

**Appendix D. National Pollutant Discharge
Elimination System Noncompliance
Summaries for 2011**

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D.1 Y-12 National Security Complex

A. Noncompliance with Permit Effluent Limitations and Requirements

Analysis of water samples obtained at Outfall 125 during January 2011 revealed a noncompliance of the Y-12 National Security Complex NPDES Permit. A composite sample obtained on January 12, 2011, provided a cadmium concentration of 0.00186 mg/L, which is above the permit monthly average value of 0.001 mg/L. This value is the only cadmium value measured at Outfall 125 during January 2011. Outfall 125 typically receives water from the basement of Building 9204-1. The source is primarily spring water with some cooling waters and condensate. However, due to the failure of the pumping system, the basement area was flooded. Sampling and analysis of water contained in the flooded basement indicated the presence of cadmium. It is believed that cadmium is a contaminate remaining in the dirt areas of the basement.

Elevated readings of cadmium were also found in two composite samples taken at Outfall 200. The permit limits for cadmium at Outfall 200 are 0.001 mg/L for the monthly average and 0.025 mg/L for the daily maximum. The composite sample taken on December 5, 2010, indicated a cadmium level of 0.00118 mg/L, and a sample taken on January 19, 2011, showed cadmium to be 0.00104 mg/L. Outfall 200 is tied to a large drain system that includes most of the entire western half of the Y-12 Complex. In investigating potential causes for the two exceedances, it is believed that runoff from the newly cleaned Old Savage Yard (OSY) site, located upstream of Outfall 200, is a plausible cause. A stormwater sample taken from the OSY showed a concentration of cadmium of 0.072 mg/L.

B. Other Events and Observations

On January 26, 2011, verbal notification was made to personnel at the Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control (DWPC), of a possible leak in a cooling system that contains a mixture of 22 percent methanol in water. On January 27, 2011, verbal notification was made to TDEC DWPC personnel that water sampling at Outfall 135 indicated the presence of total organic carbon (TOC) caused by methanol. Location of the entry point of the leak into the storm drain system was located and isolated from reaching the outfall and East Fork Poplar Creek (EFPC) by using drain plugs. The water captured in the storm drain junction box was pumped to the sanitary sewer system for treatment by the city of Oak Ridge, or pumped to a tanker truck for on-site treatment. The situation was monitored by sampling TOC and methanol in the junction box and at the Outfall 135 location. Sampling and general observations of conditions on EFPC continued to indicate no adverse impact on the stream.

A second event was a fish kill that was discovered on July 21 in the upper portions of EFPC inside the boundaries of the Y-12 Complex, and TDEC was notified. Over a three-day period, a survey of the creek recovered a total of 650 minnow-sized fish (mostly stonerollers), crayfish, and clams. Surveys conducted July 23 identified living fish throughout the creek, and the overall impact to the creek was determined to be localized and insignificant. Follow-up checks of EFPC confirmed that aquatic life is doing well. A combination of a number of factors is believed to have caused the fish to die. These include stream conditions such as low flow, elevated water temperatures, and depressed dissolved oxygen as the result of flow management water being off and a discharge of cloudy water, which occurred on the afternoon of July 20. The discharge, which lasted about 1.5 hours, was from the storm drain system upstream of Outfall 200 and likely associated with discharges from the West End Mercury Area Storm Sewer Remediation Project. Analysis of the July 20 discharge indicated elevated levels of metals. Most

notably was mercury measured at a concentration of 0.873 mg/L. Experts at the Aquatic Ecology Laboratory of the ORNL Environmental Sciences Division conducted external and internal examinations on stonerollers, the primary species involved in the incident. Examinations suggested respiratory distress. Gills were found to be frayed or damaged, causing a reduction in the exchange of respiratory gases. This factor, combined with low dissolved oxygen and relatively high water temperatures, could have resulted in respiratory failure.

D.2 East Tennessee Technology Park

On March 21, 2011, at approximately 3:00 p.m., an employee observed a discharge from sanitary sewer lift station K-1204-15 at the ETTP Central Neutralization Facility (CNF) entering into a nearby storm water inlet. This lift station collects sanitary sewage discharges from the CNF and from a break trailer located within the CNF area. Storm water from this area discharges to Mitchell Branch via storm water Outfall 170. This portion of the Outfall 170 storm water drainage network was flowing at the time the discharge into the catch basin was noticed. The discharge of sanitary sewage into the storm water outfalls is not permitted by ETTP NPDES Permit TN0002950. It was determined that this incident was a violation of the ETTP NPDES permit. A walkdown of Mitchell Branch was conducted, and no evidence of a fish kill or any other type of damage to the aquatic ecosystem of the stream was observed. No threat to human health or the environment occurred as a result of this discharge. No physical evidence of the discharge could be observed at the outfall.

On April 12, 2011, sampling subcontractor personnel were collecting routine NPDES permit compliance data at storm water Outfall 690. A pH reading of 9.6 standard units was measured at the designated NPDES monitoring location for that outfall. Sampling subcontract personnel then verified the calibration of the pH meter according to standard procedures. The pH meter calibration proved to be accurate. The pH reading of 9.6 standard units is outside the NPDES permitted range of 6.0–9.0 standard units for this outfall, which constitutes a noncompliance with the ETTP NPDES storm water permit. It is believed that storm water infiltrated through concrete debris and rubble that was generated during the demolition of the K-33 building. The pH of the storm water may have been elevated by the contact of the storm water with this material. No threat to human health or the environment occurred as a result of this incident.

D.3 Oak Ridge National Laboratory

Two missed compliance analyses (for pH and conductivity) were reported in January 2011 for the Steam Plant Wastewater Treatment Facility (SPWTF) (NPDES Outfall X02). The miss was due to an infrequent and irregular schedule of operation (the facility was only operated when an adequate batch of accumulated wastewaters necessitated treatment), which led to inadvertent oversight of communication protocol initiated by facility operators to compliance sampling technicians. Due to upgrades to the ORNL Steam Plant, the SPWTF is no longer needed and is expected to be taken out of service in 2012.

In March 2011, a construction contractor operating heavy equipment in a construction area accidentally breached an underground water supply pipe near the intersection of Fifth Street and Central Avenue. Water was released for approximately 35 minutes into Fifth Creek. Chlorine was measured at 1.1 mg/L, in excess of the maximum stream water quality standard of 0.019 mg/L. This event resulted in a small fish kill (nine stoneroller minnows were found) in both Fifth Creek and White Oak Creek. Aquatic biology staff concluded from their surveys that the detrimental impact on the fish was due to the water release but the toxicity was short lived.

Due to a sample-storage error at a contract laboratory that performs NPDES sample analyses for ORNL, the effluent Ammonia as N sample that was collected in August 2011 from Outfall X01 (ORNL Sewage Treatment Plant) was mistakenly stored for a time in an unrefrigerated area prior to analysis. This was reported as a technical nonconformance with the permit requirement that analyses be conducted per EPA protocols, which include refrigeration for ammonia samples. The sample in question was still analyzed, and the result fell within the expected range for ammonia at this facility based on historic data and was included in the calculation of the monthly average.

Several instances have occurred at the ORNL Sewage Treatment Plant (STP) where, due to heavy rains that increase influent flow volume, pumping capacity operates at maximum, and as the facility was designed, the excess enters the disinfection contact chamber directly instead of first passing through the aeration chamber. Disinfection is operationally enhanced to treat the increased flow. In November 2011, during one such instance, the daily maximum concentration for *E. coli* bacteria measured greater than 5000 cfu/100 mL, which exceeded the NPDES permit limit of 941cfu/100 mL. ORNL is evaluating options to upgrade the existing STP system within the next few years.

