PERMIT RATIONALE FOR REISSUANCE

National Warmwater Aquaculture Center, Delta Branch Experiment Station

Water NPDES No. MS0047791

August 20, 2021

Tracy Tomkins, Water I Branch

1. FACILITY INFORMATION

Facility Address: 127 Experiment Station Road

 Stoneville, MS 38776

Facility County: Washington

SIC: 0273

1. NATURE OF BUSINESS

Aquaculture research center focuses on catfish production research including nutrition, water quality, off-flavor, diseases, genetics, reproductive physiology, harvesting, aeration of ponds, molecular biology and analytical chemistry. The facility includes an aquaria as well as a laboratory housing 16 research scientists.

1. EFFLUENT AND RECEIVING STREAM FLOW DATA

Outfall 001: discharges a long term average flow of 0.0149 MGD and a daily maximum flow of 0.02016 MGD into Deer Creek (7Q10= 0.0 MGD). The receiving stream is located in the Yazoo River Basin and classified as Fish and Wildlife. The facility discharge consists of aquaculture flow-through water and storm water run-off.

1. TOTAL MAXIMUM DAILY LOAD (TMDL) AND 303(d) ISSUES

Deer Creek is not listed on the Mississippi 2020 Section 303(d) List of Impaired Water Bodies. The permit complies with the following applicable TMDLs:

* Organic Enrichment/Low DO and Nutrients – Deer Creek – Yazoo River Basin – Washington County – June 2003 – ID#903062302
* Fecal Coliform TMDL – Deer Creek – Yazoo River Basin – Bolivar and Washington Counties – June 2003 – ID#903063006 The TMDL requires compliance with the standard at end of pipe. Compliance with the current pathogen standard (E. coli) would be considered compliance with the TMDL.
1. TYPE OF WASTEWATER TREATMENT

Chlorination and dechlorination

1. EPA APPLICABLE CATEGORICAL GUIDELINES

None

VII. DATA FROM APPLICATION FORM 2C

|  |  |
| --- | --- |
| Parameter | Maximum Daily Value |
| Biochemical Oxygen Demand (BOD5) | 14.0 mg/L |
| Chemical Oxygen Demand (COD) | 23.0 mg/L |
| Total Organic Carbon (TOC) | 2.23 mg/L |
| Total Suspended Solids (TSS) | 20.0 mg/L |
| Ammonia (as N) | 1.07 mg/L |
| Flow | 0.02016 MGD |
| Temperature (winter) | 24.4oC |
| pH | 7.73 SU (min) – 8.65 SU (max) |
| Chlorine, Total Residual (TRC) | 0.01 mg/L |
| Nitrate-Nitrite | 0.458 mg/L |
| Nitrogen, Total Organic (as N) | 1.35 mg/L |
| Phosphorus, Total (as P) | 0.685 mg/L |

#### VIII. WATER QUALITY LIMITATIONS BASED ON WASTELOAD ALLOCATION

|  |  |
| --- | --- |
| Parameter | Average |
| Flow | 0.0131 MGD |
| CBOD5 | 10 mg/L |
| Total Ammonia Nitrogen (TAN) | 2 mg/L |
| Minimum DO | 6 mg/L |
| E. coli | 126 col/100ml |
| Cl2 | 0.011 mg/L |
| Total Nitrogen (TN) | Report lb/day |
| Total Phosphorus (TP) | Report lb/day |
| pH | 6 – 9 SU |

1. CATEGORICAL GUIDELINE LIMITATIONS CALCULATIONS

Not Applicable

1. TOXICITY SCREENING

Not Applicable

XI. PROPOSED FINAL LIMITATIONS

1. Average Permit Limitations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Categorical Limitation | Water Quality Limitation | Present Permit Limitation (PPL) | Proposed Permit Limitation | Basis |
| Flow | N/A | 0.0131 MGD | Report MGD | Report MGD | 1/ |
| CBOD5 | N/A | 10 mg/L | N/A | 10 mg/L | WLA |
| TSS | N/A | N/A | 30 mg/L | 30 mg/L | WLA |
| NH3-N | N/A | 2 mg/L | 2 mg/L | 2 mg/L | WLA |
| TRC | N/A | 0.011 mg/L | 0.011 mg/L | 0.011 mg/L | WLA |
| E. coli  | N/A | 126 col./100 mL | N/A | 126 col./100 mL | MS WQS |
| DO | N/A | 6.0 mg/L (min.) | 6.0 mg/L (min.) | 6.0 mg/L (min.) | WLA |
| pH | N/A | 6.0 S.U. (min.) | 6.0 S.U. (min.) | 6.0 S.U. (min.) | WLA |
| TN | N/A | Report lbs/day | N/A | Report lbs/day | WLA |
| Nitrate + Nitrite  | N/A | N/A | N/A | Report lbs/day | 2/ |
| TKN | N/A | N/A | N/A | Report lbs/day | 2/ |
| TP  | N/A | Report lbs/day | N/A | Report lbs/day | WLA  |

1. Maximum Permit Limitations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Categorical Limitation | Water Quality Limitation | Present Permit Limitation (PPL) | Proposed Permit Limitation | Basis |
| Flow | N/A | Report MGD | Report MGD | Report MGD | 1/ |
| CBOD5  | N/A | N/A | N/A | 15 mg/L | WLA |
| TSS | N/A | N/A | 45 mg/L | 45 mg/L | WLA |
| NH3-N | N/A | N/A | 3 mg/L | 3 mg/L | WLA |
| TRC | N/A | N/A | 0.019 mg/L | 0.019 mg/L | WLA |
| E. coli | N/A | N/A | N/A | 410 col./100 mL | MS WQS |
| pH | N/A | 9.0 S.U. | 9.0 S.U. | 9.0 S.U. | WLA |
| TN | N/A | Report lbs/day | N/A | Report lbs/day | WLA |
| Nitrate + Nitrite  | N/A | N/A | N/A | Report lbs/day | 2/ |
| TKN | N/A | N/A | N/A | Report lbs/day | 2/ |
| TP  | N/A | Report lbs/day | N/A | Report lbs/day | WLA  |

Carbonaceous Biochemical Oxygen Demand (5-Day), Total Suspended Solids, Ammonia as Nitrogen, E. coli, Total Residual Chlorine, pH, and Dissolved Oxygen shall be monitored twice per month with a grab sample of the effluent. Flow shall be monitored daily instantaneously.

1/ The flow limit and the conditions of the TMDL will be met by limiting the mass loadings based on a flow 0.0131 MGD.

2/ There is no test method to monitor total nitrogen (TN). Total Nitrogen is the total of nitrate/nitrite and total kjeldahl nitrogen (TKN). Nitrate/nitrite nitrogen and total kjeldahl nitrogen must be monitored and the results added together to obtain a value for total nitrogen.