

## **Appendix E: NPDES Noncompliances**



Table E.1. Summary of Y-12 Plant NPDES excursions, 1999

Excursion	Time/date	Location	Incident
99-001	12:00 noon; 6/28/99	Outfall 068	Permit limit exceedence; pH 9.3
99-002	11:17 a.m.; 6/29/99	Outfall 088	Permit limit exceedence; pH 10.8
99-003	10:05 a.m.; 6/30/99	Outfall 201	Permit limit exceedence; pH 8.7
99-004	3rd Quarter	Outfall S12	No pH measurement taken

Excursion	Description/cause	Corrective action
99-001	An elevated level of pH was recorded at Outfall 068 that exceeded the daily maximum permit limit of 9.0. Outfall 068 is a low flow steam condensate discharge which normally measures pH at approximately 7.0. The cause of the elevated value has not been determined.	It is possible that the normally elevated temperature of the steam could have caused an interference with the particular probe used on that day. This outfall will be eliminated from discharge to East Fork Poplar Creek (EFPC), and the small amount of steam condensate will discharge to a gravel bed for absorption into the ground.
99-002	An elevated level of pH was recorded at Outfall 088 that exceeded the daily maximum permit limit of 9.0. A follow-up investigation revealed that roof drains from Building 9201-1 discharge to this outfall. Recent heavy rains washing algae growth on the roof through these drains may have raised the pH levels. Also, a sanitary sewer upgrade project recently completed in the area required a reconfiguration of the piping flow path prior to the outfall, resulting in stagnant water being discharged during the rains. However, the cause of the elevated value has not been determined.	None

Table E.1 (continued)

Excursion	Description/cause	Corrective action
99-003	An Elevated level of pH was recorded at Outfall 201 that exceeded the daily maximum permit limit of 8.5. The source of the exceedence is believed to result from operations involving sodium hydroxide at either of Buildings 9204-2 (transfer) or 9404-18 (Demineralizer).	Transfer of the sodium hydroxide solution, as well as operations at the demineralizer, eased. A walkdown was conducted on the operations involving sodium hydroxide at Buildings 9204-4 and 9404-18. Dye checking was performed on the sump west of Building 9404-18 to check for leaks. This test indicated that a small leak was occurring in the underground portion of piping that extended from the building to the sump. However, it could not be determined that the leak was of sufficient magnitude to alter the stream pH to the degree measured. The underground piping will be repaired to ensure leaktightness.
99-004	On August 25, 1999, a flow measurement at Outfall S12 was performed in support of activities associated with the NPDES permit application effort. This information (that a flow had been observed) was provided to technicians who perform monitoring in support of the current NPDES permit. When the technicians arrived to perform a field pH reading, the flow had ceased and no measurements could be made. Due to near drought conditions in August and September, and the primary source of water discharged through Outfall S12 being surface runoff, no flow was available to obtain the pH measurement in September.	This storm water outfall is known to flow during periods of heavy rain. The frequency of visits to this outfall will be increased to correspond with such rain events. As a note, a review of pH data taken for this outfall over the last three years indicated a range of 6.0 to 7.9.

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Table E.2. Summary of ORNL NPDES excursions, 1999

Outfall	Date	Parameter	Explanation	Corrective action
265	01/05/99	Unpermitted Discharge	On January 5, 1999, an ORNL underground water supply pipe began leaking just south of Building 3026. The water flowed to a catch basin that feeds Outfall 265 on Fifth Creek. Muddy water from the leak resulted in turbidity in Fifth Creek, and residual chlorine was detected in Fifth Creek. Because the pipe leakage passed through an area containing legacy soil contamination, the leaking water was checked for radioactivity; gross beta activity was 74 becquerels per liter (Bq/L), and gross alpha activity was below the detection level of 10 Bq/L.	ORNL personnel immediately placed straw bales and dechlorination tablets in the path of the leak flow, mitigating the turbidity and chlorine concerns. Because the pipe was determined to supply fire protection and cooling water to several buildings and processes, alternate arrangements were made to supply water to those systems, and the leaking pipe was isolated. At the same time, Fifth Creek was surveyed for any evidence of impacts on aquatic species, and no impacts were found. The leak was excavated and repaired in the following days. Radiological surveys and analyses were continued as ORNL personnel addressed the leaking pipe. By midnight on 1/5/99 the gross beta activity level of the water from the leak had dropped to 20 Bq/L or less, and no alpha activity was ever detected. Reportable-quantity (RQ) determinations were made, and the total activity of the release was calculated to be more than three orders of magnitude less than the reportable standard. Based on the release of turbidity and chlorine, this release was considered to be nonconformance with narrative conditions of ORNL's NPDES permit.
X02	01/12/99	Iron	At the ORNL Coal Yard Runoff Treatment Facility (CYRTF), Outfall X02, effluent is clarified and filtered prior to release to White Oak Creek as pond overflow that is discharged through a flume. No unusual circumstances were visually identified in the CYRTF pond or in the sample bottle on the date of the nonconformance. In a 1994 investigation, it was determined that algae, which can be abundant on the surface of the pond in warm weather, may uptake iron (Fe) and concentrate it in the X02 pond discharge. Algal accumulation of Fe may have contributed to the excursion.	Operators reviewed all of the CYRTF operating data for the period just before and on the day of the Fe nonconformance. All operating parameters were found to be normal with no upsets or unusual conditions evident. The average iron concentration for calendar year 1998 was 0.354 mg/L with a low of 0.25 mg/L and a high of 0.677 mg/L, indicating that the plant consistently removes iron within the permit limit. A definitive cause for the nonconformance was not able to be identified.

Table E.2 (continued)

Date	Location	Excursion	Explanation	Corrective action
X01	06/30/99	Fecal Coliform Bacteria	On June 30, 1999, a grab sample analysis indicated that the concentration of fecal coliform bacteria in ORNL Sewage Treatment Plant (STP) effluent exceeded the daily-maximum NPDES permit limit for that parameter. All other NPDES effluent parameters were within limits on that day. The exceedence is attributed to operational upset caused by extensive rainfall (approximately 2.6 inches) during the previous day, which caused White Oak Creek to rise into the STP discharge piping, through the contact chamber, and into the STP wetwell. The excessive flows through the contact chamber resulted in impaired or incomplete treatment of STP effluent. ORNL personnel notified the Tennessee Department of Environment and Conservation DOE Oversight Division of the upset circumstances by telephone on 6/29/99. The STP was restored to normal function by 6/30/99; however, the presence of fecal coliform in STP effluent on that day is considered an aftermath of the exceptional conditions that were experienced on 6/29/99.	No corrective actions were determined that could have prevented the 6/30/99 exceedence. STP operators minimized the impact of the high-water conditions by reducing aeration of the STP clarifier, allowing the sludge blanket to settle and minimizing the possibility of waste particulate being conveyed to the STP tertiary filtration system. However, there may be no feasible way to preclude creek water from rising into the STP under heavy rainfall conditions.
X01	09/07/99	Oil and Grease	An effluent sample collected on September 7, 1999, at the ORNL Sewage Plant (STP) was analyzed and indicated an oil and grease concentration in excess of the NPDES daily-maximum permit limit. The elevated value also caused calculated exceedence of monthly average concentration, daily maximum amount, and monthly average amount limits as well, giving a total of four permit limit excursions from the single sampling event.	The excursion has been investigated, with no clear cause determined. Field technicians collecting the STP samples on September 7 noted nothing unusual about the appearance of the sample, although analytical laboratory personnel noted an oily residue in a separation flask during the actual analysis. STP operating conditions on and around September 7 were normal, and analytical results for other STP NPDES parameters on that date and for the remainder of that week were within permit limits and normally expected ranges.

Table E.2 (continued)

Date	Location	Excursion	Explanation	Corrective action
X12	11/04/99	Oil and Grease	The November 4, 1999, Oil and Grease sample for Outfall X12 exceeded the NPDES Permit limit for that parameter. Operations at specific facilities contributing wastewater to the Process Waste Treatment Complex, which discharges treated effluent through Outfall X12, were examined; however, no certain cause for the nonconformance was able to be determined.	To assist investigations in the event of future Oil and Grease nonconformances, the sampling and analytical protocol will be modified as follows: (1) a duplicate sample will be collected and analyzed for every Oil and Grease sample; (2) Where a sample causes an Oil and Grease nonconformance, the analytical laboratory will analyze the residue in an effort to identify the specific compound(s) contributing to the nonconformance; and (3) Sampling technicians will make a special effort to write field observations on log sheets for Oil and Grease samples.

Table E.3. Summary of ETP NPDES excursions, 1999

Date	Location	Excursion	Explanation	Corrective action
1/15/99	K-1423	Unpermitted Discharge	Discharge of concrete dust and sanitary water into storm drain catch basin	Project personnel reminded that no materials are to be discharged into the storm drain system
2/23/99	Outfall 005 (K-1203 STP)	Settleable Solids	Only 4 of 5 required weekly samples for this parameter were analyzed due to a sample log-in error	Sample log-in procedures were reviewed and evaluated
2/24/99	Storm Water Outfall 200	Unpermitted Discharge	Discharge of oily storm water runoff into storm drain catch basin	Absorbent materials placed around catch basins; residual oil leaks from equipment were cleaned up
8/12/99	Storm Water Outfall 190	Unpermitted Discharge	Discharge of contaminated groundwater into storm drain due to a transfer line being breached	Repair of the groundwater transfer line was completed as soon as possible after the breach occurred
8/24/99	Outfall 005 (K-1203 STP)	Fecal Coliform	Fecal coliform measurement of 1060 colonies per 100 mL exceeded permit limit of 1000 colonies per 100 mL	None; cause of the incident could not be determined
8/30/99	Storm Water Outfall 190	pH	pH measurement of 5.9 was outside permit limit of 6.0–9.0	None; no specific cause of the incident could be identified
10/13/99	Storm Water Outfall 100	Unpermitted Discharge	Discharge of carpet adhesive, bleach, and sanitary water into open floor drain that discharges to Storm Water Outfall 100	Lessees and subcontract personnel were reminded that no materials are to be discharged into storm drain system; floor drain plugged
10/18/99	Storm Water Outfall 200	Unpermitted Discharge	Discharge of sanitary water into storm water catch basin	Lessees were reminded that no materials are to be discharged into storm water catch basins
11/15/99	Outfall 009 (K-1515 WTP)	Aluminum	Aluminum measurement of 3.19 mg/L exceeded permit limit of 2.0 mg/L	Procedure for cleaning the K-1515-F basin were modified to prevent reoccurrence of event
12/27/99	Storm Water Outfall 100	Total Residual Chlorine	TRC measurement of 0.19 mg/L exceeded permit limit of 0.14 mg/L (TRC)	Procedure for the management of dechlorination units in K-1004-L were modified to prevent reoccurrence of this event