STATE OF TENNESSEE
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**
**DIVISION OF WATER RESOURCES**
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

November 30, 2016

Mr. Wendell Christian
General Manager
e-copy: wendell.christian@rocket.com
Aerojet Ordnance Tennessee
1367 Old State Route 34
Jonesborough, TN 37659

Subject: **NPDES Permit No. TN0057983**
**Aerojet Ordnance Tennessee**
**Jonesborough, Washington County, Tennessee**

Dear Mr. Christian:

In accordance with the provisions of the Tennessee Water Quality Control Act, Tennessee Code Annotated (T.C.A.), Sections 69-3-101 through 69-3-120, the Division of Water Resources hereby issues the enclosed NPDES Permit. The continuance and/or reissuance of this NPDES Permit is contingent upon your meeting the conditions and requirements as stated therein.

Please be advised that a petition for permit appeal may be filed, pursuant to T.C.A. Section 69-3-105, subsection (i), by the permit applicant or by any aggrieved person who participated in the public comment period or gave testimony at a formal public hearing whose appeal is based upon any of the issues that were provided to the commissioner in writing during the public comment period or in testimony at a formal public hearing on the permit application. Additionally, for those permits for which the department gives public notice of a draft permit, any permit applicant or aggrieved person may base a permit appeal on any material change to conditions in the final permit from those in the draft, unless the material change has been subject to additional opportunity for public comment. Any petition for permit appeal under this subsection (i) shall be filed with the Technical Secretary of the Water Quality, Oil and Gas Board within thirty (30) days after public notice of the commissioner's decision to issue or deny the permit. A copy of the filing should also be sent to TDEC's Office of General Counsel.

If you have questions, please contact the Johnson City Environmental Field Office at 1-888-891-TDEC; or, at this office, please contact Mr. Bob Alexander at (615) 532-0659 or by E-mail at *Robert.Alexander@tn.gov*.

Sincerely,

Vojin Janjić
Manager, Water-Based Systems

Enclosure

cc: Permit File
Johnson City Environmental Field Office
Mr. Tim Wright, Manager, Environmental Health & Safety, Aerojet Ordnance Tennessee Inc., timothy.wright@rocket.com
NPDES Permit Section, EPA Region IV, r4npdespermits@epa.gov
Mr. Ray Burgess, Civil & Environmental Consultants, Inc., rburgess@cecinc.com

# STATE OF TENNESSEE

# NPDES PERMIT

## No. TN0057983

Authorization to discharge under the
National Pollutant Discharge Elimination System (NPDES)

Issued By
**Tennessee Department of Environment and Conservation**
**Division of Water Resources**
**312 Rosa Parks Ave.**
**Nashville, Tennessee 37243-1534**

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.)

Discharger: **Aerojet Ordnance Tennessee**

is authorized to discharge: **treated process wastewater through Outfall 001, noncontact cooling water and cooling tower blowdown through Outfall 002, and treated sanitary wastewater and shower water through Outfall 003**

from a facility located: **in Jonesborough, Washington County, Tennessee**

to receiving waters named: **Little Limestone Creek at miles 8.9 (Outfall 001) and mile 9.0 (Outfalls 002 and 003)**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on: **January 1, 2017**

This permit shall expire on: **December 31, 2020**

Issuance date: **December 1, 2016**

for Tisha Calabrese Benton
Director

CN-0759 RDAs 2366

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# PART I - EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Aerojet Ordnance Tennessee is authorized to discharge treated process wastewater through Outfall 001, noncontact cooling water and cooling tower blowdown through Outfall 002, and treated sanitary wastewater and shower water through Outfall 003 to Little Limestone Creek at miles 8.9 (Outfall 001) and 9.0 (Outfalls 002 and 003).

These discharges shall be limited and monitored by the permittee as specified below:

**Outfall 001 Tier 1 Discharge Requirements (for < 2,500 to 3,750 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.001 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0004 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0008 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0019 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0069 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0035 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.3185 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.1412 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0014 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.0007 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.0269 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0119 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.0032 | lb/d | Grab | Semiannual | Daily Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Nickel, total (as Ni)** | <= | 0.002 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 0.3425 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.2066 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids (TSS)** | <= | 0.3343 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 0.7001 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) | <= | 4.0 | mg/L | Grab | 1/ Discharge | Daily Maximum |

Permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production.

Permit parameters shown above in **bold font** are subject to effluent limitation guidelines, and compliance with Daily Maximum and Monthly Average Amounts based on number of days the production facility was operating as defined in Part I.C.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Permittee must report effluent total uranium (via ICP-MS), not effluent total natural uranium.

**Outfall 001 Tier 2 Discharge Requirements (for 3,751 to 5,000 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.0015 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0006 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0011 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0028 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0245 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0119 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.1534 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.5041 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0021 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.001 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.096 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0425 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.0105 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0071 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 0.6241 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.4203 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids (TSS)** | <= | 0.634 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 1.216 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) | <= | 4.0 | mg/L | Grab | Quarterly | Monthly Average |

Permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Permit parameters shown above in **bold font** are subject to effluent limitation guidelines, and compliance with Daily Maximum and Monthly Average Amounts based on number of days the production facility was operating as defined in Part I.C.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Permittee must report effluent total uranium (via ICP-MS), not effluent total natural uranium.

**Outfall 001 Tier 3 Discharge Requirements (for 5, 001 to 6,250 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.002 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0008 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0015 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0037 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0327 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0159 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.5138 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.6721 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0028 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.0013 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.128 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0567 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.014 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0094 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 0.8322 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.5604 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total Suspended Solids (TSS)** | <= | 0.8453 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 1.6213 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) | <= | 4.0 | mg/L | Grab | Quarterly | Monthly Average |

Permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Permit parameters shown above in **bold font** are subject to effluent limitation guidelines, and compliance with Daily Maximum and Monthly Average Amounts based on number of days the production facility was operating as defined in Part I.C.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Permittee must report effluent total uranium (via ICP-MS), not effluent total natural uranium.

**Outfall 001 Tier 4 Discharge Requirements (for 6,251 to 7,500 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.0025 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.001 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0019 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0047 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0408 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0199 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.8922 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.8401 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0036 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.0017 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.1601 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0709 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.0175 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0118 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, Nitrite total (as N) | <= | 12.8 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 1.0402 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.7005 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total Suspended Solids (TSS)** | <= | 1.0567 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 2.0267 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) | <= | 4.0 | mg/L | Grab | Quarterly | Monthly Average |

Permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Permit parameters shown above in **bold font** are subject to effluent limitation guidelines, and compliance with Daily Maximum and Monthly Average Amounts based on number of days the production facility was operating as defined in Part I.C.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Permittee must report effluent total uranium (via ICP-MS), not effluent total natural uranium.

**Outfall 001 Tier 5 Discharge Requirements (for 7,501 to = 12,000 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.003 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0012 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0023 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0056 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0490 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0238 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 2.2707 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.0081 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0043 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.002 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.1921 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.085 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.021 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0141 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 1.2483 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.8406 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids** | <= | 1.268 | lb/d | Grab | 1/ Discharge | Monthly Average |

| | | | | | | |
|---|---|---|---|---|---|---|
| **(TSS)** | | | | | | |
| **Total Suspended Solids (TSS)** | <= | 2.432 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c) | <= | 4.0 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Uranium, total (c) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |

Permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Permit parameters shown above in **bold font** are subject to effluent limitation guidelines, and compliance with Daily Maximum and Monthly Average Amounts based on number of days the production facility was operating as defined in Part I.C.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Permittee must report effluent total uranium (via ICP-MS), not effluent total natural uranium.

**Outfall 002 Discharge Requirements:**

**Description : External Outfall, Number : 002, Monitoring : Effluent Gross, Season : All Year**

| Code | Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|---|
| 00010 | Temperature, water deg. C | Report | - | deg C | Grab | Twice Per Month | Daily Maximum |
| 00094 | Conductivity | Report | - | umho/cm | Grab | Twice Every Month | Daily Maximum |
| 00400 | pH (a) | >= | 6.0 | SU | Grab | Twice Per Month | Minimum |
| 00400 | pH (a) | <= | 9.0 | SU | Grab | Twice Per Month | Maximum |
| 50050 | Flow | Report | - | Mgal/d | Estimate | Twice Per Month | Daily Maximum |
| 50050 | Flow | Report | - | Mgal/d | Estimate | Twice Per Month | Monthly Average |
| TAA3B | LC50 Static 48Hr Acute Ceriodaphnia | > | 2.4 | % | Grab | Annual | Minimum |
| TAA6C | LC50 Static 48Hr Acute Pimephales | > | 2.4 | % | Grab | Annual | Minimum |

(a) pH analyses shall be performed within fifteen (15) minutes of sample collection.

**Outfall 003 Discharge Requirements:**

**Description : External Outfall, Number : 003, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| BOD, 5-day, 20 C | <= | 45 | mg/L | Grab | 2/Month | Daily Maximum |
| BOD, 5-day, 20 C | <= | 30 | mg/L | Grab | 2/Month | Monthly Average |
| Chlorine, total residual (TRC) (a) (b) | <= | 2.0 | mg/L | Grab | 5/Week | Daily Maximum |
| *E. coli*, MTEC-MF | <= | 126 | CFU/100mL | Grab | 2/Month | Monthly Average Geometric |
| *E. coli*, MTEC-MF | <= | 941 | CFU/100mL | Grab | 2/Month | Daily Maximum |
| Flow | Report | - | Mgal/d | Recorder | Continuous | Monthly Average |
| Flow | Report | - | Mgal/d | Recorder | Continuous | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.5 | mg/L | Grab | 2/Month | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 5 | mg/L | Grab | 2/Month | Monthly Average |
| Oxygen, dissolved | >= | 1.0 | mg/L | Grab | 5/Week | Minimum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 2/ Week | Daily Maximum |
| Total Suspended Solids (TSS) | <= | 30 | mg/L | Grab | 2/Month | Monthly Average |
| Total Suspended Solids (TSS) | <= | 45 | mg/L | Grab | 2/Month | Daily Maximum |
| pH (a) | >= | 6.0 | SU | Grab | 2/ Week | Minimum |
| pH (a) | <= | 9.0 | SU | Grab | 2/ Week | Maximum |

(a) pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.
(b) Total Residual Chlorine (TRC) monitoring shall be applicable when chlorine, bromine, or any other oxidant are added. The acceptable methods for TRC analysis are any method specified in Title 40 CFR Part 136 as amended. The method detection level (MDL) for TRC shall not exceed 0.05 mg/L unless the permittee demonstrates that its MDL is higher. The permittee shall retain the documentation that justifies the higher MDL and have it available for review upon request. In cases where the permit limit is less than the MDL, the reporting of TRC at less than the MDL shall be interpreted to constitute compliance with the permit.

Additional monitoring requirements and conditions applicable to Outfalls 001, 002, and 003 discharges include:

There shall be no distinctly visible floating solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.

The wastewater discharge shall not contain pollutants in quantities that will be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

Sludge or any other material removed by any treatment works must be disposed of in a manner, which prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA 68-31-101 et seq. and the Tennessee Hazardous Waste Management Act, TCA 68-46-101 et seq.

To better explain the intent of the temperature monitoring for Outfall 002, the following is duplicated from the rationale portion of the permit. Temperature will be limited according to the State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 0400-40-03-.03(3)(e)]. It is recognized that the temperature of the cooling water discharge will be greater than the temperature of the water prior to its use for cooling or other purposes. This discharge must not cause the temperature change in receiving stream to exceed 3°C relative to an upstream control point. Also, this discharge must not cause the temperature of receiving stream to exceed 30.5°C (except as a result of natural causes), and this discharge must not cause the maximum rate of temperature change in receiving stream to exceed 2°C per hour (except as a result of natural causes).

Since Outfall 002 discharges to a receiving stream with a large critical low flow relative to the wastewater, effluent temperature shall be monitored on the basis of "report only" and reported as such on the Discharge Monitoring Reports (DMRs). If the reported wastewater temperature exceeds the instream water quality temperature limit of 30.5°C, a permit violation may not have occurred, since the 30.5°C value applies to the receiving stream, not the effluent. Therefore, if the effluent temperature exceeds 30.5°C, the permittee should note in the "comments" section of the DMR that this is the temperature of the effluent. A temperature check in the receiving stream below the discharge point may be performed in order to prove facility's compliance with the Tennessee Water Quality Standards and should also be noted in the "comments" section of the DMR.

For the purpose of evaluating compliance with the permit limits established herein, where certain limits are below the state of Tennessee published required detection levels (RDLs) for any given effluent characteristics, the results of analyses below the RDL shall be reported as Below Detection Level (BDL), unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed. The Detection Level (DL) value shall be reported in the DMR "Comments" section.

## B. MONITORING PROCEDURES

### 1. Representative Sampling

Samples and measurements taken in compliance with the monitoring requirements specified herein shall be representative of the volume and nature of the monitored discharge, and shall be taken after treatment and prior to mixing with uncontaminated stormwater runoff or the receiving stream.

### 2. Sampling Frequency

If there is a discharge from a permitted outfall on any given day during the monitoring period, the permittee must sample and report the results of analyses accordingly, and the permittee should not mark the 'No Discharge' box on the Discharge Monitoring Report form. Where the permit requires sampling and monitoring of a particular effluent characteristic(s) at a frequency of less than once per day or daily, the permittee is precluded from marking the “No Discharge” block on the Discharge Monitoring Report if there has been any discharge from that particular outfall during the period which coincides with the required monitoring frequency, i.e. if the required monitoring frequency is once per month or 1/month, the monitoring period is one month, and if the discharge occurs during only one day in that period then the permittee must sample on that day and report the results of analyses accordingly.

### 3. Test Procedures

Unless otherwise noted in the permit or authorized in writing by the division, test procedures for pollutant analysis shall conform to regulations published in Title 40, CFR Part 136, promulgated pursuant to Section 304 (h) of the Clean Water Act (the "Act"), as amended. Total Uranium monitoring and analyses shall be performed using the inductively coupled plasma spectroscopy (ICP) approach using MS instrumentation methods pursuant to permit requirements provided in Part IA. The permittee shall obtained written division approval for using analytical procedures not provided in Title 40, CFR Part 136 for permit compliance.

The Outfall 003 treated effluent must be disinfected to the extent that viable *E. coli* organisms are effectively eliminated. The concentration of the *E. coli* group after disinfection shall not exceed 126 cfu per 100 ml as the geometric mean calculated on the actual number of samples collected and tested for *E. coli* within the required reporting period. The permittee may collect more samples than specified as the monitoring frequency. Samples may not be collected at intervals of less than 12 hours. For the purpose of determining the geometric mean, individual samples having an *E. coli* group concentration of less than one (1) per 100 ml shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount. A maximum daily limit of 487 colonies per 100 ml applies to lakes and Exceptional Tennessee Water. A maximum daily limit of 941 colonies per 100 ml applies to all other recreational waters.

### 4. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date and time of sampling;

b. The exact person(s) collecting samples;

c. The dates and times the analyses were performed;

d. The person(s) or laboratory who performed the analyses;

e. The analytical techniques or methods used, and;

f. The results of all required analyses.

**5. Records Retention**

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation shall be retained for a minimum of three (3) years, or longer, if requested by the Division of Water Resources.

## C. DEFINITIONS

For the purpose of this permit, ***Annually*** is defined as a monitoring frequency of once every twelve (12) months beginning with the date of issuance of this permit so long as the following set of measurements for a given 12 month period are made approximately 12 months subsequent to that time.

A ***bypass*** is defined as the intentional diversion of waste streams from any portion of a treatment facility.

A ***calendar day*** is defined as the 24-hour period from midnight to midnight or any other 24-hour period that reasonably approximates the midnight to midnight time period.

For the purposes of this permit, a ***Composite Sample*** for non-storm water discharges is a sample collected continuously over a period of 24-hours at a rate proportional to the flow.

For pollutants subject to effluent limitations guidelines, the ***Daily Maximum Amount*** is a limitation measured in pounds per day (lb/day) of the total amount, by weight, of any pollutant present in any given batch discharge divided by the number of days from the previous batch discharge that the production facility was operating. For all other parameters (including those not subject to effluent limitations guidelines), the ***Daily Maximum Amount*** is a limitation measured in lb/day, or the total amount of any pollutant in the discharge, by weight, during any calendar day and the relevant ***Daily Maximum Concentration*** is the daily maximum concentration (mg/L) actually discharged during the calendar month, regardless of ELG applicability.

For pollutants subject to effluent limitations guidelines, the ***Monthly Average Amount*** is the discharge limitation measured in pounds per day (lb/day) or calendar day, for any pollutant in the discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. For all other parameters (including

those not subject to effluent limitations guidelines), the ***Monthly Average Amount***, shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made, and the relevant ***Monthly Average Concentration*** is the average of the daily concentrations actually discharged during the calendar month, regardless of ELG applicability.

***Degradation*** means the alteration of the properties of waters by the addition of pollutants or removal of habitat.

***De Minimis*** – Alterations, other than those resulting in the condition of pollution or new domestic wastewater discharges, that represent either a small magnitude or a short duration shall be considered a *de minimis* impact and will not be considered degradation for purposes of implementing the antidegradation policy. Discharges other than domestic wastewater will be considered *de minimis* if they are temporary or use less than five percent of the available assimilative capacity for the substance being discharged. If more than one activity has been authorized in a segment and the total of the impacts uses no more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow, they are presumed to be *de minimis*. Where total impacts use more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow they may be treated as *de minimis* provided that the division finds on a scientific basis that the additional degradation has an insignificant effect on the resource and that no single activity is allowed to consume more than five percent of the assimilative capacity, available habitat or 7Q10 low flow.

***Discharge*** or "discharge of a pollutant" refers to the addition of pollutants to waters from a source.

***Dry Weather Flow*** shall be construed to represent discharges consisting of process and/or non-process wastewater only.

An ***ecoregion*** is a relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.

The ***geometric mean*** of any set of values is the $n^{th}$ root of the product of the individual values where "n" is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For the purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

A ***Grab Sample***, for the purposes of this permit, is defined as a single effluent sample of at least 100 milliliters (sample volumes <100 milliliters are allowed when specified per standard methods, latest edition) collected at a randomly selected time over a period not exceeding 15 minutes. The sample(s) shall be collected at the period(s) most representative of the total discharge.

The ***Instantaneous Concentration*** is a limitation on the concentration, in milligrams per liter (mg/L), of any pollutant contained in the discharge determined from a grab sample taken at any point in time.

A ***one week period*** (or ***calendaweek***) is defined as the period from Sunday through Saturday. For reporting purposes, a calendar week that contains a change of month shall be considered part of the latter month.

***Pollutant*** means sewage, industrial wastes, or other wastes.

A ***Qualifying Storm Event*** is one which is greater than 0.1 inches and that occurs after a period of at least 72 hours after any previous storm event with rainfall of 0.1 inches or greater.

For the purpose of this permit, a ***Quarter*** is defined as any one of the following three month periods: January 1 through March 31, April 1 through June 30, July 1 through September 30, or October 1 through December 31.

A ***rainfall event*** is defined as any occurrence of rain, preceded by 10 hours without precipitation that results in an accumulation of 0.01 inches or more. Instances of rainfall occurring within 10 hours of each other will be considered a single rainfall event.

A ***rationale*** (or “fact sheet”) is a document that is prepared when drafting an NPDES permit or permit action. It provides the technical, regulatory and administrative basis for an agency’s permit decision.

A ***reference site*** means least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.

A ***reference condition*** is a parametespecific set of data from regional reference sites that establish the statistical range of values for that particular substance at least-impacted streams.

For the purpose of this permit, ***Semi-annually*** means the same as "once every six months." Measurements of the effluent characteristics concentrations may be made anytime during a 6 month period beginning from the issuance date of this permit so long as the second set of measurements for a given 12 month period are made approximately 6 months subsequent to that time, if feasible.

A ***subecoregion*** is a smaller, more homogenous area that has been delineated within an ecoregion.

***Upset*** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

The term, ***washout*** is applicable to activated sludge plants and is defined as loss of mixed liquor suspended solids (MLSS) of 30.00% or more from the aeration basin(s).

***Waters*** means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through, or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

The ***weekly average amount***, shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar week when the measurements were made.

The ***weekly average concentration***, is the arithmetic mean of all the composite samples collected in a one-week period. The permittee must report the highest weekly average in the one-month period.

***Wet Weather Flow*** shall be construed to represent storm water runoff which, in combination with all process and/or non-process wastewater discharges, as applicable, is discharged during a qualifying storm event.

## D. ACRONYMS AND ABBREVIATIONS

1Q10 – 1-day minimum, 10-year recurrence interval
30Q5 – 30-day minimum, 5-year recurrence interval
7Q10 – 7-day minimum, 10-year recurrence interval
BAT – best available technology economically achievable
BCT – best conventional pollutant control technology
BDL – below detection level
$BOD_5$ – five day biochemical oxygen demand
BPT – best practicable control technology currently available
$CBOD_5$ – five day carbonaceous biochemical oxygen demand
CEI – compliance evaluation inspection
CFR – code of federal regulations
CFS – cubic feet per second
CFU – colony forming units
CIU – categorical industrial user
CSO – combined sewer overflow
DMR – discharge monitoring report
D.O. – dissolved oxygen
*E. coli – Escherichia coli*
EFO – environmental field office
LB (lb) - pound
$IC_{25}$ – inhibition concentration causing 25% reduction in survival, reproduction and growth of the test organisms
IU – industrial user
IWS – industrial waste survey
$LC_{50}$ – acute test causing 50% lethality
MDL – method detection level
MGD – million gallons per day
MG/L (mg/l) – milligrams per liter
ML – minimum level of quantification
ml – milliliter
MLSS – mixed liquor suspended solids
MOR – monthly operating report
NODI – no discharge
NOEC – no observed effect concentration
NPDES – national pollutant discharge elimination system
PL – permit limit

POTW – publicly owned treatment works
RDL – required detection limit
SAR – semi-annual [pretreatment program] report
SIU – significant industrial user
SSO – sanitary sewer overflow
STP – sewage treatment plant
TCA – Tennessee code annotated
TDEC – Tennessee Department of Environment and Conservation
TIE/TRE – toxicity identification evaluation/toxicity reduction evaluation
TMDL – total maximum daily load
TRC – total residual chlorine
TSS – total suspended solids
WQBEL – water quality based effluent limit
TBEL – technology based effluent limit

## E. REPORTING

### 1. Monitoring Results

Monitoring results shall be recorded monthly and submitted monthly using NETDMR. Submittals shall be no later than 15 days after the completion of the reporting period. If NETDMR is not functioning, a completed DMR with an original signature shall be submitted to the following address:

**STATE OF TENNESSEE**
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**
**DIVISION OF WATER RESOURCES**
**COMPLIANCE & ENFORCEMENT SECTION**
**William R. Snodgrass - Tennessee Tower**
**312 Rosa L. Parks Avenue, 11th Floor**
**Nashville, Tennessee 37243-1102**

If NETDMR is not functioning, a copy of the completed and signed DMR shall be mailed to Johnson City Environmental Field Office (EFO) at the following address:

**TENNESSEE DEPT. OF ENVIRONMENT & CONSERVATION**
**DIVISION OF WATER RESOURCES**
**JOHNSON CITY ENVIRONMENTAL FIELD OFFICE**
**2305 SILVERDALE ROAD**
**JOHNSON CITY TN 37601**

The electronic submission of DMR data will be accepted only if formally approved beforehand by the division. For purposes of determining compliance with this permit, data approved by the division to be submitted electronically is legally equivalent to data submitted on signed and certified DMR forms.

A copy should be retained for the permittee's files. In addition, any communication regarding compliance with the conditions of this permit must be sent to the two offices listed above.

The first DMR is due on the 15th of the month following permit effectiveness.

DMRs and any other information or report must be signed and certified by a responsible corporate officer as defined in 40 CFR 122.22, a general partner or proprietor, or a principal municipal executive officer or ranking elected official, or his duly authorized representative. Such authorization must be submitted in writing and must explain the duties and responsibilities of the authorized representative.

The permittee shall also submit its Monthly Operating Report (MOR) to the division's Johnson City Environmental Field Office.

**2. Additional Monitoring by Permittee**

If the permittee monitors any pollutant specifically limited by this permit more frequently than required at the location(s) designated, using approved analytical methods as specified herein, the results of such monitoring shall be included in the calculation and reporting of the values required in the DMR form. Such increased frequency shall also be indicated on the form.

**3. Falsifying Results and/or Reports**

Knowingly making any false statement on any report required by this permit or falsifying any result may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Water Pollution Control Act, as amended, and in Section 69-3-115 of the Tennessee Water Quality Control Act.

**4. Outlier Data**

Outlier data include analytical results that are probably false. The validity of results is based on operational knowledge and a properly implemented quality assurance program. False results may include laboratory artifacts, potential sample tampering, broken or suspect sample containers, sample contamination or similar demonstrated quality control flaw.

Outlier data are identified through a properly implemented quality assurance program, and according to ASTM standards (e.g. Grubbs Test, 'h' and 'k' statistics). Furthermore, outliers should be verified, corrected, or removed, based on further inquiries into the matter. If an outlier was verified (through repeated testing and/or analysis), it should remain in the preliminary data set. If an outlier resulted from a transcription or similar clerical error, it should be corrected and subsequently reported.

Therefore, only if an outlier was associated with problems in the collection or analysis of the samples and as such does not conform with the Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR §136), it can be removed from the data set and not reported on the Discharge Monitoring Report forms (DMRs). Otherwise, all results (including monitoring of pollutants more frequently than required at the location(s) designated, using approved analytical methods as specified in the permit) should be included in the calculation and reporting of the values required in the DMR form. You are encouraged to use "comment" section of the DMR form (or attach additional pages), in order to explain any potential outliers or dubious results.

## F. SCHEDULE OF COMPLIANCE

Unless otherwise designated in this permit, full compliance and operational levels shall be attained from the permit's effective date.

# PART II – GENERAL PROVISIONS

## A. GENERAL PROVISIONS

### 1. Duty to Reapply

Permittee is not authorized to discharge after the expiration date of this permit. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information and forms as are required to the Director of Water Pollution Control (the "Director") no later than 180 days prior to the expiration date. Such applications must be properly signed and certified.

### 2. Right of Entry

The permittee shall allow the Director, the Regional Administrator of the U.S. Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or where records are required to be kept under the terms and conditions of this permit, and at reasonable times to copy these records;

b. To inspect at reasonable times any monitoring equipment or method or any collection, treatment, pollution management, or discharge facilities required under this permit; and

c. To sample at reasonable times any discharge of pollutants.

### 3. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Water Pollution Control Act, as amended, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division of Water Resources. As required by the Federal Act, effluent data shall not be considered confidential.

### 4. Proper Operation and Maintenance

a. The permittee shall at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory and process controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems, which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit. Backup continuous pH and flow monitoring equipment are not required.

b. Dilution water shall not be added to comply with effluent requirements to achieve BCT, BPT, BAT and or other technology-based effluent limitations such as those in State of Tennessee Rule 0400-40-05-.09.

### 5. Treatment Facility Failure

The permittee, in order to maintain compliance with this permit, shall control production, all discharges, or both, upon reduction, loss, or failure of the treatment facility, until the facility is restored or an alternative method of treatment is provided. This requirement applies in such situations as the reduction, loss, or failure of the primary source of power.

**6. Property Rights**

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

**7. Severability**

The provisions of this permit are severable. If any provision of this permit due to any circumstance, is held invalid, then the application of such provision to other circumstances and to the remainder of this permit shall not be affected thereby.

**8. Other Information**

If the permittee becomes aware that he failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, then he shall promptly submit such facts or information.

## B. CHANGES AFFECTING THE PERMIT

**1. Planned Changes**

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

**2. Permit Modification, Revocation, or Termination**

a. This permit may be modified, revoked and reissued, or terminated for cause as described in 40 CFR 122.62 and 122.64, Federal Register, Volume 49, No. 188 (Wednesday, September 26, 1984), as amended.

b. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

c. If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established for any toxic pollutant under Section 307(a) of the Federal Water Pollution Control Act, as amended, the Director shall modify or revoke and reissue the permit to conform to the prohibition or to the effluent standard, providing that the effluent standard is more stringent than the limitation in the permit on the toxic pollutant. The permittee shall comply with these effluent standards or prohibitions within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified or revoked and reissued to incorporate the requirement.

d. The filing of a request by the permittee for a modification, revocation, reissuance, termination, or notification of planned changes or anticipated noncompliance does not halt any permit condition.

**3. Change of Ownership**

This permit may be transferred to another party (provided there are neither modifications to the facility or its operations, nor any other changes which might affect the permit limits and conditions contained in the permit) by the permittee if:

a. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;

b. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and liability between them; and

c. The Director, within 30 days, does not notify the current permittee and the new permittee of his intent to modify, revoke or reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

Pursuant to the requirements of 40 CFR 122.61, concerning transfer of ownership, the permittee must provide the following information to the division in their formal notice of intent to transfer ownership: 1) the NPDES permit number of the subject permit; 2) the effective date of the proposed transfer; 3) the name and address of the transferor; 4) the name and address of the transferee; 5) the names of the responsible parties for both the transferor and transferee; 6) a statement that the transferee assumes responsibility for the subject NPDES permit; 7) a statement that the transferor relinquishes responsibility for the subject NPDES permit; 8) the signatures of the responsible parties for both the transferor and transferee pursuant to the requirements of 40 CFR 122.22(a), “Signatories to permit applications”; and, 9) a statement regarding any proposed modifications to the facility, its operations, or any other changes which might affect the permit limits and conditions contained in the permit.

**4. Change of Mailing Address**

The permittee shall promptly provide to the Director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

## C. NONCOMPLIANCE

**1. Effect of Noncompliance**

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable State and Federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

**2. Reporting of Noncompliance**

a. 24-Hour Reporting

In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate regional Field Office within 24-hours from the time the permittee becomes aware of

the circumstances. (The regional Field Office should be contacted for names and phone numbers of environmental response personnel).

A written submission must be provided within five calendar days of the time the permittee becomes aware of the circumstances, unless this requirement is waived by the Director on a case-by-case basis. The permittee shall provide the Director with the following information:

i. A description of the discharge and cause of noncompliance;

ii. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

iii. The steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b. Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph 2.a. above, the permittee shall report the noncompliance on the Discharge Monitoring Report. The report shall contain all information concerning the steps taken, or planned, to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

**3. Sanitary Sewer Overflow**

a. "***Sanitary Sewer Overflow***" means the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls.

b. Sanitary Sewer Overflows are prohibited.

c. The permittee shall operate the collection system so as to avoid sanitary sewer overflows. No new or additional flows shall be added upstream of any point in the collection system, which experiences chronic sanitary sewer overflows (greater than 5 events per year) or would otherwise overload any portion of the system.

d. Unless there is specific enforcement action to the contrary, the permittee is relieved of this requirement after: 1) an authorized representative of the Commissioner of the Department of Environment and Conservation has approved an engineering report and construction plans and specifications prepared in accordance with accepted engineering practices for correction of the problem; 2) the correction work is underway; and 3) the cumulative, peak-design, flows potentially added from new connections and line extensions upstream of any chronic overflow point are less than or proportional to the amount of inflow and infiltration removal documented upstream of that point. The inflow and infiltration reduction must be measured by the permittee using practices that are customary in the environmental engineering field and reported in an attachment to a Monthly Operating Report submitted to the regional TDEC Field Office. The data measurement period shall be sufficient to account for seasonal rainfall patterns and seasonal groundwater table elevations.

e. In the event that more than five (5) sanitary sewer overflows have occurred from a single point in the collection system for reasons that may not warrant the self-imposed moratorium or completion of the actions identified in this paragraph, the permittee may request a meeting with the Division of Water Resources field office staff to petition for a waiver based on mitigating evidence.

**4. Upset**

a. "***Upset***" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i. An upset occurred and that the permittee can identify the cause(s) of the upset;

ii. The permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;

iii. The permittee submitted information required under "Reporting of Noncompliance" within 24-hours of becoming aware of the upset (if this information is provided orally, a written submission must be provided within five days); and

iv. The permittee complied with any remedial measures required under "Adverse Impact."

**5. Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

**6. Bypass**

a. "***Bypass***" is the intentional diversion of wastewater away from any portion of a treatment facility. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypasses are prohibited unless the following 3 conditions are met:

i. The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;

ii. There are not feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down-time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable

engineering judgment to prevent a bypass, which occurred during normal periods of equipment down-time or preventative maintenance;

iii. The permittee submits notice of an unanticipated bypass to the Division of Water Resources in the appropriate environmental assistance center within 24-hours of becoming aware of the bypass (if this information is provided orally, a written submission must be provided within five days). When the need for the bypass is foreseeable, prior notification shall be submitted to the Director, if possible, at least 10 days before the date of the bypass.

c. Bypasses not exceeding limitations are allowed **only** if the bypass is necessary for essential maintenance to assure efficient operation. All other bypasses are prohibited. Allowable bypasses not exceeding limitations are not subject to the reporting requirements of 6.b.iii, above.

**7. Washout**

a. For domestic wastewater plants only, a "washout" shall be defined as loss of Mixed Liquor Suspended Solids (MLSS) of 30.00% or more. This refers to the MLSS in the aeration basin(s) only. This does not include MLSS decrease due to solids wasting to the sludge disposal system. A washout can be caused by improper operation or from peak flows due to infiltration and inflow.

b. A washout is prohibited. If a washout occurs the permittee must report the incident to the Division of Water Resources in the appropriate regional Field Office within 24-hours by telephone. A written submission must be provided within 5 days. The washout must be noted on the discharge monitoring report. Each day of a washout is a separate violation.

## D. LIABILITIES

**1. Civil and Criminal Liability**

Except as provided in permit conditions for "**Bypassing,**" "**Overflow,**" and "**Upset,**" nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of wastewater to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its wastewater treatment and/or discharge activities in a manner such that public or private nuisances or health hazards will not be created.

**2. Liability Under State Law**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Pollution Control Act, as amended.

# PART III - OTHER REQUIREMENTS

## A. TOXIC POLLUTANTS

The permittee shall notify the Division of Water Resources as soon as it knows or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis, of any toxic substance(s) (listed at 40 CFR 122, Appendix D, Table II and III) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

    a. One hundred micrograms per liter (100 ug/l);

    b. Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

    c. Five (5) times the maximum concentration value reported for that pollutant(s) in the permit application in accordance with 122.21(g)(7); or

    d. The level established by the Director in accordance with 122.44(f).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

    a. Five hundred micrograms per liter (500 ug/l);

    b. One milligram per liter (1 mg/L) for antimony;

    c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 122.21(g)(7); or

    d. The level established by the Director in accordance with 122.44(f).

## B. REOPENER CLAUSE

If an applicable standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(B)(2), and 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked and reissued to conform to that effluent standard or limitation.

The division also retains the right to modify the permit for cause based on the permittee’s discharge monitoring results for the following areas: (In each case the permit modification is subject to applicable public participation.)

- The results from the permittee's Nitrite/Nitrate Nitrogen Control Program (NNNCP) may demonstrate adverse water quality instream from the standpoint of its livestock/wildlife water supply designated usage. Treated effluent ammonia nitrogen results will be considered as part of the NNNCP.
- If the permittee changes its Outfall 002 characteristics, such that its acute toxicity is removed, then the division may (based on the permittee's request and backup data) proceed with a permit modification, i.e., delete the Outfall 002 acute toxicity monitoring requirements, and apply the prior permit's 48 hour LC50 limit of >1.8% for the Outfall 001 discharge.

## C. PLACEMENT OF SIGNS

Within sixty (60) days of the effective date of this permit, the permittee shall place and maintain a sign(s) at each outfall and any bypass/overflow point in the collection system. For the purposes of this requirement, any bypass/overflow point that has discharged five (5) or more times in the last year must be so posted. The sign(s) should be clearly visible to the public from the bank and the receiving stream or from the nearest public property/right-of-way, if applicable. The minimum sign size should be two feet by two feet (2' x 2') with one inch (1") letters. The sign should be made of durable material and have a white background with black letters.

The sign(s) are to provide notice to the public as to the nature of the discharge and, in the case of the permitted outfalls, that the discharge is regulated by the Tennessee Department of Environment and Conservation, Division of Water Resources. The following is given as an example of the minimal amount of information that must be included on the sign:

**TREATED INDUSTRIAL WASTEWATER – OUTFALL 001**
**Aerojet Ordnance Tennessee**
**(Permittee's Phone Number)**
**NPDES Permit NO. TN0057983**
**TENNESSEE DIVISION OF WATER RESOURCES**
**1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Johnson City**

**NON-CONTACT COOLING WATER – OUTFALL 002**
**Aerojet Ordnance Tennessee**
**(Permittee's Phone Number)**
**NPDES Permit NO. TN0057983**
**TENNESSEE DIVISION OF WATER RESOURCES**
**1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Johnson City**

**TREATED SANITARY WASTEWATER – OUTFALL 003**
**Aerojet Ordnance Tennessee**
**(Permittee's Phone Number)**
**NPDES Permit NO. TN0057983**
**TENNESSEE DIVISION OF WATER RESOURCES**
**1-888-891-8332 ENVIRONMENTAL FIELD OFFICE - Johnson City**

## D. ANTIDEGRADATION

Pursuant to the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06, titled "Tennessee Antidegradation Statement," which prohibits the

degradation of high quality surface waters and the increased discharges of substances that cause or contribute to impairment, the permittee shall further be required, pursuant to the terms and conditions of this permit, to comply with the effluent limitations and schedules of compliance required to implement applicable water quality standards, to comply with a State Water Quality Plan or other state or federal laws or regulations, or where practicable, to comply with a standard permitting no discharge of pollutants.

## E. CERTIFIED OPERATOR

The sanitary waste treatment facilities shall be operated under the supervision of a wastewater system certified operator in accordance with the Water Environmental Health Act of 1984.

## F. ACUTE BIOMONITORING REQUIREMENTS, OUTFALL 001 AND 002 DISCHARGES

The permittee shall conduct separate 48-hour static acute toxicity tests on two test species using the final effluents from Outfalls 001 and 002. The test species to be used are Water Fleas (*Ceriodaphnia dubia)* and Fathead Minnows *(Pimephales promelas*). The measured endpoint for toxicity will be the concentration causing 50% lethality ($LC_{50}$) of the test organisms. The $LC_{50}$ shall be determined based on 50% lethality as compared to the controls.

Tests shall be conducted and results reported based on appropriate replicates of the serial percent effluent dilutions and a control as shown below, using the following tables:

| Serial Dilutions for Whole Effluent Toxicity (WET) Testing for Outfalls 001 and 002 Discharges (Permit Limit >2.4 %) | | | | | |
|---|---|---|---|---|---|
| **4 X PL** | **2 X PL** | **Permit Limit (PL)** | **0.50 X PL** | **0.25 X PL** | **Control** |
| % effluent | | | | | |
| 9.6 | 4.8 | 2.4 | 1.2 | 0.6 | 0 |

The dilution/control water used will be moderately hard water as described in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-02-012 (or the most current edition). Results from an acute standard reference toxicant quality assurance test for each species tested shall be submitted with the discharge monitoring report. Reference toxicant tests shall be conducted as required in EPA-821-02-012 (or the most current edition). Additionally, the analysis of this multi-concentration test shall include review of the concentration-response relationship to ensure that calculated test results are interpreted appropriately.

The WET tests for the Outfall 001 and 002 discharges shall be conducted using final effluent grab samples which are representative of the treated wastewater. Elevated toxicity and a test failure and constitutes a permit violation will be demonstrated if a $LC_{50}$ value is less than or equal to 2.4 %, for either species. The Outfall 002 grab samples must be collected when discharge from the cooling towers is occurring.

If, in any control more than 10% of the test organisms die in 48 hours, the test (control and effluent) is considered invalid and the test shall be repeated within 30 days of the date the initial test is invalidated. Furthermore, if the results do not meet the acceptability criteria as defined in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-02-012 (or most recent edition), or if the required concentration-response review fails to yield a valid relationship per guidance contained in Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing, EPA-821-B-00-004 (or the most current edition), that test shall be repeated. Any test initiated but terminated before completion must also be reported along with a complete explanation for the termination.

The toxicity tests for the Outfall 001 treated effluent and the Outfall 002 discharge shall be completed semi-annually.

**In the event of a test failure for the Outfall 001 or 002 samples**, the permittee must start a follow-up test within 2 weeks and submit results from a follow-up test within 30 days from obtaining initial WET testing results. The follow-up test must be conducted using the same serial dilutions as presented in the corresponding table(s) above. **The follow-up test will not negate an initial failed test. In addition, the failure of a follow-up test will constitute a separate permit violation, which must also be reported.**

In the event of 2 consecutive test failures or 3 test failures within a 12-month period for the same outfall's discharge, the permittee shall initiate a Toxicity Identification Evaluation/Toxicity Reduction Evaluation (TIE/TRE) study within 30 days. However, prior to completing the laboratory testing, the permittee must submit its proposed study to the division for review and approval. **During the term of the TIE/TRE study, the frequency of biomonitoring shall be once every three months.** Additionally, the permittee shall submit progress reports once every three months throughout the term of the TIE/TRE study. The toxicity must be reduced to allowable limits for that outfall within 2 years of initiation of the TIE/TRE study. Subsequent to the results obtained from the TIE/TRE studies, the permittee may request an extension of the TIE/TRE study period if necessary to conduct further analyses. The final determination of any extension period will be made at the discretion of the division.

The TIE/TRE study may be terminated at any time upon the completion and submission of 2 consecutive tests (for the same outfall) demonstrating compliance. Following the completion of TIE/TRE study, the frequency of monitoring will return to a regular schedule, as defined previously in this section as well in Part I of the permit. **During the course of the TIE/TRE study, the permittee will continue to conduct toxicity testing of the outfall being investigated at the frequency of once every three months but will not be required to perform follow-up tests for that outfall's discharge during the period of TIE/TRE study.**

Test procedures, quality assurance practices and determination of effluent lethality values will be made in accordance with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-02-012, or the most current edition.

Results of all tests, reference toxicant information, copies of raw data sheets, statistical analysis and chemical analysis shall be compiled in a report. The report shall be written in accordance with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-02-012, or the most current edition.

Biomonitoring reports (including follow-up reports) shall be submitted to the division electronically as provided in Part I. E.

## G. DISCHARGE NITRITE/NITRATE NITROGEN CONTROL PROGRAM

As shown in Part IA, the permit includes Outfall 001 discharge daily maximum limits for the sum of nitrite and nitrate. The previous permit required Aerojet to develop a Nitrite/Nitrate Nitrogen Control Program (NNNCP) NNNCP, to include a summary of wastewater control measures being used to reduce the Outfall 001 effluent nitrite and nitrate discharges. If the permittee only operates pursuant to the Tier 1 discharge requirements as presented in Part 1A, then the above NNNCP submittal requirements will not be necessary.

## H. INSTREAM MONITORING

To assess the impact of the permittee's discharges on Little Limestone Creek, the permittee shall continue to conduct instream analyses per the previous permit. Instream monitoring points are shown on the map included in Attachment 1.

1. Water Quality Analysis

The permittee shall conduct analyses for the following parameters in the water column: estimated flow, pH, temperature, dissolved oxygen, conductivity, gross alpha, gross beta, total uranium, nitrite, nitrate, total phosphorus, and total dissolved solids. These analyses must be conducted <u>once every four months</u> based on grab samples collected at Stations #3, #4, #5. The estimated flow shall be determined based on Station #4 measurements.

The permittee shall use its updated division-approved instream monitoring procedures, which provides sampling sequencing information to insure that the intermittent Outfall 001 discharge impacts are actually being evaluated via the instream monitoring. The permittee shall attach its Water Quality Analysis results with its DMR for the month when laboratory analyses is received.

2. Sediment Quality Analysis

The permittee shall conduct analyses for the following parameters in the sediment: total chromium, total nickel, total uranium, and total thorium. These analyses shall be conducted once during the term of the permit by a grab sample at Stations #3, #4, and #5. The permittee shall submit the division a Sediment Summary Report, which includes the current results plus instream sediment sampling results for the past two permits. The permittee shall include an overall assessment regarding sediment characteristics and trends in the report.

3. Biological Monitoring

Unless otherwise approved in writing from the division, the permittee shall complete the permit biological monitoring, as defined in this section to determine the biological integrity and diversity of the receiving stream per Rule 0400-40-03-.03(m). The permittee's biological monitoring permit requirements shall involve completing a biosurvey at two locations (upstream and downstream) on Little Limestone Creek as well as an ecoregion reference site on Big War Creek (ECO67F17).

The biosurvey shall consist of a single habitat semi-quantitative macroinvertebrate sample and a habitat survey. Habitat assessments, sample collection, subsampling, taxonomy and metric calculation shall adhere to the protocols as outlined in TDEC's most recent QSSOP for Macroinvertebrate Stream Surveys. All Quality Assurance/Quality Control procedures specified in the QSSOP shall be followed, unless otherwise approved in writing from the division. **Aerojet must obtain the Excel spreadsheet format for data on benthic macinvertebrates by contacting the DWR Planning & Standards Section (Attn: Debbie Arnwine or Kim Laster) – contact information is shown below.**

The biosurvey must be completed once during the permit term, with results report submitted within 90 days from completion of the analysis sampling.

The permittee's survey personnel qualifications shall be provided to the division's Johnson City Environment Field Office for approval prior to completing the field investigations. The permittee shall notify DWR at the Johnson City Environmental Field Office at least two weeks prior to conducting the biosurvey.

Habitat Assessment

Appropriate habitat assessment forms shall be completed concurrent with each biological survey. Due to the nature of Little Limestone Creek in the vicinity of the discharge, the Low Gradient Form (included in Appendix B of the above referenced document) shall be used in conjunction with semi-quantitative bank collections. Protocol D-2 shall be used for conducting the habitat assessment. If requested by the permittee, procedural variances may be division-approved.

Macroinvertebrate Sample Collection

A minimum of three undercut bank jabs using a 500 micron mesh net shall be collected following Protocol G, part c. The debris from all jabs shall be composited and preserved. All sorting and identification shall be conducted in the laboratory.

Subsampling

All sorting shall be done under a dissecting microscope and samples reduced to a 200+/- 20% organisms following subsampling protocols detailed in protocol I.

Taxonomy

All *taxa* in the subsample shall be identified to genus level as specified in Protocol J.

Biometrics

The following biometrics shall be calculated for each subsample (without extrapolation). Data reduction protocols must follow Protocol K. Appendix C shall be used for the NCBI and % Clingers metrics calculations.

*Taxa* Richness (TR)
EPT Richness (EPT)
EPT Abundance (% EPT - *Cheumatopsyche*)
*Chironomidae* and *Oligochaeta* Abundance (% OC)
North Carolina Biotic Index (NCBI)
Percent Contribution of Tennessee Nutrient Tolerant Organisms (%TNUTOL)
Percent Clingers (% CLINGERS)

Scoring for each metric must follow the draft SQBANK guidelines for ecoregion 67f (below). Scoring criteria may be adjusted for subsequent samples based on SQBANK data collected from the ecoregion reference site based on Protocol K – Alternative Reference Method using the 90th percentile of all SQBANK data collected from the 67f ecoregion reference site. The division will notify the permittee in writing of any revisions prior to the next sampling period.

Draft SQBANK Guidelines - Scoring based on 3 samples collected from ECO67F14 and ECO67F17. Revised 01-10-2012

| Ecoregion 67f<br>Target Index Score (January – December) = 32 | | | Method = SQBANK<br>Drainage > 2 sq mi | |
|---|---|---|---|---|
| **Metric** | **6** | **4** | **2** | 0 |
| Taxa Richness (TR) | > 29 | 20-29 | 10 – 19 | < 10 |
| EPT Richness (EPT) | > 7 | 5 – 7 | 2 – 4 | < 2 |
| % EPT-C | > 26.9 | 18.0-26.9 | 9 – 17.9 | < 9 |
| % OC | < 42.8 | 42.8 - 61.8 | 61.9 - 80.9 | > 80.9 |
| NCBI | < 6.63 | 6.63 – 7.75 | 7.76 – 8.87 | > 8.87 |
| % TNUTOL | < 31.3 | 31.3 – 54.1 | 54.2 – 77.0 | > 77.0 |
| % Clingers | > 30.2 | 20.2 – 30.2 | 10.1 - 20.1 | < 10.1 |

The following information shall be recorded at each station during the biosurvey.

Water temperature ($^{o}$C)
pH (SU)
Stream Flow (cfs)
Dissolved Oxygen (mg/l)
Conductivity (umhos/cm)

Reporting

The permittee's biological stream sampling (including complete *taxa* lists and habitat assessments) results reports shall be submitted electronically by email to the following division contacts:

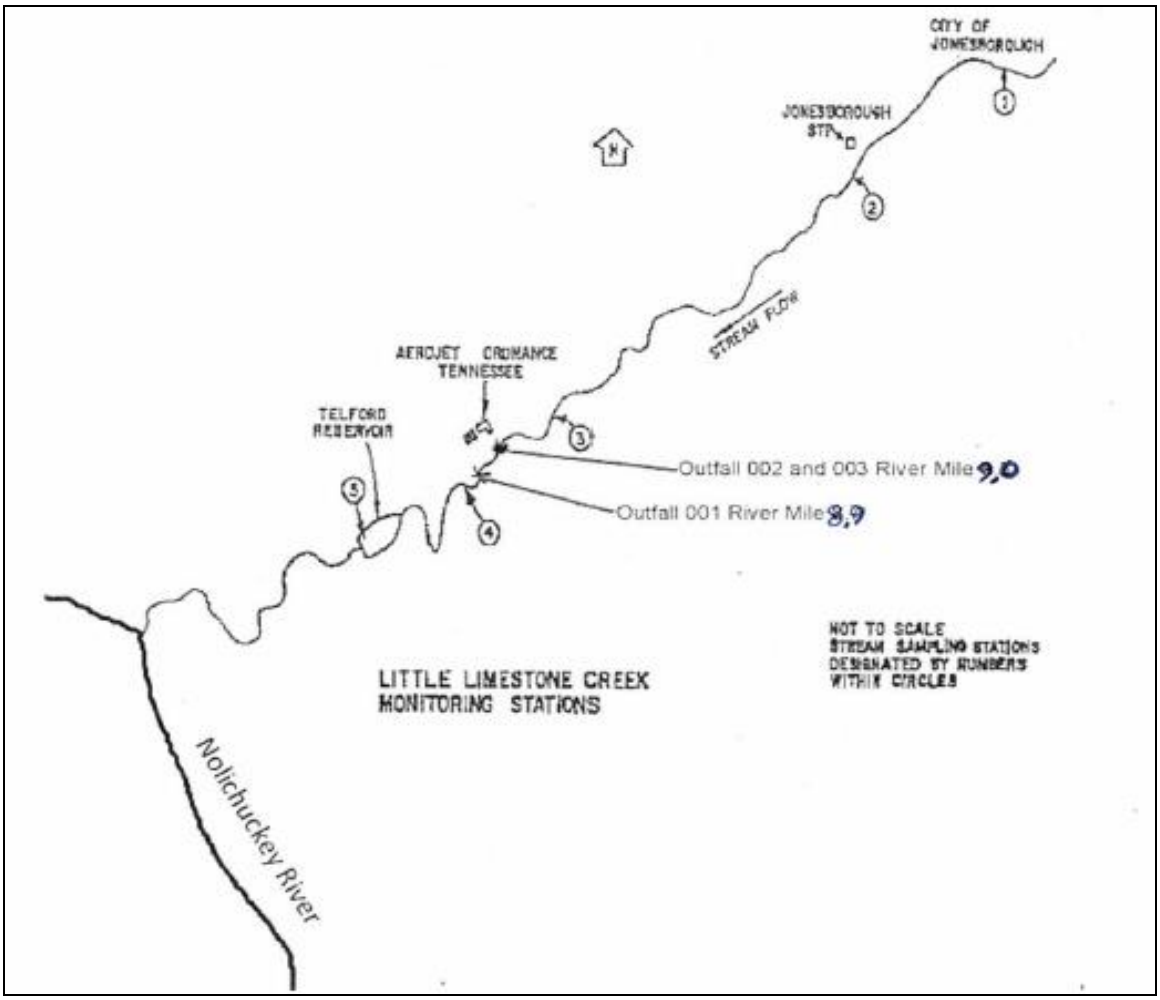
| | | | |
|---|---|---|---|
| Debbie Arnwine | Debbie.arnwine@tn.gov | Planning & Standards Unit | 615-532-0703 |
| Kim Laster | Kim.laster@tn.gov | Planning & Standards Unit | 615-770-1805 |
| Beverly Brown | Beverly.brown@tn.gov | Johnson City EFO | 423-854-5448 |
| Bryan Carter | Bryan.carter@tn.gov | Johnson City EFO | 423-854-5456 |
| Sarah Terpstra | Sarah.terpstra@tn.gov | Compliance/ Enforcement Unit | 615-532-3634 |

Electronic reporting will include Excel spreadsheets of benthic macroinvertebrate taxa.

**ATTACHMENT 1**

## LITTLE LIMESTONE CREEK MONITORING STATIONS

The following map shows the Instream Monitoring Stations.




Additional ecoregion reference monitoring site - Big War Creek (ECO67F17) for biological and habitat assessment is at 36.42626/-83.34663.

**RATIONALE - - SEPTEMBER 2016**

# Aerojet Ordnance Tennessee

**NPDES PERMIT NO. TN0057983**

**Jonesborough, Washington County, Tennessee**

**Permit Writer: Mr. Bob Alexander**[1]

## I. DISCHARGER

**Aerojet Ordnance Tennessee**
**1367 Old S34**
**Jonesborough, Washington County, Tennessee**
**Site Longitude: -82.528611 Site Latitude: 36.251111**

**Official Contact Person:**
**Mr. Wendell Christian**
**General Manager**
**(423) 753-1262**

**Nature of Business:**
**Manufacturer of tungsten and uranium metals, alloys, castings, and machined pieces. Manufacturer of steel grenade bodies.**

**SIC Code(s): 3369, 3489, 3451, and 3499**
**Industrial Classification: Primary**
**Discharger Rating: Major**

PRIMARY INDUSTRY CATEGORY means any industry category listed in the NRDC Settlement Agreement (Natural Resources Defense Council v. Train, 8 ERC 2120 [D.D.C. 1976], modified 12 ERC 1833 [D.D.C. 1979]).

## II. PERMIT STATUS

**Issued August 1, 2012**
**Expired December 31, 2015**
**Application for renewal received June 28, 2015**

**Watershed Scheduling**

**Environmental Field Office: Johnson City**
**Outfall 001: Longitude: -82.528056 Primary Outfall Latitude: 36.250000**
**Hydrocode: 6010108 Watershed Group: 5**
**Watershed Identification: Nolichucky**
**Target Reissuance Year: 2020**

[1] Robert.alexander@tn.gov, 615-532-0659

## III. PERMIT RENEWAL CONSIDERATIONS

1. Permit Limits for process wastewater, including the tiering approach involving separate discharge requirements for 5 production ranges, are retained from the current permit.
2. Reporting and permit limits for nitrogen compounds is revised; parameters include ammonia nitrogen, total nitrogen, and nitrite-plus-nitrate. Duplicate reporting and limits for total nitrates and total nitrites are deleted.
3. The requirement for instream monitoring is retained.
4. Revisions are made to permit terms, including the following:
    a) Reference to uranium testing will rely solely on EPA Method 200.8 and the ICP-OES method is eliminated.
    b) Because the facility no longer uses tributyltin for conditioning of cooling water, testing and reporting is eliminated.

## IV. FACILITY DISCHARGES AND RECEIVING WATERS

Aerojet Ordnance Tennessee [Aerojet] is a manufacturer of uranium and tungsten metals, alloys, castings, machined pieces, including steel grenade bodies. Wastestream sources and wastewater treatment systems are shown in Appendix 1, and have three separate discharges (Outfalls 001, 002 and 003) to Little Limestone Creek.

- Treated process wastewater and stormwater are intermittently discharged from Outfall 001 at river mile 8.9. Batch discharges occur once or twice per month with a volume of less than 10,000 gallons released over a 24 hour period. Total wastewater volume discharged is approximately 150k – 200k gallons per year.
- Non-contact cooling water and cooling tower blowdown are discharged from Outfall 002 at river mile 9.0. Approximately 1,000 – 3,000 gallons per day is discharged during warm weather months.
- Treated sanitary wastewater and shower water are discharged from Outfall 003 at river mile 9.0. Monthly average flows are approx. 2,100 gallons per day.

Aerojet has a general Tennessee Multi-Sector Stormwater Permit (TMSP) TNR051099 for handling those stormwater discharges that are associated with the industrial activity, but do not drain to Outfalls 001, 002, and 003. As such, these TMSP-covered stormwater discharges are not addressed in this new NPDES permit.

The State Division of Radiological Health regulates the permittee's plant pursuant to Permit No. S-90009-J21. As such, radiological assessments/results are not addressed in the new NPDES permit or corresponding rationale.

Little Limestone Creek is assessed in 2013 as unavailable waters for nitrate+nitrite, total phosphorus, ammonia, and E. coli, and as needing additional controls to meet WQC. At that time, the WQ assessment reported the effects of the Town of Jonesborough's municipal wastewater discharge, which was relocated to the Nolichucky River in May 2015. The results of the Aerojet biological monitoring from July 2015 are discussed below and indicate recent improvement in WQ conditions.

Appendix 1 also provides the Little Limestone Creek low-flows (7Q10 and 30Q5) and its designated uses.

## V. CURRENT PERMIT DISCHARGE REQUIREMENTS

Appendix 2 presents the current permit's limitations and monitoring requirements for the Outfall 001, 002 and 003 discharges.

## VI. DISCHARGE MONITORING REPORT (DMR) AND INSPECTION RESULTS

During the current permit's term, the permittee did not have any appreciable difficulty in achieving its discharge limitations.

From August 31 to September 3, 2015 JCEFO personnel conducted an on-site Compliance Evaluation Inspection (CEI). The CEI report addressed several analytical methods shortcomings/upgrade requirements. The permittee provided its CEI response in a November 5, 2015 letter presenting its detailed action plan and a proposed implementation schedule. The division's CEI results and the permittee's response letter are available in the permit file.

## VII. TECHNOLOGY-BASED LIMITS

The Standard Industrial Classification (SIC) codes for the permittee are 3369 (Non Ferrous Foundries, Except Aluminum and Copper), 3489 (Precision Turned Product Manufacturing, 3451 (Fabricated Metal Products Industry, and 3499 Powder Metallurgy Products. The permittee's discharge Outfall 001 discharge must comply with both Federal and State of Tennessee technology-based discharge limitations. Also, the Federal and State of Tennessee technology-based effluent limitations require consideration of when specific types of manufacturing began and if existing or new source criteria are applicable.

The Federal Effluent Limitations Guidelines (ELGs) for Point Sources are shown in the schematic diagram presented in Appendix 1, with detailed calculations provided in Appendix 3. As shown in Appendix 3, ELGs for both existing and new sources are applicable for the permittee's Outfall 001 discharge and were applied in developing permit requirements. Specifically, ELGs per 40 CFR Part 471 Subpart G – Uranium Forming and 40 CFR Part 471 Subpart E – Refractory Metals (Tungsten) Forming are applicable. The existing evaporator effectively eliminates consideration of wastewater discharges from the permittee's point sources subject to Metal Finishing Point Source Category pursuant to 40 CFR Part 433.

The renewed permit includes Outfall 001 discharge mass loading allocations pursuant to EPA ELGs for both regulated and non-regulated wastestreams. The renewed permit retains Outfall 001 mass loading allocations from the 2010 permit, which was based on production rates and wastestreams subject to the federal ELGs. The 2010 permit also set limit using Best Professional Judgment (BPJ) to determine mass loading allocations for the permittee's non-regulated wastestreams, e.g., foundry cooling pad wastewater, pickle room stormwater/caustic scrubber blowdown that must be treated via the permittee's wastewater treatment facility.

To account for potentially increased production due to U.S. Army requirements, a five-tiered Outfall 001 technology-based discharge permit approach has been defined. This renewed permit retains the following rationale for defining technology-based allocations:

Tier 1 = 1.0 * ELGs
Tier 2 = 1.5 * Tier 1 ELGs
Tier 3 = 2.0 * Tier 1 ELGs
Tier 4 = 2.5 * Tier 1 ELGs
Tier 5 = 3.0 * Tier 1 ELGs

This approach requires that the permittee select and report pursuant to the appropriate permit tier limitations. Although both ELG allocations for Subparts E and G were used to define the overall discharge limits, it was assumed that monthly average production per Subpart G Uranium Forming would be most representative for selecting the permit tier.

Since the permittee has a batch wastewater treatment process with intermittent discharge, the following factors per 40 CFR Part 122.45(e) were considered in determining the new permit's discharge limitations and monitoring requirements:

Discharge frequency;
Total mass;
Maximum pollutant discharge rate;
Prohibitions/limitations for the discharge of pollutant mass, concentration, or other appropriate measures.

## VIII. WATER QUALITY-BASED LIMITS

Appendix 4 presents the division's water quality reasonable potential evaluations for the permittee's discharges from Outfalls 001, 002 and 003. For Outfall 001 the calculations were focused on determining water quality requirements for heavy metals, nitrite/nitrate and ammonia nitrogen. For Outfall 002, calculations considered potential acute toxicity (48 hr LC50) of cooling water conditioning chemicals. Total residual chlorine (TRC) water quality calculations are also presented for the Outfall 003 discharge.

Background Water Quality

The Division's 2013 water quality assessment identified Little Limestone Creek's fish and aquatic life designated usage was not fully supporting due to nutrients from agricultural and municipal sources. These discharges are not related to Aerojet's effluents.

Permit Limits for Nutrients

The division frequently associates increased instream nitrite/nitrate levels with additional aquatic plant/algal growth and adverse biological impacts. For fish and aquatic life, the division's Rule 0400-40-03-.03(3)(k) notes that waters shall not contain nutrients in concentrations that stimulate aquatic plant and/or algae growth to the extent that aquatic habitat is substantially reduced and/or the biological integrity fails to meet regional goals.

The division can integrate nutrient control requirements into NPDES permit conditions (e.g., the limits, control programs) pursuant to its regionally based (ecoregions) narrative nutrient criterion (subregion 67f for the permittee's Outfall 001 discharge). Rule 0400-40-03-.03(3)(k) also provides for instream nutrients control using other scientifically defensible methods.

Current Situation

A major contribution of nutrients in the Little Limestone Creek Watershed existed for decades from the Town of Jonesborough STP. This nutrient load was relocated in 2015 downstream to the Nolichucky River.

The Aerojet biological and sediment monitoring report from September 2015 for Little Limestone Creek provides additional data on biological integrity and the health of benthic macroinvertebrates. The survey was done accurately, metrics were calculated correctly, and the data passes the TMI rating of 32 using SQBANK methods, which meets bio-criteria guidelines for the ecoregion. Significantly, the presence of Nutrient Tolerant macroinvertebrate species at <50% reinforces the status of the stream's ongoing recovery.

Permit Limits for Nitrogen Compounds

For major NPDES permits (design flows > 1.0 MGD) EPA recommends continued monitoring for total nitrogen (TN) and total phosphorus (TP) in order to have current nutrient data maintained in its Integrated Compliance Information System (ICIS) database to accurately forecast nutrient loading to the Mississippi River. This ICIS data is being used by the Mississippi Hypoxia Task Force which consists of the EPA and States along the Mississippi River. Tennessee is one of three states in Region 4 which has rivers that ultimately drain to the Mississippi River.

Additionally, Little Limestone Creek is assessed as needing additional controls on nitrogen compounds to ensure that the stream complies with the state's narrative criterion for nutrients. The stream has levels of nitrate-nitrite in excess of the 90th percentile value of 1.24 mg/l for the comparable eco-region reference streams both up and downstream of Outfall 001.. Presently, Tennessee is implementing a statewide nutrient reduction framework rather than develop site-specific TMDLs for each stream segment. Computer modeling is not complete for the Nolichucky River basin, so this permit proposes conditions expected to be consistent with that draft framework[2]

The framework is an adaptive management approach that essentially caps point source dischargers at existing capability or suggests 2 tiers of reduction based on technologically achievable effluent limits and overall watershed loading from all sources. This permit proposes a capped limit because the Nolichucky Watershed Plan (Ref. http://www.tn.gov/assets/entities/environment/attachments/wr-ws_watershed-plan-nolichucky-2008.pdf) indicates that only 6% of the land area in the watershed is developed while 94% is forest, pasture land and row crops. The permit includes a reopener clause in Part 1.5. to allow for reopening of the permit if warranted to address assumptions regarding development of the total nitrogen phosphorus limit or implementation of the framework.

Aerojet's discharges of nitrogen compounds for 2013-2016 are summarized below from DMR data. No discharge of phosphorus compounds occurs following installation of evaporation equipment during the previous permit.

| Outfall | Ammonia, mg/l | Nitrate, mg/l | Nitrite, mg/l |
|---|---|---|---|
| 001 | 2.6 – 3.7 | 5.5 – 8.0 | 0.24 – 0.42 |
| 001 pmt limit | 7.6 – 15.2 | | |
| 003 | 0.06 – 0.13 | | |
| 003 permit limit | 5.0 – 7.5 | | |

[2] http://www.tn.gov/environment/article/wr-ws-tennessee-nutrient-reduction-framework .

Ammonia

| Limit Unit Desc | Milligrams per Lite | Milligrams per Liter |
|---|---|---|
| Statistical Base | MO AVG | DAILY MX |
| Limit Value | 7.6 | 15.2 |
| DMR Values | C2 | C3 |
| 09/30/2012 | 5.075 | 5.6 |
| 10/31/2012 | 7.03 | 12 |
| 11/30/2012 | 6.83 | 9.8 |
| 12/31/2012 | 4.55 | 4.55 |
| 01/31/2013 | 3.127 | 3.65 |
| 02/28/2013 | 3.37 | 6.54 |
| 03/31/2013 | 1.75 | 3.3 |
| 04/30/2013 | 4.9517 | 7.2 |
| 05/31/2013 | 4.025 | 7.8 |
| 06/30/2013 | NODI=C | NODI=C |
| 07/31/2013 | 7.5 | 7.5 |
| 08/31/2013 | 4.5 | 8.1 |
| 09/30/2013 | 3.1075 | 5.7 |
| 10/31/2013 | 4.1 | 4.95 |
| 11/30/2013 | 3.5667 | 6.05 |
| 12/31/2013 | 3.775 | 5.75 |
| 01/31/2014 | 2.1 | 2.8 |
| 02/28/2014 | .72 | .72 |
| 03/31/2014 | .369 | .595 |
| 04/30/2014 | .5369 | 1.04 |
| 05/31/2014 | 6.35 | 9.15 |
| 06/30/2014 | 3.642 | 7.1 |
| 07/31/2014 | .17 | .435 |
| 08/31/2014 | .07 | .07 |
| 09/30/2014 | .0925 | .185 |
| 10/31/2014 | .65 | 1.15 |
| 11/30/2014 | 1.435 | 1.8 |
| 12/31/2014 | 1.0475 | 1.07 |
| 01/31/2015 | Not Det | Not Det |
| 02/28/2015 | Not Det | Not Det |
| 03/31/2015 | Not Det | Not Det |
| 04/30/2015 | Not Det | Not Det |
| 05/31/2015 | 3.85 | 3.85 |
| 06/30/2015 | 6.25 | 7.2 |
| 07/31/2015 | 4.95 | 6.75 |
| 08/31/2015 | 7.5 | 7.5 |
| 09/30/2015 | 3.8167 | 7.8 |
| 10/31/2015 | 4 | 4.7 |
| 11/30/2015 | 2.45 | 2.45 |
| 12/31/2015 | 2.05 | 2.8 |
| 01/31/2016 | 1.45 | 1.45 |
| 02/29/2016 | 4.85 | 6.8 |
| 03/31/2016 | NODI=C | NODI=C |
| 04/30/2016 | .14 | .14 |
| 05/31/2016 | 1.6475 | 3.05 |
| 06/30/2016 | 1.5 | 1.5 |
| 07/31/2016 | 5.875 | 7.3 |

## IX. ANTIDEGRADATION CONSIDERATIONS

Tennessee's Antidegradation Statement is found in the Rules of the Tennessee Department of Environment and Conservation, Chapter 0400-40-03-.06. It is the purpose of Tennessee's standards to fully protect existing uses of all surface waters as established under the Act.

The permittee's receiving stream, Little Limestone Creek (waterbody segment ID TN06010108510_2000) is located in Washington County. The division determined in 2013 that this segment is not fully supporting its fish/aquatic life designated usage due to MS4 discharges (specific parameters of concern are nitrite/nitrate and total phosphorus), grazing in riparian or shoreline zones activities resulting in deleterious instream physical substrate habitat alterations, municipal point source* discharges due to adverse impacts from unionized ammonia, nitrite/nitrate, and total phosphorus. Also, this segment is not fully supporting its recreation designated uses from grazing in riparian or shoreline zones due to *E. coli* contamination. .

*A major contribution to the adverse conditions in the Creek has been the Town of Jonesborough discharge of treated domestic wastewater. The treated effluent was relocated in 2015 downstream of Aerojet with discharge directly to the Nolichucky River, and improved WQ conditions in Little Limestone Creek are anticipated. Aerojet's 2015 instream survey indicates evidence of such improvement, as discussed above.

The previous permit and this draft renewal include limits and monitoring requirements for the existing Outfall 001, 002, and 003 discharges. Considering Outfall 001 discharge characteristics and the receiving stream's needs noted above for additional controls, the renewed permit retains limits for nitrogen compounds. Additionally, the previous permit required Aerojet to upgrade its current Nitrite/Nitrate Nitrogen Control Program (NNNCP) for the Outfall 001 ~~discharge and demonstrate mass loading reductions during the previous term.~~

Total phosphorus limits are not warranted since the permittee will continue to use its evaporator as a zero-discharge control for handling two additional wastestreams. Thus, the renewed permit includes annual monitoring requirements for the Outfall 001 total phosphorus.

With due consideration for antibacksliding (as discussed in Section X and receiving stream water quality protection, the renewed permit provides for increased discharges (via Tiers 2, 3, 4 and 5) pursuant to applicable technology-based allocations to accommodate the Army's continuing requirements. The permittee has indicated that, due to the presence of residual radioactive components, it has no reasonably feasible non-discharging alternatives (e.g., land application, discharge to municipal sewer) for its expanded discharge pursuant to its increased production due to the U.S. Army requirements.

TMDLs have been developed and approved for this waterbody segment on the following parameters and dates:

| Parameter | TMDL Approval Date |
|---|---|
| *E. coli* | March 5, 2007 |
| Siltation and Habitat Alteration | February 26, 2008 |

The current permit and proposed new permit requires disinfection to achieve *E. coli* water quality limits end-of-pipe for the Outfall 003 treated sanitary wastewater, and therefore complies with the TMDL conditions. .

## X. NEW PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

As illustrated in Appendix 6 the new permit requirements were developed using the applicable technology-based discharge values, including antibacksliding provisions considerations, and assessing if such limits protect the receiving stream's water quality. The technology-based limits were included in the new permit unless more stringent water quality values were applicable. The technology-based limits were determined from applicable EPA effluent limitations guidelines and BPJ assessments. The State of Tennessee maximum effluent limits per Rule 1200-4-5-.08, receiving stream impairments, and operational and/or treatability data, and any applicable approved Total Maximum Daily Load (TMDL) studies were also addressed in defining the new permit requirements.

The statutory provision known as "anti-backsliding" was considered in developing the new permit requirements. The term "antibacksliding" prohibits the reissuance, or modification of a NPDES permit that contains effluents limits, permit conditions, or standards that are less stringent than those established in the current permit. For parameters subject to ELGs/BPJ application, permitting increases can occur without violating "antibacksliding" provisions.

The basis for defining each discharge parameter for the three outfalls is presented below.

### A. TREATED PROCESS WASTEWATER (OUTFALL 001)

Outfall 001 treated process wastewater is stored in two 5,000 gal tanks, which allows the 9,600 gal treated wastewater to be discharged over a 24-hour period. The treated wastewater is discharged batch-wise based on production schedule, cleanup operations and rainfall. Currently, the treated Outfall 001 wastewater is discharged approximately 1x/week. For some operational conditions, it may be necessary for the permittee to discharge over a longer period and/or more frequently.

To maintain the ability to adjust its depleted uranium production rate from its current level, the five-tiered Outfall 001 permit approach from the current permit was retained.

- For Tier 1 the Outfall 001 limits and monitoring requirements are for the permittee's current production level, without allocations for additional U. S. Army depleted uranium production.
- Renewed permit's Tiers 2, 3, 4 and 5 provide for increased Outfall 001 discharge mass loadings pursuant to Army requirements and relevant ELGs/BPJs.
- Increased mass loadings (relative to Tier 1) were calculated using the approach explained in Section 7, for the following parameters: total suspended solids, oil/grease, fluorides, and heavy metals (cadmium, chromium, copper, lead, molybdenum, and nickel).
- No increases in nitrite, nitrate and nitrite + nitrate mass loadings and ammonia-nitrogen concentrations beyond the new permit's Tier 1 permit values are authorized.
- For reporting purposes, the permittee must define which production rate is applicable for each month, comply with the correct Outfall 001 permit tier

requirements, and complete/submit to the division the appropriate discharge monitoring report (DMR).

The permittee uses an evaporator (a zero discharge system) to treat all its wastewaters from processes subject to Metals Finishing Point Source Category ELGs. As such, the total toxic organics (TTO) monitoring/certification requirements are not required.

**Flow (Outfall 001)**

The permit requires that the permittee's discharge flow (MGD) be estimated/ reported as maximum daily and calculated monthly average (determined based on total volume discharged divided by the number of days when discharges actually occurred) values. The flow data provides the basis for determining mass loadings discharged to the receiving stream. Discharge flow must be estimated on a once/batch discharge basis.

**pH (Outfall 001)**

The technology-based pH limit specified in §471.71 for the regulated wastestreams is within the range 7.5 – 10 SU. The permittee's regulated and unregulated wastewaters combine prior to treatment and the permittee has documented that no practicable internal monitoring point for pH monitoring exists. As shown in Appendix 6, instream water quality requires a pH of 6.0 to 9.0 SU. As such, the upper limit water quality limit of 9.0 SU and the technology based approach applying the minimum pH value of 7.5 SU will be used for the new permit. As with the current permit, the new permit Outfall 001 discharge pH limits will be 7.5 to 9.0 SU The monitoring frequency shall be once per discharge collected as a grab sample.

**Total Suspended Solids, Oil & Grease, and Fluoride (Outfall 001)**

The Outfall 001 discharge total suspended solids, oil & grease, and fluoride mass loading limitations in the new permit are based on the relevant EPA ELGs and BPJ considerations. For monitoring these parameters, grab samples must be collected based on a once per discharge frequency for total suspended solids and oil & grease, and semiannually for fluoride.

**Settleable Solids (Outfall 001)**

Due to the permittee's industrial wastewater characteristics and physical/chemical treatment system used, the daily maximum settleable solids limit of 0.5 ml/l is considered appropriate by the division based on BPJ. Sample type will be grab, with a once per discharge monitoring frequency.

**Cadmium, Chromium, Copper, Lead, Molybdenum, and Nickel (Outfall 001)**

Technology-based mass loading limits pursuant to the applicable EPA ELGs and BPJ were included for the Outfall 001 discharge for cadmium, chromium, copper, lead, molybdenum, and nickel. These parameters must be sampled as grabs and reported as totals, based on semi-annual monitoring, per the existing permit.

**Total Uranium (Outfall 001)**

There are no federally or State of Tennessee promulgated total uranium water quality criteria for the permittee's receiving stream designated usages. Based on the permittee's decision to use EPA Method 200.8 for all metals reporting, the renewed permit limits total uranium daily maximum limits for only the ICP-MS method.

This permit retains the 4.0 mg/L daily maximum total uranium limit from previous permits. The permit's reopener clause provides for making changes to the Outfall 001 total uranium discharge requirements if warranted based on DMR results. Any permitting changes are subject to applicable public participation provisions.

**Ammonia Nitrogen (Outfall 001)**

Existing permit limits of 7.6 mg/l monthly average and 15.2 mg/l daily maximum are retained from the current permit. As shown in Appendix 5 the ammonia-nitrogen limits were determined considering the Outfall 003 discharge contribution.

**Nitrite and Nitrate (Outfall 001)**

As shown in Part IA, the permit includes Outfall 001 discharge daily maximum limits for nitrite, nitrate and the sum of nitrite and nitrate. These limits were based on protecting the receiving stream's usage as a livestock and wildlife drinking supply.

Data on effluent concentrations for nitrate+nitrite and nitrate indicate no substantial difference between the values of these two parameters. The renewed permit eliminates reporting of nitrates and nitrites as separate parameters because it is redundant. These forms of nitrogen are adequately reported in the nitrate+nitrite parameter.

The previous permit required Aerojet to develop a Nitrite/Nitrate Nitrogen Control Program (NNNCP) NNNCP, to include a summary of wastewater control measures being used to reduce the Outfall 001 effluent nitrite and nitrate discharges. If the permittee only operates pursuant to the Tier 1 discharge requirements as presented in Part 1A, then the above NNNCP submittal requirements will not be necessary.

**Total Nitrogen and Phosphorus (Outfall 001)**

Based on the DMR total nitrogen data provided in Appendix 3, most of the total nitrogen appears to be from nitrate. As such, the new permit requires the permittee to continue to monitor its Outfall 001 discharge total nitrogen on a quarterly basis.

The division acknowledges, based on very limited data, that the total phosphorus DMR results (0.16 mg/L) are low. However, due to water quality concerns as discussed in Section IX, the potential on-site sources, and division's need for additional data, the current permit's report-only on an annual basis will be retained for the new permit.

**Acute Toxicity Biomonitoring - $LC_{50}$ (Outfall 001)**

In recent years, the reported effluent toxicity value has been approximately >9.6%, which complies with the current permit limit of >2.4%, as shown in the Appendix 3. The permittee continues to use batch treatment and discharges over a 24-hour period.

**PROPOSED PERMIT LIMITS – OUTFALL 001**

**Outfall 001 Tier 1 Discharge Requirements (for < 2,500 to 3,750 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Code | Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|---|
| 00400 | pH | >= | 7.5 | SU | Grab | Once Per Discharge | Minimum |
| 00400 | pH | <= | 9.0 | SU | Grab | Once Per Discharge | Maximum |
| 00530 | Total Suspended Solids (TSS) | <= | .7001 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00530 | Total Suspended Solids (TSS) | <= | .3343 | lb/d | Grab | Once Per Discharge | Monthly Average |
| 00545 | Settleable Solids | <= | 0.5 | mL/L | Grab | Once Per Discharge | Daily Maximum |
| 00556 | Oil & Grease | <= | .3425 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00556 | Oil & Grease | <= | .2066 | lb/d | Grab | Once Per Discharge | Monthly Average |
| 00600 | Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| 00610 | Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | Once Per Discharge | Daily Maximum |
| 00610 | Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | Once Per Discharge | Monthly Average |
| 00630 | Nitrite plus Nitrate (as N) | Report | - | mg/L | Grab | Once Per Discharge | Monthly Average |
| 00630 | Nitrite plus Nitrate (as N) | <= | 89.2 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00630 | Nitrite plus Nitrate (as N) | <= | 1114 | mg/L | Grab | Once Per Discharge | Daily Maximum |
| 00665 | Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| 00951 | Fluoride, total (as F) | <= | .3185 | lb/d | Grab | Semiannual | Daily Maximum |
| 00951 | Fluoride, total (as F) | <= | .1412 | lb/d | Grab | Semiannual | Monthly Average |
| 01027 | Cadmium, total (as Cd) | <= | .0004 | lb/d | Grab | Semiannual | Monthly Average |
| 01027 | Cadmium, total (as Cd) | <= | .001 | lb/d | Grab | Semiannual | Daily Maximum |
| 01034 | Chromium, total (as Cr) | <= | .0019 | lb/d | Grab | Semiannual | Daily Maximum |
| 01034 | Chromium, total (as Cr) | <= | .0008 | lb/d | Grab | Semiannual | Monthly Average |
| 01042 | Copper, total (as | <= | .0069 | lb/d | Grab | Semiannual | Daily Maximum |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Cu) | | | | | | |
| 01042 | Copper, total (as Cu) | <= | .0035 | lb/d | Grab | Semiannual | Monthly Average |
| 01051 | Lead, total (as Pb) | <= | .0007 | lb/d | Grab | Semiannual | Monthly Average |
| 01051 | Lead, total (as Pb) | <= | .0014 | lb/d | Grab | Semiannual | Daily Maximum |
| 01062 | Molybdenum, total (as Mo) | <= | .0269 | lb/d | Grab | Semiannual | Daily Maximum |
| 01062 | Molybdenum, total (as Mo) | <= | .0119 | lb/d | Grab | Semiannual | Monthly Average |
| 01067 | Nickel, total (as Ni) | <= | .002 | lb/d | Grab | Semiannual | Monthly Average |
| 01067 | Nickel, total (as Ni) | <= | .0032 | lb/d | Grab | Semiannual | Daily Maximum |
| 50050 | Flow | Report | - | Mgal/d | Estimate | Once Per Discharge | Monthly Average |
| 50050 | Flow | Report | - | Mgal/d | Estimate | Once Per Discharge | Daily Maximum |
| TAA3B | LC50 Static 48Hr Acute Ceriodaphnia | > | 2.4 | % | Grab | Semiannual | Minimum |
| TAA6C | LC50 Static 48Hr Acute Pimephales | > | 2.4 | % | Grab | Semiannual | Minimum |
| 22708 | Uranium, natural, total | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| 22708 | Uranium, natural, total | Report | - | mg/L | Grab | Quarterly | Monthly Average |
| 22708 | Uranium, natural, total | Report | - | mg/L | Grab | Once Per Discharge | Monthly Average |
| 22708 | Uranium, natural, total | <= | 4 | mg/L | Grab | Once Per Discharge | Daily Maximum |

**Following Notes are applicable to all tiered limits:**
Permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.

**Outfall 001 Tier 2 Discharge Requirements (for 3,751 to 5,000 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Code | Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|---|
| 00400 | **pH** | >= | 7.5 | SU | Grab | Once Per Discharge | Minimum |
| 00400 | **pH** | <= | 9 | SU | Grab | Once Per Discharge | Maximum |
| 00530 | **Total Suspended Solids (TSS)** | <= | 1.216 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00530 | **Total Suspended Solids (TSS)** | <= | .634 | lb/d | Grab | Once Per Discharge | Monthly Average |
| 00545 | Settleable Solids | <= | .5 | mL/L | Grab | Once Per Discharge | Daily Maximum |
| 00556 | **Oil & Grease** | <= | .6241 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00556 | **Oil & Grease** | <= | .4203 | lb/d | Grab | Once Per Discharge | Monthly Average |
| 00600 | Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| 00610 | Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | Once Per Discharge | Monthly Average |
| 00610 | Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | Once Per Discharge | Daily Maximum |
| 00615 | Nitrogen, Nitrite total (as N) | Report | - | mg/L | Grab | Once Per Discharge | Monthly Average |
| 00615 | Nitrogen, Nitrite total (as N) | <= | 159.5 | mg/L | Grab | Once Per Discharge | Daily Maximum |
| 00615 | Nitrogen, Nitrite total (as N) | <= | 12.8 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00620 | Nitrogen, Nitrate total (as N) | Report | - | mg/L | Grab | Once Per Discharge | Monthly Average |
| 00620 | Nitrogen, Nitrate total (as N) | <= | 1114 | mg/L | Grab | Once Per Discharge | Daily Maximum |
| 00620 | Nitrogen, Nitrate total (as N) | <= | 89.2 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00630 | Nitrite plus Nitrate (as N) | Report | - | mg/L | Grab | Once Per Discharge | Monthly Average |
| 00630 | Nitrite plus Nitrate (as N) | <= | 89.2 | lb/d | Grab | Once Per Discharge | Daily Maximum |
| 00630 | Nitrite plus Nitrate (as N) | <= | 1114 | mg/L | Grab | Once Per Discharge | Daily Maximum |
| 00665 | Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| 00951 | **Fluoride, total (as F)** | <= | .5041 | lb/d | Grab | Semiannual | Monthly Average |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 00951 | **Fluoride, total (as F)** | <= | 1.1534 | lb/d | Grab | Semiannual | Daily Maximum |
| 01027 | **Cadmium, total (as Cd)** | <= | .0006 | lb/d | Grab | Semiannual | Monthly Average |
| 01027 | **Cadmium, total (as Cd)** | <= | .0015 | lb/d | Grab | Semiannual | Daily Maximum |
| 01034 | **Chromium, total (as Cr)** | <= | .0028 | lb/d | Grab | Semiannual | Daily Maximum |
| 01034 | **Chromium, total (as Cr)** | <= | .0011 | lb/d | Grab | Semiannual | Monthly Average |
| 01042 | **Copper, total (as Cu)** | <= | .0245 | lb/d | Grab | Semiannual | Daily Maximum |
| 01042 | **Copper, total (as Cu)** | <= | .0119 | lb/d | Grab | Semiannual | Monthly Average |
| 01051 | **Lead, total (as Pb)** | <= | .0021 | lb/d | Grab | Semiannual | Daily Maximum |
| 01051 | **Lead, total (as Pb)** | <= | .001 | lb/d | Grab | Semiannual | Monthly Average |
| 01062 | **Molybdenum, total (as Mo)** | <= | .096 | lb/d | Grab | Semiannual | Daily Maximum |
| 01062 | **Molybdenum, total (as Mo)** | <= | .0425 | lb/d | Grab | Semiannual | Monthly Average |
| 01067 | **Nickel, total (as Ni)** | <= | .0071 | lb/d | Grab | Semiannual | Monthly Average |
| 01067 | **Nickel, total (as Ni)** | <= | .0105 | lb/d | Grab | Semiannual | Daily Maximum |
| 50050 | **Flow** | Report | - | Mgal/d | Estimate | Once Per Discharge | Monthly Average |
| 50050 | **Flow** | Report | - | Mgal/d | Estimate | Once Per Discharge | Daily Maximum |
| TAA3B | LC50 Static 48Hr Acute Ceriodaphnia | > | 2.4 | % | Grab | Semiannual | Minimum |
| TAA6C | LC50 Static 48Hr Acute Pimephales | > | 2.4 | % | Grab | Semiannual | Minimum |
| 22708 | Uranium, natural, total | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| 22708 | Uranium, natural, total | Report | - | mg/L | Grab | Quarterly | Monthly Average |
| 22708 | Uranium, natural, total | Report | - | mg/L | Grab | Once Per Discharge | Monthly Average |
| 22708 | Uranium, natural, total | <= | 4 | mg/L | Grab | Once Per Discharge | Daily Maximum |

**Outfall 001 Tier 3 Discharge Requirements (for 5, 001 to 6,250 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.002 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0008 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0015 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0037 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0327 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0159 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.5138 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.6721 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0028 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.0013 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.128 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0567 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.014 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0094 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 0.8322 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.5604 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids (TSS)** | <= | 0.8453 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 1.6213 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c)(e) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) (f) | Report | - | mg/L | Grab | Quarterly | Monthly Average |
| Uranium, total (c) (e) | <= | 4.0 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Uranium, total (c) (f) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |

**Outfall 001 Tier 4 Discharge Requirements (for 6,251 to 7,500 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.0025 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.001 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0019 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0047 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0408 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0199 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.8922 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.8401 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0036 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.0017 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.1601 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0709 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.0175 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0118 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |

| | | | | | | |
|---|---|---|---|---|---|---|
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 1.0402 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.7005 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids (TSS)** | <= | 1.0567 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 2.0267 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c)(e) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) (f) | Report | - | mg/L | Grab | Quarterly | Monthly Average |
| Uranium, total (c) (e) | <= | 4.0 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Uranium, total (c) (f) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |

**Outfall 001 Tier 5 Discharge Requirements (for 7,501 to = 12,000 off-lb/day Monthly Average Production per 40 CFR Part 471 Subpart G):**

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.003 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0012 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0023 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0056 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0490 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0238 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 2.2707 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 1.0081 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia | > | 2.4 | % | Grab | Semiannual | Minimum |

| | | | | | | |
|---|---|---|---|---|---|---|
| LC50 Static 48Hr Acute Pimephales | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0043 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.002 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.1921 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.085 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.021 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.0141 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 1.2483 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.8406 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids (TSS)** | <= | 1.268 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 2.432 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c)(e) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c) (f) | Report | - | mg/L | Grab | Quarterly | Monthly Average |
| Uranium, total (c) (e) | <= | 4.0 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Uranium, total (c) (f) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |

## B. INSTREAM MONITORING RESULTS AND RELATED NEW PERMIT REQUIREMENTS

The new permit requires Aerojet to maintain the instream monitoring water column analyses, sediment quality analysis, and biological testing programs to confirm water quality effects of the plant's improvements in wastewater treatment.

### 1. WATER COLUMN QUALITY ANALYSIS

Aerojet shall conduct analyses for the following parameters in the water column: estimated flow, pH, temperature, dissolved oxygen, conductivity, gross alpha, gross beta, total uranium, nitrite+nitrate, phosphorus and total dissolved solids. These analyses will be conducted once every four months based on grab samples collected at Stations #3, #4, #5. The estimated flow shall be determined based on Station #4 measurements.

The permittee shall use division-approved instream monitoring procedures, which provides sampling sequencing information to insure that the intermittent Outfall 001 discharge impacts are actually being evaluated via the instream monitoring. The permittee shall submit any recommended revisions to its proposed instream monitoring procedures to the division's Johnson City Environmental Field Office and the Nashville Central Office within 90 days from the new permit's effective date.

[Note: The *dye tracer test is not required to be repeated. The test was conducted during the previous permit and has been used to develop a simple computer model used for timing of sampling based on the actual receiving stream flow and Outfall 001 treated effluent discharge rate and duration*. *Giventhe dilution ratio in the mixing zone of over 100:1, current practices for sample collection are deemed valid*.]

### 2. SEDIMENT QUALITY ANALYSIS

Sediment testing must be completed once during the new permit's term and submitted to the division's local and central offices. The Sediment Summary Report must summarize the permittee's testing results for at a minimum, the last two permit cycles (starting with permit's effective date) and incorporate new data as available, provide the permittee's discussions regarding Outfall 001 treated effluent quality improvements achieved, anticipated future efforts and safeguards. The sediment monitoring requirements in the permittee current permit (grab samples at Stations #3, #4, and #5) must be analyzed for total chromium, total nickel, total uranium, and total thorium.

### 3. BIOLOGICAL MONITORING

The new permit includes detailed requirements for the permittee to complete biological monitoring to examine the impact of permittee's discharges on the receiving stream's biological characteristics. The permittee must update it biological monitoring program and coordinate with the Johnson City Environmental Field Office to complete the new permit's requirements. The results of all the evaluation (two copies) must be submitted with the monthly Discharge Monitoring Reports within 90 days of the completion of the analysis sampling.

## C. NON-CONTACT COOLING WATER AND COOLING TOWER BLOWDOWN (OUTFALL 002)

**Flow (Outfall 002)**

Flow monitoring allows the pollutant loadings to the receiving stream to be quantified. Flow shall be monitored (estimated) at the time of sample collection and reported in Million Gallons per Day (MGD) at a frequency of twice per month (2/month).

**pH (Outfall 002)**

According to the State of Tennessee Water Quality Standards [Chapter 0400-40-03-.03(3) (b)], the pH for the protection of Fish and Aquatic Life shall lie within the range of 6.0 to 9.0 SU and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours. The effluent limitation for pH will be retained in a range 6.0 to 9.0 SU, and the sample type will be grab.

**Effluent Temperature (Outfall 002)**

Temperature will be limited according to the State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 0400-40-03-.03(3)(e)]. It is recognized that the temperature of the cooling water discharge will be greater than the temperature of the water prior to its use for cooling or other purposes. This discharge must not cause the temperature change in receiving stream to exceed 3°C relative to an upstream control point. Also, this discharge must not cause the temperature of receiving stream to exceed 30.5°C (except as a result of natural causes), and this discharge must not cause the maximum rate of temperature change in receiving stream to exceed 2°C per hour (except as a result of natural causes).

Since the Outfall 002 discharges to a receiving stream with a large low-flow relative to the effluent flow rate, the division does not consider discharge numerical temperature limitations to be required for the new permit. However, the Outfall 002 effluent temperature must be monitored on the basis of "report only" and reported as such on the Discharge Monitoring Reports (DMRs). Understanding that the reported temperature is that of the effluent, an exceedance of the above mentioned temperature of 30.5°C from water quality criteria is not necessarily a permit violation. The 30.5°C value applies to the receiving stream, not the effluent. Therefore, if the effluent temperature exceeds 30.5°C, the permittee should note in the "comments" section of the DMR that this is the temperature of the effluent. A temperature check in the receiving stream below the discharge point may be performed in order to prove facility's compliance with the Tennessee Water Quality Standards and should also be noted in the "comments" section of the DMR.

**Supplemental Monitoring Parameters including TRC (Outfall 002)**

Due to permittee's cooling towers operation (e.g., varying cycles and chemical additives used), the previous permit required testing Outfall 002 discharge for Total Dissolved Solids (TDS), Chlorides, Conductivity, tributyltin and 48-hour LC50 Acute Toxicity.

Effluent data for **tributyltin** reported during the previous permit indicates only trace levels of the compound are found since Aerojet's discontinued use in 2015. :

| Date | Monthly Average, mg/l | Daily Maximum, mg/l |
|---|---|---|
| 9/30/12 | 0.005 | 0.0051 |
| 3/31/13 | 0.0007 | 0.0007 |
| 6/30/13 | 0.0036 | 0.0036 |
| 9/30/13 | 0.015 | 0.015 |
| 6/30/14 | 0.0025 | 0.0025 |
| 12/31/14 | 0.01 | 0.01 |
| 3/31/15 | 0.0085 | 0.0089 |
| 6/30/15 | 0.0049 | 0.0049 |
| 12/31/15 | 0.0052 | 0.0052 |
| 3/31/16 | 0.0003 | 0.0003 |
| 6/30/16 | 0.00039 | 0.00039 |
| **AVERAGE** | **0.0051** | **0.0051** |
| **June 2015-16 AVERAGE** | **0.0027** | **0.0027** |
| | | |
| **Permit Limit** | **0.039** | **0.249** |

Effluent monitoring data from 2012 – 2015 reflects that Outfall 002 exhibits no toxicity from cooling tower discharges (i.e., 48-hour LC50 results equal 9.6%, which is safely greater than the permit limit of 2.4%). Accordingly, the monitoring frequency is reduced from semiannual to annual.

The previous permit also required Aerojet to test Outfall 002 for TRC should cooling tower problems develop which require the permittee to use municipal drinking water on a once-through basis. Aerojet has reported no municipal usage in the last two years for cooling. Reports of effluent TRC concentrations remain less than 0.1 mg/l.

Based on the division's water quality reasonable potential evaluations for Outfall 002 provided in Appendix 3:

- Discharge limits are included for 48 hr LC50 acute toxicity.
- Monitoring frequency is revised from semiannual to annual for toxicity testing.
- No limit is required for Total Residual Chlorine during periods of municipal water use for cooling.
- Testing for tributyltin is deleted from the renewed permit.

## D. PROPOSED PERMIT LIMITS – OUTFALL 002

**Description : External Outfall, Number : 002, Monitoring : Effluent Gross, Season : All Year**

| Code | Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|---|
| 00010 | Temperature, water deg. C | Report | - | deg C | Grab | Twice Per Month | Daily Maximum |
| 00094 | Conductivity | Report | - | umho/cm | Grab | Twice Every Month | Daily Maximum |
| 00400 | pH | >= | 6.0 | SU | Grab | Twice Per Month | Minimum |
| 00400 | pH | <= | 9.0 | SU | Grab | Twice Per Month | Maximum |
| 50050 | Flow | Report | - | Mgal/d | Estimate | Twice Per Month | Daily Maximum |
| 50050 | Flow | Report | - | Mgal/d | Estimate | Twice Per Month | Monthly Average |
| TAA3B | LC50 Static 48Hr Acute Ceriodaphnia | > | 2.4 | % | Grab | Annual | Minimum |
| TAA6C | LC50 Static 48Hr Acute Pimephales | > | 2.4 | % | Grab | Annual | Minimum |

## E. TREATED SANITARY WASTEWATER AND SHOWER WATER (OUTFALL 003)

Most of the current permit limits will be retained in the new permit for the Outfall 003 treated sanitary wastewater discharge. During a prior permit reissuance, a stream model of the receiving waters was used to verify that the previous permit limits for $BOD_5$, ammonia (as N), and dissolved oxygen would not cause the instream dissolved oxygen to fall below the minimum level specified in State of Tennessee Water Quality Standards, Chapter 0400-40-03-.03(3)(a) for the protection of Fish & Aquatic Life (5 mg/l). The model was based on summer ambient conditions and considered the sanitary wastewater discharges of the upstream Jonesborough STP (river mile 12.5) – since relocated to downstream waters - and the David Crockett High School STP (river mile 10.2).

**Flow (Outfall 003)**

Pollutant loadings to the receiving stream can be calculated using the discharge flow. As such, the flow must be monitored continuously by recorder and reported monthly in Million Gallons per Day (MGD).

**Total Suspended Solids (Outfall 003)**

Total Suspended Solids (TSS) is a general indicator of the treated wastewater quality and will be limited in the new permit. The technology-based limits for TSS of 30 mg/l monthly average and 45 mg/l daily maximum, retained from the current permit.

The State of Tennessee Water Quality Standards for the protection of Fish & Aquatic Life [Chapter 0400-40-03-.03(3) (c)] states there shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life in the receiving stream.

**pH (Outfall 003)**

According to the State of Tennessee Water Quality Standards [Chapter 0400-40-03-.03(3) (b)], the pH for the protection of Fish and Aquatic Life shall lie within the range of 6.0 to 9.0 SU and shall not fluctuate more than 1.0 unit in this range over a period of 24-hours. Considering that the receiving stream will provide some buffering capacity, effluent limitation for pH will be retained in a range 6.0 to 9.0 SU The sample type will be grab.

**Total Residual Chlorine (Outfall 003)**

Recently the permittee replaced the sanitary wastewater treatment system. The newly-installed treatment system included a UV disinfection system instead of chlorine-based unit. However, the permittee wants the capacity to use the chlorine-based system for disinfection should problems with the UV unit occur. As such, the as noted in Appendix 3, the technology-based TRC limit of 2.0 mg/l will apply if an oxidant (e.g., chlorine) is used for disinfection.

**$BOD_5$ (Outfall 003)**

The $BOD_5$ limits are technology-based and established in accordance with the State of Tennessee maximum limits per Rule 1200-4-5-.09(1)(a)1. The current permit limits of 30 mg/l monthly average concentration and 45 mg/l daily maximum concentration, will be retained for the new permit. The sample type will be grab.

**Dissolved Oxygen (Outfall 003)**

The dissolved oxygen limit is established in accordance with State of Tennessee Water Quality Criteria Rule 0400-40-03-.03(3). The Outfall 003 discharge must contain as a daily minimum at least 1.0 mg/l dissolved oxygen. The sample type will be grab.

**Settleable Solids (Outfall 003)**

The limit for Settleable Solids discharge limit from the current permit of 0.5 ml/l, as a daily maximum will be retained for the new permit. The sample type will be grab.

**E. coli (Outfall 003)**

Wastewater disinfection is normally used for protecting the receiving stream from pathogenic microorganisms, and provides a means of permittee documentation i.e., adverse

instream conditions are not due to its discharge. *E. coli* is an indicator organism used as a measure of bacteriological health of a receiving stream and disinfection effectiveness.

The concentration of the *E. coli* group after disinfection shall not exceed 126 cfu per 100 ml as the geometric mean calculated on the actual number of samples collected and tested for *E. coli* within the required reporting period. The permittee may collect more samples than specified as the monitoring frequency. Samples may not be collected at intervals of less than 12 hours. For the purpose of determining the geometric mean, individual samples having an *E. coli* group concentration of less than one (1) per 100 ml shall be considered as having a concentration of one (1) per 100 ml. In addition, the concentration of the *E. coli* group in any individual sample shall not exceed a specified maximum amount. Unless otherwise specified by the division, a maximum daily limit of 941 colonies per 100 ml applies for recreational usage.

**Ammonia-Nitrogen (Outfall 003)**

The new permit retains the current permit's discharge ammonia-nitrogen limits (5.0 mg/L monthly average and 7.5 mg/L daily maximum). Instream biological nitrification of the discharged ammonia-nitrogen would result in additional instream nitrite/nitrate. With respect to the aquatic toxicity associated with ammonia discharges from Outfalls 001 and 003, the contributions from each were assessed in Appendix 4.

## F. PROPOSED PERMIT LIMITS – OUTFALL 003

**Description : External Outfall, Number : 003, Monitoring : Effluent Gross, Season : All Year**

| Code | Parameter | Qualifier | Value | Unit | Sample Type | Frequency | Statistical Base |
|---|---|---|---|---|---|---|---|
| 00300 | Oxygen, dissolved (DO) | >= | 1 | mg/L | Grab | Five Per Week | Minimum |
| 00310 | BOD, 5-day, 20 C | <= | 30 | mg/L | Grab | Twice Per Month | Monthly Average |
| 00310 | BOD, 5-day, 20 C | <= | 45 | mg/L | Grab | Twice Per Month | Daily Maximum |
| 00400 | pH | >= | 6.0 | SU | Grab | Two Per Week | Minimum |
| 00400 | pH | <= | 9.0 | SU | Grab | Two Per Week | Maximum |
| 00530 | Total Suspended Solids (TSS) | <= | 30 | mg/L | Grab | Twice Per Month | Monthly Average |
| 00530 | Total Suspended Solids (TSS) | <= | 45 | mg/L | Grab | Twice Per Month | Daily Maximum |
| 00545 | Settleable Solids | <= | 0.5 | mL/L | Grab | Two Per Week | Daily Maximum |
| 00610 | Nitrogen, Ammonia total (as N) | <= | 7.5 | mg/L | Grab | Twice Per Month | Daily Maximum |
| 00610 | Nitrogen, Ammonia total (as N) | <= | 5.0 | mg/L | Grab | Twice Per Month | Monthly Average |
| 50050 | Flow | Report | - | Mgal/d | Recorder | Continuous | Daily Maximum |
| 50050 | Flow | Report | - | Mgal/d | Recorder | Continuous | Monthly Average |
| 50060 | Chlorine, total residual | <= | 2.0 | mg/L | Grab | Five Per Week | Daily Maximum |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | (TRC) | | | | | | |
| 51040 | E. coli | <= | 941 | CFU/100mL | Grab | Twice Per Month | Daily Maximum |
| 51040 | E. coli | <= | 126 | CFU/100mL | Grab | Twice Per Month | Monthly Geometric Mean |

## XI. PERMIT DURATION

The proposed limitations meet the requirements of Section 301(b)(2)(A), (C), (D), (E), and (F) of the Clean Water Act as amended. It is the intent of the division to organize the future issuance and expiration of this particular permit such that other permits located in the same watershed and group within the State of Tennessee will be set for issuance and expiration at the same time. In order to meet the target reissuance date for the Nolichucky watershed and following the directives for the Watershed Management Program initiated in January, 1996, the permit will be issued to expire in 2020.

## APPENDIX 1 - FACILITY DISCHARGES AND RECEIVING WATER

| RECEIVING STREAM - LITTLE LIMESTONE CREEK | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Low Flow - Frequency and Duration | | | | Designated Uses | | | | |
| Low-Flow | 7Q10 | 30Q5 | | FISH | RECREATION | IRRIGATION | LW&W | DOMESTIC |
| (cfs) | 2.72 | 3.16 | | X | X | X | X | -- |
| (mgd) | 1.76 | 2.04 | | INDUSTRIAL | NAVIGATION | | | |
| | | | | -- | -- | | | |

**OUTFALL 001 @ River Mile = 8.9**

| LONGITUDE | LATITUDE |
|---|---|
| -82.528282 | 36.249859 |

| FLOW (GPD) | DISCHARGE SOURCE |
|---|---|
| 9,600 | Treated Process Wastewater |
| | |
| **9,600** | **Total - Intermittent Discharged (a)** |

**Treatment: Physical/Chemical Treatment**

**(a) Discharged over 24 hr period - Permittee may discharge over longer period if needed.**

**OUTFALL 002 @ River Mile = 9.0**

| LONGITUDE | LATITUDE |
|---|---|
| -82.526094 | 36.250551 |

| FLOW (MGD) | DISCHARGE SOURCE |
|---|---|
| 0.00326 | Non-Contact Cooling Water and Cooling Tower Blowdown |
| | |
| **0.00326** | **Total - Continuous Discharge** |

**Treatment: None**

**OUTFALL 003 @ River Mile = 9.0**

| LONGITUDE | LATITUDE |
|---|---|
| -82.525750 | 36.250828 |

| FLOW (MGD) | DISCHARGE SOURCE |
|---|---|
| 0.0017 | Sanitary Wastewater |
| 0.0008 | Shower Water |
| **0.0025** | **Total - Continuous Discharge** |

**Treatment: Activated Sludge Package Plant w/UV Disinfection**

## APPENDIX 2 - CURRENT PERMIT LIMITS AND MONITORING REQUIREMENTS

**Description : External Outfall, Number : 001, Monitoring : Effluent Gross, Season : All Year**

| Parameter | Qualifier | Value | Unit | Sample | Frequency | Statistical Base |
|---|---|---|---|---|---|---|
| **Cadmium, total (as Cd)** | <= | 0.001 | lb/d | Grab | Semiannual | Daily Maximum |
| **Cadmium, total (as Cd)** | <= | 0.0004 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0008 | lb/d | Grab | Semiannual | Monthly Average |
| **Chromium, total (as Cr)** | <= | 0.0019 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0069 | lb/d | Grab | Semiannual | Daily Maximum |
| **Copper, total (as Cu)** | <= | 0.0035 | lb/d | Grab | Semiannual | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Monthly Average |
| **Flow (a)** | Report | - | Mgal/d | Estimate | 1/ Discharge | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.3185 | lb/d | Grab | Semiannual | Daily Maximum |
| **Fluoride, total (as F)** | <= | 0.1412 | lb/d | Grab | Semiannual | Monthly Average |
| LC50 Static 48Hr Acute Ceriodaphnia (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| LC50 Static 48Hr Acute Pimephales (d) | > | 2.4 | % | Grab | Semiannual | Minimum |
| **Lead, total (as Pb)** | <= | 0.0014 | lb/d | Grab | Semiannual | Daily Maximum |
| **Lead, total (as Pb)** | <= | 0.0007 | lb/d | Grab | Semiannual | Monthly Average |
| **Molybdenum, total (as Mo)** | <= | 0.0269 | lb/d | Grab | Semiannual | Daily Maximum |
| **Molybdenum, total (as Mo)** | <= | 0.0119 | lb/d | Grab | Semiannual | Monthly Average |
| **Nickel, total (as Ni)** | <= | 0.0032 | lb/d | Grab | Semiannual | Daily Maximum |
| **Nickel, total (as Ni)** | <= | 0.002 | lb/d | Grab | Semiannual | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrite plus nitrate total 1 det. (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrite plus nitrate total 1 det. (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |

| | | | | | | |
|---|---|---|---|---|---|---|
| Nitrogen, Ammonia total (as N) | <= | 15.2 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Ammonia total (as N) | <= | 7.6 | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, Nitrate total (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, Nitrate total (as N) | <= | 89.2 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Nitrate total (as N) | <= | 1,114 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Nitrite total (as N) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Nitrogen, Nitrite total (as N) | <= | 159.5 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, Nitrite total (as N) | <= | 12.8 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| Nitrogen, total (as N) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |
| **Oil & Grease** | <= | 0.3425 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **Oil & Grease** | <= | 0.2066 | lb/d | Grab | 1/ Discharge | Monthly Average |
| Phosphorus, total (as P) | Report | - | mg/L | Grab | Annual | Daily Maximum |
| Settleable Solids | <= | 0.5 | mL/L | Grab | 1/ Discharge | Daily Maximum |
| **Total Suspended Solids (TSS)** | <= | 0.3343 | lb/d | Grab | 1/ Discharge | Monthly Average |
| **Total Suspended Solids (TSS)** | <= | 0.7001 | lb/d | Grab | 1/ Discharge | Daily Maximum |
| **pH (b)** | >= | 7.5 | SU | Grab | 1/ Discharge | Minimum |
| **pH (b)** | <= | 9.0 | SU | Grab | 1/ Discharge | Maximum |
| Uranium, total (c)(e) | Report | - | mg/L | Grab | 1/ Discharge | Monthly Average |
| Uranium, total (c)(f) | Report | - | mg/L | Grab | Quarterly | Monthly Average |
| Uranium, total (c) (e) | <= | 4.0 | mg/L | Grab | 1/ Discharge | Daily Maximum |
| Uranium, total (c)(f) | Report | - | mg/L | Grab | Quarterly | Daily Maximum |

Appendix 2 - continued

## OUTFALL 001 - TIER 2 PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

(Tier 2 per 40 CFR Part 471 Subpart G Monthly Average Production 3,751 to 5,000 off-lb/day)

**TREATED PROCESS WASTEWATER**

| EFFLUENT CHARACTERISTIC | EFFLUENT LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | MONTHLY | | DAILY | | | |
| | AVG. CONC. (mg/l) | AVG. AMNT. (lb/day) | MAX. CONC. (mg/l) | MAX. AMNT. (lb/day) | MSRMNT. FRQNCY. | SAMPLE TYPE |
| Flow (MGD) | Report (a) | | Report (a) | | 1/Discharge | Estimate |
| pH (s.u.) (b) | -- | -- | 7.5 - 9.0 | | 1/Discharge | Grab |
| Total Suspended Solids | -- | 0.6052 | -- | 1.1708 | 1/Discharge | Grab |
| Settleable Solids | -- | -- | 0.5 ml/l | | 1/Discharge | Grab |
| Oil & Grease | -- | 0.3987 | -- | 0.5981 | 1/Discharge | Grab |
| Total Nitrogen | -- | -- | Report | -- | 1/Quarter | Grab |
| Ammonia - Nitrogen (as N) | Report | -- | Report | -- | 1/Discharge | Grab |
| Nitrite - Nitrogen (as N) | Report | -- | 165.9 | 13.3 | 1/Discharge | Grab |
| Nitrate - Nitrogen (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Nitrite + Nitrate (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Total Phosphorus (as P) | -- | -- | Report | -- | Semi-annual | Grab |
| Fluoride | -- | 0.4600 | -- | 1.0363 | Semi-annual | Grab |
| Cadmium | -- | 0.0006 | -- | 0.0015 | Semi-annual | Grab |
| Total Chromium | -- | 0.0011 | -- | 0.0027 | Semi-annual | Grab |
| Copper | -- | 0.0109 | -- | 0.0224 | Semi-annual | Grab |
| Lead | -- | 0.0010 | -- | 0.0021 | Semi-annual | Grab |
| Molybdenum | -- | 0.0388 | -- | 0.0877 | Semi-annual | Grab |
| Nickel | -- | 0.0064 | -- | 0.0096 | Semi-annual | Grab |
| Total Uranium (ICP-OES) (c) | Report | -- | 4.0 | | 1/Discharge | Grab |
| Total Uranium (ICP-MS) (c) | Report | -- | Report | | 1/Quarter | Grab |
| 48-HR $LC_{50}$ (d) | > 1.8 % Effluent | | | | Semi-annual | Grab |

Note: The permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Parameters subject to ELGs shown shaded.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.

(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.

(c) Pursuant to requirements shown in Part III J.

(d) Pursuant to requirements shown in Part III F.

Appendix 2 - continued

**OUTFALL 001 - TIER 3 PERMIT LIMITATIONS AND MONITORING REQUIREMENTS**
**(Tier 3 per 40 CFR Part 471 Subpart G Monthly Average Production 5,001 to 6,250 off-lb/day)**

**TREATED PROCESS WASTEWATER**

| EFFLUENT CHARACTERISTIC | EFFLUENT LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | MONTHLY | | DAILY | | | |
| | AVG. CONC. (mg/l) | AVG. AMNT. (lb/day) | MAX. CONC. (mg/l) | MAX. AMNT. (lb/day) | MSRMNT. FRQNCY. | SAMPLE TYPE |
| Flow (MGD) | Report (a) | | Report (a) | | 1/Discharge | Estimate |
| pH (s.u.) (b) | -- | -- | 7.5 - 9.0 | | 1/Discharge | Grab |
| Total Suspended Solids | -- | 0.8070 | -- | 1.5611 | 1/Discharge | Grab |
| Settleable Solids | -- | -- | 0.5 ml/l | | 1/Discharge | Grab |
| Oil & Grease | -- | 0.5315 | -- | 0.7974 | 1/Discharge | Grab |
| Total Nitrogen | -- | -- | Report | -- | 1/Quarter | Grab |
| Ammonia - Nitrogen (as N) | Report | -- | Report | -- | 1/Discharge | Grab |
| Nitrite - Nitrogen (as N) | Report | -- | 165.9 | 13.3 | 1/Discharge | Grab |
| Nitrate - Nitrogen (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Nitrite + Nitrate (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Total Phosphorus (as P) | -- | -- | Report | -- | Semi-annual | Grab |
| Fluoride | -- | 0.6134 | -- | 1.3817 | Semi-annual | Grab |
| Cadmium | -- | 0.0008 | -- | 0.0020 | Semi-annual | Grab |
| Total Chromium | -- | 0.0015 | -- | 0.0037 | Semi-annual | Grab |
| Copper | -- | 0.0145 | -- | 0.0298 | Semi-annual | Grab |
| Lead | -- | 0.0013 | -- | 0.0028 | Semi-annual | Grab |
| Molybdenum | -- | 0.0517 | -- | 0.1169 | Semi-annual | Grab |
| Nickel | -- | 0.0086 | -- | 0.0128 | Semi-annual | Grab |
| Total Uranium (ICP-OES) (c) | Report | -- | 4.0 | | 1/Discharge | Grab |
| Total Uranium (ICP-MS) (c) | Report | -- | Report | | 1/Quarter | Grab |
| 48-HR $LC_{50}$ (d) | > 1.8 % Effluent | | | | Semi-annual | Grab |

Note: The permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Parameters subject to ELGs shown shaded.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.

(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.

(c) Pursuant to requirements shown in Part III J.

(d) Pursuant to requirements shown in Part III F.

Appendix 2 - continued

**OUTFALL 001 - TIER 4 PERMIT LIMITATIONS AND MONITORING REQUIREMENTS**
**(Tier 4 per 40 CFR Part 471 Subpart G Monthly Average Production 6,251 to 7,500 off-lb/day)**

**TREATED PROCESS WASTEWATER**

| EFFLUENT CHARACTERISTIC | EFFLUENT LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | MONTHLY | | DAILY | | | |
| | AVG. CONC. (mg/l) | AVG. AMNT. (lb/day) | MAX. CONC. (mg/l) | MAX. AMNT. (lb/day) | MSRMNT. FRQNCY. | SAMPLE TYPE |
| Flow (MGD) | Report (a) | | Report (a) | | 1/Discharge | Estimate |
| pH (s.u.) (b) | -- | -- | 7.5 - 9.0 | | 1/Discharge | Grab |
| Total Suspended Solids | -- | 1.0087 | -- | 1.9514 | 1/Discharge | Grab |
| Settleable Solids | -- | -- | 0.5 ml/l | | 1/Discharge | Grab |
| Oil & Grease | -- | 0.6646 | -- | 0.9968 | 1/Discharge | Grab |
| Total Nitrogen | -- | -- | Report | -- | 1/Quarter | Grab |
| Ammonia - Nitrogen (as N) | Report | -- | Report | -- | 1/Discharge | Grab |
| Nitrite - Nitrogen (as N) | Report | -- | 165.9 | 13.3 | 1/Discharge | Grab |
| Nitrate - Nitrogen (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Nitrite + Nitrate (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Total Phosphorus (as P) | -- | -- | Report | -- | Semi-annual | Grab |
| Fluoride | -- | 0.7667 | -- | 1.7271 | Semi-annual | Grab |
| Cadmium | -- | 0.0010 | -- | 0.0025 | Semi-annual | Grab |
| Total Chromium | -- | 0.0019 | -- | 0.0046 | Semi-annual | Grab |
| Copper | -- | 0.0182 | -- | 0.0373 | Semi-annual | Grab |
| Lead | -- | 0.0016 | -- | 0.0035 | Semi-annual | Grab |
| Molybdenum | -- | 0.0647 | -- | 0.1461 | Semi-annual | Grab |
| Nickel | -- | 0.0107 | -- | 0.0160 | Semi-annual | Grab |
| Total Uranium (ICP-OES) (c) | Report | -- | 4.0 | | 1/Discharge | Grab |
| Total Uranium (ICP-MS) (c) | Report | -- | Report | | 1/Quarter | Grab |
| 48-HR $LC_{50}$ (d) | > 1.8 % Effluent | | | | Semi-annual | Grab |

Note: The permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Parameters subject to ELGs shown shaded.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.

(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.

(c) Pursuant to requirements shown in Part III J.

(d) Pursuant to requirements shown in Part III F.

Appendix 2 - continued

## OUTFALL 001 - TIER 5 PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

(Tier 5 per 40 CFR Part 471 Subpart G Monthly Average Production 7,501 to = 12,000 off-lb/day)

TREATED PROCESS WASTEWATER

| EFFLUENT CHARACTERISTIC | EFFLUENT LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | MONTHLY | | DAILY | | | |
| | AVG. CONC. (mg/l) | AVG. AMNT. (lb/day) | MAX. CONC. (mg/l) | MAX. AMNT. (lb/day) | MSRMNT. FRQNCY. | SAMPLE TYPE |
| Flow (MGD) | Report (a) | | Report (a) | | 1/Discharge | Estimate |
| pH (s.u.) (b) | -- | -- | 7.5 - 9.0 | | 1/Discharge | Grab |
| Total Suspended Solids | -- | 1.2105 | -- | 2.3416 | 1/Discharge | Grab |
| Settleable Solids | -- | -- | 0.5 ml/l | | 1/Discharge | Grab |
| Oil & Grease | -- | 0.7973 | -- | 1.1962 | 1/Discharge | Grab |
| Total Nitrogen | -- | -- | Report | -- | 1/Quarter | Grab |
| Ammonia - Nitrogen (as N) | Report | -- | Report | -- | 1/Discharge | Grab |
| Nitrite - Nitrogen (as N) | Report | -- | 165.9 | 13.3 | 1/Discharge | Grab |
| Nitrate - Nitrogen (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Nitrite + Nitrate (as N) | Report | -- | 1,494 | 120 | 1/Discharge | Grab |
| Total Phosphorus (as P) | -- | -- | Report | -- | Semi-annual | Grab |
| Fluoride | -- | 0.9201 | -- | 2.0726 | Semi-annual | Grab |
| Cadmium | -- | 0.0012 | -- | 0.0030 | Semi-annual | Grab |
| Total Chromium | -- | 0.0022 | -- | 0.0055 | Semi-annual | Grab |
| Copper | -- | 0.0218 | -- | 0.0447 | Semi-annual | Grab |
| Lead | -- | 0.0019 | -- | 0.0042 | Semi-annual | Grab |
| Molybdenum | -- | 0.0776 | -- | 0.1753 | Semi-annual | Grab |
| Nickel | -- | 0.0129 | -- | 0.0192 | Semi-annual | Grab |
| Total Uranium (ICP-OES) (c) | Report | -- | 4.0 | | 1/Discharge | Grab |
| Total Uranium (ICP-MS) (c) | Report | -- | Report | | 1/Quarter | Grab |
| 48-HR $LC_{50}$ (d) | > 1.8 % Effluent | | | | Semi-annual | Grab |

Note: The permittee shall submit with the DMR the level of production that actually occurred during each month and the limitations, standards, or prohibitions applicable to that level of production. Parameters subject to ELGs shown shaded. The permittee shall request a permit modification (e.g., Tier 6 allocations) if production > 12,000 off-lb/day is expected.

(a) Flow shall be reported in Million Gallons per Day (MGD). Monthly average flow to be reported as total volume discharged divided by the number of days that permittee discharged.

(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.

(c) Pursuant to requirements shown in Part III J.

(d) Pursuant to requirements shown in Part III F.

Appendix 2 - continued

## OUTFALL 002 - PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

**Cooling Water and Cooling Tower Blowdown**

| EFFLUENT CHARACTERISTIC | EFFLUENT LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | MONTHLY | | DAILY | | | |
| | AVG. CONC. (mg/l) | AVG. AMNT. (lb/day) | MAX. CONC. (mg/l) | MAX. AMNT. (lb/day) | MSRMNT. FRQNCY. | SAMPLE TYPE |
| Flow (a) | -- | | Report (MGD) | | 2/Month | Estimate |
| pH (s.u.) (b) | Range 6.0 - 9.0 | | | | 2/Month | Grab |
| Effluent Temperature | -- | | Report ($^{o}$ C) | | 2/Month | Grab |
| Total Dissolved Solids | -- | -- | Report | -- | 2/Month | Grab |
| Chlorides | -- | -- | Report | -- | 2/Month | Grab |
| Conductivity (umhos/cm) | -- | -- | Report | -- | 2/Month | Grab |
| Tributyltin | -- | -- | Report | -- | 1x/Quarter | Grab |
| 48-HR $LC_{50}$ (c) | -- | -- | Report | -- | 1x/Quarter | Grab |

(a) Flow shall be reported in Million Gallons per Day (MGD).
(b) pH analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Pursuant to requirements shown in Part III F.

## OUTFALL 003 - PERMIT LIMITATIONS AND MONITORING REQUIREMENTS

**Treated Sanitary Wastewater and Shower Water**

| EFFLUENT CHARACTERISTIC | EFFLUENT LIMITATIONS | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | MONTHLY | | DAILY | | | |
| | AVG. CONC. (mg/l) | AVG. AMNT. (lb/day) | MAX. CONC. (mg/l) | MAX. AMNT. (lb/day) | MSRMNT. FRQNCY. | SAMPLE TYPE |
| Flow (a) | Report (MGD) | | Report (MGD) | | Continuous | Recorder |
| pH (s.u) (b) | Range 6.0 - 9.0 | | | | 2/Week | Grab |
| $BOD_5$ | 30 | -- | 45 | -- | 2/Month | Grab |
| Total Suspended Solids (TSS) | 30 | -- | 45 | -- | 2/Month | Grab |
| Solids, Settleable | -- | -- | 0.5 ml/l | -- | 2/Week | Grab |
| Chlorine, Total Residual (TRC) (c) | -- | -- | 2.0 | -- | 5/Week | Grab |
| Dissolved Oxygen (D.O.) | -- | -- | 1.0 mg/l minimum | | 5/Week | Grab |
| Ammonia Nitrogen (as N) | 5.0 | -- | 7.5 | -- | 2/Month | Grab |
| *E. coli* (cfu/100 ml) | 126 | | 941 | | 2/Month | Grab |

(a) Flow shall be reported in Million Gallons per Day (MGD).
(b) pH and TRC analyses shall be performed within fifteen (15) minutes of sample collection.
(c) Total Residual Chlorine (TRC) monitoring shall be applicable when chlorine, bromine, or any other oxidants are added. The acceptable methods for analysis of TRC are any methods specified in Title 40 CFR, Part 136 as amended. The method detection level (MDL) for TRC shall not exceed 0.05 mg/L unless the permittee demonstrates that its MDL is higher. The permittee shall retain the documentation that justifies the higher MDL and have it available for review upon request. In cases where the permit limit is less than the MDL, the reporting of TRC at less than the MDL shall be interpreted to constitute compliance with the permit.

# APPENDIX 3 - TECHNOLOGY-BASED LIMITS

**40 CFR PART 471 EFFLUENT LIMITATION GUIDELINES**
**NONFERROUS METALS FORMING AND METAL POWDERS POINT SOURCE CATEGORY**

**Subpart G - Uranium Forming Subcategory**

| | (c) Heat Treatment Contact Cooling Water | | (e) Surface Treatment Spent Baths | | (f) Surface Treatment Rinse | | (g) Wet Air Pollution Control Scrubber Blowdown | |
|---|---|---|---|---|---|---|---|---|
| **Production** | **4,000 off-lb/day** | | **3,000 off-lb/day** | | **3,000 off-lb/day** | | **3,000 off-lb/day** | |
| **EFFLUENT CHARACTERISTIC** | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] |
| | **§471.71 - BPT** | | | | | | | |
| **CADMIUM** | 0.285 | 0.646 | 0.004 | 0.010 | 0.050 | 0.115 | 0.0006 | 0.001 |
| **CHROMIUM** | 0.342 | 0.836 | 0.005 | 0.012 | 0.061 | 0.149 | 0.0007 | 0.002 |
| **COPPER** | 1.90 | 3.61 | 0.027 | 0.052 | 0.337 | 0.641 | 0.004 | 0.007 |
| **LEAD** | 0.380 | 0.798 | 0.006 | 0.012 | 0.068 | 0.142 | 0.0007 | 0.002 |
| **NICKEL** | 2.42 | 3.65 | 0.035 | 0.052 | 0.428 | 0.647 | 0.005 | 0.007 |
| **FLUORIDE** | 50.2 | 113 | 0.718 | 1.62 | 8.90 | 20.1 | 0.092 | 0.208 |
| **MOLYBDENUM** | 6.5 | 12.6 | 0.093 | 0.180 | 1.16 | 2.23 | 0.012 | 0.023 |
| **OIL & GREASE** | 22.8 | 38 | 0.327 | 0.544 | 4.05 | 6.74 | 0.042 | 0.070 |
| **TSS** | 37.1 | 77.9 | 0.531 | 1.12 | 6.57 | 13.8 | 0.068 | 0.143 |
| **pH (s.u.)** | (a) | (a) | (a) | (a) | (a) | (a) | (a) | (a) |
| | **§471.72 - BAT** | | | | | | | |
| **CADMIUM** | 0.003 | 0.006 | 0.002 | 0.006 | 0.027 | 0.068 | 0.0003 | 0.0007 |
| **CHROMIUM** | 0.005 | 0.012 | 0.004 | 0.010 | 0.051 | 0.125 | 0.0005 | 0.001 |
| **COPPER** | 0.019 | 0.040 | 0.017 | 0.035 | 0.260 | 0.432 | 0.002 | 0.005 |
| **LEAD** | 0.004 | 0.009 | 0.004 | 0.008 | 0.044 | 0.095 | 0.0005 | 0.001 |
| **NICKEL** | 0.012 | 0.017 | 0.010 | 0.015 | 0.125 | 0.186 | 0.001 | 0.002 |
| **FLUORIDE** | 0.827 | 1.86 | 0.718 | 1.62 | 8.90 | 20.1 | 0.092 | 0.208 |
| **MOLYBDENUM** | 0.070 | 0.158 | 0.061 | 0.137 | 0.752 | 1.70 | 0.008 | 0.018 |

| | (h) Sawing or Grinding Spent Emulsions | | (k) Area Cleaning Rinse | | (l) Drum Washwater | | (m) Laundry Washwater | |
|---|---|---|---|---|---|---|---|---|
| **Production** | **2,500 off-lb/day** | | **3,000 off-lb/day** | | **3,000 off-lb/day** | | **50 employees** | |
| **EFFLUENT CHARACTERISTIC** | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] | Maximum for Monthly Avg. [lb/million off-lb] | Maximum Daily [lb/million off-lb] | Maximum for Monthly Avg. [mg/emp-day] | Maximum Daily [mg/emp-day] |
| | **§471.71 - BPT** | | | | | | | |
| **CADMIUM** | 0.0009 | 0.002 | 0.007 | 0.015 | 0.007 | 0.015 | 7.86 | 17.8 |
| **CHROMIUM** | 0.001 | 0.003 | 0.008 | 0.019 | 0.008 | 0.020 | 9.43 | 23.1 |
| **COPPER** | 0.006 | 0.011 | 0.043 | 0.082 | 0.045 | 0.084 | 52.4 | 99.6 |
| **LEAD** | 0.001 | 0.003 | 0.009 | 0.018 | 0.009 | 0.019 | 10.5 | 22.0 |
| **NICKEL** | 0.007 | 0.011 | 0.055 | 0.083 | 0.057 | 0.085 | 66.6 | 101 |
| **FLUORIDE** | 0.150 | 0.338 | 1.14 | 2.56 | 1.17 | 2.64 | 1390 | 3120 |
| **MOLYBDENUM** | 0.020 | 0.038 | 0.147 | 0.284 | 0.152 | 0.293 | 179 | 347 |
| **OIL & GREASE** | 0.068 | 0.114 | 0.515 | 0.858 | 0.532 | 0.886 | 629 | 1050 |
| **TSS** | 0.111 | 0.233 | 0.837 | 1.76 | 0.864 | 1.82 | 1020 | 2150 |
| **pH (s.u.)** | (a) | (a) | (a) | (a) | (a) | (a) | (a) | (a) |
| | **§471.72 - BAT** | | | | | | | |
| **CADMIUM** | 0.0005 | 0.001 | 0.004 | 0.009 | 0.004 | 0.009 | 2.10 | 5.24 |
| **CHROMIUM** | 0.0009 | 0.002 | 0.007 | 0.016 | 0.007 | 0.017 | 3.93 | 9.70 |
| **COPPER** | 0.004 | 0.007 | 0.026 | 0.055 | 0.027 | 0.057 | 16.0 | 33.6 |
| **LEAD** | 0.001 | 0.002 | 0.006 | 0.012 | 0.006 | 0.013 | 3.41 | 7.34 |
| **NICKEL** | 0.002 | 0.003 | 0.016 | 0.024 | 0.017 | 0.025 | 9.70 | 14.4 |
| **FLUORIDE** | 0.150 | 0.338 | 1.14 | 2.56 | 1.17 | 2.64 | 692 | 1560 |
| **MOLYBDENUM** | 0.013 | 0.029 | 0.096 | 0.216 | 0.099 | 0.223 | 58.4 | 132 |

**(a) Within the range 7.5 to 10.0 at all times.**

**Subpart G - Mass Loading Allocations for Outfall 001**

| | For Subcategories (c), (e), (f), (g), (h), (k) & (l) | | For Subcategory (m) | | Total for Subcategories (c), (e), (f), (g), (h), (k), (l), & (m) | |
|---|---|---|---|---|---|---|
| **EFFLUENT CHARACTERISTIC** | Maximum for Monthly Avg. [lb/day] | Maximum Daily [lb/day] | Maximum for Monthly Avg. [lb/day] | Maximum Daily [lb/day] | Maximum for Monthly Avg. [lb/day] | Maximum Daily [lb/day] |
| **CADMIUM (b)** | 0.000125 | 0.000305 | 0.000231 | 0.000577 | 0.000356 | 0.000882 |
| **CHROMIUM (b)** | 0.000231 | 0.000560 | 0.000433 | 0.001068 | 0.000664 | 0.001628 |
| **COPPER (b)** | 0.001082 | 0.001930 | 0.001762 | 0.003700 | 0.002844 | 0.005630 |
| **LEAD (b)** | 0.000200 | 0.000428 | 0.000376 | 0.000808 | 0.000576 | 0.001236 |
| **NICKEL (b)** | 0.000560 | 0.000832 | 0.001068 | 0.001586 | 0.001628 | 0.002417 |
| **FLUORIDE (b)** | 0.039743 | 0.089669 | 0.076211 | 0.171806 | 0.115954 | 0.261475 |
| **MOLYBDENUM (b)** | 0.003361 | 0.007587 | 0.006432 | 0.014537 | 0.009792 | 0.022124 |
| **OIL & GREASE (c)** | 0.107768 | 0.179579 | 0.069273 | 0.115639 | 0.177041 | 0.295218 |
| **TSS (c)** | 0.175288 | 0.368112 | 0.112335 | 0.236784 | 0.287622 | 0.604896 |
| **pH (s.u.) (c)** | (d) | (d) | (d) | (d) | (d) | (d) |

**(b) Based on BAT allocations**
**(c) Based on BPT allocations**
**(d) Within the range 7.5 to 10.0 at all times.**

Appendix 3 - continued

**40 CFR PART 471 EFFLUENT LIMITATION GUIDELINES**
**NONFERROUS METALS FORMING AND METAL POWDERS POINT SOURCE CATEGORY**

**Subpart E - Refractory Forming Subcategory - Tungsten (BPT)**

| EFFLUENT CHARACTERISTIC | (o) Alkaline Cleaning Rinse | | (s) Sawing or Grinding Spent Emulsions | | (w) Miscellaneous Waterwater Sources | | (x) Dye Penetrant Testing Wastewater | |
|---|---|---|---|---|---|---|---|---|
| | Maximum for Monthly Avg. | Maximum Daily | Maximum for Monthly Avg. | Maximum Daily | Maximum for Monthly Avg. | `` Daily | Maximum for Monthly Avg. | Maximum Daily |
| | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] |
| | §471.51 - BPT | | | | | | | |
| COPPER | 816 | 1,550 | 0.297 | 0.565 | 0.345 | 0.656 | 0.078 | 0.150 |
| NICKEL | 1,040 | 1,570 | 0.377 | 0.570 | 0.438 | 0.663 | 0.099 | 0.150 |
| FLUORIDE | 21,600 | 48,600 | 7.84 | 17.7 | 9.11 | 20.6 | 2.00 | 4.60 |
| MOLYBDENUM | 2,790 | 5,400 | 1.02 | 1.97 | 1.18 | 2.28 | 0.266 | 0.513 |
| OIL & GREASE | 9,790 | 16,300 | 3.57 | 5.94 | 4.14 | 6.9 | 0.930 | 1.60 |
| TSS | 15,900 | 33,500 | 5.79 | 12.2 | 6.73 | 14.2 | 1.50 | 3.20 |
| pH (s.u.) | (a) | (a) | (a) | (a) | (a) | (a) | (a) | (a) |

**(a) Within the range 7.5 to 10.0 at all times.**

**New Source Performance Standards (NSPS)**

**Subpart E - Refractory Forming Subcategory - Tungsten**

| EFFLUENT CHARACTERISTIC | (o) Alkaline Cleaning Rinse | | (s) Sawing or Grinding Spent Emulsions | | (w) Miscellaneous Waterwater Sources | | (x) Dye Penetrant Testing Wastewater | |
|---|---|---|---|---|---|---|---|---|
| | Maximum for Monthly Avg. | Maximum Daily | Maximum for Monthly Avg. | Maximum Daily | Maximum for Monthly Avg. | Maximum Daily | Maximum for Monthly Avg. | Maximum Daily |
| | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] | [lb/million off-lb] |
| | §471.53 - NSPS | | | | | | | |
| COPPER | 4.98 | 10.5 | 0.181 | 0.380 | 0.211 | 0.442 | 0.048 | 0.100 |
| NICKEL | 3.02 | 4.49 | 0.110 | 0.164 | 0.128 | 0.190 | 0.029 | 0.043 |
| FLUORIDE | 216 | 486 | 7.84 | 17.7 | 9.11 | 20.6 | 2.05 | 4.62 |
| MOLYBDENUM | 18.2 | 41.1 | 0.663 | 1.50 | 0.770 | 1.74 | 0.173 | 0.391 |
| OIL & GREASE | 81.6 | 81.6 | 2.970 | 2.97 | 3.450 | 3.45 | 0.776 | 0.776 |
| TSS | 97.9 | 123 | 3.570 | 4.46 | 4.140 | 5.18 | 0.931 | 1.170 |

**Note: NSPS includes pH within range 7.5 to 10.0 at all times.**

**Subpart E - NSPS Mass Loading Allocations for (o), (s), (w), & (x).**

| | NSPS for 750 off-lb/day Production | | | | | | | | Maximum for Monthly Avg. | Maximum Daily |
|---|---|---|---|---|---|---|---|---|---|---|
| | [lb/day] | [lb/day] | [lb/day] | [lb/day] | [lb/day] | [lb/day] | [lb/day] | [lb/day] | [lb/day] | [lb/day] |
| COPPER | 0.003735 | 0.007875 | 0.000136 | 0.000285 | 0.000158 | 0.000332 | 0.000036 | 0.000075 | 0.004065 | 0.008567 |
| NICKEL | 0.002265 | 0.003368 | 0.000083 | 0.000123 | 0.000096 | 0.000143 | 0.000022 | 0.000032 | 0.002465 | 0.003665 |
| FLUORIDE | 0.162000 | 0.364500 | 0.005880 | 0.013275 | 0.006833 | 0.015450 | 0.001538 | 0.003465 | 0.176250 | 0.396690 |
| MOLYBDENUM | 0.013650 | 0.030825 | 0.000497 | 0.001125 | 0.000578 | 0.001305 | 0.000130 | 0.000293 | 0.014855 | 0.033548 |
| OIL & GREASE | 0.061200 | 0.061200 | 0.002228 | 0.002228 | 0.002588 | 0.002588 | 0.000582 | 0.000582 | 0.066597 | 0.066597 |
| TSS | 0.073425 | 0.092250 | 0.002678 | 0.003345 | 0.003105 | 0.003885 | 0.000698 | 0.000878 | 0.079906 | 0.100358 |

**NSPS = 750 off-lb/day production**

**Note: Above shaded values not used for Tier 1 allocation; however, were included for Tiers 2, 3, 4, and 5 calculations.**

Appendix 3 - continued

**ELG + BPJ DISCHARGE ALLOCATIONS DUE TO 40 CFR PART 471 (SUBPARTS E AND G)**

| | Permit Tier (a) | Nominal | Production Range | ELG Discharge Parameters | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Oil & Grease | | TSS | | Lead | | Copper | | Nickel | | Fluoride | | Molybdenum | | Cadmium | | Chromium | |
| | | | | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) | Monthly Avg. (lb/day) | Daily Max. (lb/day) |
| **Subpart E (b)** | | | | | | | | | | | | | | | | | | | | | |
| | 1 (c) | 750 | <750 to 938 | 0.002588 | 0.002588 | 0.003105 | 0.003885 | -- | -- | 0.000158 | 0.000332 | 0.000096 | 0.000332 | 0.006833 | 0.015450 | 0.000578 | 0.001305 | -- | -- | -- | -- |
| | | | | | | | | | | | | | | | | | | | | | |
| | 1 (d) | 750 | <750 to 938 | 0.066600 | 0.066600 | 0.079910 | 0.100036 | -- | -- | 0.004065 | 0.008567 | 0.002465 | 0.003865 | 0.176250 | 0.396690 | 0.014855 | 0.033548 | -- | -- | -- | -- |
| | 2 | 1,125 | 939 to 1,406 | 0.099900 | 0.099900 | 0.119865 | 0.150054 | -- | -- | 0.006098 | 0.012851 | 0.003698 | 0.005498 | 0.264375 | 0.595035 | 0.022283 | 0.050322 | -- | -- | -- | -- |
| | 3 | 1,500 | 1,407 to 1,875 | 0.133200 | 0.133200 | 0.159820 | 0.200072 | -- | -- | 0.008130 | 0.017134 | 0.004930 | 0.007330 | 0.352500 | 0.793380 | 0.029710 | 0.067096 | -- | -- | -- | -- |
| | 4 | 1,875 | 1,876 to 2,344 | 0.166500 | 0.166500 | 0.199775 | 0.250089 | -- | -- | 0.010163 | 0.021418 | 0.006163 | 0.009163 | 0.440625 | 0.991725 | 0.037138 | 0.083870 | -- | -- | -- | -- |
| | 5 | 2,250 | 2,345 to 2,700 | 0.199800 | 0.199800 | 0.239730 | 0.300107 | -- | -- | 0.012195 | 0.025701 | 0.007395 | 0.010995 | 0.528750 | 1.190070 | 0.044565 | 0.100644 | -- | -- | -- | -- |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| **Subpart G (d)** | | | | | | | | | | | | | | | | | | | | | |
| | 1 | -- (d) | <1.00 to 1.25 | 0.177041 | 0.295218 | 0.287622 | 0.604896 | 0.000576 | 0.001236 | 0.002844 | 0.005630 | 0.001628 | 0.002417 | 0.115954 | 0.261475 | 0.009792 | 0.022124 | 0.000356 | 0.000882 | 0.000664 | 0.001628 |
| | 2 | 1.5 X | 1.26 to 1.88 | 0.265562 | 0.442827 | 0.431433 | 0.907344 | 0.000864 | 0.001854 | 0.004266 | 0.008445 | 0.002442 | 0.003626 | 0.173931 | 0.392213 | 0.014688 | 0.033186 | 0.000534 | 0.001323 | 0.000996 | 0.002442 |
| | 3 | 2X | 1.88 to 2.50 | 0.354082 | 0.590436 | 0.575244 | 1.209792 | 0.001152 | 0.002472 | 0.005688 | 0.011260 | 0.003256 | 0.004834 | 0.231908 | 0.522950 | 0.019584 | 0.044248 | 0.000712 | 0.001764 | 0.001328 | 0.003256 |
| | 4 | 2.5X | 2.56 to 3.12 | 0.442603 | 0.738045 | 0.719055 | 1.512240 | 0.001440 | 0.003090 | 0.007110 | 0.014075 | 0.004070 | 0.006043 | 0.289885 | 0.653688 | 0.024480 | 0.055310 | 0.000890 | 0.002205 | 0.001660 | 0.004070 |
| | 5 | 3X | 3.13 to 3.75 | 0.531123 | 0.885654 | 0.862866 | 1.814688 | 0.001728 | 0.003708 | 0.008532 | 0.016890 | 0.004884 | 0.007251 | 0.347862 | 0.784425 | 0.029376 | 0.066372 | 0.001068 | 0.002646 | 0.001992 | 0.004884 |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| **Total (e)** | 1 | 1 | | 0.206573 | 0.342477 | 0.334336 | 0.700098 | 0.000662 | 0.001421 | 0.003452 | 0.006856 | 0.001983 | 0.003161 | 0.141205 | 0.318464 | 0.011926 | 0.026943 | 0.000409 | 0.001014 | 0.000764 | 0.001872 |
| | 2 | 1.5 | | 0.420281 | 0.624136 | 0.633993 | 1.216007 | 0.000994 | 0.002132 | 0.011918 | 0.024490 | 0.007060 | 0.010491 | 0.504052 | 1.135335 | 0.042516 | 0.096034 | 0.000614 | 0.001521 | 0.001145 | 0.002808 |
| | 3 | 2 | | 0.560374 | 0.832181 | 0.845324 | 1.621343 | 0.001325 | 0.002843 | 0.015891 | 0.032653 | 0.009414 | 0.013989 | 0.672069 | 1.513780 | 0.056688 | 0.128046 | 0.000819 | 0.002029 | 0.001527 | 0.003744 |
| | 4 | 2.5 | | 0.700468 | 1.040227 | 1.056655 | 2.026679 | 0.001656 | 0.003554 | 0.019863 | 0.040816 | 0.011767 | 0.017486 | 0.840087 | 1.892224 | 0.070860 | 0.160057 | 0.001024 | 0.002536 | 0.001909 | 0.004681 |
| | 5 | 3 | | 0.840561 | 1.248272 | 1.267985 | 2.432015 | 0.001987 | 0.004264 | 0.023836 | 0.048980 | 0.014121 | 0.020983 | 1.008104 | 2.270669 | 0.085032 | 0.192068 | 0.001228 | 0.003043 | 0.002291 | 0.005617 |

Note:

(a) Five tiered permit developed due to U.S. Army requirement for AOT to be able to triple its annual production.

(b) 750 lb/day NSPS for 40 CFR Part 471 EGL Subpart E - Refractory Forming Subcategory - Tungsten (BAT)

(c) 40 CFR Part 471 EGL Subpart E - allocation with sawing/grinding spent emulsion, alkaline cleaning rinse and dye penetrant testing wastestream to evaporator for Tier 1 only.

(d) Tier 1 assuming 3 wastestream referenced in footnote (c) do not flow to evaporator - this used for Tiers 2, 3, 4, and 5 discharge allocations.

(e) Total includes 1.15 increase for discharge allocation due to non-ELG streams per BPJ.

**APPENDIX 4 - WATER QUALITY CONSIDERATIONS**

The following procedure is used to calculate the allowable instream concentrations water quality based new permit limitations.

a. The most recent background conditions of the receiving stream segment are compiled. This information includes:

   * 7Q10 of receiving stream (1.76 MGD, USGS)
   * 30Q5 of receiving stream (2.04 MGD, USGS)
   * Calcium hardness (210 mg/l)
   * Total suspended solids (18 mg/l)
   * Background metals concentrations (½ water quality criteria, or upstream avg)
   * Other dischargers impacting this segment (several upstream)
   * Downstream water supplies, if applicable

b. The chronic water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel and zinc. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions.

c. The acute water quality criteria are converted from total recoverable metal at lab conditions to dissolved lab conditions for the following metals: cadmium, copper, trivalent chromium, lead, nickel, zinc and silver. Then translators are used to convert the dissolved lab conditions to total recoverable metal at ambient conditions for the following metals: cadmium, copper, lead, nickel and silver.

d. The resulting allowable trivalent and hexavalent chromium concentrations are compared with the effluent values characterized as total chromium on permit applications. If reported total chromium exceeds an allowable trivalent or hexavalent chromium value, then the calculated value will be applied in the permit for that form of chromium unless additional effluent characterization is received to demonstrate reasonable potential does not exist to violate the applicable state water quality criteria for chromium.

e. A standard mass balance equation determines the total allowable concentration (permit limit) for each pollutant. This equation also includes a percent stream allocation of no more than 90% unless otherwise designated.

   The following formulas are used to evaluate water quality protection:

$$Cm = \frac{QsCs + QwCw}{Qs + Qw}$$

where:

Cm = resulting in-stream concentration after mixing
Cw = concentration of pollutant in wastewater
Cs = stream background concentration
Qw = wastewater flow
Qs = stream low flow

***to protect water quality:***

$$Cw \leq \frac{(S_A)\,[Cm\,(Qs + Qw) - QsCs]}{Qw}$$

where ($S_A$) is the percent "Stream Allocation".

Calculations for this permit have been done using a standardized spreadsheet, titled "Water Quality Based Effluent Calculations." Division policy dictates the following procedures in establishing these permit limits:

1. The critical low flow values are determined using USGS data:

   Fish and Aquatic Life Protection
   7Q10 - Low flow under natural conditions
   1Q10 - Regulated low flow conditions

   Other than Fish and Aquatic Life Protection
   30Q5 - Low flow under natural conditions

2. Fish & Aquatic Life water quality criteria for certain Metals are developed through application of hardness dependent equations. These criteria are combined with dissolved fraction methodologies in order to formulate the final effluent concentrations.

3. For criteria that are hardness dependent, chronic and acute concentrations are based on a Hardness of 25 mg/L and Total Suspended Solids (TSS) of 10 mg/L unless STORET or Water Supply intake data substantiate a different value. Minimum and maximum limits on the hardness value used for water quality calculations are 25 mg/L and 400 mg/L respectively. The minimum limit on the TSS value used for water quality calculations is 10 mg/L.

4. Background concentrations are determined from the division database, results of sampling obtained from the permittee, and/or obtained from nearby stream sampling data. If this background data is not sufficient, one-half of the chronic "In-stream Allowable" water quality criteria for fish and aquatic life is used. If the measured background concentration is greater than the chronic "In-stream Allowable" water quality criteria, then the measured background concentration is used in lieu of the chronic "In-stream Allowable" water quality criteria for the purpose of calculating the appropriate effluent limitation (Cw). Under these circumstances, and in the event the "stream allocation" is less than 100%, the calculated chronic effluent limitation for fish and aquatic life should be equal to the chronic "In-stream Allowable" water quality criteria. These guidelines should be strictly followed where the industrial source water is not the receiving stream. Where the industrial source water is the receiving stream, and the measured background concentration is greater than the chronic "In-stream Allowable"

water quality criteria, consideration may be given as to the degree to which the permittee should be required to meet the requirements of the water quality criteria in view of the nature and characteristics of the receiving stream.

The spreadsheet has fifteen (15) data columns, all of which may not be applicable to any particular characteristic constituent of the discharge. A description of each column is as follows:

**Column 1**: The "Stream Background" concentrations of the effluent characteristics.

**Column 2:** The "Chronic" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Continuous Concentration (CCC) is calculated using the equation:

$$CCC = (\exp \{ m_C [ \ln (\text{stream hardness}) ] + b_C \} ) (CCF)$$

CCF = Chronic Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained *in The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent; no chronic criterion exists for silver. Published criteria are used for non-metal parameters.

**Column 3:** The "Acute" Fish and Aquatic Life Water Quality criteria. For cadmium, copper, trivalent chromium, lead, nickel, silver, and zinc, this value represents the criteria for the dissolved form at laboratory conditions. The Criteria Maximum Concentration (CMC) is calculated using the equation:

$$CMC = (\exp \{ m_A [ \ln (\text{stream hardness}) ] + b_A \} ) (ACF)$$

ACF = Acute Conversion Factor

This equation and the appropriate coefficients for each metal are from Tennessee Rule 0400-40-03-.03 and the EPA guidance contained in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996). Values for other metals are in the total form and are not hardness dependent. Published criteria are used for non-metal parameters.

**Column 4:** The "Fraction Dissolved" converts the value for dissolved metal at laboratory conditions (columns 2 & 3) to total recoverable metal at in-stream ambient conditions (columns 5 & 6). This factor is calculated using the linear partition coefficients found in *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007, June 1996) and the equation:

$$\frac{C_{diss}}{C_{total}} = \frac{1}{1 + \{ [K_{po}] [ss^{(1+a)}] [10^{-6}] \}}$$

ss = in-stream suspended solids concentration [mg/l]

Linear partition coefficients for streams are used for unregulated (7Q10) receiving waters, and linear partition coefficients for lakes are used for regulated (1Q10) receiving waters. For those parameters not in the dissolved form in columns 2 & 3 (and all non-metal parameters), a Translator of 1 is used.

**Column 5:** The "Chronic" Fish and Aquatic Life Water Quality criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 2 by the value in column 4.

**Column 6:** The "Acute" Fish and Aquatic Life Water Quality criteria at in-stream ambient conditions. This criteria is calculated by dividing the value in column 3 by the value in column 4.

**Column 7:** The "Chronic" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the chronic limit.

**Column 8:** The "Acute" Calculated Effluent Concentration for the protection of fish and aquatic life. This is the acute limit.

**Column 9:** The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Organism Consumption (Recreation).

**Column 10:** The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Water and Organism Consumption. These criteria are only to be applied when the stream use classification for the receiving stream includes both "Recreation" and "Domestic Water Supply."

**Column 11**: The In-Stream Water Quality criteria for the protection of Human Health associated with the stream use classification of Domestic Water Supply.

**Column 12:** The Calculated Effluent Concentration associated with Organism Consumption.

**Column 13:** The Calculated Effluent Concentration associated with Water and Organism Consumption.

**Column 14**: The Calculated Effluent Concentration associated with Domestic Water Supply.

The calculated chronic water quality effluent concentrations from Column 7 should be compared, individually, to the values calculated in Columns 12, 13, and 14 in order to determine the most stringent chronic permit limitations. The calculated acute water quality effluent concentrations from Column 8 should then be compared, individually, to values equal to two (2) times the values presented in Columns 12, 13, and 14 in order to determine the most stringent acute permit limitations. These water quality based limits should then be compared to any technology based (CFR or Tennessee "Rules") effluent limitations, and/or any previous permit limitations, for final determination of the permit limits.

**Ammonia Nitrogen Aquatic Toxicity Calculations**

The State utilizes the EPA document, 1999 Update to Ambient Water Quality Criteria for Ammonia and assumed temperatures of 25°C and 15°C and stream pH of 8 to derive an allowable instream protection value. A mass balance with plant and stream flows and this allowable value determines the monthly average permit limit. Seasonal limits may also be allowed due to ambient temperature variations between the summer and winter seasons.

A pH value of 8 (instead of historically used 7.5) was chosen for two reasons: 1.) ambient upstream monitoring results show that the pH often exceeds 7.5, and is up to 8 sometimes 2.) this assumption is more conservative.

East TN- 25°C, 15°C
Middle TN- 27°C, 17°C
West TN- 30°C, 20°C

| | Winter | | | | Summer | | | |
|---|---|---|---|---|---|---|---|---|
| Temp (°C)= | 15 | | | Temp (°C)= | 25 | | | |
| pH= | 8.0 | | | pH= | 8.0 | | | |
| Min (2.85, 1.45*10^ 0.028*(25-T)) | 2.76 | 2.85 | 2.76 | Min (2.85, 1.45*10^ 0.028*(25-T)) | 1.45 | 2.85 | 1.45 | |

$$CCC = \left( \frac{0.0577}{1+10^{(7.688-pH)}} + \frac{2.487}{1+10^{(pH-7.688)}} \right) * \text{Min}(2.85,\ 1.45*10^{0.028*(25-T)})$$

CCC= **2.36** CCC= **1.24**

CCC - Continuous Chronic Criterion Allowable instream NH3-N concentration [mg/l]

$$CCC = \frac{(\text{Critical Low Flow [MGD]} * \text{Background Ammonia Nitrogen [mg/L]}) + (\text{Discharge Flow [MGD]} * \textbf{Effluent Concentration [mg/L]})}{(\text{Critical Low Flow [MGD]} + (\text{Discharge Flow [MGD]})}$$

| where: | | |
|---|---|---|
| | 1.76 | Critical Low Flow [MGD] (7Q10 value) |
| | 1.2 | Background Ammonia Nitrogen Concentration [mg/L] |
| | 0.0096 | Outfall 001 Flow [MGD] |

**Total treated effluent NH3-N discharge concentrations and loadings for summer winter and summer conditions follow:**

| Winter | | Summer | |
|---|---|---|---|
| **215** | Concentration [mg/L] | **8.2** | Concentration [mg/L] |
| **17** | Amount [lb/day] | **0.66** | Amount [lb/day] |

**Outfall 003 allocation @ discharge limit = 5.0 mg/L monthly avg. This would result in a NH3-N loading = 5.0*8.34*0.0025= 0.10 lb/day Resulting Outfall 001 NH3-N = 0.66-0.10 = 0.56 lb/day translating to 0.56/(8.34*0.0096) = 7.0 mg/L NH3-N monthly avg limit. The corresponding daily maximum limit = 7.0 mg/L * 2 = 14.0 mg/L NH3-N**

**WATER QUALITY BASED EFFLUENT CALCULATION**
**OUTFALL 001**

**FACILITY:** Aerojet Ordnance Tennessee
**PERMIT #:** TN0057983

| Stream (7Q10) [MGD] | Stream (30Q5) [MGD] | Waste Flow [MGD] | Ttl. Susp. Solids [mg/l] | Hardness (as CaCO3) [mg/l] | Stream Allocation [%] |
|---|---|---|---|---|---|
| 1.76 | 2.04 | 0.0096 | 18 | 210 | 90 |

| EFFLUENT CHARACTERISTIC | 1 Stream Bckgrnd. Conc. [ug/l] | 2 Fish/Aqua. Life Water Quality Criteria Chronic [ug/l] | 3 Fish/Aqua. Life Water Quality Criteria Acute [ug/l] | 4 Effluent Fraction Dissolved [Fraction] | 5 Fish & Aquatic Life Water Quality Criteria (7Q10) In-Stream Allowable Chronic [ug/l] | 6 In-Stream Allowable Acute [ug/l] | 7 Calc. Effluent Chronic [ug/l] | 8 Calc. Effluent Acute [ug/l] | Calc. Effluent Chronic [lb/day] | Calc. Effluent Acute [lb/day] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cadmium (a)** | 0.04 | 0.4 | 4.1 | 0.267 | 1.540 | 15.492 | 248.9 | 2,563.5 | 0.0199 | 0.2052 |
| **Copper (a)** | 1.6 | 16.9 | 27.0 | 0.314 | 53.723 | 86.037 | 8,648.6 | 14,009.6 | 0.6924 | 1.1217 |
| **Lead (a)** | 1.1 | 5.59 | 143 | 0.167 | 33.474 | 858.989 | 5,371.8 | 142,324.8 | 0.4301 | 11.3951 |
| **Nickel (a)** | 9.8 | 97.4 | 877 | 0.372 | 261.947 | 2358.417 | 41,840.1 | 389,644.4 | 3.3499 | 31.1965 |
| **Silver (a)** | 5.8 | NA | 11.525 | 1.000 | NA | 11.525 | N/A | 961.2 | N/A | 0.0770 |
| **Zinc (a)** | 14 | 222 | 220 | 0.254 | 873.344 | 866.258 | 142,577.7 | 141,402.2 | 11.4153 | 11.3212 |
| **Chromium III** | 0.59 | 136 | 1,046 | 0.196 | 695.205 | 5344.463 | 115,237.1 | 886,549.0 | 9.2263 | 70.9807 |
| **Chromium VI** | 0.1 | 11 | 16 | 1.000 | 11.000 | 16.000 | 1,808.4 | 2,637.9 | 0.1448 | 0.2112 |
| **Cyanide (b)** | 2.600 | 5.2 | 22.0 | 1.000 | 5.200 | 22.000 | 433.7 | 3,220.8 | 0.0347 | 0.2579 |
| **Toluene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Benzene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **1,1,1 Trichloroethane** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Ethylbenzene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Carbon Tetrachloride** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Chloroform** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Tetrachloroethylene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Trichloroethylene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **1,2, trans Dichloroethylene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Methylene Chloride** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Total Phenols** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Napthalene** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Total Phthalates** | 0.000 | NA | NA | 1.000 | NA | NA | NA | NA | NA | NA |
| **Chlorine (T. Res.)** | 0.000 | 11.000 | 19.000 | 1.000 | 11.000 | 19.000 | 2,027.7 | 3,502.3 | 0.1623 | 0.2804 |

| EFFLUENT CHARACTERISTIC | 9 Human Health Water Quality Criteria (30Q5) In-Stream Criteria Organisms [ug/l] | 10 In-Stream Criteria Water/Organisms [ug/l] | 11 In-Stream Criteria DWS [ug/l] | 12 Calculated Effluent Organisms [ug/l] | 13 Calculated Effluent Water/Organisms [ug/l] | 14 Calculated Effluent DWS [ug/l] | Calculated Effluent Organisms [lb/day] | Calculated Effluent Water/Organisms [lb/day] | Calculated Effluent DWS [lb/day] |
|---|---|---|---|---|---|---|---|---|---|
| **Cadmium (a)** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Copper (a)** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Lead (a)** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Nickel (a)** | 4,600 | N/A | N/A | 883,144.9 | N/A | N/A | 70.708 | N/A | N/A |
| **Silver (a)** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Zinc (a)** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Chromium III** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Chromium VI** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Cyanide (b)** | 140.0 | N/A | N/A | 26,437.6 | N/A | N/A | 2.117 | N/A | N/A |
| **Toluene** | 15,000 | N/A | N/A | 2,885,940.0 | N/A | N/A | 231.060 | N/A | N/A |
| **Benzene** | 510.0 | N/A | N/A | 98,122.0 | N/A | N/A | 7.856 | N/A | N/A |
| **1,1,1 Trichloroethane** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Ethylbenzene** | 2,100 | N/A | N/A | 404,031.6 | N/A | N/A | 32.348 | N/A | N/A |
| **Carbon Tetrachloride** | 16.0 | N/A | N/A | 3,078.3 | N/A | N/A | 0.246 | N/A | N/A |
| **Chloroform** | 4,700 | N/A | N/A | 904,261.2 | N/A | N/A | 72.399 | N/A | N/A |
| **Tetrachloroethylene** | 33.0 | N/A | N/A | 6,349.1 | N/A | N/A | 0.508 | N/A | N/A |
| **Trichloroethylene** | 300.0 | N/A | N/A | 57,718.8 | N/A | N/A | 4.621 | N/A | N/A |
| **1,2, trans Dichloroethylene** | 10,000 | N/A | N/A | 1,923,960.0 | N/A | N/A | 154.040 | N/A | N/A |
| **Methylene Chloride** | 5900.0 | N/A | N/A | 1,135,136.4 | N/A | N/A | 90.884 | N/A | N/A |
| **Total Phenols** | 1,700,000 | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Napthalene** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Total Phthalates** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |
| **Chlorine (T. Res.)** | NA | N/A | N/A | NA | N/A | N/A | NA | N/A | N/A |

(a) Denotes metals for which Fish & Aquatic Life Criteria are expressed as a function of total hardness.The Fish & Aquatic Life criteria for this metal are in the dissolved form at laboratory conditions. The in-stream allowable criteria and calculated effluent concentrations are in the total recoverable form.
(b) The criteria for this parameter are in the total recoverable form.
NOTE: Water Quality criteria for stream use classifications other than Fish & Aquatic Life are based on the 30Q5 flow.

**48-hour LC50 Acute Biomonitoring Considerations (Outfall 001 and 002 Discharges)**

Since the division considers the permittee's Outfall 001 and 002 discharges to contain pollutants whose combined effects may have a reasonable potential to be detrimental to fish and aquatic life, the new permit includes acute biomonitoring requirements. The Tennessee Water Quality Criteria stipulate that "*The waters shall not contain toxic substances, whether alone or in combination with other substances, which will produce toxic conditions...".* . Based on the permittee's manufacturing activities and DMR 48-hour LC50 results and rationale presented in this section, the permit includes discharge limits for Outfalls 001 and 002.

For its current production level (i.e., Tier 1 permit requirements), the permittee has an intermittent Outfall 001 discharge, which may cause acute toxicity impacts in the receiving stream. Likewise, the Outfall 002 discharge may include chemicals used for cooling tower water treatment which may result in adverse acute toxicity impact within the receiving stream. The following calculations were used to determine discharge $LC_{50}$ limits for the combined Outfall 001 and 002.

$$DF = \frac{Qs + Qw}{Qw} = \text{Dilution Factor}$$

Where:

$Qw_{001}$ = Outfall 001 discharge = 0.0096 MGD
$Qw_{002}$ = Outfall 002 discharge = 0.00326 MGD
Qs = receiving stream low-flow 7Q10 = 1.76 MGD

Therefore,

$$DF = \frac{(1.76 + 0.0096 + 0.00326)}{0.01286} = 137.8$$

Since the calculated dilution factor is less than 500:1, and assuming immediate and complete-mixing, the receiving stream biota acute protection requires:

$$LC_{50} \text{ of the wastewater must be} > \frac{100\%}{DF \times 0.3} > \text{Lethal concentration}$$

For Outfall 001:

$$LC_{50} \text{ of the wastewater must be} > \frac{100\%}{137.8 \times 0.3} > 2.4\ \%$$

Since the permittee uses batch treatment with intermittent discharge (each over a 24 hr period), the same Outfall 001 acute $LC_{50}$ limit are applicable for the new permit's five-tiers.

If the $LC_{50}$ toxicity result is at or less than the above permitted $LC_{50}$ values, the division will deem that elevated effluent toxicity exists, which constitutes a permit violation.

**WATER QUALITY BASED EFFLUENT CALCULATIONS**
**OUTFALL 003**

**FACILITY:** **Aerojet Ordnance Tennessee**
**PERMIT #:** TN0057983

| Stream (7Q10) | Stream (30Q5) | Waste Flow | Ttl. Susp. Solids | Hardness (a) (as CaCO3) | Stream Allocation |
|---|---|---|---|---|---|
| [MGD] | [MGD] | [MGD] | [mg/l] | [mg/l] | [%] |
| 1.76 | 2.04 | 0.0025 | 18 | 210 | 90 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | Stream Bckgrnd. | Fish/Aqua. Life Water Quality Criteria | | Effluent Fraction | Fish & Aquatic Life Water Quality Criteria (7Q10) | | | |
| | | | | | In-Stream Allowable | | Calc. Effluent Concentration | |
| **EFFLUENT CHARACTERISTIC** | Conc. | Chronic | Acute | Dissolved | Chronic | Acute | Chronic | Acute |
| | [ug/l] | [ug/l] | [ug/l] | [Fraction] | [ug/l] | [ug/l] | [ug/l] | [ug/l] |
| **Chlorine (T. Res.)** | 0.000 | 11.000 | 19.000 | 1.000 | 11.000 | 19.000 | **7,755** | **13,395** |

| | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|
| | Human Health Water Quality Criteria (30Q5) | | | | | |
| | In-Stream Criteria | | | Calculated Effluent Concentration | | |
| **EFFLUENT CHARACTERISTIC** | Organisms | Water/Organisms | DWS | Organisms | Water/Organisms | DWS |
| | [ug/l] | [ug/l] | [ug/l] | [ug/l] | [ug/l] | [ug/l] |
| **Chlorine (T. Res.)** | NA | NA | NA | **NA** | **NA** | **NA** |

Technology-based daily maximum TRC discharge limit = 2.0 mg/L

To evaluate aquatic toxicity from Outfall 002 during use of municipal water for cooling, the waste flow of 0.003 MGD is compared and found to be approximately equal to the flow from Outfall 003 of 0.002 MGD. The calculations shown above indicate an effluent TRC limit of approximately 7 mg/l for chronic conditions and 13 mg/l would be warranted. Given that municipal drinking water concentrations are prohibited above 4 mg/l by TDEC rules, the discharge of cooling water with these levels is unlikely. Accordingly, a TRC limit is not required for Outfall 002.