

**Appendix E. National Pollutant Discharge  
Elimination System Noncompliance  
Summaries for 2005**



# Appendix E. National Pollutant Discharge Elimination System Noncompliance Summaries for 2005

## E.1. Y-12 COMPLEX

### E.1.1. Toxicity Test Failure

#### Description and Cause

Toxicity tests at East Fork Poplar Creek in-stream National Pollutant Discharge Elimination System (NPDES) monitoring point 201 [East Fork Poplar Creek kilometer (EFK) 25.1] were conducted January 6 to 13, 2005, using *Ceriodaphnia dubia* and fathead minnows as test species. The 96-h LC<sub>50</sub> (the concentration of an aqueous sample lethal to 50% of test organisms in a given time span) was greater than 100% for both species. The no-observed effect concentration (NOEC) for fathead minnows' survival and growth and the *Ceriodaphnia* survival were 100%. However, the NOEC for *Ceriodaphnia* reproduction was 80%. A confirmation test was conducted at the 201 monitoring point January 21 to 28, 2005, using *Ceriodaphnia dubia* as the test species. The 96-h LC<sub>50</sub> was greater than 100%, and the NOECs for *Ceriodaphnia* survival and reproduction were 100%. Toxicity tests are conducted quarterly at monitoring point 201, and for years the toxicity as measured by the LC<sub>50</sub> and NOEC has remained stable at 100% for both test species. During the same time period of the original test (January 6 to 13, 2005) another toxicity test was conducted as part of the Y-12 Biological Monitoring and Abatement Program downstream at EFK 24.1. That test showed no toxicity. The cause of toxicity demonstrated for *Ceriodaphnia* reproduction is not known.

### E.1.2. Permit Limit Noncompliance at Outfall 55

#### Description and Cause

A sample for mercury obtained on July 7, 2005, at outfall 55 had a concentration of 0.00482 mg/L, which is above the permit daily maximum limit of 0.004 mg/L. Approximately 1.2 in. of rain fell on that date, which could have caused some movement of legacy contamination from the area of Building 9201-2. The outfall receives discharges including storm water from Building 9201-2. However, no single causative factor was determined for this event.

### E.1.3. Permit Limit Noncompliances at Central Mercury Treatment System

#### Description and Cause

The Central Mercury Treatment System (outfall 551) is designed to treat groundwater and surface water containing mercury, which accumulates in sumps in former mercury use buildings at the Y-12 Complex. In one of the buildings (9201-5) a leak developed in a cooling system that contains a solution of tap water and approximately 21% methanol. The methanol-water solution leaked into the basement sump and was pumped along with other influent wastewaters into an in-ground equalization tank known as the 2100-U tank. The methanol was carried into the treatment facility and adversely affected the ability of the facility, especially the carbon columns, to treat mercury. Noncompliance to the daily maximum mercury permit limit of 0.004 mg/L occurred on October 25, November 30, December 7, and December 14, 2005. The monthly average for mercury of 0.002 mg/L was exceeded in November and December, 2005.

#### Corrective Action

Corrective actions to resolve the problem include shutdown of the treatment facility, cleaning and disinfecting lines and treatment equipment, replacement of carbon, and collection of sump water in storage

tanks to hold and treat. Testing of several types of carbon to find more efficiency in treatment have also been conducted. Investigations continue to remedy the problem and to return the treatment system to full-time reliable operation. Additional information about the event is provided in Sect. 2.2.17, “Environmental Occurrences.”

## **E.2 East Tennessee Technology Park**

### **E.2.1 Sanitary Water Line Break**

#### **Description and Cause**

On January 24, 2005, routine sampling at storm water outfall 100 returned a result of total residual chlorine of 1.25 mg/L. The NPDES permit limit at that location is 0.14 mg/L. An investigation revealed that a sanitary water line break had occurred near Building K-1004-L and that some of the water was entering the storm water network.

#### **Corrective Actions**

The section of water line was immediately valved off, and repairs were effected. Subsequent monitoring of the outfall and the receiving waters revealed no detectable impacts.

## **E. 3. OAK RIDGE NATIONAL LABORATORY**

### **E.3.1 Bypass**

#### **Description and Cause**

Untreated sewage backed up in a collection line and overflowed onto the grass and nearby streets and was discharged to First Creek through outfalls 001 and 014.

#### **Corrective Action**

Blockage in the sewer line was cleared, and the contaminated areas were cleaned up. All ORNL staff received an internal communication between January 9–13, 2006, reminding them of appropriate discharges to the sanitary sewer and the risks of inappropriate materials.

### **E.3.2. Total Residual Oxidant**

#### **Description and Cause**

A lawn mower hit and damaged an aboveground hose that conveys water from a supply water faucet and through a dechlorinator as a mechanism of mixing dechlorination chemical with source streams. The faucet was mistakenly turned off, stopping the leak and unknowingly stopping the dechlorination of outfall 081.

#### **Corrective Action**

The existing supply water configuration was repaired, and an administrative control tag has been added to the faucet. A daily inspection program of the faucet and hose was implemented and well as required awareness training for staff working in the area.

### **E.3.3. Temperature Change**

Four instream temperature change limits were exceeded during the annual temperature sampling campaign, which was conducted during an extended outage of the High Flux Isotope Reactor.

#### **Corrective Action**

A longer, shallower discharge flow path had been utilized to mitigate thermal load for the outfall 281 discharge. Over time, the sand bag dam that diverted water into the flow path deteriorated such that the discharge traveled a shorter and deeper tributary, providing less time and distance for heat dissipation. All cooling system equipment was checked and was found to be operating properly. Flow was diverted to a new path, which provides more aeration and additional cooling time before the discharging into Melton Branch. Compliance with temperature requirements is being evaluated by additional monitoring.

