DD | 02 | 07/14/21 | CIRCULAR BASIN | 1635 | +? | 39.000 | 513.8 | | DILUTED 1:10,000 /NO BACKGROUND MONITORING CONDUCTED |
| WH-016-0 | 02 | 07/15/21 | IRRIGATION | 1122 | +? | 22.207 | 511.0 | | NO BACKGROUND MONITORING CONDUCTED |
| WH-016-1 | 03 | 07/23/21 | IRRIGATION | 1337 | +? | 0.516 | 511.2 | | |
| WH-016-0 | 05 | 08/04/21 | IRRIGATION | 1412 | B | 0.024 | 508.2 | | |

Approved by: **I. Bledsoe** on **8/26/21**

Comments: Results that meet all criteria for positive detection but do not have background results (sampled prior to 7/13) are reported questionable as there is no baseline to establish positive concentrations for that location. Also, no location shall be called positive if there is only one occasion when the dye concentration met criteria.
 See criteria for interpreting results of synchronous scanning below.

- IB = Initial Background
- B = Background (<10 times background or lowest detection limit)
- POR = Peak Out of Range (>5nm, <10nm from dye peak center)
- ND = No Detection
- NPI=No Peak Indicated
- WL - Water Low- High Sensitivity Scan
- WH - Water High- Low Sensitivity Scan
- ++ = Positive (10 times background or lowest detection limit)
- +++ = Very positive (100 times background or lowest detection limit)
- ++++ = Extremely positive (1000 times background or lowest detection limit)
- +? = Questionable Positive, needs two hits in a row to equal +
- Q = Lab Duplicate
- QA = Quality Assurance/Quality Control Laboratory Dye Standards
- PeakFit Utilized (Statistical Analysis Peakfitting Software)

Criteria for Interpreting Results of Synchronous Scanning

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Pond Dye Test

Analysis requested by:

Grant Burroughs- Big Sky Water & Sewer District

FLUORESCIN
 Color Index:
 Acid Yellow 73
 Dye Receptor:
 Activated Charcoal
 Analysis by:
 Spectrofluorophotometer

CHARCOAL RECEPTORS

FLUORESCIN
 PQL in Eluent: 0.005 ppb
 PQL in Water: 0.010 ppb
 λ in Eluent: 317.2 nm
 λ in Water: 310.6 nm

| Lab ID | Event | Date Collected | Feature Name | TIME | Peakfit | Results | Conc in ppb | Peak Center (nm) | Comments |
|----------|-------|----------------|-------------------------------|------|---------|---------|-------------|------------------|---|
| EL-001-0 | 03 | 07/20/21 | STA 101 | 1016 | | +? | 0.167 | 515.2 | NO BACKGROUND MONITORING CONDUCTED |
| EL-001-0 | 04 | 07/27/21 | STA 101 | 910 | | ND | | | WFG-POWER LINES |
| EL-001-1 | 06 | 08/06/21 | STA 101 | 920 | | ND | | | WFG-POWER LINES |
| EL-001-0 | 08 | 08/12/21 | STA 101 | 935 | | ND | | | WFG-POWER LINES |
| EL-002-0 | 03 | 07/20/21 | STA 102 | 1025 | | +? | 0.173 | 514.6 | NO BACKGROUND MONITORING CONDUCTED |
| EL-002-0 | 04 | 07/27/21 | STA 102 | 923 | | ND | | | WFG-POWER STATION |
| EL-002-1 | 06 | 08/06/21 | STA 102 | 935 | | ND | | | WFG-POWER STATION |
| EL-002-0 | 08 | 08/12/21 | STA 102 | 950 | | ND | | | WFG-POWER STATION |
| EL-003-0 | 03 | 07/20/21 | STA 103 | 1049 | | +? | 0.134 | 513.6 | NO BACKGROUND MONITORING CONDUCTED |
| EL-003-0 | 04 | 07/27/21 | STA 103 | 949 | | ND | | | WFT-100YARDS DOWNSTREAM |
| EL-003-1 | 06 | 08/06/21 | STA 103 | 1005 | | ND | | | WFT-100YARDS DOWNSTREAM |
| EL-003-0 | 08 | 08/12/21 | STA 103 | 1005 | | ND | | | WFT-100YARDS DOWNSTREAM |
| EL-004-0 | 03 | 07/20/21 | STA 104 | 1059 | | +? | 0.114 | 514.0 | NO BACKGROUND MONITORING CONDUCTED |
| EL-004-0 | 04 | 07/27/21 | STA 104 | 953 | | ND | | | WFG-PIPELINE |
| EL-004-1 | 06 | 08/06/21 | STA 104 | 1025 | | ND | | | WFG-PIPELINE |
| EL-004-0 | 08 | 08/12/21 | STA 104 | 1015 | | ND | | | WFG-PIPELINE |
| EH-005-0 | 03 | 07/20/21 | STA 105 | 1120 | | +? | 2.276 | 517.2 | NO BACKGROUND MONITORING CONDUCTED |
| EL-005-0 | 04 | 07/27/21 | STA 105 | 1000 | | +? | 0.232 | 516.4 | UNDERDRAIN STREAM |
| EL-005-1 | 06 | 08/06/21 | STA 105 | 1040 | | +? | 0.264 | 517.8 | UNDERDRAIN STREAM |
| EL-005-0 | 08 | 08/12/21 | STA 105 | 1035 | | +? | 0.114 | 516.8 | UNDERDRAIN STREAM |
| EH-006-0 | 03 | 07/23/21 | STA 106 | 1005 | | +? | 37.526 | 517.2 | NO BACKGROUND MONITORING CONDUCTED |
| EH-006-1 | 04 | 07/27/21 | STA 106 | 1005 | | +? | 2.496 | 517.2 | UNDERDRAIN RUNOFF |
| EH-006-2 | 06 | 08/06/21 | STA 106 | 1035 | | +? | 2.231 | 517.2 | UNDERDRAIN RUNOFF |
| EL-006-0 | 08 | 08/12/21 | STA 106 | 1030 | | +? | 0.698 | 516.8 | UNDERDRAIN RUNOFF |
| EL-007-0 | 04 | 07/27/21 | STA 107 | 1007 | | ND | | | NO BACKGROUND MONITORING CONDUCTED |
| EL-007-0 | 08 | 08/12/21 | STA 107 | 1055 | | ND | | | WFG- JUNIPER 100 YRDS DOWNSTREAM |
| EL-008-0 | 03 | 07/20/21 | STA 108 | 1220 | X | B | 0.041 | 519.5 | PEAKFIT RESULTS/ NO BACKGROUND MONITORING CONDUCTED |
| EL-008-0 | 04 | 07/27/21 | STA 108 | 1017 | | ND | | | WFG- AT LITTLE COYOTE RD |
| EL-008-1 | 06 | 08/06/21 | STA 108 | 1120 | | ND | | | WFG- AT LITTLE COYOTE RD |
| EL-008-0 | 08 | 08/12/21 | STA 108 | 1100 | | ND | | | WFG- AT LITTLE COYOTE RD |
| EL-009-0 | 03 | 07/20/21 | STA 109 | 1230 | | +? | 0.798 | 516.4 | NO BACKGROUND MONITORING CONDUCTED |
| EL-009-0 | 04 | 07/27/21 | STA 109 | 1033 | | ND | | | CHAPEL SPRINGS |
| EH-009-1 | 06 | 08/06/21 | STA 109 | 1140 | | ND | | | CHAPEL SPRINGS |
| EL-009-0 | 08 | 08/12/21 | STA 109 | 1110 | | ND | | | CHAPEL SPRINGS |
| EL-010-0 | 03 | 07/20/21 | STA 110 | 1249 | | ND | | | NO BACKGROUND MONITORING CONDUCTED |
| EL-010-0 | 04 | 07/27/21 | STA 110 | 1045 | | ND | | | WFG-AT TWO MOONS RD |
| EL-010-1 | 06 | 08/06/21 | STA 110 | 1155 | | ND | | | WFG-AT TWO MOONS RD |
| EL-010-0 | 08 | 08/12/21 | STA 110 | 1120 | | ND | | | WFG-AT TWO MOONS RD |
| EL-011-0 | BG01 | 07/13/21 | UNDERDRAIN MH-1 | 900 | X | IB | 0.263 | 516.5 | PEAKFIT RESULTS |
| EH-011-1 | 03 | 07/20/21 | UNDERDRAIN MH-1 | 1520 | | ++ | 32.452 | 517.2 | |
| EH-011-1 | 04 | 07/27/21 | UNDERDRAIN MH-1 | 1410 | | + | 3.786 | 517.2 | |
| EH-011-0 | 05 | 08/03/21 | UNDERDRAIN MH-1 | 1340 | | B | 2.583 | 517.2 | |
| EH-011-0 | 07 | 08/10/21 | UNDERDRAIN MH-1 | 1507 | | B | 1.722 | 517.2 | |
| EL-012-0 | BG01 | 07/13/21 | MIDDLE FORK ABOVE GOLF COURSE | 808 | | ND | | | |
| EL-012-1 | 03 | 07/20/21 | MIDDLE FORK ABOVE GOLF COURSE | 1432 | | ND | | | |
| EL-013-0 | BG01 | 07/13/21 | MIDDLE FORK BELOW GOLF COURSE | 818 | | ND | | | |
| EL-013-1 | 03 | 07/20/21 | MIDDLE FORK BELOW GOLF COURSE | 1444 | | ND | | | |
| EL-014-0 | BG01 | 07/13/21 | MIDDLE FORK BELOW MEADOW | 832 | | ND | | | |
| EL-014-1 | 03 | 07/20/21 | MIDDLE FORK BELOW MEADOW | 1453 | | +? | 0.127 | 514.4 | |

Approved by: L. Bledsoe on 8/26/21

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- EH - Eluent High- Low Sensitivity Scan
- + = Positive (10 times background or lowest detection limit)
- ++ = Very positive (100 times background or lowest detection limit)
- +++ = Extremely positive (1000 times background or lowest detection limit)
- +? = Questionable Positive, needs two hits in a row to equal +
- Q = Lab Duplicate
- QA = Quality Assurance/Quality Control Laboratory Dye Standards
- PeakFit Utilized (Statistical Analysis Peakfitting Software)

Criteria for Interpreting Results of Synchronous Scanning

Interpretation of dye tracing data is not the same as or as straight forward as interpreting the results of chemical analyses. Sometimes additional evidence beyond the minimum criteria must be considered in the