



**Texas Commission on Environmental Quality  
New Technology Implementation Grant (NTIG) Program**

**Operation Phase Annual/Final Status Report**

**Contract Number:** 582-15-53907-1471  
**Grantee:** Southwest Research Institute  
**Report for the Annual period:** 2020-2021 – Final Status Report **Date Submitted:** 07/09/2021

**Section I. Accomplishments**

*Provide a bulleted list of operations of the facility during the past year.  
Include exact numbers and/or estimates.*

Southwest Research Institute (SwRI) Fire Technology Department (FTD) installed a pollution abatement system (PAS). The start-up date of this system occurred on March 24, 2016. The PAS is a fabric-filter baghouse paired with a dry scrubbing soda ash system and an activated carbon chemical adsorption system. The purpose of this PAS is to capture and control overheated exhaust gas emissions of particulate matter, as well as toxic and hazardous air pollutants from three buildings collocated in the FTD area. A schematic of the area where the system is servicing three buildings is shown in Figure 1. Current pictures of the system and its major components are shown in Figures 2 through 6.

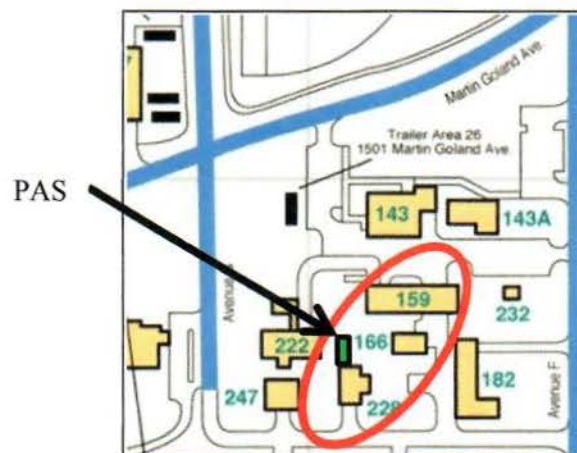


Figure 1. FTD area showing the location of the three buildings and PAS (red oval).

Testing activities performed in all three buildings associated with this PAS have been recorded. Emissions for each test event are estimated per-occurrence based on quantity and composition of materials tested. An aggregate report of the testing activities and estimated emissions in each building is submitted monthly. Due to the frequent changing nature of research projects and/or the unknown composition of some testing materials, actual emissions are not routinely determined. The

following bulleted lists indicate the details associated with the three buildings (B159, B166, and B228) connected to the PAS during the period of July 2020-June 2021:

- The total number of tests performed in this period for this group of buildings was 115, of which:
  - 62 tests were performed in B159, representing 53.91% of the total tests.  
A variety of fire resistance test were conducted, many in support of the automotive and wood industries.
  - 16 tests were performed in B166, representing 13.91% of the total tests.  
The majority of the testing conducted was in support of battery testing.
  - 37 tests were performed in B228, representing 32.18% of the total tests.  
The majority of the testing conducted was in support of battery testing.
- Cumulative particulate matter (PM) emissions to the atmosphere were 48.86 pounds (0.024 ton).
  - The abated amount was 4,837.13 lb (2.42 ton).
- Cumulative sulfur dioxide (SO<sub>2</sub>) emissions to the atmosphere were 2.01 pounds (0.001 ton).
  - The abated amount was 18.09 lb (0.009 ton).
- Cumulative emissions to the atmosphere of acid gases, including hydrogen bromide (HBr), hydrogen chloride (HCl), and hydrogen fluoride (HF) were 2.71 pounds (0.001 ton).
  - The abated amount was 11.67 lb (0.006 ton).
- The pressure drop and flow-rate across the Bag House are continually monitored during operations. The pressure drop is reset to 1.5 inches of water when diminished flow-rates are identified. This operational flexibility is due to the system's reverse-pulsed mechanism, which is capable of injecting air to remove the constituents captured in the filter bags. This process allows the system to quickly recalibrate proper pressure and flow rate in the system for optimal operations.

## Section II. Key Events and Issues

*Report any key events that occurred during this reporting period. Please include any major project updates that impacted operations.*

During the most recent annual reporting period, an augmented internal/external quench system was installed to maintain overheated exhaust gas below the baghouse bypass threshold of 500 Deg F. A new external spray cooling system was also installed to apply spray water at a rate of 10 gallons per minute along the transit of exhaust from the Jet-Fire plenum to the primary quench system. Routine checks and maintenance have kept the system and its components properly operational.

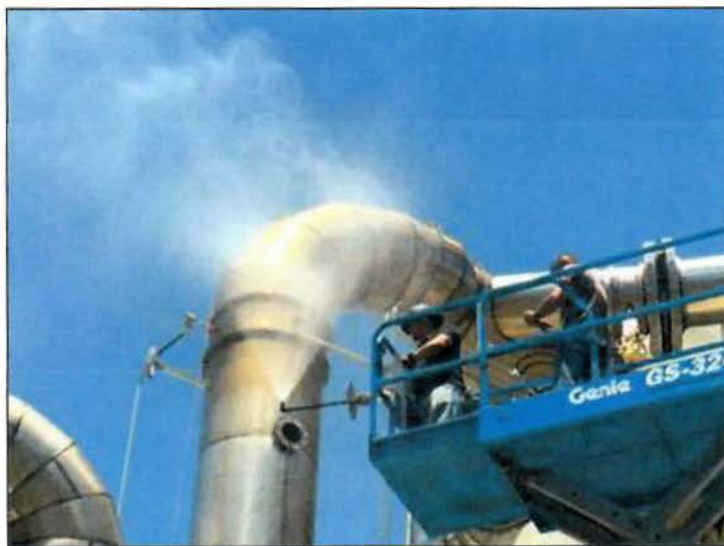


Figure 2. Photograph of quench water spray system testing and installation.



*Report any anticipated or unanticipated problem(s).*

SwRI's FTD currently does not anticipate any problems with the proper functioning of the system.

*Proposed Solution(s): Report any possible solution(s) to the anticipated or unanticipated problem(s).*

SwRI's FTD currently does not anticipate any problems with the proper functioning of the system.

*Action(s) Conducted and Results: Describe the action(s) taken to resolve the anticipated or unanticipated problem(s). Were the actions successful in resolving the problem?*

- By installation of enhanced internal/external quench systems, the issue of high temperature exhaust bypassing the Bag House has been minimized.
- The PAS has been operating properly with no problems during the 2020-2021 period, with no instances of excess opacity events due to Bag House bypass.

**Section III. Provide a summary of the overall state of the facility and grant funded equipment.**

The PAS has been working properly during the 2020-2021 period. The installation of additional internal sprinklers and an external spray system was performed during the prior year with no reoccurrences of exhaust bypass. Routine checks and maintenance have been conducted, as recommended by the manufacturer.

This system has enabled the FTD to expand its capabilities to include high-smoke products, fiberglass-reinforced plastic, penetration sealants, electrical cables, jet-fire testing, and lithium-ion batteries. Figures 3 through 5 show the current physical state of the system with all photographs being current as of 06/24/2021.

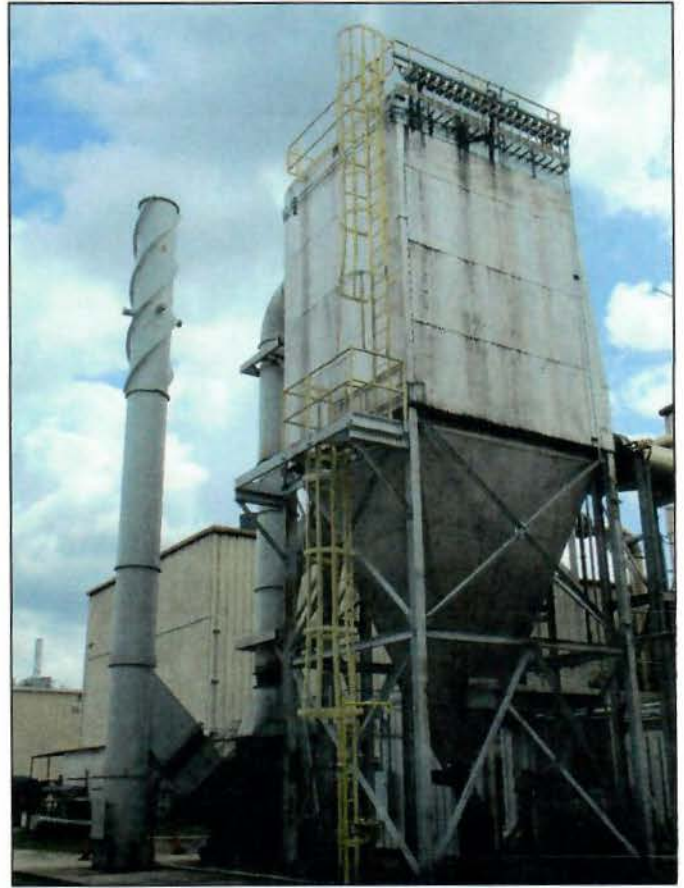


Figure 3 . Photographs of Pollution Abatement System and its components looking south (left photo) and looking northeast (right photo).





Figure 4. Photographs of the fan and hopper.

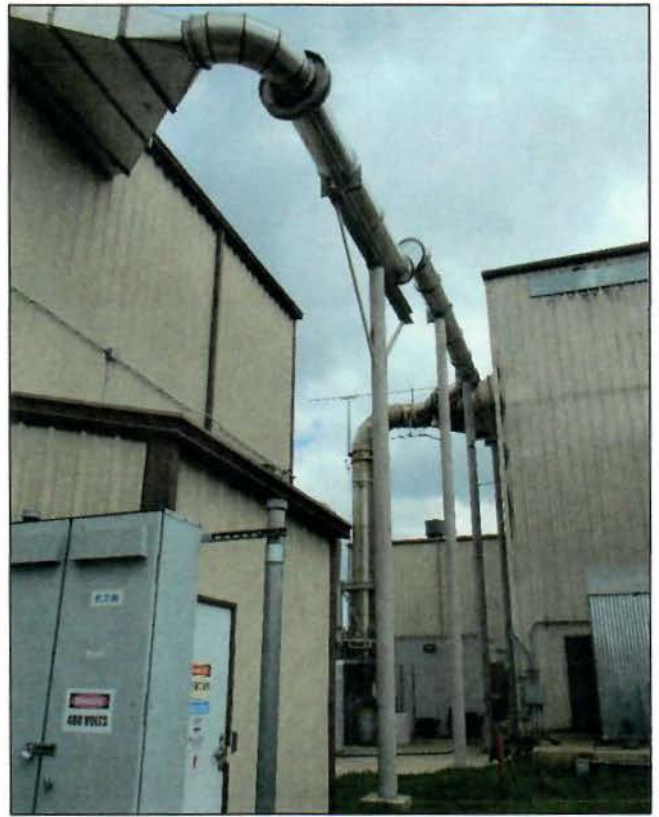


Figure 5. Photographs of the supplementary ductwork, dampers, and valves.

**ction IV. Goals and Issues for Upcoming Period**

*Provide a brief description of the project goal(s) you hope to realize during the next reporting period.*

This annual report covers the final reporting period. The overarching goal is to keep the system operating at optimal condition. For this, an assessment of the components will continue to be performed to identify any potential issues.

An important goal for the system is to ensure that preventive maintenance is being performed on a scheduled basis. This will be done to ensure that unintended downtime is avoided and to extend the life of the system.

Paul Easley, Vice President of Facilities and Services

***Authorized Official/ Project Representative's Printed name***  
***(blue ink)***



Date: July 09, 2021

***Authorized Official Signature/ Project Representative's name***  
***(blue ink)***

**NOTE:** *Please attach any additional information that you feel should be a part of your report.*

This form may be submitted via e-mail to your Grant Coordinator or a paper copy may be sent to the following address:

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