



Department of Energy

Washington, DC 20585

January 9, 2017

David Seely
Remedial Project Manager
Region 5-SR-6J
US Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, IL 60604

Mr. Brian Nickel
EPA Supervisor, DERR
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, OH 45402-2911

SUBJECT: Summary of Per- or Polyfluorinated Alkyl Substances Records Search for Indications of Use at Mound Site

Dear Mr. Seely and Mr. Nickel:

Enclosed is the Summary of the Per- or Polyfluorinated Alkyl Substances (PFAS) Records Search for Indications of Use at the Mound, Ohio, Site dated December 2016, that was presented to the Mound Core Team on December 15, 2016.

The summary written report documents the results of research on historical Mound Site records pertaining to use, if any, of PFAS at the site. The U.S. Department of Energy (DOE) concludes that no PFAS chemicals, including perfluorooctanesulfonic acid or perfluorooctanic acid, were used at the Mound site except for small quantities that were completely consumed as mass spectroscopy standards.

This letter documents the Core Team's agreement on December 15, 2016 that this DOE letter and enclosure satisfy the January 30, 2017, milestone date stipulated in the Fourth Five-Year Review Report for the Mound Site, dated September 2016. Based upon the results of the enclosed report, a determination regarding the protectiveness of the site conditions needs to be established. This can be discussed at the next scheduled Core Team meeting.

Please call me at 513-648-3333 if you have any questions or require additional information. Please send any correspondence to:

U.S. Department of Energy
Office of Legacy Management
10995 Hamilton-Cleves Hwy.
Harrison, OH 45030

Sincerely,

SUSAN
SMILEY

Digitally signed by SUSAN SMILEY
DN: c=US, o=U.S. Government,
ou=Department of Energy,
cn=SUSAN SMILEY,
0.9.2342.19200300.100.1.1=8900100
0223787.
Date: 2017.01.09 10:38:21 -0500

Susan Smiley
Mound Site Manager
DOE-LM-20.2



David Seely
Brian Nickel
Page 2

Enclosure

cc: (electronic w/enclosure)
Gwendolyn Hooten, DOE
Becky Cato, Navarro
Beverly Cook, Navarro
Chuck Friedman, Navarro
Melissa Lutz, Navarro
Joyce Massie, Navarro
rc-ohio
File: MND 0045.02(A)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF: SR-6J

December 4, 2017

Ms. Sue Smiley
Fernald Preserve Manager
U.S. Department of Energy
Office of Legacy Management
10995 Hamilton-Cleves Highway
Harrison, Ohio 45030

Subject: A Summary of the Per or Polyfluorinated Alkyl Substances Records Search for Indications of Use at the Mound, Ohio, Site, December 2016

Dear Ms. Smiley:

U.S. Department of Energy (DOE)'s Mound Site Five-Year Review (FYR) September 2016 Report identified the need to evaluate the potential for Per- or Polyfluorinated Alkyl Substances (PFAS) may have been used and potentially released into the environment. The FYR identified a milestone date of January 30, 2017 to present DOE's comprehensive research into whether PFAS may have been utilized at the Mound Site.

DOE presented its findings to the Core Team on December 15, 2016 ahead of the milestone identified within the FYR. These findings are documented within a report entitled "A Summary of the Per- or Polyfluorinated Alkyl Substances Records Search for Indications of Use at the Mound, Ohio, Site" dated December 2016.

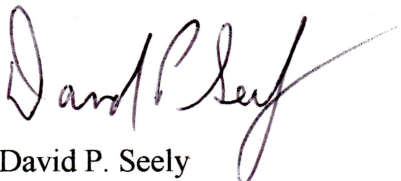
U.S. Environmental Protection Agency (EPA) has completed the review of the subject document. EPA finds the document provides a comprehensive review of potential use of PFAS at the Mound Site and has no comments. Based upon this information provided within the document, EPA concurs with DOE's conclusion that PFASs were not use at the Mound Site except for very small quantities used as mass spectroscopy standards which were completely consumed.

Additionally, EPA is satisfied that DOE has satisfactorily resolved the issue identified in the FYR and the protectiveness of the remedies implemented at the Site is not threatened by the lack of environmental sampling data. If new information arises which identifies additional PFAS use

at the Mound Site, EPA may revisit whether the protectiveness of the remedies may be threatened.

If there are any questions, please contact me at (312) 886-7058.

Sincerely,

A handwritten signature in black ink, appearing to read "David P. Seely". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

David P. Seely
Remedial Project Manager
Superfund Division
U.S. Environmental Protection Agency

cc: Brian Nickel, OEPA



John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

April 14, 2017

Ms. Sue Smiley
Site Manager, Fernald Preserve
U.S. DOE, Office of Legacy
Management
10995 Hamilton-Cleves Highway
Harrison, Ohio 45030

RE: DOE Mound Facility, Miamisburg
Remediation Response
Project Records
Remedial Response
Montgomery County
557000864003

Subject: Ohio EPA's Review of "A Summary of the Per-or Polyfluorinated Alkyl Substances Records Search for Indications of Use at the Mound, Ohio, Site (December 2016)"

Dear Ms. Smiley:

Ohio EPA has completed our review of "*A Summary of the Per-or Polyfluorinated Alkyl Substances Records Search for Indications of Use at the Mound, Ohio, Site (dated December 2016)*". Ohio EPA's has no comments or concerns with this document.

Please feel free to contact Anthony Campbell at (937) 285-6069 or me at (937) 285-6468, if you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian Nickel", is written over a light blue horizontal line.

Brian Nickel
Supervisor
Division of Environmental Response and Revitalization

ec: David Seely, U.S. EPA
Anthony Campbell, Site Coordinator, DERR-SWDO
Melissa Lutz, Navarro, Mound Site Lead

BN/bp

**A Summary of the Per-
or Polyfluorinated Alkyl
Substances Records Search for
Indications of Use at the
Mound, Ohio, Site**

December 2016



**U.S. DEPARTMENT OF
ENERGY**

Legacy
Management

This page intentionally left blank

Contents

Abbreviations.....	ii
1.0 Introduction.....	1
2.0 Background of PFOS and PFOA as Emerging Contaminants.....	1
3.0 Chemical Research Methodology for Mound Site Records.....	2
4.0 Results of Search.....	7
4.1 Fire Suppression Systems and Fire Extinguishers.....	7
4.2 Fire Department and Fire Fighter Training Facility.....	8
4.3 High-Interest Buildings.....	8
4.4 Burn Area.....	9
4.5 Chemical Incineration at the Landfill.....	9
4.6 Waste Disposal.....	9
4.7 Final Reviews.....	9
5.0 Conclusion.....	10

Figure

Figure 1. Mound Buildings and Areas of Interest for PFAS Summary Report.....	3
--	---

Tables

Table 1. List of High-Interest Buildings and Areas.....	5
Table 2. List of Unique Calibration Standards for Mass Spectroscopy.....	8

Attachments

Attachment A-1	List of References Consulted during Research
Attachment A-2	List of Janitorial Chemicals
Attachment A-3	List of Plant Operations Chemicals in Power House, Water Treatment, and Sanitary Treatment Systems
Attachment A-4	List of Chemicals Used or Stored in Building 98

Abbreviations

AFFFs	aqueous film-forming foams
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
PFAS	per- or polyfluorinated alkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PRS	potential release site
WR	weapon reserve

1.0 Introduction

The U.S. Environmental Protection Agency (EPA) has identified per- or polyfluorinated alkyl substances (PFASs) as emerging contaminants to be reviewed for use, spillage, and possible exposure to the public or workers at sites where these materials were used. Perfluorooctane-sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) compounds, which are a subset of PFASs, can be used as firefighting foam. Because the Mound, Ohio, Site had a fire fighter fighting training facility, there is particular interest in these two compounds. One part of this review program at former cleanup sites is to determine if there are any health risks associated with these contaminants, which could have been spilled or released to the ground and may seep into groundwater and be ingested.

The Mound Site (EPA ID OH6890008984) in Miamisburg, Ohio, was remediated by the U.S. Department of Energy (DOE) in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The DOE Office of Legacy Management prepared this summary to document the research methodology and conclusion that PFOS and PFOA compounds were not used at the Mound site. This summary responds to Recommendation 1 in the Fourth Five-Year Review for the Mound, Ohio, Site, Miamisburg, Ohio, September 2016 (LMS/MND/S14085).

2.0 Background of PFOS and PFOA as Emerging Contaminants

In the 1930s, DuPont researchers discovered the unique properties of long hydrocarbon chains with most hydrogen carbon atoms replaced by fluorine atoms. Following this discovery, many industrial and commercial uses for this new class of materials were developed including but not limited to those of surface-active agents and in a variety of products such as firefighting foams, coating additives, cleaning products, textiles and leather products, metal plating, photographic industry items, photolithography, semiconductors, special paper and packaging, coating additives, cleaning products, pesticides, water repellents, and Teflon™. Of particular interest are the aqueous film-forming foams (AFFFs) that were introduced as fire extinguishing agents for fuel fires, especially targeted for use at airports, military bases, and fuel depots because of their high decomposition temperatures, which allowed them to smother large fires with little decomposition. The materials used as fire extinguisher/suppressants were PFOS and to a lesser extent PFOA. In 2002 the 3M Company, the primary manufacturer of PFOS and PFOA, voluntarily phased out all production of both. PFOS chemicals are no longer being manufactured in the United States. PFOA is still in use in plastics, liquid repellants, and nonstick cookware or in their manufacturing.

Although these materials were toxic, proper handling and curing were thought to control human and environmental exposure. Around 2007, the toxicity of the PFOS/PFOA was studied and then reevaluated in 2015. As a result, the toxicity was found to be greater than originally thought, and exposure levels were greatly lowered. The class of compounds came to be known as PFASs or sometimes AFFFs. EPA initiated a nationwide program in “Emerging

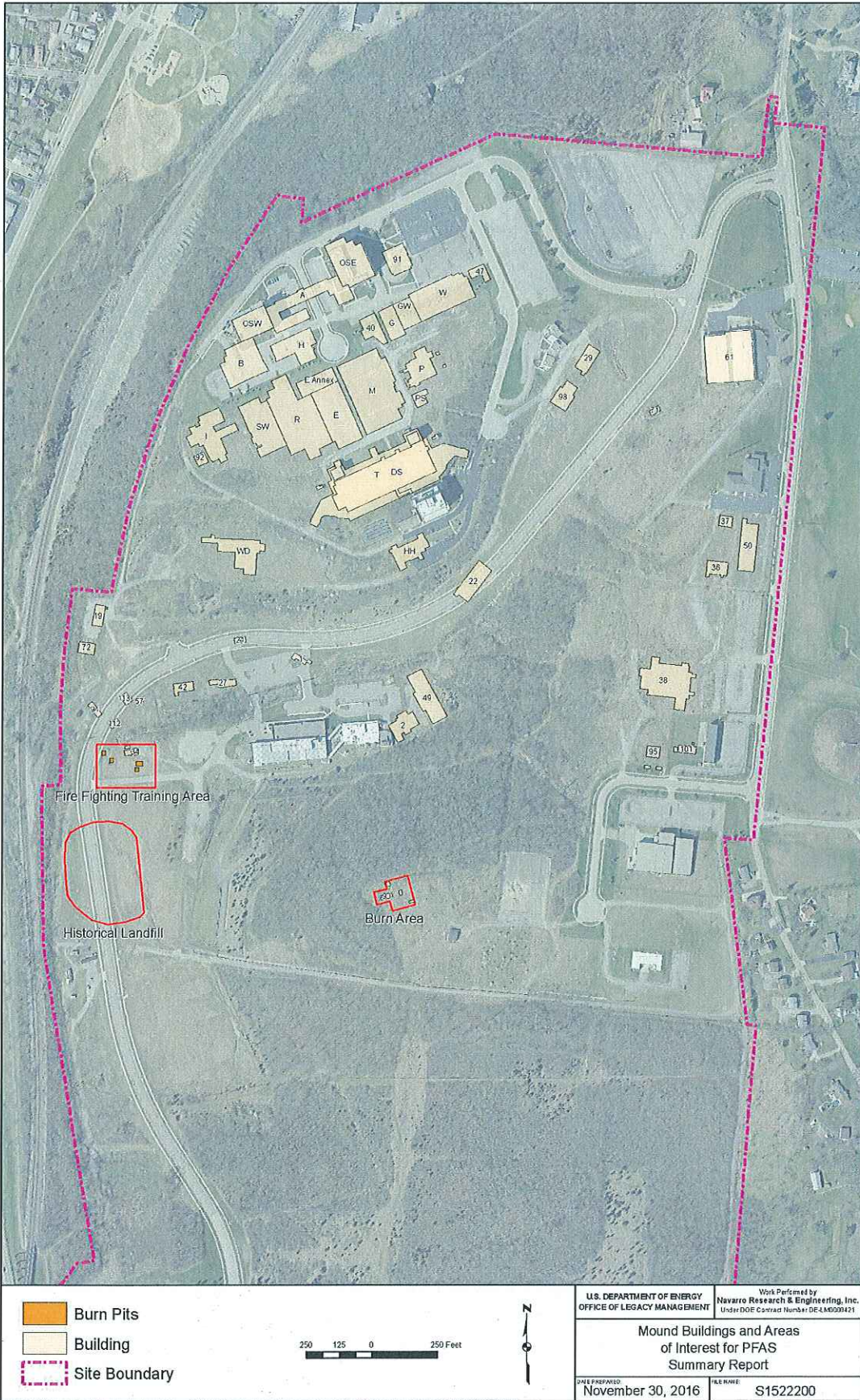
Contaminants – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA)” in 2014 to identify areas where these materials were used and then determine if spills, leaks, or normal usage could have caused conditions that would result in human exposure through the drinking water pathway.

3.0 Chemical Research Methodology for Mound Site Records

In 2016, as part of the fourth Five-Year Review process at the DOE Mound site located in Miamisburg, Ohio, DOE addressed the emerging contaminants PFOS and PFOA. It was stated in this Five-Year Review that a significant body of historical documentation and chemical inventories had been compiled and reviewed regarding the use of these emerging contaminants at the Mound site. The results of this review indicated that these chemicals were not used at the Mound site as fire suppressants, although small quantities of similar materials were used as molecular-weight calibration standards for mass spectroscopy. As part of the recommendation and follow-up section of the Five-Year Review, DOE committed to presenting the details of this research to the Mound core team, along with this written summary so that a determination regarding the protectiveness of the site conditions could be established.

When the research first began, known key documents and reports were specifically requested and reviewed, including Building Data Packages, On-Scene Coordinator Reports, Closeout Reports, Site Scoping Reports, Sitewide Work Plans, Potential Release Site Packages, Environmental Appraisal Report Of The Mound Plant March 1996 Volumes 1 through 12, and chemical inventories. The CERCLA documents such as Removal Actions, Field Investigations, Remedial Investigation/Feasibility Studies, Site Scoping Reports, and On-Scene Coordinator Reports among others were selected for review because they contain before-and-after conditions of contaminated areas and buildings and identified problems to be addressed or that were addressed during cleanup. These insights were especially valuable in the description of lines that needed to be drained in buildings prior to demolition and wastes that needed to be removed. In addition, an exhaustive search of Mound site records was conducted using key words and phrases to identify any other reports and documents.

While the records search encompassed the entire site, particular attention was given to those buildings, areas, and systems that would have been the most likely to use AFFFs. These included the building sprinkler systems, the Fire Fighting Training Area, the Central Fire Stations, the Burn Area, and the Open Landfill Area. These areas along with the site buildings are noted in Figure 1.



V:\Sites\OHMound\Project\WorkArea\water\olMound\20161128_mound_fire_training_areas_tut\GIS\1522200.mxd\water\olMound\20161128\20161128_23 AM

Figure 1. Mound Buildings and Areas of Interest for PFAS Summary Report

This page intentionally left blank

The magnitude of the complete search can be summarized as follows:

- Reviewed approximately 1200 references to identify the specific references that would be used during this effort (Attachment A-1).
- Reviewed approximately 27,000 pages to locate information that demonstrates that PFAS/AFFFs were not used at the Mound site.
- Reviewed records of chemicals handled in 132 current and former buildings, including magazines, emergency generator structures, the burn area, the fire fighter housing facility, and the fire fighter training area.
- Identified and closely reviewed 49 high-interest buildings and areas generating 330 pages of chemical inventories and chemical waste. Table 1 provides a list of these 49 buildings and areas.

Table 1. List of High-Interest Buildings and Areas

Building or Area Designation	Description
1	Research, Testing & Blending of Energetic Materials
2	Energetic Materials Destructive Testing
19	Salvage, Storage & CERCLA Soil Sample Packaging
22	Storage of Low-Level Rad Waste
27	Research & Production of Explosives
29	Plastics Formulation & Manufacturing
34	Fire Fighter Training Area
36	General Purpose Heat Source Testing Operations
37	R&D Batteries, Converting Freon Processes, & Heat Source Machine Shop
38	Referred to as Building PP Heat Source Related Activities
40	Print Shop & Graphic Services
42	Thermite Production
47	Original Central Fire Station
49	Production With Energetic Materials
50	RTG Assembly & Testing Facility
57	Sanitary Disposal Facility
61	Central Warehouse Facility
71	Chemical Storage Facility
72	Hazardous Waste Treatment, Storage, & Disposal
90	Retort in Burn Area
91	Program Support & Dosimeter Evaluation
92	Training Facility
94	CERCLA Contractor Staging for Soil and Water Samples
95	Utility Operations
98	New Central Fire Station
101	Maintenance Support with Chemicals Used for Maintenance
112	Sanitary Disposal Facility Sand Filters, Treatment, Testing Lab & Monitoring
113	Sanitary Disposal Facility Dewatering & Chemical & Equipment Storage

Table 1 (continued). List of High-Interest Buildings/Areas

Building or Area Designation	Description
24	Potable Water Softening and Chlorination Facility
A	Administration
B	Biology
Burn Area	Thermal Decomposition of Explosives
DS	Dimensional Standards
E/E Annex	Electronics, Explosives & Environmental
GW	Offices & Bonded Stores
H	Laundry Facilities
G	Garage
HH	Hydrolysis House (Stable Isotope Separation)
I	Inert Assembly
M	Machine Shop
OSE	Office Support East
OSW	Office Support West
P	Power House
PS	Paint Shop
R	Research
SW	Semi Works
T	Technical
W	Warehouse/Trade Shops
WD/WDA	Waste Disposal (Rad)

Areas that received focused attention during the records search included:

- The methods of fire extinguishment used at the site, including portable fire extinguishers; fire protection systems installed in buildings; and fire control at the fire fighter training facility, the burn area, and at the open landfill where chemicals were burned prior to 1974.
- The production and surveillance areas even though they were not considered high suspect areas for AFFF materials since none of these materials were approved for use in weapon reserve (WR) production at Mound.
- The fire department building, because all plant fire extinguishers were serviced in that facility.
- The buildings where research, development, and analysis were conducted because of the variety of experimentation and the use of highly specialized tools and instruments. Development activities that were conducted allowed scientists and engineers freedom to use a variety of both standard and unique materials.
- The fire fighter training facility, burn area, and chemical incineration at the open landfill prior to 1974 because the open landfill was removed and encapsulated, making room for a 5-million-gallon storm-water-control retention basin.

4.0 Results of Search

The search started out broadly, casting a wide net, but then focused on those areas that were the most suspect. The following is a summary of the search.

Chemical inventories were reviewed for all buildings. Many buildings at the Mound site had only janitorial supplies. Janitorial supplies for cleaning and sanitizing work areas and bathroom facilities consisted of cleaners, wax, wax strippers, window cleaners, and other similar chemicals. None of these supplies contained any perfluoro or polyfluoro chemicals. A complete list of janitorial supplies is given in Attachment A-2.

Except for the fire suppression systems and fire extinguishers (discussed below), the buildings that only used janitorial supplies were eliminated from further research, and the focus turned to other areas at the site. These included the plant support systems buildings (power house, potable water system, sanitary sewage treatment facility); the fire department and fire fighter training facility; the burn area; and buildings where research, development, production, analysis, and surveillance activities were conducted.

The plant support systems buildings (power, drinking water, and sewage treatment) were reviewed even though PFAS/AFFF materials were not approved for use in any of those systems. The list of materials approved for use in these plant support systems is in Attachment A-3. It is clear that PFAS/AFFF materials were not part of:

- Janitorial cleaning supplies
- Drinking-water treatment
- Anti-scaling agents for the boilers
- Corrosion inhibitors for the chiller system
- Disinfectants for treated sewage
- Materials approved for use in production

Eliminating the plant support systems helped to focus on the areas at the Mound site that required a more detailed, thorough review of the chemical inventories and usage. The rationale that developed for the search was to review all buildings for the following:

- Fire extinguishers
- Fire protection systems
- Other areas that would use chemicals such as photography dark rooms not in the areas where other chemicals were routinely in use

4.1 Fire Suppression Systems and Fire Extinguishers

All building fire sprinkler systems at the Mound site used water. The portable fire extinguishers utilized either Halon 1211 (bromo(chloro)difluoromethane) or 12-B (monoammonium phosphate and sodium dicarbonate) as fire suppressants. No other chemicals, materials, or other agents were used as fire suppressants or fire extinguishing agents at the Mound site.

4.2 Fire Department and Fire Fighter Training Facility

- Fire department housing facilities (Buildings 47 and 98). The list of chemicals used in this facility is shown in Attachment A-4. None of these are PFAS/AFFF. The list is accurate for the original facility, Building 47, and the newer facility of Building 98.
- Fire fighter training area (Building 34). Drawings clearly show that Building 34 had only a water sprinkler system. Investigative studies and training documents describe the fire hydrant east of the facility on the road that was used for all training activities. Furthermore, the only chemical listed in the documents reviewed for the fire fighter training facility and on waste disposal documents is diesel fuel. While not a concern for this review, it was noted during the record search that depleted uranium was burned in practice fires and lithium was reportedly disposed of in the area. There was no definitive description of the why and how those two elements were discovered in the fire fighter training area.

4.3 High-Interest Buildings

The 49 high-interest buildings were selected on the basis of activities conducted in the buildings. Research, development, production, analysis, bonded stores, receiving inspection, fire department housing facility, fire fighter training, and the burn area were chosen for a closer review. The reports, documents, studies, and websites listed in the references were used to find and extract information in this evaluation of chemicals used and not used at the Mound site.

The potential release sites (PRSs) associated with the fire fighter training are 18, 19, and 20; those associated with the burn area are 258, 259, 260, 261, 262, 263, 264, 265, and 369; and those associated with E/E Building Annex are 103 and 105. All were closely examined. Chemical inventories and waste disposal records for each building were reviewed. The summary of chemical findings for the high-interest buildings is:

- Production, bonded stores and receiving inspection—only WR approved materials and no PFAS/AFFFs were approved for or used in WR products.
- Research—thousands of chemicals (solid, liquid, and gas) were used. Only one long-chain chemical, hexadecanoic acid (also known as palmitic acid), which is a naturally occurring fatty acid found in food and used in industry, was found. It appears that this material was evaluated as a filler and mold-release agent by the plastics research group. It was never selected for WR use.
- Analytical labs—in addition to the standard reagent chemicals expected in analytical work identified during the search, several unique calibration standards were found in the E/E Annex analytical labs inventory list but not in the waste disposal documents. Table 2 provides the list of these calibration standards, the amount purchased, and the amount used.

Table 2. List of Unique Calibration Standards for Mass Spectroscopy

Calibration Standard	Amount Purchased (grams)	Amount Used (grams)
Perfluoro heptatonic acid	2	2
Perfluoro butylamine	50	50
Perfluoro kerosene H	2	2
Perfluoro kerosene L	2	2
Perfluoro-2-butyl tetrahydrofuran	2	2

The complete use of these calibration standards explains why these never showed up on E/E Annex waste disposal documents. These calibration standards were completely used up and, therefore, did not enter the waste stream.

Documents associated with PRS 103 and PRS 105, both associated with the E/E Annex demolition, were also examined for any information about chemicals found in the ground below the building.

4.4 Burn Area

- There were a number of materials burned in this area, including explosives, energetic materials, weapons components containing explosives, classified explosive components, and lab wastes consisting of explosives, cardboard explosive containers, and paper wipes used to clean the explosives labs. There were six Resource Conservation and Recovery Act-regulated units (two storage units and four treatment units) within the Burn Area.
- No water supply to the burn area or to any of the structures in it existed.
- No fire suppression system was installed in the burn area or in any of the structures. There were portable fire extinguishers located outside Building 90 (the control building).
- In the Burn Area Certification and Final Amended Closure Plan, January 1998, there is no mention of removal of a fire suppression system or the disposal of fire suppression chemicals.

4.5 Chemical Incineration at the Landfill

Although chemical incineration took place at the landfill prior to 1974, there was not a fire suppression system installed at this open-burning area. There are no reports showing that fires ever got out of control or needed to be extinguished. There were fire hydrants available in the immediate area that would have been used for fire control.

4.6 Waste Disposal

A review of waste removed from buildings and waste disposal documentation did not contain any information regarding PFAS or AFFFs.

4.7 Final Reviews

There were two last items reviewed in order to cover all possible resources. These items are discussed below.

The risk-based cleanup guideline values developed specifically for the Mound site cleanup by Lockheed Martin Energy Systems in conjunction with DOE and Mound personnel were reviewed. Mound-specific chemicals and radionuclides were identified as contaminants of concern (COCs). This was the opportunity for identifying materials that would have cleanup values assigned to make sure that no COCs were left onsite above cleanup guideline values. There were no PFAS or AFFF materials identified as COCs.

The final step taken to check an outside source for toxic materials at the Mound site was to review the U.S. Department of Labor Site Exposure Matrices. This website contains lists of toxic chemicals and materials used at almost all DOE sites. The website was last updated July 18, 2016. There is no mention of PFAS/AFFFs including specifically PFOS or PFOA being used at the Mound site.

5.0 Conclusion

This thorough review encompassed all functional types of work at the Mound site including those of office, laboratory, research and development, and production. It also focused on other support aspects including chemical inventories for storage, use, and disposal; fire station activities and fire fighter training; the burning of energetic materials and components; janitorial supplies; plant support systems; waste disposal, and CERCLA-related cleanup activities. This provided an all encompassing review of all areas regardless of type of work performed, activities conducted, or plant support systems where chemicals could have been present or were used.

As a result of this extensive review, it is concluded that no per- or polyfluorinated chemicals including PFOS or PFOA were ever used at the Mound site except for small quantities that were completely consumed as mass spectroscopy standards.

Attachment A

This page intentionally left blank

Attachment A

- A-1 List of References Consulted during Research
- A-2 List of Janitorial Chemicals
- A-3 List of Plant Operations Chemicals in Power House, Water Treatment, and Sanitary Treatment Systems
- A-4 List of Chemicals Used or Stored in Building 98

Attachment A-1
List of References Consulted during Research

1. Comprehensive Environmental Assessment and Response Program (CEARP), Phase I – Installation Assessment, Mound, April 1986, Draft
2. Installation Assessment, Mound, April 1986, Draft
3. Preliminary Review - Visual Site Inspection for RCRA Facility Assessment of Mound Plant, July 1988
4. Environmental Survey, Final Report, Mound Plant, June 1990 (US DOE, Environment, Safety, and Health, Office of Environmental Audit)
5. Limited Field Investigation Operable Unit 3, Miscellaneous Sites Health and Safety Plan, Final, February 1991
6. Operable Unit 9, Site Scoping Report Volume 6 - Photo History Report. February 1992 Final.
7. Operable Unit 9, Site Scoping Report: Volume 11 - Spills and Response Actions. March 1992 Final. Revision 0.
8. Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Work Plan. Volume 2. May 1992 Final
9. Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Work Plan. Volume 1. May 1992 Final
10. Closure Report, Building 34, Aviation Fuel Storage Tank. Final. Revision 0. August 1992
11. Operable Unit 9, Site Scoping Report: Volume 7 - Waste Management. August 1993. Final. Revision 0.
12. Operable Unit 3 Limited Field Investigation Report Mound Plant Miamisburg Closure Project May 1993 Final
13. Operable Unit 3, Miscellaneous Sites Limited Field Investigation Report, Volume 1 LFI Report Text (Sections 1-6), July 1993 Final, Revision 0.
14. Action Memorandum/Removal Site Evaluation. Operable Unit 5 Fire Fighting Training Area (FFTA) Site. January 1994 Final.
15. Fire Fighting Training Area Removal Action, Operable Unit 5, OU-5, Work Plan, Volume 1 - Text and Appendices A,B,C,D, Final, Revision 0, June 1994

16. Fire Fighting Training Area (FFTA) Removal Action Operable Unit 5 Work Plan. Volume 3 - Appendices F and G. Final. Revision 0, June 1994
17. Fire Fighting Training Area (FFTA) Removal Action Operable Unit 5 Work Plan. Volume 2 - Appendix E. Final. Revision 0, June 1994
18. Comments/Responses: Fire Fighting Training Area (FFTA) Removal Action Memorandum. July 1994
19. Operable Unit 9 Site Scoping Report: Volume 12 - Site Summary Report. December 1994 Final.
20. Risk-Based Guideline Values. Final. Revision 0; Exposure Scenario Equations and Exposure Variable Documentation. Draft. Revision 3; Draft. Revision 2; Guideline Value Tables. Draft. Revision 3; Oak Ridge National Laboratory Tritium Inhalation Laboratory. December 1995
21. Fire Fighting Training Area Response Action On-Scene Coordinator (OSC) Report. Release Block J, Potential Release Site, PRS 18, Final, Revision 0, February 1996
22. Volume 1 Environmental Appraisal Report of the Mound Plant March 1996
23. Volume 2 Environmental Appraisal Report of the Mound Plant March 1996
24. Volume 3 Environmental Appraisal Report of the Mound Plant March 1996
25. Volume 4 Environmental Appraisal Report of the Mound Plant March 1996
26. Volume 5 Environmental Appraisal Report of the Mound Plant March 1996
27. Volume 6 Environmental Appraisal Report of the Mound Plant March 1996
28. Volume 7 Environmental Appraisal Report of the Mound Plant March 1996
29. Volume 8 Environmental Appraisal Report of the Mound Plant March 1996
30. Volume 9 Environmental Appraisal Report of the Mound Plant March 1996
31. Volume 10 Environmental Appraisal Report of the Mound Plant March 1996
32. Volume 11 Environmental Appraisal Report of the Mound Plant March 1996
33. Volume 12 Environmental Appraisal Report of the Mound Plant March 1996
34. Mound Plant Potential Release Site Package PRS 19, Final, Revision 1, November 1996
35. Mound Plant Potential Release Site Package PRS 18, Final, Revision 1, November 1996
36. Mound Plant, Potential Release Site Package, PRS 17, Building 34 Oil Burn Structure, Release Block J, Final, Revision 1, February 1997

37. Mound Plant Potential Release Site Package PRS 20 Aviation Fuel Storage Tank Release Block J, Final, Revision 1, February 1997
38. Mound Plant Potential Release Site Package. Release Block F, PRS 307, Soil Contamination, Building 29, Plastics Formulation Facility. Public Release. Revision 0, April 1997
39. Mound Plant, Building Data Package. Magazines 5, 6, 7, 10, 11, 20, 53, 54. Located Within Release Block C, E, R, Q. Final, November 1997
40. Closure Certification of the Burn Area at the Mound Plant U.S. Department of Energy Mound Plant- Miamisburg, Ohio EPA I.D. No. OH68900089B4 Ohio 1.0. No. 05-57-0677, Final, January 1998
41. Work Plan For Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach, February 1999
42. Action Memorandum Engineering Evaluation/Cost Analysis, E-Building, Electronics Laboratory, Removal Action, April 2000, Final, Revision 0, April 2000
43. Action Memorandum Engineering Evaluation/Cost Analysis (EECA), Buildings R, SW, 58 & 68 Slab Removal Action, Public Review Draft, November 2002 Revision 0
44. Mound Plant Action Memorandum Engineering Evaluation/Cost Analysis (EE/CA), B-Building Removal Action, Final, March 2002.
45. Mound Plant, Building Data Package (BDP), Building 42, Explosives Component Fabrication Facility, Public Review Draft, May 2002.
46. Mound Plant, Building Data Package (BDP), Building 29, Plastics Formulation Facility, Final, June 2002. Addendum included with this report.
47. DOE (U.S. Department of Energy), 1998. Closure Certification of the Burn Area at the Mound Plant U.S. Department of Energy Mound Plant- Miamisburg, Ohio EPA I.D. No. OH68900089B4 Ohio 1.0. No. 05-57-0677, January.
48. DOE (U.S. Department of Energy), 2015. Operations and Maintenance Plan for the U.S. Department of Energy, Mound, Ohio, Site, LMS/MND/S08406, January.
49. DOE (U.S. Department of Energy), 1999. Work Plan for Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach, Final, Revision 0, 1505-9902220003, February.
50. DOE (U.S. Department of Energy), 2003. Phase I Proposed Plan Public Review Draft Miamisburg Closure Project, March.
51. DOE (U.S. Department of Energy), 2003. Phase I Residual Risk Evaluation Miamisburg Closure Project, Final, March.
52. DOE (U.S. Department of Energy), 2003. Phase I Record of Decision, Miamisburg Closure Project, Final, July.

53. DOE (U.S. Department of Energy), 2003. Phase I Environmental Summary CERCLA 120(h) Summary Notice of Hazardous substances Miamisburg Closure Project, Final, December.
54. Mound Plant, Building Data Package (BDP), Building SST, Salt Storage Shed, Final, August 2002.
55. Mound Plant, Building Data Package, Building 42, Explosives Component Fabrication Facility, Final, August 2002.
56. Mound Plant Closeout Report, Building 29, Final, August 2002.
57. Mound Plant, Building Data Package, (BDP) Building 98, Central Fire Station, Final, September 2002.
58. On-Scene Coordinator (OSC) Report, E-Building, Electronics Laboratory, Removal Action, Final, Revision 0, October 2002.
59. Mound Plant, Building 42, Explosives Component Fabrication Facility, Closeout Report, Final, October 2002.
60. Mound Plant Closeout Report, Building 98, Central Fire Station, Final, October 2002.
61. Miamisburg Closure Project, Building Data Package (BDP), T-Building, Technical Building, Public Review Draft, February 2003.
62. Action Memorandum Engineering Evaluation/Cost Analysis (EE/CA), T-Building Removal Action, February 2003.
63. Phase I Proposed Plan Public Review Draft Miamisburg Closure Project March 2003.
64. Phase I Residual Risk evaluation Miamisburg Closure Project Final March 2003.
65. Miamisburg Closure Project, Building Data Package, Building 61, Logistical Support Warehouse, Final, March 2003.
66. Mound Plant, Building Data Package, (BDP), Building 94, Materials Compatibility, Final, May 2003.
67. Miamisburg Closure Project, T-Building, Technical Building, Building Data Package (BDP), Final, June 2003.
68. Miamisburg Closure Project, Building Data Package, Building 49, Explosive Fabrication Facility, Final, June 2003.
69. Miamisburg Closure Project, Building 49, Explosive Fabrication Facility, Closeout Report, Final, June 2003.
70. Phase I Record of Decision Miamisburg Closure Project, Final, July 2003.

71. Action Memorandum Engineering Evaluation Cost Analysis (EE/CA), T-Building Removal Action, Final, June 2003.
72. Miamisburg Closure Project, Building 47, Building Data Package, Old Central Fire Station (Demolition), Final, July 2003.
73. Miamisburg Closure Project, Building Data Package (BDP), Building 28 (Transition), Ceramic Production/Plastics Development, Final, September 2003.
74. Phase I Environmental Summary CERCLA 120(h) Summary Notice of Hazardous substances Miamisburg Closure Project Final December 2003.
75. Miamisburg Closure Project, Building Data Package (BDP), Building 48 (Demolition), Process Mechanization Facility/Explosive Surveillance, Final, March 2004.
76. Miamisburg Closure Project, Building 47, Old Central Fire Station (Demolition) Closeout Report, Final, Revision 1, April 2005.
77. PRS 17 Removal Action OSC Report March 2006 Final U.S. Department of Energy Miamisburg Closure Project.
78. Building 34 Footprint Removal Action, On-Scene Coordinator (OSC) Report. This Report Closes Building 34 Footprint. Final, May 2006.
79. RSWB Removal Action On-Scene Coordinator (OSC) Report. Closes PRS 131 through PRS 146, PRS 209, PRS 234, PRS 249-254, 327-329, 425, 437-438 and 440. Closes slab/soil for Buildings R, SW, 58, 62, 68, B-Stack, T-Stack and B-Building structure/slab/soil July 2006 Final U.S. Department of Energy Miamisburg Closure Project.
80. Emerging Contaminants – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) March 2014 U.S. EPA.
81. Perfluorinated Compounds (PFCs) and Human Health Concerns April 2009 Global Health & Science Initiative.
82. Department of Labor web site for DOE facilities at <http://sem.dol.gov/expanded/index.cfm>
83. Department of Ecology State of Washington <http://www.ecy.wa.gov>
84. Agency for Toxic Substances & Disease Registry Toxic substances Portal – Perfluoroalkyls December 2015 <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=1117&tid=237>
85. ENVIRONMENTAL PROTECTION AGENCY 40 CFR Part 721 Perfluoroalkyl Sulfonates; Proposed Significant New Use Rule March 10, 2006 www.gpo.gov/fdsys/pkg/FR-2006-03-10/pdf/E6-3444.pdf
86. Integrated Environmental Assessment and Management Perfluoroalkyl and polyfluoroalkyl substances in the environment: Terminology, classification, and origins September 2001

<http://onlinelibrary.wiley.com/doi/10.1002/ieam.258/abstract;jsessionid=0B217E2E8608B5775C970B5B40615F09.f02t01>

87. United States Department of Labor Site Exposure Matrices (SEM)
<http://sem.dol.gov/expanded/index.cfm>

Attachment A-2
List of Janitorial Chemicals

Blue Max Spray Buff
Clean-N-Dry
CLR Window
Conquest
DD/85 Spray
DMQ
Duo-Powder
Floor Finish Above
Fountain Head
Gloss-Extendera
Grease-Be-Gone
Head Start
Insect Spray/Cherry
Insecticide/WAS
Kindest Care
Lava Hand Soap
Lil Brother SAM
NABC
Neut. Floor Corp.
Odor Bane
On-Base-Sealer
One-Step/Sure Bet
Polish/Lemon
Pummel Hand Soap
Rinse Free/Strip
SBS-61 Lotion Soap
Scrub-Ender
Seal, Con-Seal
Sealer/Ironstone
Shineline Base
Snapout
Spin- out
Spot, Pile Driver
Spotter, Pull Out
Stainless Cleaner
Statcide, GP
Stripper, Zip
Surface Gleem
Treatment/Dust
Triple SSS
Vesta Powder
Window Shine

Attachment A-3
List of Plant Operations Chemicals in Power House, Water Treatment, and Sanitary Treatment Systems

Power House

Industrial Microbicide for use in Industrial Process

Water Systems Industrial Microbicide for use in Industrial Process

Water Systems, Recirculating Closed Loop Water Cooling Systems

- 5-Chloro-2-methyl-4-isothiazolin-3-one
- 2-methyl-4-isothiazolin-3-one
- Glutaraldehyde

Corrosion Inhibitor

- Organophosphate
- Sodium molybdate

Drinking Water Treatment

Disinfectant

- Sodium hypochlorite

Softener

- Zeolite softening beds

Rust inhibitor

- Sodium silicate

Sanitary Sewage Treatment

Disinfectant

- Sodium hypochlorite
- Sodium bisulfite

Lab Testing

- Total-chlorine reagent
- Free-chlorine reagent
- Bromthymol blue indicator
- Cresol red indicator
- Molybdenum indicator
- Molybdenum buffer reagent
- Buffer pH 7.0
- Buffer pH 10
- Ferrozine iron

Zeolite softening beds

Chemicals and Injection equipment for chlorination

- Sodium hypochlorite
- Sodium bisulfite

Attachment A-4
List of Chemicals Used or Stored in Building 98

All Purpose Cleaner
Cold Clean 500
Ethylene Glycol
Fog Pruf
Kindest Kare
Light Water Foam
Low Suds Laundry Soap
Met-L-Ex
Nabc Cleaner
Oxygen
Ph Nine
Pro-Shine
Propylene Glycol
Safe Step
Sodium Bicarbonate
Turtle Wax
Unleaded Gasoline
WD-40