

# **Endpoint Solutions**

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Mr. John Feeney  
Wisconsin Department of Natural Resources  
Plymouth Service Center  
1155 Pilgrim Parkway  
Plymouth, WI 53073

April 6, 2020

**Subject: Site Investigation Work Plan – PFAS Contamination**

Arkema Coating Resins/Cook Composites & Polymers/Freeman Chemical  
340 Railroad Street, Saukville, Wisconsin  
BRRTS #: 02-46-000767, FID #: 246004330

Dear John:

On behalf of Retia USA LLC (Retia), Endpoint Solutions Corp. (Endpoint) has prepared this Site Investigation Work Plan (SIWP) to evaluate the Arkema Coating Resins/Cook Composites & Polymers/Freeman Chemical facility at 340 Railroad Street in the Village of Saukville, Ozaukee County, Wisconsin (the “Site” or “subject property”) for the presence of contamination associated with per- and polyfluoroalkyl substances (PFAS). The location of the Site is depicted on **Figure 1**. This SIWP is being prepared in response to the request issued by the Wisconsin Department of Natural Resources (WDNR) in a Notice of Non-Compliance letter dated March 5, 2020.

## **BACKGROUND INFORMATION**

Based on our research, we do not believe PFAS constituents were ever utilized at the Site in the production of the products; however, it has come to our attention that alcohol resistant aqueous film forming foam (AR-AFFF) was stored in two (2) aboveground storage tanks at the Site, as well as in a mobile extinguishing cart. The two (2) ASTs were located in the engineering office and the hazardous waste incinerator, and the mobile extinguishing cart was stored in the fire shed. These locations are depicted on **Figure 2**. The AR-AFFF used at the Site consisted of National Foam Universal Gold 3%. Product information and its Safety Data Sheet (SDS) are attached in **Appendix A**.

The AST of AR-AFFF kept in the engineering office (Building 39) was utilized for the sprinkler system in the warehouse (Building 32). The AST of AR-AFFF kept in the liquid incinerator (Building 68) was utilized for the sprinkler system in the liquid incinerator (Building 68) and the incinerator tank storage (Building 69). The mobile extinguishing cart was stored in the fire shed (Building 49). Additionally, several five (5) gallon buckets of AR-AFFF were stored in the fire shed (Building 49) to be utilized with a suction nozzle in the event of a fire to allow additional fire fighting measures beyond the sprinkler systems and the mobile extinguisher cart.

As part of our historical review, an interview with Mr. Dan Bolz, former Maintenance Supervisor with Cook Composites and Polymers and Arkema was conducted. Mr. Bolz was employed in various positions at the Site between 1965 and 2015 when operations at the Site ceased. Based on

our research, PFAS were first used in AFFF in the early 1960s with the earliest efforts to patent AFFF occurring in 1963. According to Mr. Bolz, during his tenure at the Site, there were no fires or incidents which required a need for the AR-AFFF to be released in an emergency situation. With the exception of a single event when a representative of the Site's insurance carrier requested a demonstration of the delivery nozzle to evaluate whether the volume of foam being created would be sufficient to effectively manage a fire, Mr. Bolz had no knowledge of AR-AFFF in a liquid or foam state being released at the Site. According to Mr. Bolz, the nozzle test was performed to the southeast of the engineering office (Building 39) and the Water Tank (Building 38) to an unpaved surface. The general area of the release of AR-AFFF to the ground surface during the nozzle test is also depicted on **Figure 2**.

Therefore, based on the information discussed above, the PFAS investigation will focus on the liquids incinerator (Buildings 68 and 69) area, the warehouse and engineering office (Buildings 32 and 39), the fire shed (Building 49) and the unpaved area to the southeast of Buildings 32 and 38.

## PROPOSED SCOPE OF WORK

### SOIL SAMPLING

Based on the available information, in order to assess for the presence of PFAS at the Site, we propose to collect shallow soil samples in the vicinity of the AR-AFFF storage tanks in the liquids incinerator (Buildings 68 and 69) and the engineering office (Building 39) and in the vicinity of the Fire Shed (Building 49). In addition, we propose to collect up to five (5) shallow soil samples in the unpaved area where the AR-AFFF foam was discharged during the nozzle test. The approximate locations of the proposed soil samples are depicted on **Figure 3**.

We propose to collect a single five-foot (5') Macrocore sample from the ground surface to five (5) feet below the ground surface (ft bgs). One (1) sample from each boring location will be submitted to TestAmerica/Eurofins for PFAS analysis using the modified EPA Method 537. The analysis will report the full Wisconsin 36 compound list of constituents. The sample segment for laboratory analysis will be chosen from the native soils encountered nearest to the ground surface.

### GROUNDWATER SAMPLING

To-date, the only known release of AR-AFFF to the ground surface occurred during a nozzle test with AR-AFFF released to the unpaved area to the southeast of Buildings 38 and 39. As the Site is the location of an ongoing environmental response, monitoring wells screened in the surficial glacial drift aquifer and the shallow dolomite aquifer are located throughout the Site. Two (2) monitoring wells screened in the glacial drift (W-04A and W-49) and two (2) monitoring wells screened in the shallow dolomite (W-23 and W-50) are located immediately south and immediately east of the unpaved area to the southeast of Buildings 38 and 39. Therefore, we propose to collect groundwater samples from each of these monitoring wells for PFAS analysis using the modified EPA Method 537. The analysis will report the full Wisconsin 36 compound list of constituents.

Based on the lack of confidence of groundwater results associated with samples collected from open boreholes or temporary monitoring wells, we propose to limit the groundwater sampling to

these permanent monitoring wells. With the exception of W-23, the four (4) monitoring wells proposed to be sampled as part of this investigation have historically been free of volatile organic compounds (VOCs). Shallow dolomite monitoring well W-23, last sampled in October 2019, contained estimated concentrations of benzene (0.28 micrograms per liter ( $\mu\text{g/L}$ ), cis-1,2-dichloroethene (0.78  $\mu\text{g/L}$ ) and vinyl chloride (0.24  $\mu\text{g/L}$ ). The results were all reported as estimates between the limits of detection (LODs) and the limits of quantitation (LOQs). Furthermore, historical groundwater elevation data collected from the onsite wells indicates a general west to east groundwater flow direction in both aquifers in the southeast corner of the Site, which places monitoring wells W-49 and W-50 in a downgradient direction from the unpaved area to the southeast of Buildings 38 and 39.

All sampling will follow the *General PFAS Sampling Guidance* (revision 10/16/2018) prepared by the Michigan Department of Environmental Quality (MDEQ) and Endpoint Standard Operating Procedure (SOP) 013 – *Soil and Groundwater Sampling for PFAS Compounds*. SOP 013 is attached in **Appendix B** for your reference.

## **QUALITY ASSURANCE/QUALITY CONTROL SAMPLING**

Due to the high potential for cross contamination and the relatively low regulatory standards for PFAS constituents, proper sampler preparation, selection of equipment and decontamination between sample locations is imperative for data quality. In order to effectively evaluate the potential for positive bias in the results due to external factors, we propose the following quality assurance/quality control (QA/QC) samples be collected and submitted for analysis during the Site investigation activities.

### **EQUIPMENT RINSE BLANKS**

One (1) equipment rinsate blank will be collected per five (5) samples collected using reusable equipment (ie. – downhole drilling equipment). The equipment rinsate blank will be collected by pouring laboratory-supplied PFAS-free water over or through decontaminated sampling equipment.

### **FIELD BLANKS**

One (1) field blank sample per sample cooler will be prepared. The field blank samples will be prepared by placing an aliquot of laboratory-supplied PFAS-free water in a laboratory-supplied container.

### **TRIP BLANKS**

One (1) trip blank sample per sample cooler will be analyzed. The trip blank sample will consist of a bottle of laboratory-supplied PFAS-free water transported to the Site with the sample containers and back to the laboratory without being exposed to field conditions.

## **REPORTING**

Following receipt of the final analytical results, a brief report will be prepared summarizing the results of the sampling, the results of the QA/QC samples, a comparison of the results to currently

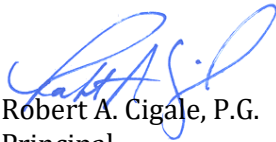
accepted regulatory limits or guidance values and recommendations for further assessment, if necessary.

**CLOSING**

We trust the proposed Site investigation activities described in this Work Plan sufficiently address the request made by the WDNR in the March 5, 2020 Notice of Non-Compliance. Following review of this Work Plan, we request the WDNR issue an opinion whether Retia USA LLC should proceed with the scope of work described herein. Should you have any questions or comments regarding the contents of this Work Plan, please feel free to contact me directly at 414-858-1202 or via email at bob@endpointcorporation.com.

Sincerely,

**Endpoint Solutions**



Robert A. Cigale, P.G.  
Principal

cc: Michelle Norman – WDNR-SED  
Doug Loutzenhiser – Retia USA LLC

**ATTACHMENTS**

Figures  
Appendix A  
Appendix B

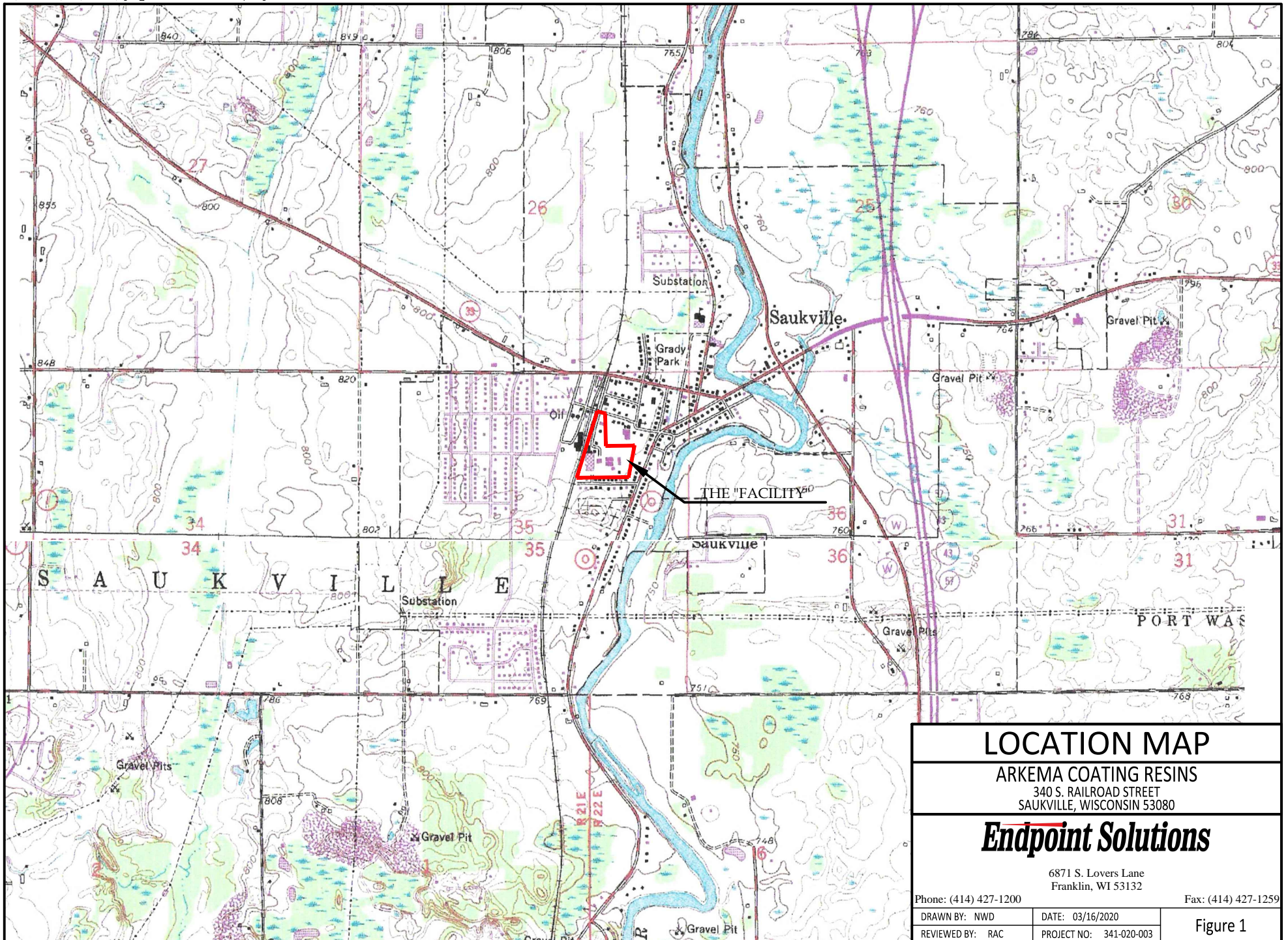
**FIGURES**

FIGURE 1 – LOCATION MAP

FIGURE 2 – AR-AFFF STORAGE LOCATIONS

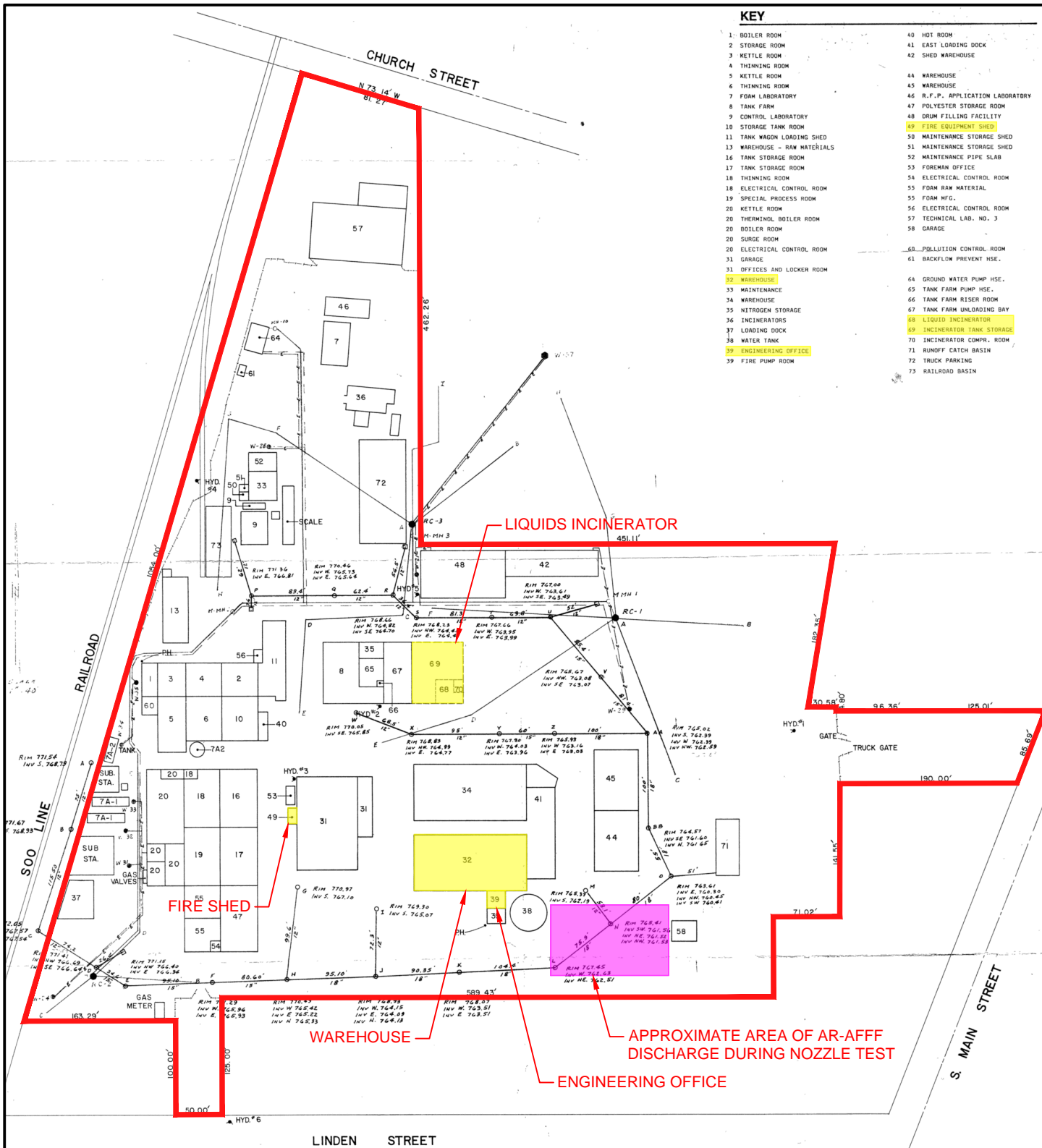
FIGURE 3 –SOIL SAMPLING LOCATIONS

FIGURE 4 – GROUNDWATER SAMPLING LOCATIONS

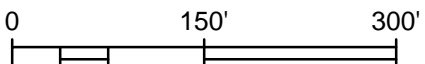


**KEY**

- 1 BOILER ROOM
- 2 STORAGE ROOM
- 3 KETTLE ROOM
- 4 THINNING ROOM
- 5 KETTLE ROOM
- 6 THINNING ROOM
- 7 FOAM LABORATORY
- 8 TANK FARM
- 9 CONTROL LABORATORY
- 10 STORAGE TANK ROOM
- 11 TANK WAGON LOADING SHED
- 13 WAREHOUSE - RAW MATERIALS
- 14 TANK STORAGE ROOM
- 17 TANK STORAGE ROOM
- 18 THINNING ROOM
- 18 ELECTRICAL CONTROL ROOM
- 19 SPECIAL PROCESS ROOM
- 20 KETTLE ROOM
- 20 THERMINOL BOILER ROOM
- 20 BOILER ROOM
- 20 SURGE ROOM
- 20 ELECTRICAL CONTROL ROOM
- 31 GARAGE
- 31 OFFICES AND LOCKER ROOM
- 32 WAREHOUSE
- 33 MAINTENANCE
- 34 WAREHOUSE
- 35 NITROGEN STORAGE
- 36 INCINERATORS
- 37 LOADING DOCK
- 38 WATER TANK
- 39 ENGINEERING OFFICE
- 39 FIRE PUMP ROOM
- 40 HOT ROOM
- 41 EAST LOADING DOCK
- 42 SHED WAREHOUSE
- 44 WAREHOUSE
- 45 WAREHOUSE
- 46 R.F.P., APPLICATION LABORATORY
- 47 POLYESTER STORAGE ROOM
- 48 DRUM FILLING FACILITY
- 49 FIRE EQUIPMENT SHED
- 50 MAINTENANCE STORAGE SHED
- 51 MAINTENANCE STORAGE SHED
- 52 MAINTENANCE PIPE SLAB
- 53 FOREMAN OFFICE
- 54 ELECTRICAL CONTROL ROOM
- 55 FOAM RAW MATERIAL
- 55 FOAM MFG.
- 56 ELECTRICAL CONTROL ROOM
- 57 TECHNICAL LAB. NO. 3
- 58 GARAGE
- 60 POLLUTION CONTROL ROOM
- 61 BACKFLOW PREVENT. HSE.
- 64 GROUND WATER PUMP HSE.
- 65 TANK FARM PUMP HSE.
- 66 TANK FARM RISER ROOM
- 67 TANK FARM UNLOADING BAY
- 68 LIQUID INCINERATOR
- 69 INCINERATOR TANK STORAGE
- 70 INCINERATOR COMPRA. ROOM
- 71 RUNOFF CATCH BASIN
- 72 TRUCK PARKING
- 73 RAILROAD BASIN



— SUBJECT PROPERTY  
 AR-AFF STORAGE LOCATION



## AR-AFF STORAGE LOCATIONS

**ARKEMA COATING RESINS**  
 340 S. RAILROAD STREET  
 SAUKVILLE, WISCONSIN 53080

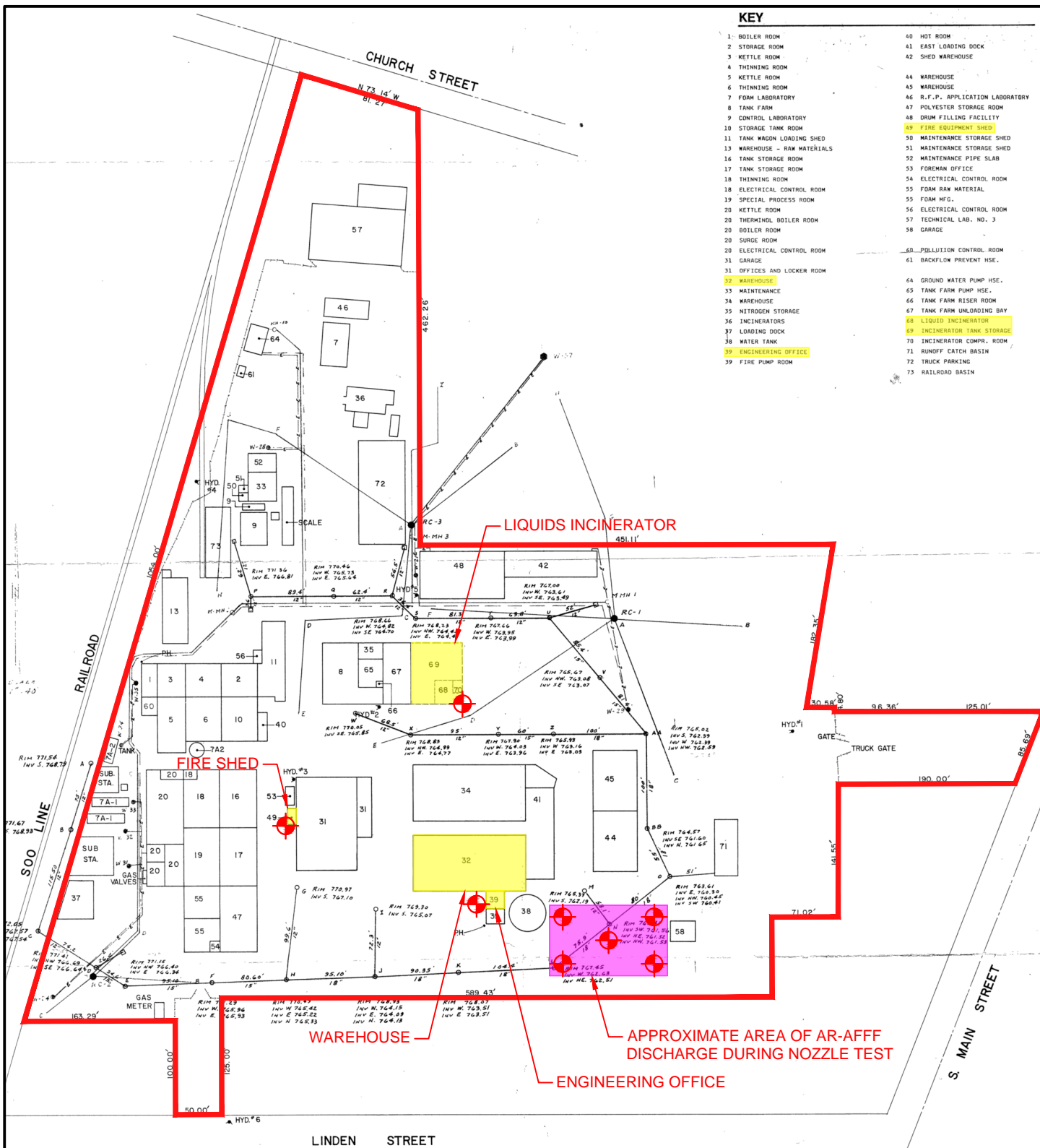
*Endpoint Solutions*

6871 S. Lovers Lane  
 Franklin, WI 53132

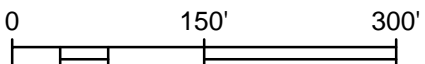
Phone: (414) 427-1200		Fax: (414) 427-1259
DRAWN BY: NWD	DATE: 03/18/2020	Figure 2
REVIEWED BY: RAC	PROJECT NO: 341-020-003	

**KEY**

- 1 BOILER ROOM
- 2 STORAGE ROOM
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- 72 TRUCK PARKING
- 73 RAILROAD BASIN



— SUBJECT PROPERTY  
 AR-AFFF STORAGE LOCATION  
⊗ PROPOSED SOIL SAMPLE LOCATION



## SOIL SAMPLE LOCATIONS

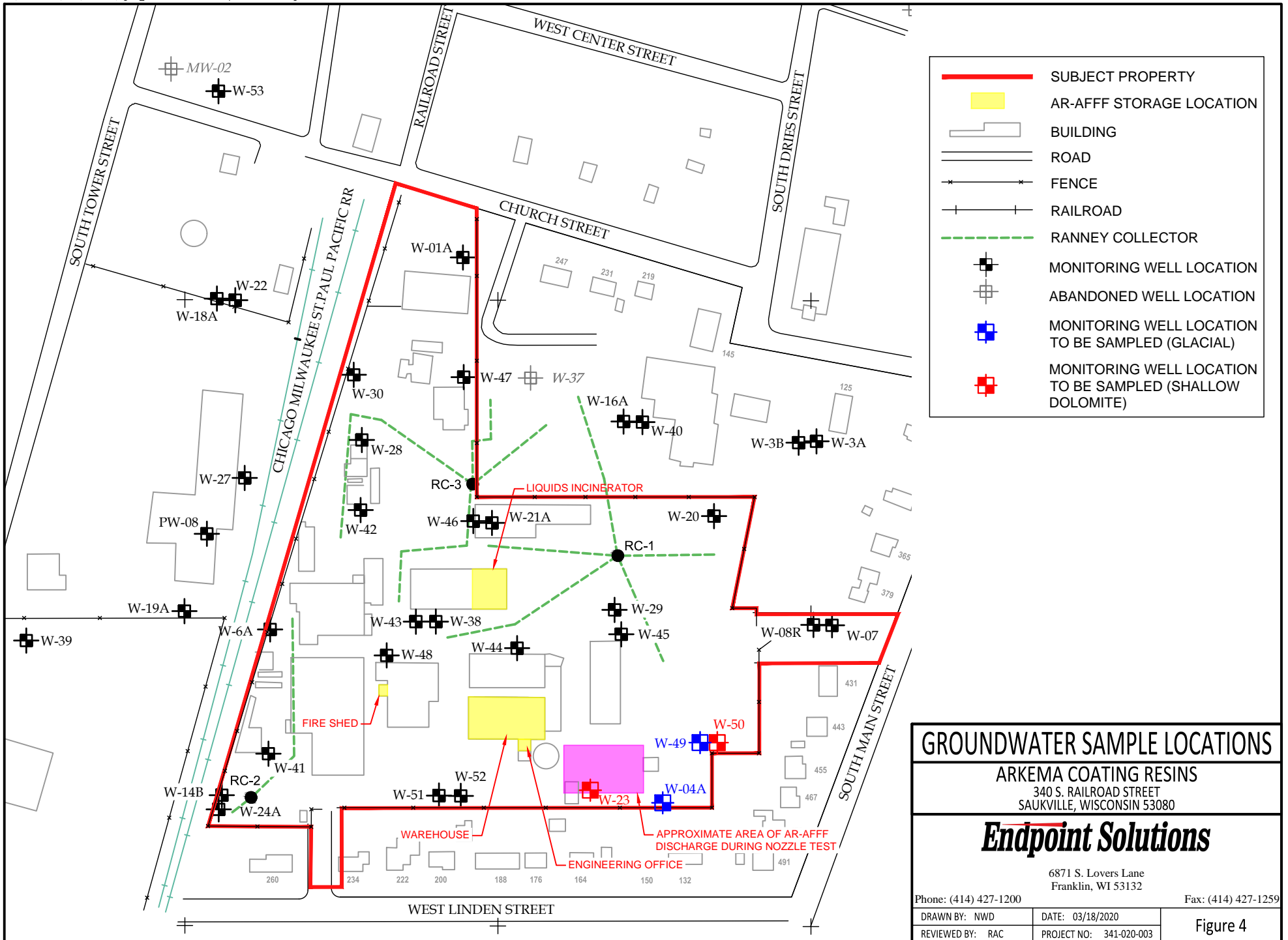
**ARKEMA COATING RESINS**  
 340 S. RAILROAD STREET  
 SAUKVILLE, WISCONSIN 53080

**Endpoint Solutions**

6871 S. Lovers Lane  
 Franklin, WI 53132

Phone: (414) 427-1200	DATE: 03/18/2020	Fax: (414) 427-1259
DRAWN BY: NWD	PROJECT NO: 341-020-003	Figure 3
REVIEWED BY: RAC		





**APPENDIX A**

PRODUCT INFORMATION

SAFETY DATA SHEET

# UNIVERSAL GOLD™ 3%

## ALCOHOL RESISTANT AQUEOUS FILM FORMING FOAM (AFFF)

Liquid Concentrate for use on hydrocarbons & polar solvents at 3%  
Recommended storage temperatures: Minimum 35°F (2°C) Maximum 120°F (49°C)

### ⚠ Caution

- Do not touch internally.
- Protect skin and eyes when using.
- Generic chemical safety data provided for substances considered to be a proprietary trade secret. Tests by an independent laboratory for acute oral toxicity and primary skin irritation were negative. Test data indicate that Universal GOLD is irritating eye irritant. Symptoms may include stinging, severe redness, swelling of the eye and possible burns to the cornea if left untreated. Consult NF's Material Safety Data Sheet for further information.

### Safety Instructions

- In case of accidental contact with eyes, flush with water and immediately consult physician if irritation persists.
- If accidentally spilled, this product may present a slip hazard. Clean up spills promptly by flushing with water.
- Facilitate an animal feed which have come in contact with this product should be discarded.

### Instructions

- Use as a fire fighting foam only. Not for any other purpose.
- Store within temperature range shown above. Refer to National Foam Product Data Sheets and Engineering Manual for storage information.
- To use, dilute or proportion with water at 3% (3 parts foam/97 parts water).
- For recommended application rates and equipment consult National Foam Product Data Sheets and Engineering Manual.
- Inspect contents at least every 12 months. Samples may be sent to NF's Technical Service Department. Consult Representative for details.
- When not in use, keep container tightly closed at all times and away from heat, flame, or cold temperatures.
- Do not mix with any other type or brand of foam liquid or otherwise contaminate. To do so may reduce or negate effectiveness and will void warranty.
- Do not reuse container. After use, dispose of empty container in accordance with applicable federal, state and local regulations.

### Notice to Customer/User

This product can be a highly effective agent for suppression and control of fire hazards only when used in accordance with NF's instructions. However, despite NF's no liability over the Customer's use, there is no assurance of the product's effectiveness in every application. Selection of application equipment and maintenance of same and training of operators associated with fire hazards to be protected, etc., is critical and does not guarantee that this product will be effective to extinguish any fire. Customer/User should also be aware that although compatibility with fire other substances for storage outside the recommended storage temperatures have shown, it may render this product ineffective for its intended use. NF's test data sheets and bulletins for manufacturers should be read and storage requirements before using. Customer/User shall determine the suitability of the product for its intended use. National Foam, Inc. and its subsidiaries shall not be liable for any loss or damage, direct or indirect or consequential, arising out of the use of or the inability to use the product.



Listed 275M  
Foam Liquid Concentrate



55 U.S. Gallons  
(208 litres)

### Contents

- Water, 2-(2-Butoxyethoxy)-Ethanol Sulfate, Decyl Sulfate, Alkyl Polyglycoside, Fluorinated Surfactant

TM Universal GOLD 2% is a trademark of National Foam, Inc.  
Universal GOLD 3% is covered by United States Patents # 4,998,118 and # 4,907,932

## Red Alert

Emergency Response Number  
(610) 363-1400

# 1<sup>st</sup> Defense NF™

National Foam, Inc.  
P.O. Box 270  
150 Gordon Drive  
Exton, PA 19341-1350

Made in U.S.A.  
Rev. 11-12-93



# Universal<sup>®</sup> Gold<sup>C6</sup> 1%/3%

Alcohol Resistant Aqueous Film-Forming Foam  
NFC420



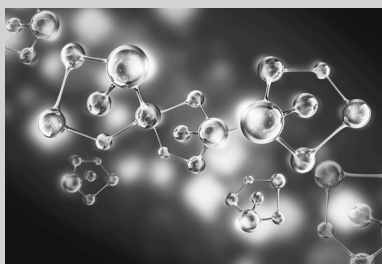
## Assurance

*Firefighting and environmental performance you can rely on*

National Foam prides itself on the open and honest way in which we conduct our business throughout the world. Our foams are an extension of our ethical beliefs and we pride ourselves in being the responsible foam manufacturer, balancing high performance with minimal environmental impact.

## C6 Technology

Environmentally Responsible Universal<sup>®</sup> Gold<sup>C6</sup> 1%/3% alcohol-resistant aqueous film forming foam (AR-AFFF) is used at 1% or 3% concentration to extinguish hydrocarbon fires, and 3% for polar-solvent (water miscible) fires. The C6 Fluorosurfactants have been developed and refined specifically to lower the environmental impact without reducing performance. This new formulation demonstrates National Foam's commitment to superior flexibility, firefighting performance, and environmental responsibility. It is suitable for use with most types of proportioning and discharge equipment.



- ✔ Environmentally responsible foam concentrate.
- ✔ Suitable for use with fresh or sea water.
- ✔ Compatible with a wide range of proportioning and foam making devices.
- ✔ Suitable for use with foam compatible dry powder extinguishing agents.
- ✔ Listed for use on hydrocarbons at 1% or 3% proportioning.
- ✔ Listed for use on a wide variety of polar solvent fuels at 3% proportioning.
- ✔ Underwriters Laboratories, Inc.
- ✔ Underwriters Laboratories of Canada (ULC).
- ✔ United States Coast Guard (USCG) for 3% only.

Universal Gold<sup>C6</sup> 1%/3% is an AR-AFFF concentrate with a special biosynthesized polymer. This polymer is designed to fulfill two functions. The first is to form a protective membrane between the fuel and the foam as it contacts the water-miscible fuel, making extinguishment possible. The second function is to make the foam more stable and heat-resistant, resulting in better burnback resistance and sealability compared to conventional AFFFs. The unique state-of-the-art Universal Gold<sup>C6</sup> 1%/3% concentrate formulation is recognized by United States Patents 4,999,119 and 5,207,932.

Universal Gold<sup>C6</sup> 1%/3% is used in fire suppression systems and manual applications to fight the broadest range of Class B fires. Its versatility simplifies the extinguishment of unknown Class B fuels. Typical applications include storage tanks, loading racks, docks, process areas, warehouses, spills, etc.

## Typical Physical Properties

Appearance.....	Amber-Colored Viscous Liquid
Specific Gravity at 77°F(25°C).....	1.03
pH.....	8.2
Viscosity.....	2,800 cP*
Freezing Point.....	26°F(-3°C)
Min Usable Temperature.....	35°F(2°C)
Max Usable Temperature.....	120°F(49°C)

\*Brookfield #4 Spindle @ 60 rpm. Viscosity measured under different shear conditions will vary because of pseudoplastic rheology of this non-Newtonian product.

## Storage and Handling

Universal Gold<sup>C6</sup> 1%/3% is ideally stored in its original shipping container or in tanks or other containers which have been designed for such foam storage. Recommended construction materials are stainless steel (Type 304L or 316), high density cross-linked polyethylene, or reinforced fiberglass polyester (isophthalic polyester resin) with a vinyl ester resin internal layer coating (50 -100 mils). Refer to National Foam Technical Bulletin NFTB100 for further information.

# Universal<sup>®</sup> Gold<sup>C6</sup> 1%/3%

## Alcohol Resistant Aqueous Film-Forming Foam

Universal Gold<sup>C6</sup> 1%/3% foam concentrate is freeze/thaw stable. Should the product freeze during shipment or storage, no performance loss is expected upon thawing.

Foam concentrates are subject to evaporation which accelerates when the product is exposed to air. Storage tanks should be sealed and fitted with a pressure vacuum vent to prevent free exchange of air. The recommended storage environment should be within the UL listed temperature range of 35°F to 120°F (2°C to 49°C). When product is stored in atmospheric storage tanks, contents must be covered with 1/4-inch (6.35mm) of National Foam Seal Oil to ensure prevention of air coming into contact with the foam concentrate. Use of Seal Oil is only recommended in stationary storage tanks. Refer to National Foam Technical Bulletin NFTB100 or National Foam product data sheet NFC950 for further information.

It is recommended that Universal Gold<sup>C6</sup> 1%/3% not be mixed with any other type of foam concentrate in long-term storage. Such mixing could lead to chemical changes in the product and a possible reduction in or loss of its firefighting capability. Most expanded foams are compatible for side-by-side application during an incident.

### **Shelf Life, Inspection, and Testing**

The shelf life of any foam concentrate is maximized by proper storage conditions and maintenance. Factors affecting shelf life are wide temperature changes, extreme high or low temperatures, evaporation, dilution, and contamination by foreign materials. Properly stored National Foam AR-AFFF foam concentrates have been tested and shown no significant loss of firefighting performance, even after 25 years.

Annual testing of all firefighting foams is recommended by the National Fire Protection Association (NFPA). National Foam provides a Technical Service Program to conduct such tests. Refer to National Foam product data sheet NFC960 for further details on Technical Service Program.

### **Environmental and Toxicological Information**

Universal Gold<sup>C6</sup> 1%/3% contains no ingredients reportable under the Superfund Amendments and Reauthorization Act (SARA) Title III, Section 313 of 40 CFR-372 or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as of July 1, 1995. National Foam Concentrates do not contain PFOS in accordance with USEPA Stewardship Program 2010/2015.

Prevent foam concentrate and foam solution from entering ground water, surface water, or storm drains. Discharge and disposal of Universal Gold<sup>C6</sup> 1%/3% concentrate or foam solution should be made in accordance with federal, state, and local regulations. Refer to National Foam Technical Bulletin NFTB110 for further information.

Universal Gold<sup>C6</sup> 1%/3% has not been tested for acute oral toxicity, primary skin irritation or primary eye irritation. Repeated skin contact will remove oils from the skin and cause dryness. Universal Gold<sup>C6</sup> 1%/3% is a primary eye irritant, and contact with the eyes should be avoided. Users are advised to wear protective equipment. If Universal Gold<sup>C6</sup> 1%/3% enters the eyes, flush them well with water and seek immediate medical attention. For further details, see the Universal Gold<sup>C6</sup> 1%/3% Safety Data Sheet NMS420.

# Universal<sup>®</sup> Gold<sup>C6</sup> 1%/3%

## Alcohol Resistant Aqueous Film-Forming Foam

<b>Underwriters Laboratories-Listed Application Rates for Universal Gold<sup>C6</sup> 1%/3%</b>
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### Type III Application Rates

<u>Fuel Group</u>	<u>Proportioning %</u>	<u>UL-Listed Rate gpm/ft<sup>2</sup> (lpm/m<sup>2</sup>)</u>
Hydrocarbons	1%	0.16 (6.5)*
Hydrocarbons	3%	0.16 (6.5)*
MTBE/Gasoline Blends (up to 30% MTBE)	3%	0.15 (6.1)
Ethanol/Gasoline Blends (up to 15.6% ethanol)	3%	0.15 (6.1)
Biodiesel (methyl ester from lipid sources)	3%	0.10 (4.1)

### Type II Application Rates

<u>Fuel Group</u>	<u>Proportioning %</u>	<u>UL-Listed Rate gpm/ft<sup>2</sup> (lpm/m<sup>2</sup>)</u>
Alcohols	3%	0.13 (5.3)
Ethanol	3%	0.10 (4.1)
Methanol	3%	0.10 (4.1)
Aldehydes	3%	0.24 (9.8)
Amines	3%	0.15 (6.1)
Carboxylic Acids	3%	0.15 (6.1)
Esters	3%	0.10 (4.1)
Ethers	3%	0.15 (6.1)
ETBE	3%	0.14 (5.7)
MTBE	3%	0.13 (5.3)
TAME	3%	0.13 (5.3)
Hydrocarbons	3%	0.10 (4.1)
Ketones	3%	0.16 (6.5)
Methyl Ethyl Ketone	3%	0.12 (4.9)
MTBE/Gasoline Blends (up to 17.5% MTBE)	3%	0.10 (4.1)
Biodiesel (ME) Methyl Ester from Lipid Sources	3%	0.10 (4.1)

*For materials marked with an asterisk (\*), refer to NFPA 11 for additional design criteria.*

*Please refer to UL Fire Protection Online Certifications Directory for additional information on application rates and other discharge devices.*

Ordering Information			
Container	Shipping Weight	Shipping Dimensions	Part Number
5-Gallon Pails (19 liters)	45.5 lb. (20.6 kg)	1.13 cu. ft. <sup>3</sup> (0.032 cu. m)	2130-7340-4
55-Gallon Drums (208 liters)	495 lb. (224.5 kg)	11.1 cu. ft. <sup>3</sup> (0.314 cu. m)	2130-7481-4
275-Gallon IBC Reusable Tote Tank (1041 liters)	2497 lb. (1132.6 kg)	48.2 cu. ft. <sup>3</sup> (1.365 cu. m)	2130-7725-4
330-Gallon IBC Reusable Tote Tank (1249 liters)	2990 lb. (1356.3 kg)	55.8 cu. ft. <sup>3</sup> (1.580 cu. m)	2130-7033-4
Bulk	8.59 lb./gal. (1.03 kg/l)		2130-7001-4

# Universal<sup>®</sup> Gold<sup>C6</sup> 1%/3%

Alcohol Resistant Aqueous Film-Forming Foam

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**1. IDENTIFICATION**

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<b>Product Name</b>	Universal Gold <sup>®C6</sup> 1%/3% Alcohol Resistant Aqueous Film Forming Foam Concentrate (AR-AFFF)
<b>Recommended use of the chemical and restrictions on use</b>	
<b>Identified uses</b>	Firefighting Foam Concentrate
<b>Restrictions on Use</b>	See Section 15
<b>Company Identification</b>	National Foam 350 East Union Street West Chester, PA 19382
<b>Customer Information Number</b>	(610) 363-1400
<b>Emergency Telephone Number</b>	Infotrac at (800) 535-5053
<b>Issue Date</b>	August 21, 2019
<b>Supersedes Date</b>	February 7, 2019
<i>Safety Data Sheet prepared in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200, the Canadian Hazardous Products Regulations (HPR) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)</i>	

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**2. HAZARD IDENTIFICATION**

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**Hazard Classification**  
Eye Damage/Irritation – Category 2A

**Label Elements**  
Hazard Symbols



Signal Word: Warning

**Hazard Statements**  
Causes serious eye irritation.

**Precautionary Statements**

**Prevention**

Wash hands thoroughly after handling.  
Wear eye protection and face protection.

**Response**

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
If eye irritation persists: Get medical advice/attention.

**Storage**

None

**Disposal**

None

**Other Hazards**

This product contains fluoroalkyl surfactants and is required to be disposed of by high temperature incineration. See Sections 13 and 15 for additional information.



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**2. HAZARD IDENTIFICATION**

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**Specific Concentration Limits**

The values listed below represent the percentages of ingredients of unknown toxicity.

Acute oral toxicity	<5%
Acute dermal toxicity	5 - 15%
Acute inhalation toxicity	15 - 25%
Acute aquatic toxicity	15 - 25%

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**3. COMPOSITION/INFORMATION ON INGREDIENTS**

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This product is a mixture.

Component	CAS Number	Concentration*
Sodium decyl sulfate	142-87-0	1 - 5%
Alkylpolyglycoside	132778-08-6	1 - 5%
Dipropylene Glycol Monomethyl Ether	34590-94-8	1 - 5%

\*Exact concentration withheld as trade secret.

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**4. FIRST- AID MEASURES**

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**Description of necessary first-aid measures****Eyes**

Immediately flood the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

**Skin**

Wash skin thoroughly with soap and water. Obtain medical attention if irritation persists.

**Ingestion**

Dilute by drinking large quantities of water and obtain medical attention.

**Inhalation**

Move victim to fresh air. Obtain medical attention immediately for any breathing difficulty.

**Most important symptoms/effects, acute and delayed**

Aside from the information found under Description of necessary first aid measures (above) and Indication of immediate medical attention and special treatment needed, no additional symptoms and effects are anticipated.

**Indication of immediate medical attention and special treatment needed****Notes to Physicians**

Treat symptomatically.

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**5. FIRE - FIGHTING MEASURES**

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**Suitable Extinguishing Media**

This preparation is used as an extinguishing agent and therefore is not a problem when trying to control a fire. Use extinguishing agent appropriate to other materials involved.

**Specific hazards arising from the chemical**

None known

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**5. FIRE - FIGHTING MEASURES**

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**Special Protective Actions for Fire-Fighters**

Wear full protective clothing and self-contained breathing apparatus as appropriate for specific fire conditions.

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**6. ACCIDENTAL RELEASE MEASURES**

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**Personal precautions, protective equipment and emergency procedures**

Wear appropriate protective clothing. Prevent skin and eye contact.

**Environmental Precautions**

Prevent foam concentrate or foam solution from entering ground water, surface water, or storm drains. Discharge and disposal of concentrate or foam solution should be made in accordance with federal, state, and local regulations. See Section 13 for disposal requirements.

**Methods and materials for containment and cleaning up**

Contain and absorb using appropriate inert material and transfer into suitable containers for recovery or disposal. See Section 13 for disposal requirements.

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**7. HANDLING AND STORAGE**

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**Precautions for safe handling**

Wear appropriate protective clothing. Prevent skin and eye contact.

**Conditions for safe storage**

Store in original containers between 35°F and 120°F (2°C and 49°C). Storage area should be: - cool - dry - well ventilated - under cover - out of direct sunlight

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**Control parameters**

Exposure limits are listed below, if they exist.

**Dipropylene Glycol Monomethyl Ether**

ACGIH TLV: 100 ppm (606 mg/m<sup>3</sup>) 8hr TWA; 15 min STEL 150 ppm (909 mg/m<sup>3</sup>); Danger of cutaneous absorption.

OSHA PEL: 100 ppm (600 mg/m<sup>3</sup>) Danger of cutaneous absorption.

**Appropriate engineering controls**

Use with adequate ventilation. If this product is used in a pressurized system, there should be local procedures for the selection, training, inspection and maintenance of this equipment. When used in large volumes, use local exhaust ventilation.

**Individual protection measures****Respiratory Protection**

Wear respiratory protection if there is a risk of exposure to high vapor concentrations, aerosols or if applied to hot surfaces. A NIOSH approved full face respirator may be worn. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

**Skin Protection**

Gloves

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**Eye/Face Protection**

Chemical goggles or safety glasses with side shields.

**Body Protection**

Normal work wear.

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

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**Appearance**

	<b>Physical State</b>	Liquid
	<b>Color</b>	Amber
<b>Odor</b>		Mild, pleasant
<b>Odor Threshold</b>		No data available
<b>pH</b>		8.2
<b>Specific Gravity</b>		1.03
<b>Boiling Range/Point (°C/F)</b>		No data available
<b>Melting Point (°C/F)</b>		No data available
<b>Flash Point (°C/F)</b>		>200°F
<b>Vapor Pressure</b>		No data available
<b>Evaporation Rate (BuAc=1)</b>		No data available
<b>Solubility in Water</b>		Soluble
<b>Vapor Density (Air = 1)</b>		Not applicable
<b>VOC (%)</b>		No data available
<b>Partition coefficient (n-octanol/water)</b>		No data available
<b>Viscosity</b>		No data available
<b>Auto-ignition Temperature</b>		Not applicable
<b>Decomposition Temperature</b>		No data available
<b>Upper explosive limit</b>		Not applicable
<b>Lower explosive limit</b>		Not applicable
<b>Flammability (solid, gas)</b>		Not applicable

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**10. STABILITY AND REACTIVITY**

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**Reactivity**

No data available.

**Chemical Stability**

Stable under normal conditions.

**Possibility of hazardous reactions**

Hazardous polymerization will not occur.

**Conditions to Avoid**

Contact with incompatible materials

**Incompatible Materials**

Water reactive materials – burning metals – electronically energized equipment

**Hazardous Decomposition Products**

Oxides of carbon – hydrogen fluoride – aldehydes – ketones – organic acids

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**11. TOXICOLOGICAL INFORMATION**

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**Acute Toxicity**Product

Oral LD50 (rat) &gt;5000mg/kg

Alkylpolyglycoside

Oral LD50 (rat) &gt;5000mg/kg

Dipropylene Glycol Monomethyl Ether

Oral LD50 (rat) &gt;5000 mg/kg

Dermal LD5 (rabbit) &gt;9510 mg/kg

Inhalation LC50 (rat) &gt; 3.35 mg/l,7h, vapour, no deaths occurred at this concentration

**Specific Target Organ Toxicity (STOT) – single exposure**

Available data indicates this product is not expected to cause target organ effects after a single exposure.

**Specific Target Organ Toxicity (STOT) – repeat exposure**

Available data indicates this component not expected to cause target organ effects after repeated exposure.

**Serious Eye damage/Irritation**Product: Primary irritant (rabbit) (tested on a similar product)Sodium decyl sulfate: Severe eye irritant (based on similar material)Alkylpolyglycoside: Severely irritating (rabbit) (50% solution)**Skin Corrosion/Irritation**Product: Not a primary irritant (rabbit) (tested on a similar product)**Respiratory or Skin Sensitization**

Available data indicates this product is not expected to cause skin sensitization.

**Carcinogenicity**

Not considered carcinogenic by NTP, IARC, and OSHA.

**Germ Cell Mutagenicity**

Available data indicates this product is is not expected to be mutagenic.

**Reproductive Toxicity**

Available data indicates this product is not expected to cause reproductive toxicity or birth defects.

**Aspiration Hazard**

Not an aspiration hazard.

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**12. ECOLOGICAL INFORMATION**

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**Ecotoxicity**

No relevant studies identified.

**Mobility in soil**

No relevant studies identified.

**Persistence/Degradability**

No relevant studies identified.

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**12. ECOLOGICAL INFORMATION**

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**Bioaccumulative Potential**

No relevant studies identified.

**Other adverse effects**

No relevant studies identified.

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**13. DISPOSAL CONSIDERATIONS**

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**Disposal Methods**

This product, as sold, is not a RCRA-listed waste or hazardous waste as characterized by 40 CFR 261. However, state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Therefore, applicable local and state regulatory agencies should be contacted regarding disposal of waste foam concentrate or foam/foam solution.

Concentrate

Prevent foam concentrate from entering ground water, surface water or storm drains. Small quantities of foam concentrate may be collected on absorbents which can then be disposed of. Disposal should be made in accordance with local, state and federal regulations. High temperature incineration is required at a minimum of 1000°C with a minimum residence time of 2 seconds.

Foam/Foam Solution

Prevent foam/foam solution from entering ground water, surface water or storm drains. Small quantities of foam solution may be collected on absorbents which can then be disposed of. Disposal should be made in accordance with local, state and federal regulations. High temperature incineration is required at a minimum of 1000°C with a minimum residence time of 2 seconds.

**NOTE:** Please consult National Foam for additional information regarding the disposal of foam concentrates and foam solutions or visit <http://nationalfoam.com/use-discharge-and-disposal-of-firefighting-foam-products/>

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**14. TRANSPORT INFORMATION**

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**Shipping Information**

**Shipping Description**  
**National Motor Freight Code**

Fire Extinguisher Charges or Compounds N.O.I., Class 70  
69160 Sub 0

This information is not intended to convey all transportation classifications that may apply to this product. Classifications may vary by container volume and by regional regulations. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules when transporting this material.

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**15. REGULATORY INFORMATION**

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**United States TSCA Inventory**

This product contains an ingredient that has restricted use under the EPA Toxic Substance Control Act. This product may only be used as a fire fighting foam. Any other use of this product is strictly prohibited. Disposal of this product must be done by incineration at a minimum of 1000°C with a minimum residence time of 2 seconds.

**Canada DSL Inventory**

This product contains an ingredient that is not listed on the Domestic Substance List (DSL) or the Non-Domestic Substance List (NDSL).

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**15. REGULATORY INFORMATION**

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**SARA Title III Sect. 311/312 Categorization**

Eye irritation

**SARA Title III Sect. 313**

This product does not contain any chemicals that are listed in Section 313 at or above de minimis concentrations.

**California Proposition 65****WARNING:** This product can expose you to chemicals including diethanolamine and formaldehyde, which are known to the State of California to cause cancer, and perfluorooctanoic acid and methanol, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to[www.p65warnings.ca.gov/](http://www.p65warnings.ca.gov/)**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**

None

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**16. OTHER INFORMATION**

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**NFPA Ratings**

NFPA Code for Health - 0

NFPA Code for Flammability - 0

NFPA Code for Reactivity - 0

NFPA Code for Special Hazards - None

**Legend**

ACGIH: American Conference of Governmental Industrial Hygienists

CAS#: Chemical Abstracts Service Number

EC50: Effect Concentration 50%

IARC: International Agency for Research on Cancer

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

N/A: Denotes no applicable information found or available

OSHA: Occupational Safety and Health Administration

PEL: Permissible Exposure Limit

RQ: Reportable Quantity

STEL: Short Term Exposure Limit

N/A: Denotes no applicable information found or available

OSHA: Occupational Safety and Health Administration

PEL: Permissible Exposure Limit

RQ: Reportable Quantity

STEL: Short Term Exposure Limit

TLV: Threshold Limit Value

TSCA: Toxic Substance Control Act

Revision Date: August 21, 2019

Replaces: February 7, 2019

Changes made: Changes to Sections 2, 6, 8, 13 and 15.

**Information Source and References**

This SDS is prepared by Hazard Communication Specialists based on information provided by internal company references.

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**16. OTHER INFORMATION**

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**Prepared By:** EnviroNet LLC.

Universal Gold is a registered trademark of Angus International.

The information and recommendations presented in this SDS are based on sources believed to be accurate. National Foam assumes no liability for the accuracy or completeness of this information. It is the user's responsibility to determine the suitability of the material for their particular purposes. In particular, we make **NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED**, with respect to such information, and we assume no liability resulting from its use. Users should ensure that any use or disposal of the material is in accordance with applicable Federal, State, and local laws and regulations.

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**APPENDIX B**

ENDPOINT SOP No. 013 - SOIL AND GROUNDWATER SAMPLING FOR PFAS COMPOUNDS



## Standard Operating Procedure 013

### SOIL AND GROUNDWATER SAMPLING FOR PFAS COMPOUNDS

Standard operating procedure (SOP) 013 describes the steps for collection of representative soil and groundwater samples for per- and polyfluoroalkyl substances (PFAS). Due to their unique chemical properties, various PFAS can lower surface tension, are oil-repelling and are water repelling while maintaining relatively high solubility. Some documented PFAS uses include hydraulic fluids, biocides, construction materials, fire-fighting foams, household products, wetting and mist suppressant agents, surfactants, insulators, protective coatings, non-stick coatings, oil and water repellants for paper, cardboard and clothing and many everyday personal care products, including cosmetics, deodorants, sunscreens, etc. The probability for false positives is relatively high during PFAS sampling due to the prevalence of PFAS-containing products around us, as well as the low laboratory detection limits. Therefore, this SOP will address pre-sampling preparations as well as the methodology to use while actively sampling to reduce the potential for false positives and cross-contamination scenarios.

#### 1.0 Allowable Equipment

Many typical everyday items contain, or may contain PFAS, including waterproof clothing and paper, fabric softeners, cosmetics, sunscreens and bug repellants. Additionally, sampling equipment utilized on sites contaminated with typical contaminants (petroleum, chlorinated solvents, metals, PCBs, etc.) may also contain PFAS. The following list of equipment is allowable for use on a site undergoing an investigation for PFAS.

##### Clothing

- Well-laundered synthetic or 100% cotton clothing (no fabric softener during most recent laundering);
- No new, unwashed, water repellent or UV protective clothing.

##### PPE

- Non-coated Tyvek®;
- Powderless nitrile gloves.

##### Field Equipment

- High-density polyethylene (HDPE);
- Low-density polyethylene (LDPE);
- Polypropylene;
- Silicone; stainless-steel; natural rubber, nylon, uncoated metal;
- Ziplock storage bags;
- Glass jars;
- Laboratory-provided PFAS-free HDPE or polypropylene bottles;
- Wet ice;
- HDPE sheeting;
- Looseleaf paper or Rite in the Rain® notebooks;
- Aluminum, polypropylene or Masonite clipboards;
- Ballpoint pens, pencils, fine or ultra-fine Sharpies®;
- Alconox®, Liquinox®, Citranox®;
- Cotton cloth or untreated paper towel;
- Laboratory-supplied PFAS-free water.

## 2.0 Pre-Sample Preparations

### Clothing

Approximately 50% of PFAS usage is related to protective coatings applied to textiles. PFAS have been utilized to provide water and stain resistance to pants, jackets, shirts, shoes and boots. These protections include stain resistance, water repellants, UV protection and insect resistance. In addition, clothing that has been recently laundered with fabric softeners should be avoided.

### Personal Hygiene and Personal Care Products

If proper sample and equipment procedures described in this SOP and the Michigan Department of Environmental Quality's (MDEQ's) *General PFAS Sampling Guidance* are followed, it is not necessary to avoid the use of personal hygiene and personal care products prior to and on the days of sampling. However, personal care products should not be handled or applied while in the sampling area or while wearing personal protective equipment. If the application of personal care products is required, the personal care products should only be applied in the staging area before donning personal protective equipment. Hands used to apply personal care products should be thoroughly wash with soap and water prior to donning personal protective equipment and new powderless nitrile gloves.

### Food Packaging

PFAS has been used as a specialty coating by the paper industry, including in food packaging. These materials include paper plates, food containers, bags and wraps. Pre-packaged foods, fast foods or carryout should not be consumed in the sampling area. Food and drink should be consumed in the staging area once personal protective equipment has been removed. The hands and face should be thoroughly washed with soap and water prior to donning personal protective equipment and a new pair of powderless nitrile gloves.

## 3.0 Sample Collection

### Direct Push Drilling

Soil samples collected using direct push methods in accordance with ASTM D-6282 are typically collected continuously in four (4)- to five (5)-foot sections using a macro sample tube. The macro sampler is a clear plastic tube that fits inside the drilling rod and is advanced along with the rod and drill shoe. The drill shoe should be decontaminated per the steps outlined in **Section 4.0** of this SOP between each sample interval.

After the macro sampler is extracted with the soil sample intact, the macro sampler should be placed on a piece of HDPE sheeting placed on a dedicated sampling table or the truck tailgate. The macro sampler will be cut open with a hooked-blade knife or proprietary macro sampler knife. The hook-blade or proprietary knife should be decontaminated between sample intervals following the steps outlined in **Section 4.0** of this SOP. Wearing a new pair of powderless nitrile gloves, examine the extracted sample and visually classify the sample using the USCS and record observations on a field boring log.

Collect a representative sample using decontaminated equipment and fresh gloves for placement directly into laboratory-supplied glassware. Labels should be pre-printed or completed with a ballpoint pen or a fine or ultra-fine tip Sharpie®. At no time during the sampling process should the container or cap be placed on any surface which may not be PFAS-free or directly on the ground. Collected samples should be placed in a cooler on wet ice while awaiting transport under chain-of-custody conditions to the laboratory.

Groundwater Sampling

Groundwater samples should be collected using samplers dedicated to each monitoring location. Polyethylene bailers and nylon rope are the preferred method for sampling groundwater. Powderless nitrile gloves should be changed out between each sampling location. Samples should be transferred directly from the bailer to the laboratory-supplied containers. Labels should be pre-printed or completed with a ballpoint pen or a fine or ultra-fine tip Sharpie®. At no time during the sampling process should the container or cap be placed on any surface which may not be PFAS-free or directly on the ground. Collected samples should be placed in a cooler on wet ice while awaiting transport under chain-of-custody conditions to the laboratory.

**4.0 Decontamination**


While it is customary to decontaminate all equipment at the conclusion of sampling, in regards to PFAS sampling, it should be assumed the equipment was not previously decontaminated; therefore, all equipment should be decontaminated prior to performing any sampling on the site. In addition, all reusable sampling equipment (drill rig drive shoe, macro sampler knives, water level indicator probes, etc.) should be thoroughly decontaminated between each sample interval and between each sample location.

Decontamination Procedure

1. In a PFAS-free bucket, wash the equipment with a mixture of laboratory-supplied PFAS-free water and Alconox®, Liquinox® or Citrinox®. Equipment can be scrubbed using polyethylene or polyvinylchloride (PVC) brushes.
2. In a second PFAS-free bucket, rinse the equipment with laboratory-supplied PFAS-free water.
3. A second pour-over rinse using laboratory-supplied PFAS-free water should be performed.


Following decontamination, care should be taken not to place the decontaminated equipment on any surface containing PFAS or the ground surface. The decontaminated equipment should be handled with a fresh pair of powderless nitrile gloves. If necessary, the equipment can be dried using non-treated paper towels.

**APPROVALS**

  
Prepared by: Robert A. Cigale, P.G.


April 6, 2020

Date

  
Reviewed by: Kirk Kapfhammer, P.G.

April 6, 2020

Date

  
Approved by: Wade Wollermann, P.E.

April 6, 2020

Date