ENVIRONMENT SAFETY & HEALTH
Sandia National Laboratories

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Building 1090 Improvements
Analytical Services Program
September 5, 2018

SAND2018-10136R

Management Surveillance of Activity Level Operations
Failure mode analysis/identification of potential process improvements leading to the development of new engineered controls and facility improvements
(Pam Puissant and Al Bendure, 0631 Analytical Services)

Laboratory Issues Identified Pre-2016

- Building exhaust system incompatible with acid fumes generated by sample digestion processes
  - Stains observed on ceiling tiles in Room 170 as a result of acid leakage
  - Condensation buildup and noticeable drips into fume hoods
  - Several failures of exhaust vent valves
- A loss of electrical power to the building could potentially expose MOWs to acid fumes
- Concerns about lab space differential pressure remaining negative with respect to office space
- No emergency lighting in lab spaces
- Disconnected workflow and traffic patterns between lab spaces
- Moving sample receipt room into Room 178 resulted in no lab space for the Air Monitoring Program
- Laboratory space in Rooms 170 and 172 under-utilized

New Laboratory Construction and Engineered Controls (Completed March 2016)

- Creation of Sample Packaging Facility (SPF) in former Industrial Hygiene Analytical Chemistry Laboratory (Room 170)
- Consolidated all acid evaporation activities to Room 184 with the addition of a new dedicated exhaust fan, Teflon-coated, acid resistant ductwork, and PVC fume hoods with wash-down capabilities.
- Installation of a UPS dedicated to powering the acid evaporation exhaust system in Room 184 during power outage
- Addition of emergency lighting in all lab spaces
- Installation of differential air pressure monitors for Room 184 and controls on limiting work in hoods during high winds
- Construction of new sample receiving room in Room 178, including HEPA fume hood and direct access into the main count lab
- The removal and re-purpose of fume hoods from Room 170 into Room 186
- Reconfiguration of the lab entry ways to improve operational work flow and traffic flow between labs
- Addition of a new vestibule location next to Room 190
- Installation of new DI water system in Sample Packaging Facility to support improved quality control for monitoring
- Created a new Air Monitoring Laboratory within Room 170

Other Laboratory Issues Identified (March 2016-Present)

- Undesirable vehicle traffic patterns with the addition of the Sample Packaging Facility
- Electric cart parking was impeding sample drop off at the Sample Packaging Facility
- No emergency exit on south side of building for office area
- SNL upper management could not enter 1090 building with existing badge reader
- External laboratory doors without windows
- Additional office space and conference room needed
- No direct access from lab spaces to lab storage room

New Facility Improvements and Engineered Controls (March 2016-Present)

- Re-routing of the driveway entrance into the Sample Packaging Facility to provide more direct and safer access
- Installation of new bollards on north end of building and around storm water retention basin to control vehicular traffic flow
- New emergency exit door and sidewalk on south end of building
- New electric cart parking pad on northeast end of building, in a more visible location
- Installed new chip readers on all exterior doors
- Installed safety glass windows in exterior laboratory doors for line of sight
- Removed excess electrical outlets from the Sample Packaging Facility
- Ergonomics assessment resulted in more usable space in SPF, allowing for more efficient sample traffic and work flows
- Acquired scissor carts to eliminate lifting of filled water bottles
- Installed large screen in SPF to improve quality checks on COCs
- Reconfiguration of Room 180 and hallway (no longer needed) to allow addition of two new offices (Sept 2017)
- New direct access entryway established from main count lab to laboratory equipment storage room (Sept 2017)
- Reconfiguration of Room 168 to accommodate new conference room and storage cabinets (Sept 2017)

Planned Future Improvements

- New soil preparation laboratory in Room 194
- Engineering study to extend firewalls to ceiling in Room 184
- Enclose outside cage area to create more controlled and improved storage space
- Additional vehicle parking areas