



**Sandia National Laboratories**

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**Terry W. Cooper**  
Senior Manager  
Environmental Stewardship

Mr. William V. Wechsler  
Assistant Manager for Engineering  
U.S. Department of Energy  
National Nuclear Security Administration  
Sandia Field Office  
P.O. Box 5400  
Albuquerque, NM 87185

Dear Mr. Wechsler:

**Subject: *Transmittal of the Sandia National Laboratories/New Mexico Five-Day Report for the Accidental Slug Discharge at the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) Industrial Wastewater Permit No. 2069 Outfall***

This letter represents the five-day written notification for elevated fluoride levels at the Building 858N, Acid Waste Neutralization (AWN) System in accordance with the ABCWUA Sewer Use and Wastewater Ordinance § 3-6-5(B), Reports of Potential Problems. This AWN System is covered under the ABCWUA Industrial Wastewater Permit No. 2069G. The immediate notification to the ABCWUA occurred at 21:42 on August 1, 2019.

At 19:50 on Thursday, August 1, 2019, elevated levels of fluoride were observed at the Building 858N AWN System. Staff members observed a reading of 21.56 parts per million (ppm) on the automated monitoring system with a peak reading of 27.82 ppm observed at 20:15. The peak was immediately followed by a decline with an additional reading of 15.53 ppm observed at 21:25. Preliminary readings indicate that fluoride was above the daily maximum composite limit of 22.7 ppm for approximately 56 minutes.

The cause of the elevated fluoride level was identified as overflow from an acid scrubber that drains to the AWN System. A hydrogen fluoride (HF) spray cabinet is used to etch material deposited on equipment during one of the processes within the Building 858N fabrication facility. A tank that contains 49% HF is sprayed on the parts, and during this process a portion of the HF is swept away by the local exhaust ventilation. This acid is scrubbed from the air via a water sprayer prior to being



*Exceptional Service in the National Interest*



discharged into the atmosphere. The water in the acid scrubber is recycled and replenished at a rate of 5 gallons per minute. The overflow from the acid scrubber goes to the AWN System and is the source of the elevated fluoride levels. This process is routine, and a slight increase of the fluoride level is typically seen during this process.

The attached Chart 1 represents fluoride concentrations within the AWN System. The blue curve represents the fluoride concentration in the first of the four AWN tanks. The orange curve is the fluoride concentration after the fourth tank and is discharged to the sanitary sewer. The red dots indicate the potential of hydrogen (pH) of the scrubber reservoir water. The data shows that as the pH of the scrubber water decreases, the fluoride levels increase. This is a strong indication that the HF is getting into the scrubber water (as it is designed to do). The transparent red rectangles show the different runs that occurred and their corresponding times. The solid red line indicates the time the 49% HF tank was emptied to the fluoride holding tank. This corresponding data shows that fluoride levels continued to drop, indicating the elevated fluoride levels are from activity-level work and not mechanical failure.

A graph of the fluoride concentrations (Chart 2), provided from the AWN monitoring system, shows fluoride levels over the 24-hour period for August 11, 2019. The graph identifies normal operating levels of fluoride at approximately 8 ppm along with the elevated fluoride spike. Engineers have determined fluoride concentrations for the 24-hour average were 7.8 ppm, well below the ABCWUA Sewer Use and Wastewater Control Ordinance Daily Maximum Composite Limit of 22.7 ppm. Additionally, Chart 1 identified the total weight of the fluoride during a 290-minute period was approximately 4,380 grams. During this period, wastewater flow levels were monitored at approximately 260 gallons per minute.

Sandia National Laboratories personnel are scheduled to perform a root cause analysis to better understand why the levels were elevated higher than normal. Routine processes will be evaluated to better prepare for elevated levels of fluoride within the acid scrubber system.

Should you have any questions or comments concerning this report, or require additional information, please contact me at (505) 284-1831.

Sincerely,

Terry Cooper

Enclosure:

- 1: Chart 1 – Fluoride concentrations and scrubber pH concentrations within the Acid Waste Neutralization System
- 2: Chart 2 – Fluoride concentration curve

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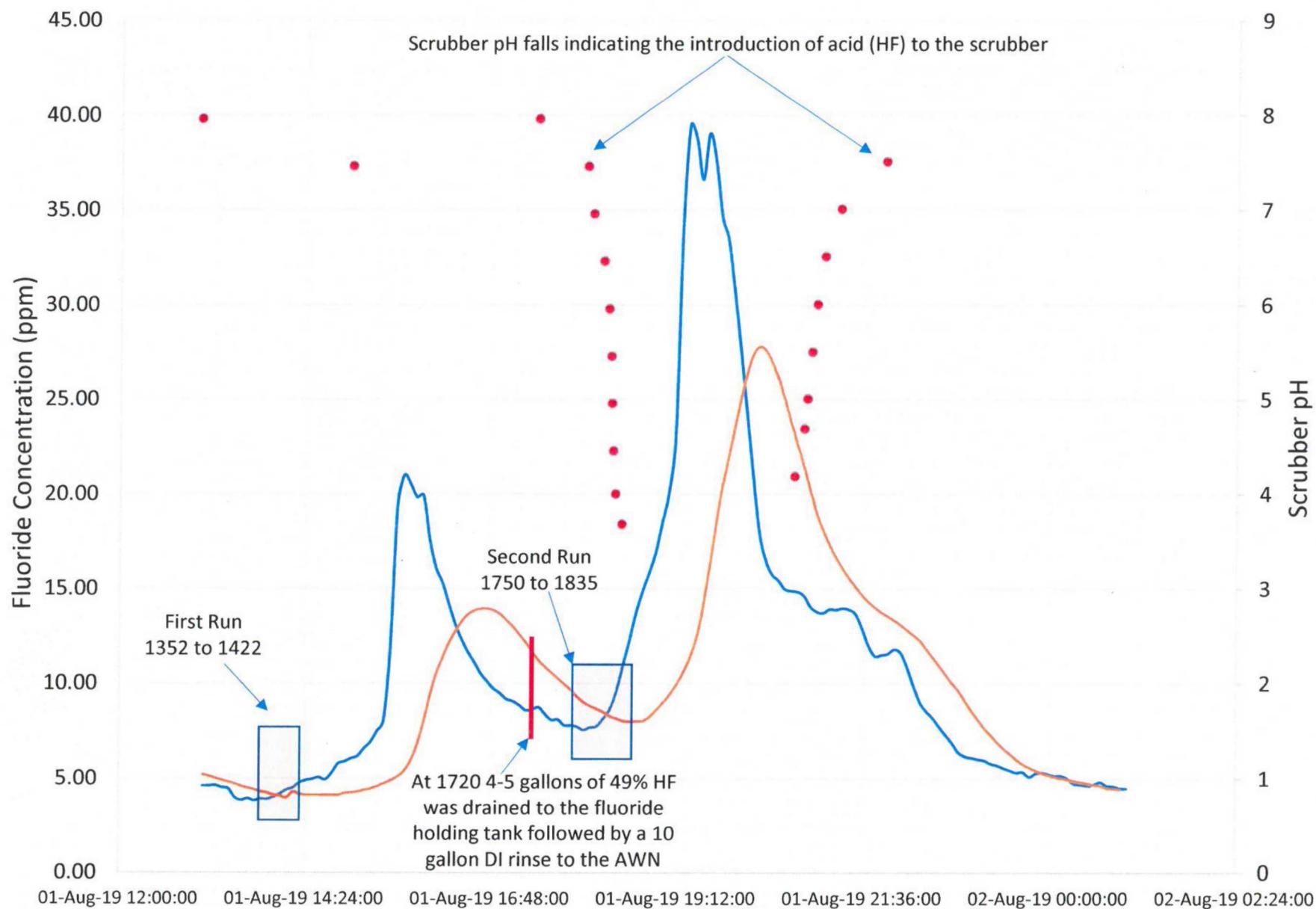
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Chart 1

— Tank 1 — Discharge • Scrubber pH



30.00

Chart 2

25.00

20.00

15.00

10.00

5.00

0.00

8/1/19 6:00 PM

8/1/19 7:12 PM

8/1/19 8:24 PM

8/1/19 9:36 PM

8/1/19 10:48 PM

8/2/19 12:00 AM

266 gal/m for 290m = 77,140 gal

77,140 gal X 3785 ml/gal = 294,974,900 ml

Avg. Fluoride concentration over the 290 m is 15ppm

Grams of Fluorine = 294,974,900 ml X (15 g /10<sup>6</sup> ml) = 4380 g

