# QC Review

## Organization Name

January 20, 2022

Prepared by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

QAPP version: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Data Quality Objectives**

|  | **Frequency %** | | | | | **Completeness %** |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Field Duplicate** | **Lab Duplicate** | **Field Blank** | **Lab Blank** | **Spike/ Check Accuracy** |
| Water Temp | 10 | 10 | -- | -- |  | 90 |
| pH | 10 | 10 | -- | -- | 10 | 90 |
| DO | 10 | 10 | -- | 10 | 10 | 90 |
| Conductivity | 10 | 10 | -- | 10 | 10 | 90 |
| TSS | 10 | 5 | 10 | 5 | 5 | 90 |
| TP | 10 | 5 | 10 | 5 | 5 | 90 |
| ortho - P | 10 | 5 | 10 | 5 | 5 | 90 |
| NO3 | 10 | 5 | 10 | 5 | 5 | 90 |
| NH3 | 10 | 5 | 10 | 5 | 5 | 90 |

| **Parameter** | **Value Range** | **Field Duplicate** | **Lab Duplicate** | **Field Blank** | **Lab Blank** | **Spike/Check Accuracy** |
| --- | --- | --- | --- | --- | --- | --- |
| Water Temp | -- | <= 10% RPD | <= 10% RPD | -- | -- | -- |
| pH | -- | ± 0.5 S.U. | ± 0.5 S.U. | -- | -- | ± 0.2 S.U. |
| DO | < 4 mg/L | <= 20% RPD | <= 20% RPD | < 0.1 mg/L | < 0.1 mg/L | ± 5% |
| DO | >= 4 mg/L | <= 10% RPD | <= 10% RPD | < 0.1 mg/L | < 0.1 mg/L | ± 5% |
| Conductivity | < 250 µS/cm | <= 30% RPD | <= 20% RPD | < 25 µS/cm | < 25 µS/cm | ± 50 µS |
| Conductivity | >= 250 µS/cm | <= 20% RPD | <= 10% RPD | < 25 µS/cm | < 25 µS/cm | ± 50 µS |
| TSS | < 3 mg/L | ± 1 mg/L | <= 20% RPD | BDL | BDL | -- |
| TSS | >= 3 mg/L | <= 30% RPD | <= 20% RPD | BDL | BDL | -- |
| TP | < 0.05 mg/L | ± 0.02 mg/L | ± 0.01 mg/L | BDL | BDL | ± 0.01 mg/L |
| TP | >= 0.05 mg/L | <= 30% RPD | <= 20% RPD | BDL | BDL | ± 15% |
| ortho – P | < 0.05 mg/L | ± 0.01 mg/L | <= 20% RPD | BDL | BDL | ± 0.01 mg/L |
| ortho – P | >= 0.05 mg/L | <= 20% RPD | <= 20% RPD | BDL | BDL | ± 15% |
| NO3 | -- | <= 30% RPD | <= 20% RPD | < 0.05 mg/L | < 0.05 mg/L | ± 15% |
| NH3 | -- | <= 30% RPD | <= 20% RPD | < 0.05 mg/L | < 0.05 mg/L | ± 15% |

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### QC Frequencies for 1/1/2021 to 12/31/2021

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Type** | **Parameter** | **Number of Data Records** | **Number of Dups/Blanks/**  **Spikes** | **Frequency %** | **Hit/Miss** |
| Field Duplicates |  |  |  |  |  |
|  | NO3 | 265 | 30 | 11 % |  |
|  | TP | 254 | 18 | 7 % | MISS |
|  | Conductivity | 222 | 40 | 18 % |  |
| Lab Duplicates |  |  |  |  |  |
|  | NO3 | 265 | 30 | 11 % |  |
|  | TP | 254 | 18 | 7 % |  |
| Field Blanks |  |  |  |  |  |
|  | NO3 | 265 | 30 | 11 % |  |
|  | TP | 254 | 18 | 7 % | MISS |
| Lab Blanks |  |  |  |  |  |
|  | NO3 | 265 | 30 | 11 % |  |
|  | TP | 254 | 18 | 7 % |  |
| Lab Spikes |  |  |  |  |  |
|  | NO3 | 265 | 30 | 11 % |  |
|  | TP | 254 | 18 | 7 % |  |
| Instrument Checks | |  |  |  |  |
|  | DO | 254 | 40 | 16 % |  |
|  | Conductivity | 222 | 42 | 19 % |  |

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Field Duplicate** | **Lab Duplicate** | **Field Blank** | **Lab Blank** | **Spike/Check Accuracy** |
| Water Temp | 11% | 11% | -- | -- | -- |
| pH | 11% | 12% | -- | -- | 10% |
| DO | 11% | 9% | -- | 10% | 10% |
| Conductivity | 11% | 12% | -- | 10% | 10% |
| TSS | 10% | 6% | 10% | 5% | 5% |
| TP | 10% | 6% | 10% | 5% | 4% |
| ortho – P | 10% | 6% | 10% | 5% | 5% |
| NO3 | 12% | 6% | 10% | 5% | 5% |
| NH3 | 7% | 6% | 10% | 5% | 3% |
| Chloride | 10% | 6% | 10% | 5% | 5% |

### QC Accuracy Summary for 1/1/2021 to 12/31/2021

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type** | **Parameter** | **Number of QC Checks** | **Number of Misses** | **% Acceptance** |
| Field Duplicates |  |  |  |  |
|  | NO3 | 65 | 3 | 95 % |
|  | TP | 54 | 12 | 78 % |
|  | Conductivity | 22 | 2 | 91 % |
| Lab Duplicates |  |  |  |  |
|  | NO3 | 65 | 3 | 95 % |
|  | TP | 54 | 12 | 78 % |
| Field Blanks |  |  |  |  |
|  | NO3 | 65 | 3 | 95 % |
|  | TP | 54 | 12 | 78 % |
| Lab Blanks |  |  |  |  |
|  | NO3 | 65 | 3 | 95 % |
|  | TP | 54 | 12 | 78 % |
| Lab Spikes |  |  |  |  |
|  | NO3 | 22 | 3 | 86 % |
|  | TP | 18 | 1 | 94 % |
| Instrument Checks | |  |  |  |
|  | DO | 8 | 1 | 87 % |
|  | Conductivity | 8 | 0 | 100 % |

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Field Duplicate** | **Lab Duplicate** | **Field Blank** | **Lab Blank** | **Spike/Check Accuracy** |
| Water Temp | 91% | 95% | -- | -- | -- |
| pH | 91% | 95% | -- | -- | 100% |
| DO | 91% | 95% | -- | 100% | 100% |
| Conductivity | 91% | 95% | -- | 100% | 100% |
| TP | 78% | 78% | 78% | 95% | 94% |
| NO3 | 95% | 95% | 95% | 95% | 86% |
| NH3 | 95% | 95% | 95% | 95% | 86% |
| Chloride | 95% | 95% | 95% | 95% | 86% |

### Data Completeness for 1/1/2021 to 12/31/2021

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Number of Data Records** | **Number of Qualified Records** | **Complete-ness %** | **Hit/ Miss** | **Number of Censored Records** | **Notes** |
| Water Temp | 265 | 5 | 98% |  |  |  |
| pH | 265 | 0 | 100% |  |  |  |
| DO | 254 | 4 | 98% |  |  |  |
| Conductivity | 254 | 3 | 99% |  |  |  |
| TSS | 254 | 35 | 86% | MISS |  |  |
| TP | 265 | 2 | 99% |  |  |  |
| ortho – P | 265 | 1 | 100% |  |  |  |
| NO3 | 254 | 0 | 100% |  |  |  |
| NH3 | 254 | 0 | 100% |  |  |  |
| Chloride | 265 | 6 | 98% |  |  |  |
| Chl-a | 254 | 4 | 98% |  |  |  |

Notes:

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### QC Raw Data for 1/1/2021 to 12/31/2021

**Field Blanks**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Date** | **Site** | **Result** | **MDL** | **Hit/Miss** |
| NO3 |  |  |  |  |  |
|  | 3/15/21 | A-235 | BDL | 0.05 mg/L |  |
|  | 3/15/21 | A-789 | BDL | 0.05 mg/L |  |
|  | 4/16/21 | A-982 | 0.07 mg/L | 0.05 mg/L | MISS |
| TP |  |  |  |  |  |
|  | 3/15/21 | A-235 | BDL | 0.01 mg/L |  |
|  | 3/15/21 | A-789 | 0.02 mg/L | 0.01 mg/L | MISS |
|  | 4/16/21 | A-982 | BDL | 0.01 mg/L |  |

Notes:

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**Lab Blanks**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Date** | **Sample ID** | **Result** | **MDL** | **Hit/Miss** |
| NO3 |  |  |  |  |  |
|  | 3/15/21 | K16452-MB1 | BDL | 0.05 mg/L |  |
|  | 3/15/21 | K16453-MB1 | BDL | 0.05 mg/L |  |
|  | 4/16/21 | K16454-MB1 | 0.07 mg/L | 0.05 mg/L | MISS |
| TP |  |  |  |  |  |
|  | 3/15/21 | K16452-MB2 | BDL | 0.01 mg/L |  |
|  | 3/15/21 | K16453-MB2 | 0.02 mg/L | 0.01 mg/L | MISS |
|  | 4/16/21 | K16454-MB2 | BDL | 0.01 mg/L |  |

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**Field Duplicates**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Date** | **Site** | **Initial Result** | **Dup. Result** | **Diff./RPD** | **Hit/Miss** |
| NO3 |  |  |  |  |  |  |
|  | 3/15/21 | A-235 | BDL | 0.06 mg/L | 20% RPD |  |
|  | 3/15/21 | A-789 | 0.07 mg/L | 0.09 mg/L | 25% RPD | MISS |
|  | 4/16/21 | A-982 | 0.07 mg/L | 0.08 mg/L | 13% RPD |  |
| TP |  |  |  |  |  |  |
|  | 3/15/21 | A-235 | 0.02 mg/L | 0.03 mg/L | 0.01 mg/L |  |
|  | 3/15/21 | A-789 | 0.02 mg/L | 0.04 mg/L | 0.02 mg/L |  |
|  | 4/16/21 | A-982 | 0.06 mg/L | 0.09 mg/L | 40% RPD | MISS |

Notes:

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**Lab Duplicates**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Date** | **Sample ID** | **Initial Result** | **Dup. Result** | **Diff./RPD** | **Hit/Miss** |
| NO3 |  |  |  |  |  |  |
|  | 3/15/21 | K16452-MB1 | BDL | 0.06 mg/L | 20% RPD |  |
|  | 3/15/21 | K16453-MB1 | 0.07 mg/L | 0.2 mg/L | 96% RPD | MISS |
|  | 4/16/21 | K16454-MB1 | 0.07 mg/L | 0.08 mg/L | 13% RPD |  |
| TP |  |  |  |  |  |  |
|  | 3/15/21 | K16452-MB2 | 0.02 mg/L | 0.03 mg/L | 0.01 mg/L |  |
|  | 3/15/21 | K16453-MB2 | 0.02 mg/L | 0.04 mg/L | 0.02 mg/L | MISS |
|  | 4/16/21 | K16454-MB2 | 0.06 mg/L | 0.09 mg/L | 40% RPD | MISS |
| Conductivity | |  |  |  |  |  |
|  | 3/15/21 | MAR-01 | 768 µS/cm | 782 µS/cm | 2% RPD |  |
|  | 4/16/21 | APR-01 | 768 µS/cm | 900 µS/cm | 16% RPD | MISS |

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**Lab Spikes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Date** | **Sample ID** | **Spike** | **Amt Recovered** | **% Recovery** | **Hit/Miss** |
| NO3 |  |  |  |  |  |  |
|  | 3/15/21 | NO3-1 | 0.100 mg/L | 0.096 mg/L | 96% |  |
|  | 4/16/21 | NO3-2 | 0.10 mg/L | 0.12 mg/L | 120% | MISS |
| TP |  |  |  |  |  |  |
|  | 3/15/21 | TP-1 | 1.00 mg/L | 1.04 mg/L | 104% |  |
|  | 4/16/21 | TP-2 | 0.10 mg/L | 0.11 mg/L | 110% |  |

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**Instrument Checks (post sampling)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Date** | **Sample ID** | **Calibration Standard** | **Instrument Reading** | **Accuracy** | **Hit/Miss** |
| DO |  |  |  |  |  |  |
|  | 3/15/21 | DO-3-15 | 100.5 % | 110.2 % | 9.7 % | MISS |
|  | 4/16/21 | DO-4-16 | 100.5 % | 98.3 % | 2.2 % |  |
| pH |  |  |  |  |  |  |
|  | 3/15/21 | PH-3-15 | 7.02 S.U. | 7.22 S.U. | 0.20 S.U. |  |
|  | 4/16/21 | PH-4-16 | 7.02 S.U. | 6.70 S.U. | 0.32 S.U. | MISS |

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