

FINAL

**PERFLUORINATED COMPOUNDS PRELIMINARY ASSESSMENT
SITE VISIT REPORT**

**WISCONSIN AIR NATIONAL GUARD BASE
GENERAL MITCHELL INTERNATIONAL AIRPORT
MILWAUKEE, WISCONSIN**



Prepared For:

**Headquarters Air National Guard
Joint Base Andrews, Maryland**

December 2015

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**BB&E, Inc.
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LIST OF ACRONYMS

AFFF	Aqueous Film Forming Foam
AFCEC	Air Force Civil Engineer Center
AFRES	Air Force Reserve
AOC	Area of Concern
ARW	Air Refueling Wing
BB&E	BB&E, Inc.
FD	fire department
ft	feet
FTA	Fire Training Area
gal	gallon
HEF	high expansion foam
IRP	Installation Restoration Program
OWS	oil water separator
PA	Preliminary Assessment
PFCs	Perfluorinated Compounds
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHAL	Provisional Health Advisory Levels
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
WIANG	Wisconsin Air National Guard

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1.0 INTRODUCTION

A preliminary assessment (PA) site visit was conducted by BB&E, Inc. (BB&E) from August 11-13, 2015 at the Wisconsin Air National Guard (WIANG) 128th Air Refueling Wing (ARW), General Mitchell International Airport (General Mitchell), Milwaukee, Wisconsin (Base). The site location is shown on Figure 1. The purpose of the visit was to identify potential sites of historic environmental releases of perfluorinated compounds (PFCs), specifically from Aqueous Film Forming Foam (AFFF) usage and storage. Prior to the site visit, BB&E conducted research of any documented Fire Training Areas (FTAs) in operation since 1970, or any other use or release of AFFF in accordance with the Final Perfluorinated Compound (PFC) Preliminary Assessment Work Plan (BB&E, 2015). During the site visit, BB&E conducted personnel interviews, reviewed on-site documentation and toured each potential site.

Individuals contributing to this PA effort included the following:

- Clair Breckenridge – WIANG, State Environmental Officer
- John Charlier – WIANG, Fire Chief
- Mark Culver – WIANG, Alarms
- Robert Lynch – WIANG, Maintenance Mechanic and Buildings Ground Superintendent (Retired)

Base property parcels are discontinuous, and will therefore be discussed in the report based on geographic location: Guard Central, Guard East, Guard South, and Guard West (see Appendix C-1).

Sections 2.0 and 3.0 outline the potential PFC sources identified on the Base property during the records review and site visit, while Section 4.0 provides conclusions and recommendations. Representative photos of the subject sites taken during the site visit are attached as Appendix A. Interview questions/records of communication are included in Appendix B and other supporting documentation is provided in Appendix C.

1.1 Hydrogeologic Setting

Hydrogeologic information was obtained from the Final Record of Decision report prepared by MWH (MWH, 2015).

Limestone and dolomite bedrock underlie the glacial deposits in the area, and most of the water wells in the area are completed within a shallow aquifer composed of a dolomite unit (the Niagara Aquifer). The upper sand and gravel aquifer (glacial deposits) is in hydraulic connection with the underlying dolomite Niagara Aquifer. The prevalence of localized thick layers of clay underlying the Base area, where present, locally restricts the hydraulic connection between the shallow and the deeper bedrock aquifer. Soil boring and well log data indicate that clay layers are not continuous across the Base, or in some locations may be interbedded with permeable sands or gravel. Thus, a hydraulic connection may exist at some locations at the Base, which could allow potential surface contaminants to reach the bedrock aquifer.

Groundwater has been encountered at shallow depths, ranging between 5 to 10 feet below land surface, in borings installed on the Base. Direction of groundwater flow at Guard Central is estimated to be northwest toward the main drainage ditch located immediately west of the Base. Direction of groundwater flow at Guard South is generally west southwest (HSI GeoTrans, 1997). Direction of groundwater flow at Guard East is generally northeasterly (BEM, 2009). Groundwater flow patterns at the Base and its surrounding areas are included in Appendix C-3.

The Milwaukee and the Menomonee Rivers are located approximately 5 miles north of the Base. Root River is located approximately 8 miles west of the Base. The nearest creek, Oak Creek, is located approximately one-half mile west of the Base. Surface water drainage at the Base is largely controlled by the Base Drainage Ditch, which is associated with IRP Site 4 (Appendix C-4). The drainage ditch is located along the north and west perimeters of Guard Central, and bisects the southern half of the installation. The drainage ditch is approximately 1000 ft long on the southern side, 2000 ft long on the western side, 800 ft long on the northern side, and about 10 ft wide. Depth varies from about 3 ft up to 10 ft (OpTech, 1996). The majority of the ditch is unpaved with the exception of a cement culvert on the southern side. The ditch exits the installation near the western installation boundary and enters the adjacent General Mitchell International Airport. Surface water flows north to Bailey's Pond, located near the northeast

corner of the installation. Drainage from Bailey's Pond discharges into Wilson Park Creek and subsequently the Kinnickinnic River, eventually discharging into Lake Michigan.

Lake Michigan is located approximately 2.5 miles east of the Base and is the primary source of drinking water for the Milwaukee area and supplies the municipal water system. Although connected to the municipal water supply system, several surrounding private residences may have private water wells. A water supply well is located at Guard West, but is not in use, and there are no plans for its future use. Wells that connect several water bearing zones may act as conduits for the transport of contaminants. Further discussion of onsite and area wells is included in Section 3.2.1.1 of this report.

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2.0 FIRE TRAINING AREAS

Based on this PA investigation, there is no evidence that a FTA was located on Base property. According to the 1984 Phase I – Records Search, fire training exercises (1960s to mid-1970s) were conducted at the FTA located at the Former Air Force Reserve (AFRES). The WIANG used approximately 180 gallons (gal) of unidentified foam per year during that time period (Weston, 1984). The Former AFRES is located south of WIANG Guard West (Appendix C-1).

The Former AFRES is currently part of an on-going PFC investigation by the Air Force Civil Engineer Center (AFCEC). A figure demonstrating potential AFFF areas at the Former AFRES was obtained from AFCEC and is included as Appendix C-2. Please note, this figure is from the Draft PFC Preliminary Assessment and may be altered prior to finalization.

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3.0 NON-FIRE TRAINING AREAS

Non-FTA Areas of Concern (AOCs) are sites where AFFF has been released and may include crash sites, hangars, fuel spill areas, hazardous waste storage facilities, firefighting equipment testing areas, etc. The following section includes a description of any Non-Fire Training AOCs, Operational History, Waste Characteristics, and pathway evaluations.

3.1 AOC Description, Operational History, and Waste Characteristics

The following are the Non-FTA AOCs that were identified during this PA Investigation. Appendix A contains photos of these areas. Records review focused on the potential PFC sources within the Base property boundaries. According to the Base personnel, AFFF has been used since 1970. The types of AFFF used and stored in the areas specified below included National Foam (3%), ANSULITE (3%), and 3M (3%).

3.1.1 KC-135 Accident Area

On December 10, 1993, a KC-135 aircraft burned and exploded during minor electrical and avionics system repair in the northwest corner of the aircraft apron. In addition to the WIANG Fire Department (FD), trucks from three other fire departments responded; a mixture of AFFF and water was used to extinguish the fire for approximately one hour by all four entities. The water/AFFF mixture would have been collected by the aircraft apron storm water sewer system, which discharges to the West Spill Containment Basin on the north end of the aircraft apron, or according to Base personnel, may have discharged directly to the ditch as runoff over the apron berm. The Base Drainage Ditch discharges into Bailey's Pond, which is outside of the Base property boundary. Once in the ditch, AFFF may have seeped into the aquifer and mobilized in the groundwater.

3.1.2 Truck Fire Area

In the late 1990s, a truck fire occurred along the south end of Tanker Avenue. According to Base personnel, AFFF was used to extinguish the fire. There are no known records documenting emergency response or the amount of AFFF used. Any AFFF release in this area would have

been routed to the Base Drainage Ditch. There are no other truck fire instances where AFFF was used.

3.1.3 WIANG FD Equipment Testing Area (Southwest Corner of Guard Central)

Although the exact start date of AFFF use is unknown, the WIANG FD used long stretches of road/grass in the southwest corner of Guard Central property for AFFF spray testing and calibration of vehicle equipment until August 6, 2015, when an order was received from ANG Headquarters to cease AFFF testing activities. Roads used for equipment testing included Prime Beef Drive, Performance Avenue, and Upset Avenue. Foam was observed in the Base Drainage Ditch during various equipment testing events. Following collection into the Base Drainage Ditch, any AFFF released may have been routed to Bailey's Pond, impacting surface water. AFFF released during equipment testing in porous green spaces may have seeped into the subsurface and groundwater.

Appendix C-5 includes photographs from Base personnel showing AFFF releases from FD equipment testing.

3.1.4 WIANG FD Equipment Testing Area (Guard South)

According to Base personnel, the WIANG FD may have used the gravel road on the east side of the landfill near Guard South for AFFF spray testing and calibration of vehicle equipment. This area is generally flat; any AFFF released may have flowed in a southerly direction along the road, or pooled in the standing water area observed during the PA site visit, which was located at the north end of the road near the Guard Central gate (see photo #4 in Appendix A and landfill topography map in Appendix C-3). Any AFFF released in porous green spaces has the potential to seep into the subsurface and groundwater.

3.1.5 WIANG FD Equipment Testing Area (Guard East)

According to Base personnel, the WIANG FD may have used the property parcel south of Grange Avenue (Guard East) for AFFF spray testing and calibration of vehicle equipment. Surface water in this area typically flows into the drainage ditches along Grange Avenue, which discharge into Bailey's Pond (BEM, 2009). Any AFFF released in porous green spaces has the potential to seep into the subsurface and groundwater.

3.1.6 Hangar 208

Hangar 208, located in the northeastern portion of Guard Central, has been equipped with AFFF fire suppression systems since the mid-1990s, and is currently using 3% 3M and/or Ansulite. According to WIANG personnel, hangar fire suppression systems are tested every third year or following extended down time (e.g., construction). Testing logs are included in Appendix C-6. No records of accidental foam releases exist; however, according to Mr. Culver during the PA site visit, there may have been an accidental release at Hangar 208 prior to his tenure, which began in 2004 (anecdotal knowledge). Any AFFF releases during testing or accidental release within the hangar would have been routed to the floor drains or trench drains, that lead to an oil/water separator (OWS) which then discharges into the sanitary sewer system.

3.1.7 Hangar 304

Hangar 304, located in the northeastern portion of Guard Central, was formerly equipped with AFFF fire suppression systems, starting in the late 1980s. The fire suppression systems were retrofitted for use of high expansion foam (HEF) in 2009. According to WIANG personnel, hangar fire suppression systems are tested every third year or following extended down time (e.g., construction). No records of accidental foam releases exist. Any AFFF releases during testing would have been routed to the floor drains or trench drains in the hangar, that lead to an OWS which then discharges into the sanitary sewer system. However, it should be noted that soil contamination was discovered in 2006 on the northwest side of Hangar 304 during construction activities, possibly attributed to a former OWS (BB&E, 2011). Any AFFF released to this former OWS may have resulted in soil or groundwater impacts.

3.1.8 Hangar 308

Hangar 308, located in the northeastern portion of Guard Central, was formerly equipped with AFFF fire suppression systems, starting in the late 1980s. The fire suppression systems were retrofitted for use of HEF in 2009. According to WIANG personnel, hangar fire suppression systems are tested every third year or following extended down time (e.g., construction). Testing logs are included in Appendix C-6. Any AFFF releases during testing would have been routed to the floor drains or trench drains in the hangar, that lead to an OWS which then discharges into the sanitary sewer system. However, petroleum soil contamination was discovered in 2006 on

the southwest side of Hangar 308, possibly attributed to a former OWS (BB&E, 2011). Any AFFF released to this former OWS may have resulted in soil or groundwater impacts.

Additionally, according to Mr. Lynch during the PA interview process, an accidental AFFF release occurred by the south dock of Hangar 308 approximately 20 years ago.

3.1.9 Building 621 (Current Fire Station)

AFFF is stored in 5-gal containers and 55-gal drums by the WIANF FD at the current fire station which has been occupied since 1995. Three crash trucks and one engine use 3% AFFF currently; approximately 100 – 500 gals are carried per vehicle. Except for during emergency response, AFFF is transferred to vehicles within the fire station; trench drains within the station lead to an OWS which then discharges into the sanitary sewer system. When necessary, FD vehicles are washed within the fire station.

The WIANF FD also stores AFFF offsite at the AFRES Fire Station, referred to by Base personnel as “Fire Station #2”. No foam release records exist for the AFRES Fire Station. According to Base personnel, each fire station has a primary supply of AFFF for vehicles and a reload supply.

3.1.10 Former Fire Station

An unknown quantity of AFFF was stored by the WIANF FD at the former fire station (formerly known as Building 103) until its closure circa 1994. The former fire station was located where Building 208 currently resides. According to WIANF personnel, three vehicles were stored at the station, and a nearby washrack may have been used for vehicles that had been supplied with AFFF. No foam release records exist for the former fire station. An undated photo of the former fire station is included in Appendix C-7.

3.1.11 Base Drainage Ditch

An unknown quantity of AFFF has been discharged over time to the drainage ditch, which bisects the southern portion of Guard Central, north of Prime Beef Drive, and flows north along the west side of the aircraft apron, and east toward Bailey’s Pond. The ditch is mostly unpaved, with the exception of the cement culverts south of Building 621. The majority of AFFF releases

to the drainage ditch have resulted from AFFF spray testing and calibration of FD vehicle equipment. Any AFFF released in porous green spaces has the potential to seep into the subsurface and groundwater.

3.1.12 Former Base Drainage Ditch

Western expansion of the aircraft apron covered a segment of the Base Drainage Ditch. This former segment now lies under the western portion of the aircraft apron. The majority of AFFF releases to the drainage ditch have resulted from AFFF spray testing and calibration of FD vehicle equipment. Any AFFF released in porous green spaces has the potential to seep into the subsurface and groundwater.

3.1.13 Additional AFFF Storage Areas

As discussed above, WIANG AFFF is currently stored at Building 621 (current Fire Station) and the offsite AFRES Fire Station. In addition to past AFFF storage at the Former Fire Station, as discussed above, AFFF was also stored at Hangar 306 and Building 500 (Supply). Hangar 306 has only contained HEF since 2009, when Hangars 304 and 308 were retrofitted for use of HEF. There are no known records of AFFF releases at Hangar 306 or Building 500.

According to WIANG FD personnel, vehicles supplied with AFFF have been stationed at following areas: Building 621 – Current Fire Station (see Section 3.1.9), Building 103 - Former Fire Station (see Section 3.1.10), AFRES Fire Station (off-site, located south of Guard West), Building 701 - Civil Engineering Garage, and Building 706 - Vehicle Maintenance. There are no known records or personnel knowledge of accidental AFFF releases from FD vehicles.

3.2 Pathway and Environmental Hazard Assessment

The following is a preliminary evaluation of the threats and targets associated with each exposure pathway.

3.2.1 Groundwater

No documentation was available showing that groundwater at the Base has been tested for PFCs; therefore it is unknown whether PFCs are present in the groundwater. Based on historical

practices, they may be present in the groundwater due to fire truck spray testing, fire response with AFFF, and accidental releases from buildings where AFFF fire suppression systems existed.

3.2.1.1 *Water Wells*

A potable water well exists at Guard West, located within Building 301, but has not been used since approximately 2005. According to Base personnel, the well has not been abandoned although Building 301 is not occupied and is scheduled for demolition. The well has been maintained as a contingency and has been monitored and maintained in accordance with state requirements (BB&E, 2011). The well formerly supplied potable water for two Guard West buildings. The groundwater flow direction will need to be determined for the property between Guard West and Guard South, which is owned by General Mitchell International Airport, in order to assess whether groundwater in the area of the Guard South WIAFG FD Equipment Testing AOC has the potential to impact this potable well.

Additionally, Base personnel have located an artesian well at Guard East, on the north side of Grange Avenue, east of the train trestle (Figure 2). Based on the northwesterly surface water flow from the Guard East WIAFG FD Equipment Testing AOC, this artesian well may be impacted by PFCs.

A review of the EDR Radius Map™ Report with Geotrack® dated July 21, 2015 shows one water well within a one-mile radius of the Base, located at Guard East (Appendix C-8). According to WIAFG personnel, this well no longer exists.

3.2.2 *Soil*

No documentation was available showing that soils at the Base have been tested for PFCs; therefore it is unknown whether PFCs are present in the soil. However, based on historical practices, they may be present in the soil in the following areas:

- Soil off the aircraft apron near the KC-135 accident area
- Soil by the Truck Fire Area
- Soil at the WIAFG FD Equipment Testing Area (Southwest Corner of Guard Central)

- Soil at the WIANF FD Equipment Testing Area (Guard South)
- Soil at the WIANF FD Equipment Testing Area (Guard East)
- Soil downgradient of Hangar 208
- Soil near the northwest side of Hangar 304 where an OWS release may have occurred
- Soil near the south maintenance dock and the southwest corner of Hangar 308 where accidental AFFF releases may have occurred
- Soil outside of the Current and Former Fire Stations
- Base Drainage Ditch
- Former Base Drainage Ditch

In their anionic forms, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are water soluble and can migrate readily from soil to groundwater. The United States Environmental Protection Agency (USEPA) has not established Provisional Health Advisory Levels (PHALs) for PFOS and PFOA in soil (USEPA, 2014). The primary exposure pathway for PFOS and PFOA would be the ingestion of contaminated drinking water.

3.2.3 Sediment

No documentation was available showing that sediments at the Base have been tested for PFCs; therefore it is unknown whether PFCs are present in sediments. Based on historical practices, PFCs could be present in sediment in locations that have received drainage from the site, particularly the Base Drainage Ditch and Former Base Drainage Ditch, which have received AFFF releases from Guard Central.

3.2.4 Surface Water

Surface water from Guard Central flows toward the Base Drainage Ditch, which exits the installation near the western installation boundary and enters the adjacent General Mitchell International Airport. Surface water thereafter flows east to Bailey's Pond. Surface water from Guard East also discharges to Bailey's Pond. Fire truck spray testing occurred in the southern

portion of the Guard Central drainage ditch and potentially occurred in the grassy area at Guard East; therefore, PFCs may be present in the surface water of Bailey's Pond.

The storm sewer from the western portion of the aircraft apron discharges to the West Spill Containment Basin; the storm sewer from the eastern portion discharges to the East Spill Containment Basin. PFCs may be present in the West Spill Containment Basin due to potential AFFF runoff from the KC-135 aircraft accident response in 1993.

There are no known nearby surface water bodies at Guard South.

Drainage patterns at the Base and its surrounding areas are included in Appendix C-3. Several areas are identified to be on the National Wetland Inventory according to the EDR report, as shown in Appendix C-8.

4.0 FINDINGS AND CONCLUSIONS

Seventeen potential release sites have been identified at the WIANC Base during this PA. Further investigation needs to be completed at the Base to monitor and characterize any groundwater, soil, sediment, and/or surface water PFC contamination onsite. Sampling of soil, sediment, groundwater, and surface water within the Base and at the outfall of Bailey's Pond is recommended at a minimum to evaluate the potential of migration of PFCs. In addition, verification of the structural integrity of the existing oil/water separators and connected sanitary sewer is also advised.

Table 1 summarizes the recommendation and rationale for each AOC identified at the Base.

Table 1: Preliminary Assessment Report Summary and Recommendations

No.	Potential AFFF PFC AOCs	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
1	KC-135 Accident Area	42.943276°	-87.889131°	In 1993, AFFF was released to extinguish an aircraft fire on the aircraft apron. AFFF likely drained to the West Spill Containment Basin and may have been discharged over the apron berm, potentially infiltrating permeable ground soils.	Proceed to SI; focus on the West Spill Containment Basin (surface water, groundwater, and soil) and soils at the edge of the northwest corner of the apron.
2	Truck Fire Area	42.938886°	-87.886470°	AFFF was released to extinguish a truck fire along Tanker Avenue. AFFF likely was discharged to the Base Drainage Ditch, and may have infiltrated permeable ground soils in the subject area around Tanker Avenue.	Proceed to SI; focus on soil along the south side of Tanker Avenue and groundwater.
3	WIANG FD Equipment Testing Area (Southwest Corner of Guard Central)	42.938352°	-87.889045°	Known FD equipment testing and calibration area. Known AFFF discharges to surface soils. AFFF likely infiltrated into permeable ground soils in grassy areas or discharged to the Base Drainage Ditch from concrete areas.	Proceed to SI; focus on soil and groundwater.
4	WIANG FD Equipment Testing Area (Guard South)	42.936215°	-87.887060°	Possible FD equipment testing and calibration area. Possible AFFF discharges to surface soils. AFFF may have infiltrated into permeable ground soils.	Proceed to SI; focus on soil and groundwater.
5	WIANG FD Equipment Testing Area (Guard East)	42.943072°	-87.883627°	Possible FD equipment testing and calibration area. Possible AFFF discharges to surface soils. AFFF may have infiltrated into permeable ground soils.	Proceed to SI; focus on soil and groundwater.
6	Hangar 208	42.943284°	-87.886341°	Fire suppression system supplied with AFFF. Any AFFF releases likely entered the sanitary sewer; however, outside releases to the apron may have occurred.	Proceed to SI; focus on soil and groundwater at the downgradient edges of the apron based on surface drainage patterns.

Table 1: Preliminary Assessment Report Summary and Recommendations (Continued)

No.	Potential AFFF PFC AOCs	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
7	Hangar 304	42.942571°	-87.886380°	Fire suppression system formerly supplied with AFFF. A possible AFFF release by the northwest side of the building (former OWS) may have impacted soil and groundwater.	Proceed to SI; focus on soil on the northwest side of the building near the former OWS and groundwater.
8	Hangar 308	42.941918°	-87.886498°	Fire suppression system formerly supplied with AFFF. Possible AFFF releases by the south dock and southwest side (former OWS) of the building may have impacted soil and groundwater.	Proceed to SI; focus on soil by the south dock and near the former OWS on the southwest side of the building and groundwater.
9	Building 621 (Current Fire Station)	42.939679°	-87.889259°	Current AFFF storage area. No documented releases. Any discharges likely entered the sanitary sewer; however, outside releases may have occurred.	Proceed to SI; focus on soil and groundwater.
10	Former Fire Station	42.943298°	-87.886364°	Former AFFF storage area. No documented releases. Any discharges likely entered the sanitary sewer; however, outside releases may have occurred.	Proceed to SI; focus on soil and groundwater.
11	Base Drainage Ditch	42.941688°	-87.890559°	AFFF discharges from FD equipment testing have been observed. AFFF likely infiltrated into permeable surface soils.	Proceed to SI; focus on surface water, groundwater, sediment, and soil throughout the length of the ditch.
12	Former Base Drainage Ditch	42.942316°	-87.889583°	AFFF discharges from FD equipment testing have been observed. AFFF likely infiltrated into permeable surface soils.	Proceed to SI; focus on groundwater and soil.
13	Hangar 306	42.942257°	-87.886402°	AFFF storage and FD vehicle station areas. No documented releases. Any discharges likely entered the sanitary sewer. The AFRES Fire Station is located off-site.	NFA.
14	Building 500	42.939936°	-87.886836°		
15	Building 701	42.937668°	-87.887531°		
16	Building 706	42.938169°	-87.887193°		
17	AFRES Fire Station	42.933806°	-87.905290°		

Table 1: Preliminary Assessment Report Summary and Recommendations (Continued)

No.	Potential AFFF PFC AOCs	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
18	Guard West Potable Water Well	42.938181°	-87.901347°	Dependent upon groundwater direction, may have been impacted by potential AFFF activities at the WIANF FD Equipment Testing Area (Guard South) AOC	Proceed to SI; focus on groundwater.
19	Guard East Artesian Well	42.944691°	-87.884938°	May have been impacted by the WIANF FD Equipment Testing Area (Guard East) AOC	Proceed to SI; focus on groundwater.

AFFF – Aqueous Film Forming Foam
 AFRES – Air Force Reserve
 AOC – Area of Concern
 FD – Fire Department
 GPS – Global Positioning Satellite

NFA – No Further Action
 OWS – oil/water separator
 PFC – Perfluorinated Compound
 SI – Site Investigation
 WIANF – Wisconsin Air National Guard

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FIGURES

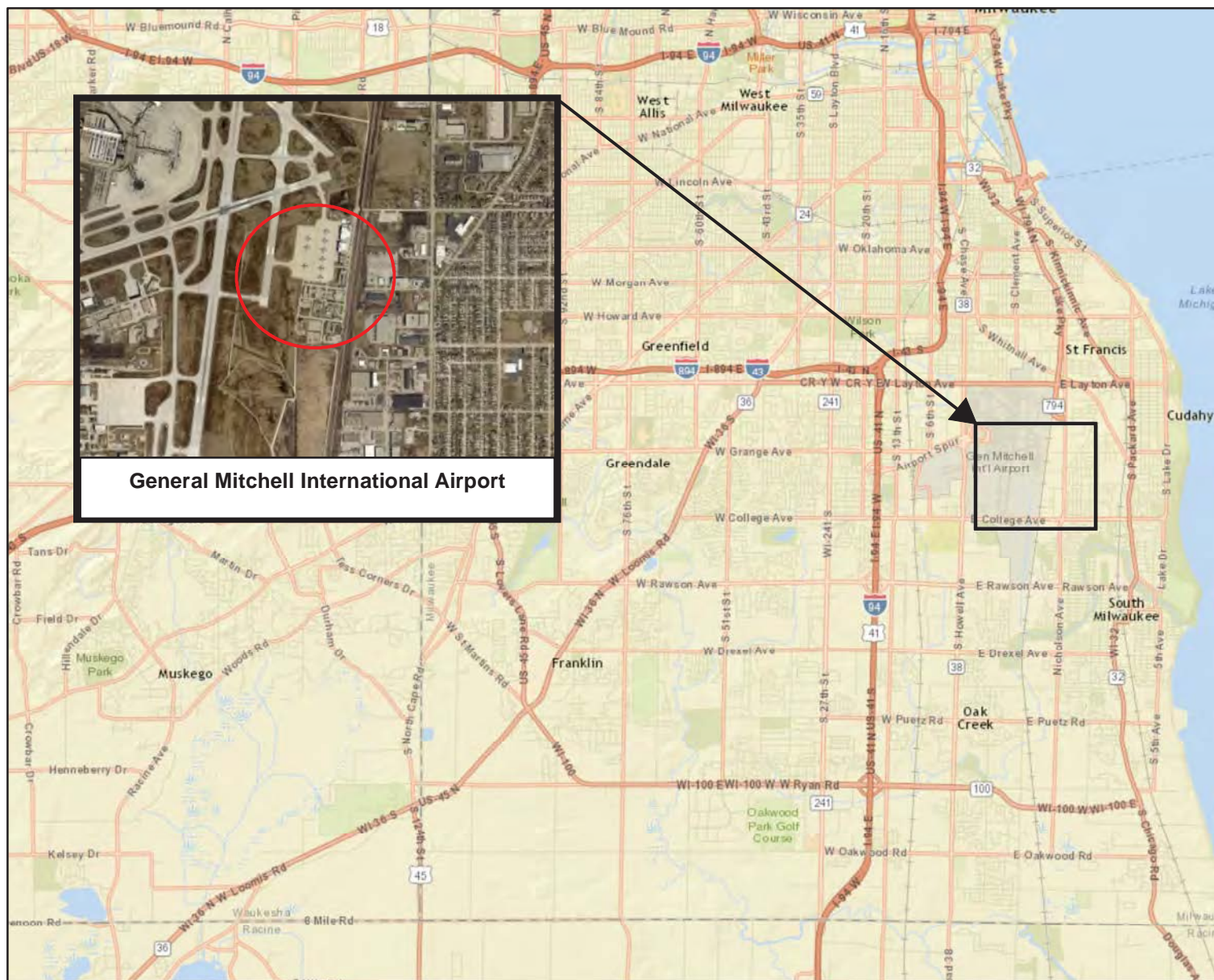
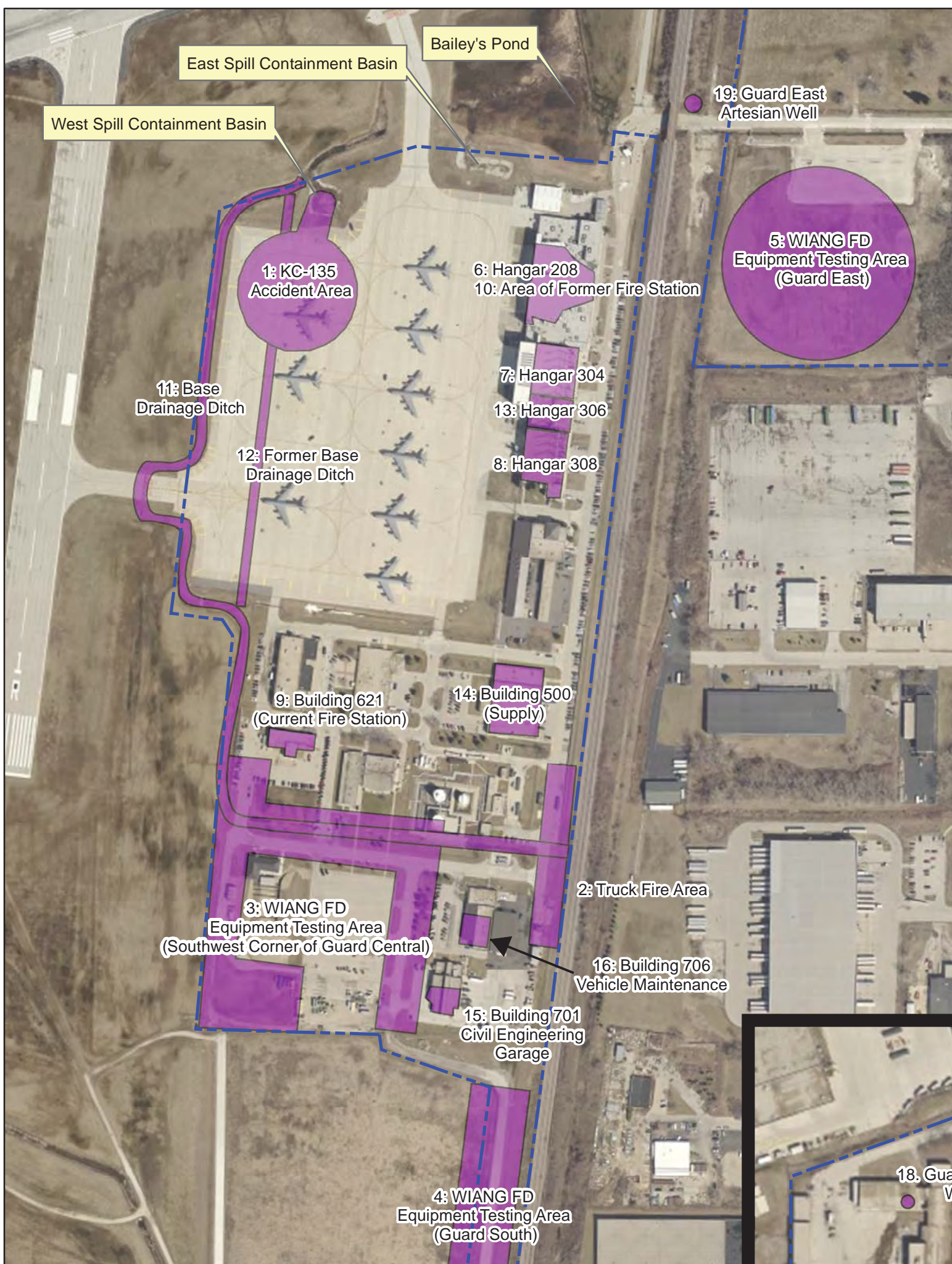


Figure 1
Site Location Map

Wisconsin Air National Guard Base
Milwaukee, Wisconsin



East Spill Containment Basin

Bailey's Pond

West Spill Containment Basin

19: Guard East Artesian Well

1: KC-135 Accident Area

6: Hangar 208
10: Area of Former Fire Station

5: WIANG FD Equipment Testing Area (Guard East)

11: Base Drainage Ditch

12: Former Base Drainage Ditch

7: Hangar 304

13: Hangar 306

8: Hangar 308

9: Building 621 (Current Fire Station)

14: Building 500 (Supply)

3: WIANG FD Equipment Testing Area (Southwest Corner of Guard Central)

2: Truck Fire Area

16: Building 706 Vehicle Maintenance

15: Building 701 Civil Engineering Garage

4: WIANG FD Equipment Testing Area (Guard South)

18: Guard East Artesian Well

APPENDIX A

PHOTO DOCUMENTATION

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015

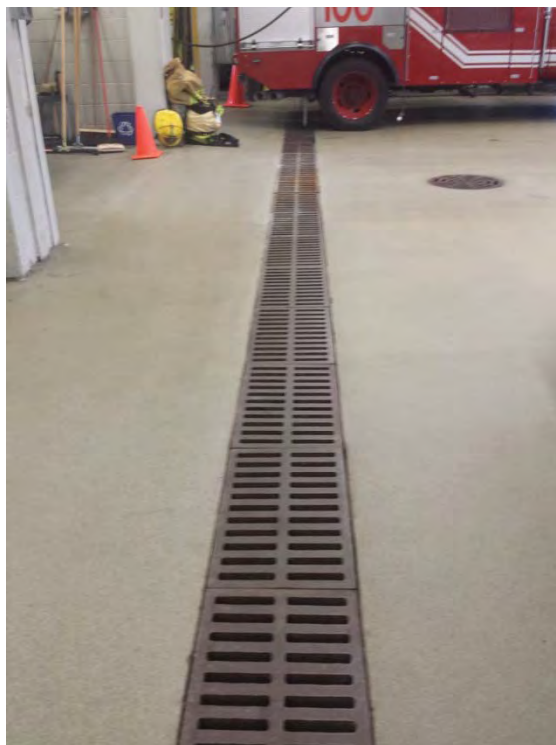


Photo 1: Trench drain at Building 621 (Fire Station).



Photo 2: AFFF storage at Building 621 (Fire Station).

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 3: Base drainage ditch on the south side of Building 621 (Fire Station).



Photo 4: Looking south toward Guard South (potential WIANG FD Equipment Testing Area).

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 5: Looking north toward Truck Fire AOC.



Photo 6: Looking southeast toward the WIANG FD Equipment Testing Area along Prime Beef Drive at Guard Central.

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 7: The southern portion of the Base drainage ditch at Guard Central.



Photo 8: Looking west toward the WIANG FD Equipment Testing Area in the southeast corner of Guard Central.

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 9: From left to right: Hangar 308, Hangar 306, Hangar 304 and Hangar 208.



Photo 10: The former AFFF storage area at Hangar 306.

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 11: The AFFF fire suppression system at Hangar 208

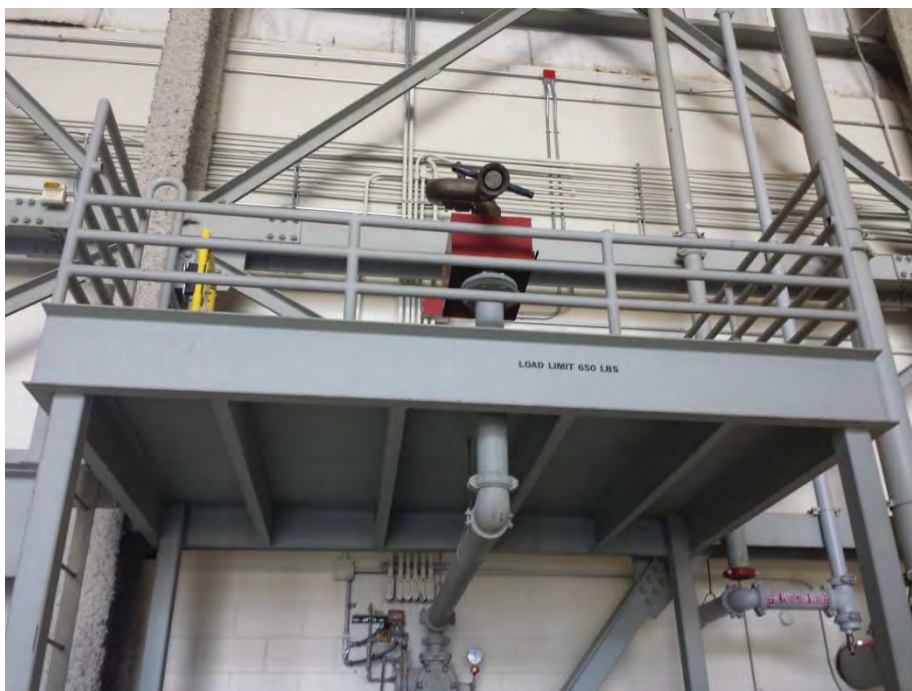


Photo 12: One of four AFFF cannons inside Hangar 208.

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 13: Looking south toward the potential WIANG FD Equipment Testing Area at Guard East.



Photo 14: An artesian well exists to the right of the train trestle.

Appendix A
Wisconsin Air National Guard, PFC PA Site Visit, Milwaukee, WI – August 11-13, 2015



Photo 15: A potable water well is located inside the left door at Building 301 at Guard West.



Photo 16: The Guard West potable water well, located inside Building 301.

APPENDIX B

INTERVIEW QUESTIONS AND RECORDS OF COMMUNICATION

Combined Interview

- Fire Chief John Charlier (23 yrs on Base)
- State Env Officer Claire Breckenridge (15 yrs)

**Interview Questions regarding AFFF use
(At Present and back to 1970)**

1. When did AFFF first start being used on this installation?

1970

2. What are the years of active use for each Fire Training Area (FTA), Aircraft Hangar, Fire Department, other places AFFF may have been used (collectively Potential Areas of Concern (PAOC)?

Bld 208 1994?

Bld 621 Fire Station 1995

3. What type of AFFF is used or has been used on this installation (i.e. 3%, 6%, High Expansion Foam)?

3%, High expansion

3% AFFF Bldg 208 HEF 304/308 2009 TO Present

4. What manufacturer's AFFF products are used or were used on this installation (i.e. 3M, Ansul, Chemguard, etc.)?

3M, National

5. Did you ever dispose of old bulk AFFF, if so, when and where?

Fire / Base
No / Yes through Potw

6. Is the AFFF stored as a mixed solution (3% or 6%) or do you formulate the AFFF on the installation?

Stored as a 3% solution

7. If AFFF is formulated on base, where is the solution mixed, contained, transferred, etc.?

8. Are your automated fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

Yes - Bld 208 underwing system uses AFFF

Bldg 304/308 converted to HEF 2009

FD.
For fire dept, had
enough to fill
vehicles, plus a
2nd load

9. If retrofitted, when was that done?

10. Do you have an inventory of the amount of AFFF stored on the installation, now and in the past, or present in automated fire suppression systems? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

Tank Storage was 4 to 6 K gal Between
304, 308, 208. NO Ponds, Discharged to POTW

11. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located? Any vehicles have a history of leaking AFFF?

P-2, P-4, P-19, P-19R, P-23, P-34, P-72

Fire Station 3d 621 / old station / Guard post / CE garage
Vehicle maintenance

12. How much AFFF (gallons) is/was carried/stored in the specified vehicles?

Between 100 - 500 gallons

13. Do you ever dispose of unused AFFF? If so, how and where?

Fire / Base
No / NOT in a few Years

approx. 6 drums of old AFFF
discharged to POTW in 2010
or 2011.

14. Has unused AFFF ever been disposed of in the past? If so, how and where?

Fire / Base

No / I'm sure JUST DON'T KNOW where other Than POTW

15. Do you/did you test the vehicles spray patterns to make sure equipment is working properly?

Fire / Base
Yes

- UP untill 6 AUG-15 when we were ordered to Halt

16. How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

~~monthly~~ - yes, see map for areas on base
Monthly were testing both place.

Annual testing for distance

17. Can you describe the procedure on how vehicles and systems are/were supplied with AFFF?

When a vehicle is low on AFFF we either dump 5 gallons of foam through top foam hatch or using intake pump

18. Can you provide the procedures on how these vehicles are/were cleaned/decontaminated and where vehicle cleaning is performed currently as well as performed in the past?

Fire: Washed in vehicle stalls in station and past for station

Base: Water rinse outside if washing was not needed

19. Is/was there a specified area on the installation where vehicles are filled with AFFF and does this area have secondary containment in case of spills?

Vehicles filled in stalls unless it was on scene of emergency.
No secondary containment.

20. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of?

N/A

21. How many FTAs are/were on this installation and where are they?

None

22. How many FTAs are active and inactive?

N/A NONE

23. What types of fuels/flammables were used at the FTAs?

N/A NONE

24. For inactive FTAs, when was the last time that fire training using AFFF was conducted at them? Find out ahead of time in Admin Record for former FTAs.

N/A NONE

25. What are/were the non-FTA locations where PFCs or AFFF release systems are installed (i.e. Hangars, Wastewater Treatment Plants, Fire Stations, etc.)? Where are/were these locations (Building numbers)?

Bld 208, 304 / 30E

26. Do you have a list (Building names and numbers, current and demolished) where the fire suppression systems either currently contain or have contained AFFF?

Bld 208 304 / 30E

27. Do you have records of fuel spill logs and emergency response logs? Knowledge of aircraft mishaps/crashes?

Yes

28. Do you have recollection or records of AFFF being used as a precaution in response to fuel releases to prevent fires?

Fire: NO

Base: NOT in the last 15 Years.

29. Do you have recollection or records of historical emergency response sites (i.e. crash sites and fires) where AFFF was used?

Yes

30. Do you have recollection or record of emergency runway landings where foam might have been used as a precaution?

NO

NOT BY US IF USED FOR THIS

31. If not written records or incomplete written records, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used?

NO

32. What is the typical procedure for removing dispensed AFFF from an area where it has been used?

construction removed

Allowed to dissipate, or Tricked to Pot'n

33. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

Bldg 500 supply

Bldg 621 Fire House

Storage of drums Bldg 306 for Hanger Tanks, OLD AFFF system

34. Do you have or did you have a chrome plating shop on base? If no, skip to Question #38.

NO

35. What were/are the years of operation of that chrome plating shop?

N/A

36. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control?

N/A

37. If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

N/A

38. Is there anyone else or other base organization personnel that you would recommend we interview? Name, organization, position, phone number, e-mail.

—

39. Was it common practice to wash away fuel spills with AFFF?

Fire: NO

Base: I'm sure that was a practice in the past before 2000
That's when I got here

40. Identify drainage patterns around flightline/ramp area. Point source discharge is likely AFFF

Area of Concern (AOC). Current Ramp and Drainage has changed

as of 2001. Detention Ponds did not exist. All

Drainage went into surface waters west of Ramp and North. everything ended in the detention Pond owned

By Airport next to our gate. All drainage on base

Now and back to 1962 when the base was built

Drains to that area. Prior to 1962 base was

located ^{at or near where} ~~where~~ Airport terminal is now

Airport has two Fire Training Pits north of the base. I know since I've been here (2000) we have not used them nor have we used the FTP at the old reserve (440th). I'm sure we used them prior to that but have no records of that.

~~4~~ Mark Culver (Alarms)
- 11 yrs on Base
- 5 yrs in this position

**Interview Questions regarding AFFF use
(At Present and back to 1970)**

1. When did AFFF first start being used on this installation?

Not known

2. What are the years of active use for each Fire Training Area (FTA), Aircraft Hangar, Fire Department, other places AFFF may have been used (collectively Potential Areas of Concern (PAOC))?

- NA -

3. What type of AFFF is used or has been used on this installation (i.e. 3%, 6%, High Expansion Foam)?

4. What manufacturer's AFFF products are used or were used on this installation (i.e. 3M, Ansul, Chemguard, etc.)?

- NA -

5. Did you ever dispose of old bulk AFFF, if so, when and where?

- NA -

6. Is the AFFF stored as a mixed solution (3% or 6%) or do you formulate the AFFF on the installation?

- NA -

7. If AFFF is formulated on base, where is the solution mixed, contained, transferred, etc.?

- NA -

8. Are your automated fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

- NA -

9. If retrofitted, when was that done?

~~Apple~~
All hangars
planning to do
transfer to HEF
within 4 yrs.

10. Do you have an inventory of the amount of AFFF stored on the installation, now and in the past, or present in automated fire suppression systems? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

- NA -

11. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located? Any vehicles have a history of leaking AFFF?

- NA -

12. How much AFFF (gallons) is/was carried/stored in the specified vehicles?

- NA -

13. Do you ever dispose of unused AFFF? If so, how and where?

- NA -

14. Has unused AFFF ever been disposed of in the past? If so, how and where?

- NA -

15. Do you/did you test the vehicles spray patterns to make sure equipment is working properly?

- NA -

16. How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

- NA -

17. Can you describe the procedure on how vehicles and systems are/were supplied with AFFF?

- NA -

18. Can you provide the procedures on how these vehicles are/were cleaned/decontaminated and where vehicle cleaning is performed currently as well as performed in the past?

- NA -

19. Is/was there a specified area on the installation where vehicles are filled with AFFF and does this area have secondary containment in case of spills?

- NA -

20. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of?

- NA -

21. How many FTAs are/were on this installation and where are they?

- NA -

22. How many FTAs are active and inactive?

- NA -

23. What types of fuels/flammables were used at the FTAs?

- NA -

24. For inactive FTAs, when was the last time that fire training using AFFF was conducted at them? Find out ahead of time in Admin Record for former FTAs.

- NA -

25. What are/were the non-FTA locations where PFCs or AFFF release systems are installed (i.e. Hangars, Wastewater Treatment Plants, Fire Stations, etc.)? Where are/were these locations (Building numbers)?

- NA -

26. Do you have a list (Building names and numbers, current and demolished) where the fire suppression systems either currently contain or have contained AFFF?

- NA -

27. Do you have records of fuel spill logs and emergency response logs? Knowledge of aircraft mishaps/crashes?

- NA -

28. Do you have recollection or records of AFFF being used as a precaution in response to fuel releases to prevent fires?

- NA -

29. Do you have recollection or records of historical emergency response sites (i.e. crash sites and fires) where AFFF was used?

- NA -

30. Do you have recollection or record of emergency runway landings where foam might have been used as a precaution?

- NA -

31. If not written records or incomplete written records, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used?

I accidental release heard about prior to Mark's tenure in Bldg 208 - working with flow system.
Not sure if foam flowed through.

No accidental releases during Mark's tenure.

Probably
no records
kept for
accidental
discharges

current
Storage: Cannons's Haz Material Storage Room (North
end of hangar) ↓ has self-contained
sump (secondary
containment)

32. What is the typical procedure for removing dispensed AFFF from an area where it has been

used?
Clarke Breckenridge: All discharges of foam from hangars → POTW
Discharge was slowly diluted with water.
The POTW has been notified prior to any release discharge.

33. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

Testing done for cannons (Bldg 208) - flow goes to sanitary.
Set to do this yr again. Systems in hangars tested every
3rd year or if hangar down for a time (e.g. construction) - done
when brought back on.

34. Do you have or did you have a chrome plating shop on base? If no, skip to Question #38.

- NA -

35. What were/are the years of operation of that chrome plating shop?

36. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control?

37. If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

38. Is there anyone else or other base organization personnel that you would recommend we interview? Name, organization, position, phone number, e-mail.

Robert (Bob) Lynch - worked 30 yrs here (Retired)
- Carol (front desk) would have information

39. Was it common practice to wash away fuel spills with AFFF?

- NA -

Note: 304 & 303 (current = HEF) share fire suppression system,
so only run water through 308 during testing.

40. Identify drainage patterns around flightline/ramp area. Point source discharge is likely AFFF Area of Concern (AOC).

- N/A -

*** Robert Lynch** (Recently Retired)
↳ started 1979 (full time)
↳ as Maintenance Mechanic
then as Buildings Ground Superintendent

**Interview Questions regarding AFFF use
(At Present and back to 1970)**

1. When did AFFF first start being used on this installation?

When buildings were first installed

Bldgs 304, 308 - late 80s

Bldg 208 - mid 90s

2. What are the years of active use for each Fire Training Area (FTA), Aircraft Hangar, Fire Department, other places AFFF may have been used (collectively Potential Areas of Concern (PAOC)?

- NA -

3. What type of AFFF is used or has been used on this installation (i.e. 3%, 6%, High Expansion Foam)?

4. What manufacturer's AFFF products are used or were used on this installation (i.e. 3M, Ansul, Chemguard, etc.)?

this was always used in hangars (from Marionette, MI)

5. Did you ever dispose of old bulk AFFF, if so, when and where?

Not known

6. Is the AFFF stored as a mixed solution (3% or 6%) or do you formulate the AFFF on the installation?

Not known

7. If AFFF is formulated on base, where is the solution mixed, contained, transferred, etc.?

- NA -

8. Are your automated fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

- NA -

9. If retrofitted, when was that done?

- NA -

10. Do you have an inventory of the amount of AFFF stored on the installation, now and in the past, or present in automated fire suppression systems? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

- NA -

11. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located? Any vehicles have a history of leaking AFFF?

- NA -

12. How much AFFF (gallons) is/was carried/stored in the specified vehicles?

- NA -

13. Do you ever dispose of unused AFFF? If so, how and where?

Not known

14. Has unused AFFF ever been disposed of in the past? If so, how and where?

Not known

15. Do you/did you test the vehicles spray patterns to make sure equipment is working properly?

- NA -

16. How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

- NA -

17. Can you describe the procedure on how vehicles and systems are/were supplied with AFFF?

- NA -

18. Can you provide the procedures on how these vehicles are/were cleaned/decontaminated and where vehicle cleaning is performed currently as well as performed in the past?

- NA -

19. Is/was there a specified area on the installation where vehicles are filled with AFFF and does this area have secondary containment in case of spills?

- NA -

20. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of?

- NA -

21. How many FTAs are/were on this installation and where are they?

- NA -

22. How many FTAs are active and inactive?

- NA -

23. What types of fuels/flammables were used at the FTAs?

- NA -

24. For inactive FTAs, when was the last time that fire training using AFFF was conducted at them? Find out ahead of time in Admin Record for former FTAs.

- NA -

25. What are/were the non-FTA locations where PFCs or AFFF release systems are installed (i.e. Hangars, Wastewater Treatment Plants, Fire Stations, etc.)? Where are/were these locations (Building numbers)?

Bldgs 208, 304, 308, ~~306~~, ~~302~~

26. Do you have a list (Building names and numbers, current and demolished) where the fire suppression systems either currently contain or have contained AFFF?

↑ Same

27. Do you have records of fuel spill logs and emergency response logs? Knowledge of aircraft mishaps/crashes?

Active fire in 93 (plane explosion)
- AFFF used

28. Do you have recollection or records of AFFF being used as a precaution in response to fuel releases to prevent fires?

Not known

29. Do you have recollection or records of historical emergency response sites (i.e. crash sites and fires) where AFFF was used?

See #27

30. Do you have recollection or record of emergency runway landings where foam might have been used as a precaution?

- NA -

31. If not written records or incomplete written records, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used?

Accidental release ^{of AFFF} at Bldg 308 dock
↳ approx 20 yrs ago

- Bldg 308: accidental release on South dock
approx. 20 years ago.

- There are videos of testing releases - Mark Culver would have

32. What is the typical procedure for removing dispensed AFFF from an area where it has been used?

~~AFFF testing releases~~
Testing release discharges (from fire suppression systems) were routed directly to floor drain because it's too much work to clean the main floor.

33. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

- Bldg 306 (old machine shop) - AFFF was stored here
- Bldg 500 - AFFF was stored here and is now stored at Fire Station #2 instead

34. Do you have or did you have a chrome plating shop on base? If no, skip to Question #38.

- NA -

35. What were/are the years of operation of that chrome plating shop?

36. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control?

37. If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

38. Is there anyone else or other base organization personnel that you would recommend we interview? Name, organization, position, phone number, e-mail.

39. Was it common practice to wash away fuel spills with AFFF?

- NA -

40. Identify drainage patterns around flightline/ramp area. Point source discharge is likely AFFI
Area of Concern (AOC).

by 14

APPENDIX C

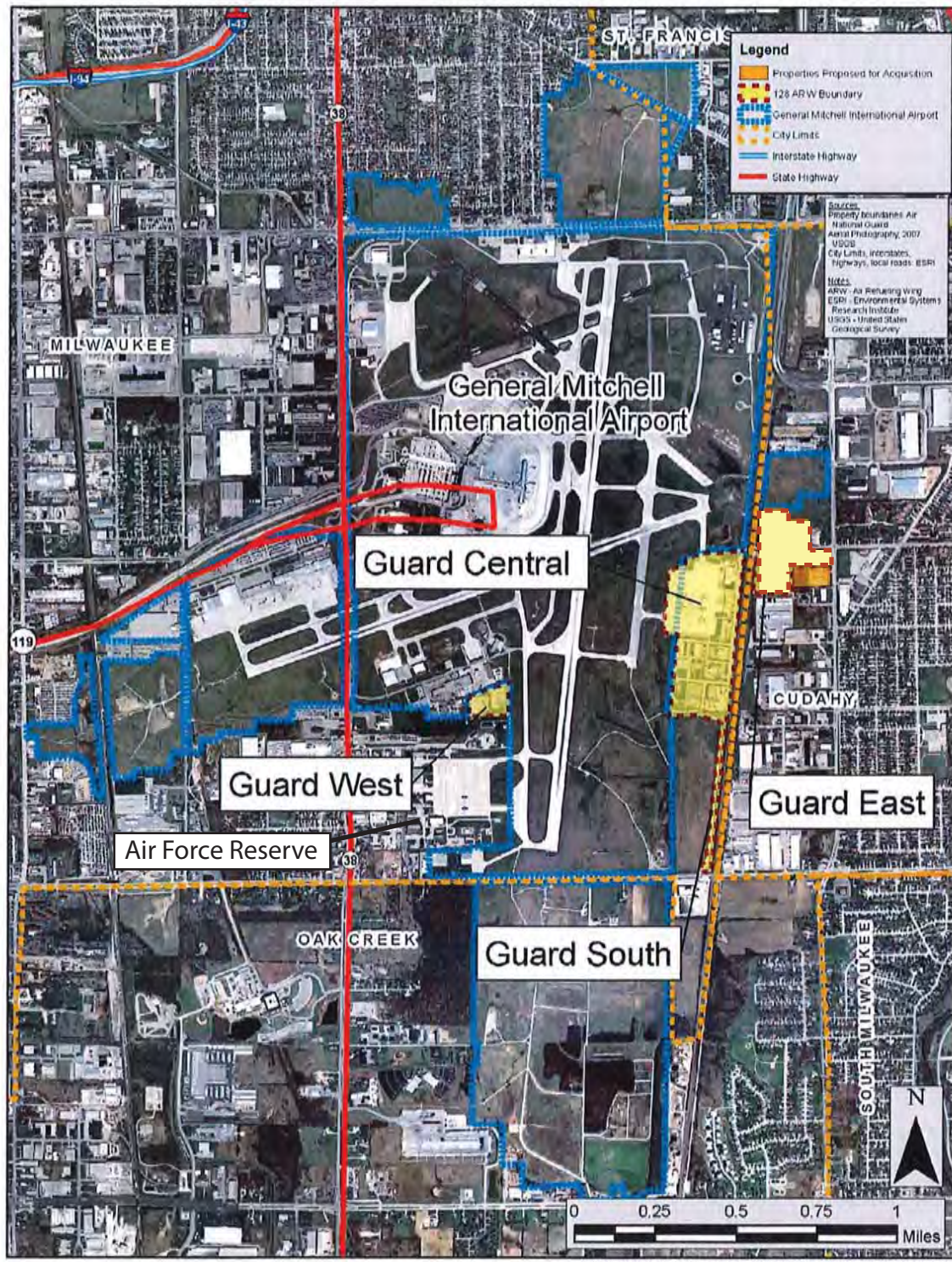
SUPPORTING DOCUMENTATION

APPENDIX C-1

ADDITIONAL SITE LOCATION MAPS

BB&E Note: Guard East installation boundary revised.

Figure 1-2. Location of 128 ARW Within GMIAP



Installation Restoration Program

PHASE I - RECORDS SEARCH

**For Air Force Reserve and
Air National Guard Facilities at
General Billy Mitchell Field
Milwaukee, Wisconsin**

November 1984

Prepared for:
**United States Air Force Reserve
Robins AFB, Georgia 31098**



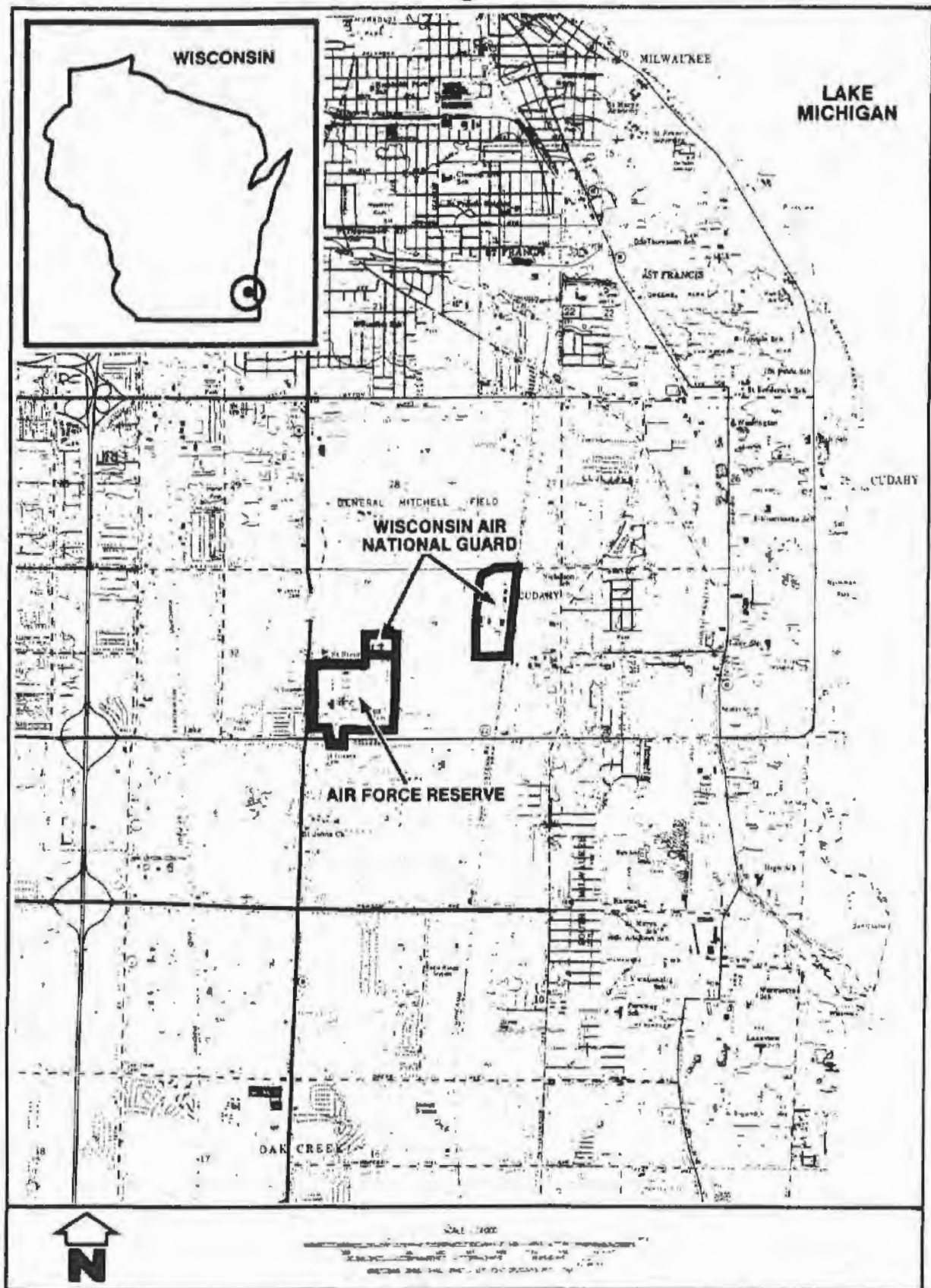


FIGURE 2.1 AREA LOCATION MAP

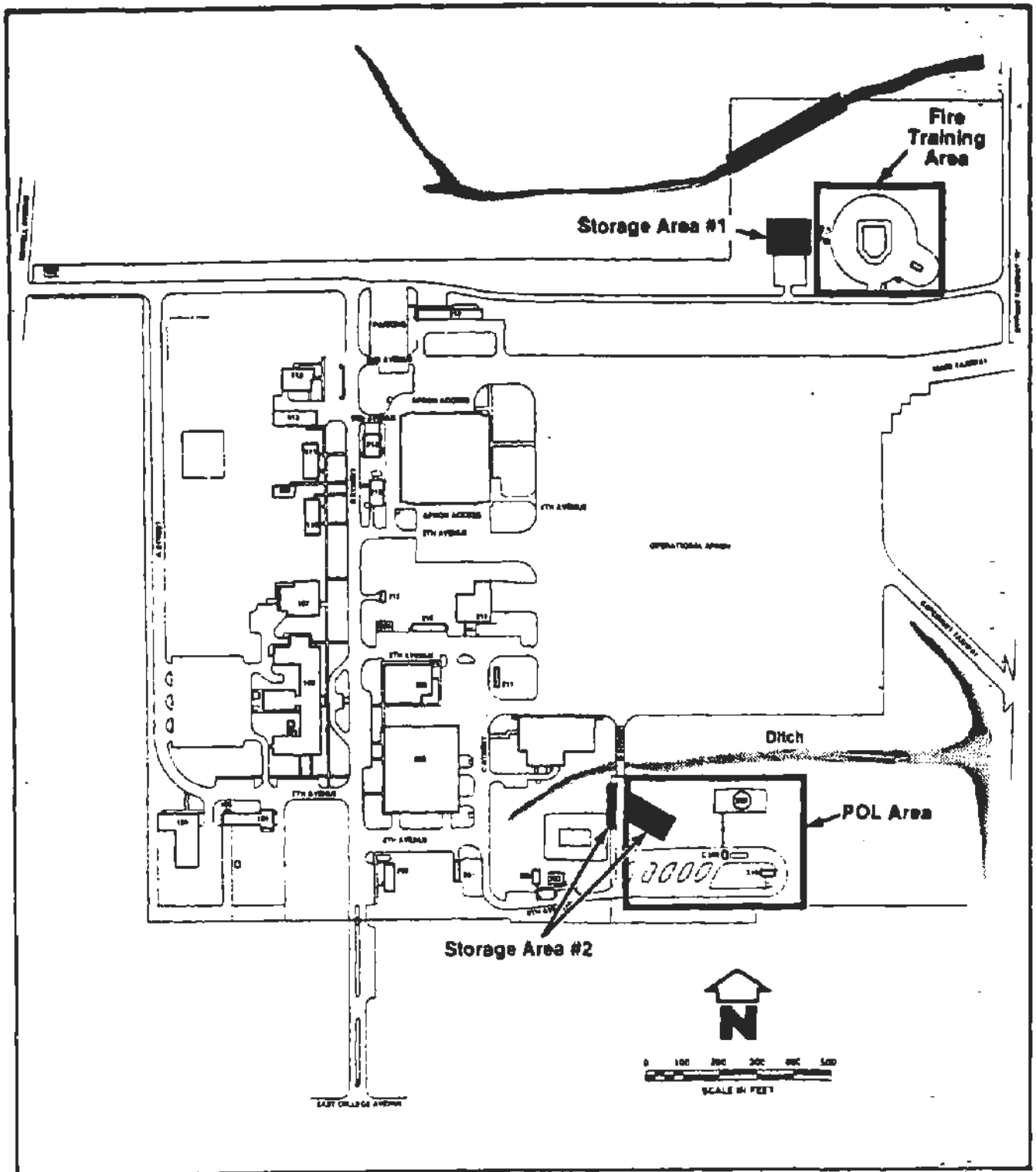
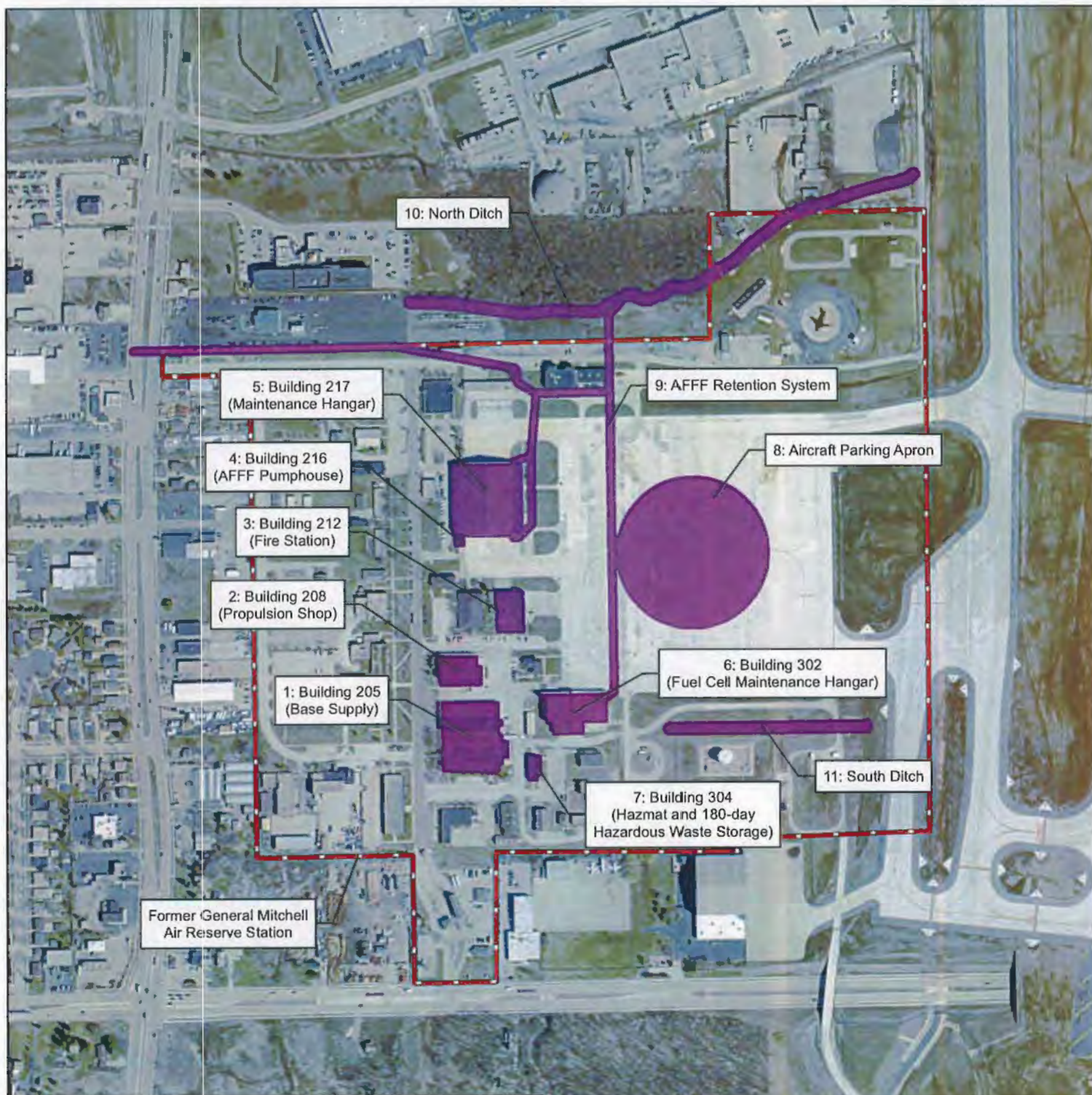


FIGURE ES-1 SITES SUBJECTED TO HARM RATING
U.S. AIR FORCE RESERVE

APPENDIX C-2

POTENTIAL AFFF AREA MAP AT FORMER AFRES

(Note: Figure obtained from the Draft Preliminary Assessment for the Former AFRES and locations may not be final)



Note:

Numbers associated with AFFF Areas correspond to Tables 5 and 6.
 Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar
 Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping,
 Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SYMBOL KEY

- Potential AFFF Area
- General Mitchell ARS Installation Boundary

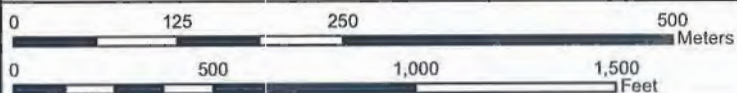
Air Force Civil Engineer Center

2261 Hughes Avenue
 Building 171, Ste 155
 JB SA Lackland, Texas 78236



**FIGURE 3
 Potential AFFF Areas**

PFC Preliminary Assessment
 Former General Mitchell Air Reserve Station
 Milwaukee, Wisconsin



01/12/2015

Gen_Mitchell_Potential PFC_Areas_PRR

PROJ: 557290177

Drawn: KAN

APPENDIX C-3

GROUNDWATER AND SURFACE FLOW DIRECTION MAPS

LEGEND



Sanitary Sewer



Storm Sewer



Permitted Non-Stormwater Discharge



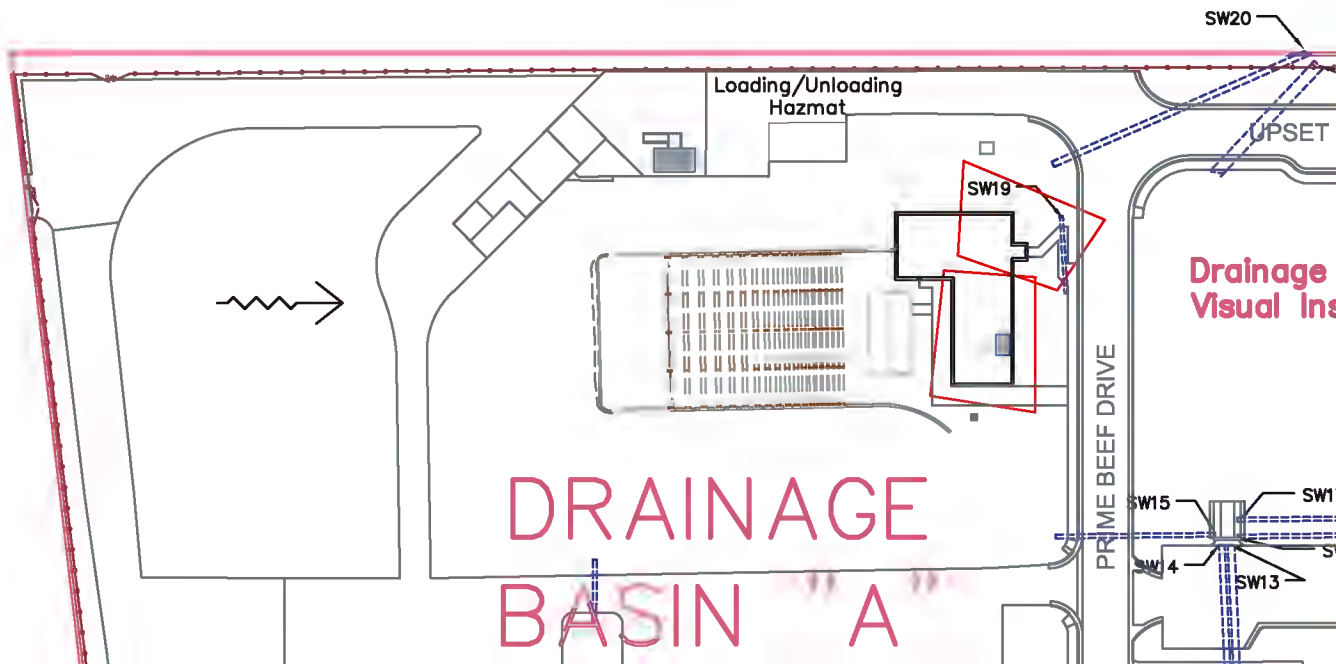
Drainage Basin



Hazmat Storage Area
(see Table 3.4 for details)



Sampling/Inspection Point



**PRELIMINARY ASSESSMENT/SITE INVESTIGATION
REPORT FOR
COMPLIANCE RESTORATION PROGRAM
WISCONSIN AIR NATIONAL GUARD
GENERAL MITCHELL INTERNATIONAL AIRPORT
MILWAUKEE, WISCONSIN**



**Contract Number W912DR-13-D-0017
Delivery Order Number 0001**

**FINAL
July 2015**



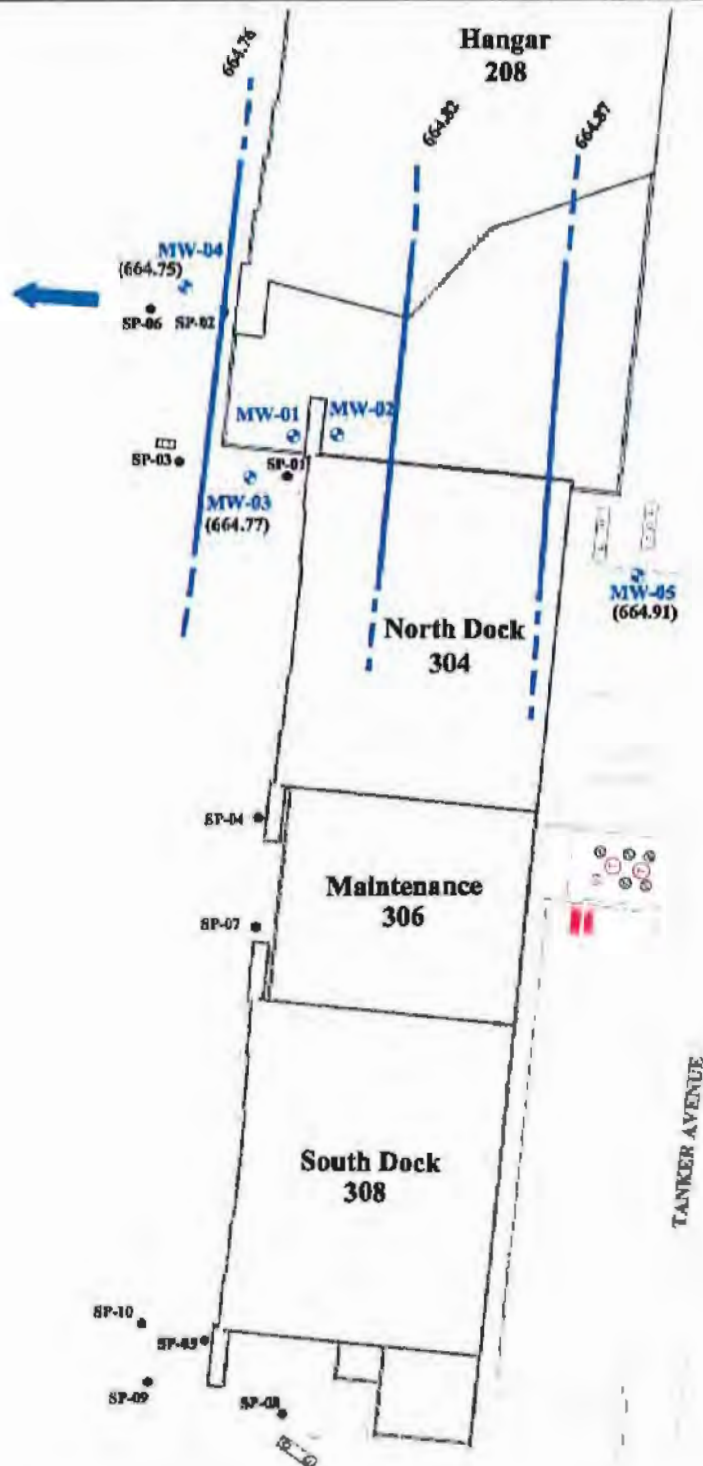
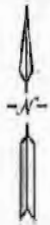
Legend

- IRP Site
- Area of Concern (AOC)
- Installation Boundary*
- ➔ Estimated General Groundwater Flow Direction (OpTech 1996)*

*Source: Installation boundary as shown in the Common Installation Picture (CIP) geodatabase provided by ANG GeoBase on 6/16/2014; Groundwater flow direction as documented in the Site Investigation Report for IRP Site No. 4 (OpTech 1996).

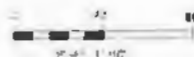


<p>LOCATIONS OF AOCs AT GENERAL MITCHELL</p> <p>WISCONSIN AIR NATIONAL GUARD MILWAUKEE, WI</p>
<p>PROJECT: G:\GIS_DATA\Great Lakes\General Mitchell\Projects\PA\SI\Figure 1-1 AOC Location Map.mxd</p>
<p>FIGURE: 1-1 DATE: 2/20/2015</p>



LEGEND

- (664.91) GROUNDWATER ELEVATION (FT ABOVE MSL)
- SP-10 SOIL PROBE IDENTIFIER AND NUMBER
- ⊕ MW-04 MONITORING WELL IDENTIFIER AND NUMBER



SOURCE: KAPUR & ASSOC. 2008; 128th ARW/CE; MODIFIED BY PEER



PEER

PROJ./3005-028
WIANG/SA-RPT/FIG 6.2

POTENTIOMETRIC SURFACE MAP (16 NOVEMBER 2007)
BUILDING 304-HANGAR, 128th AIR REFUELING WING
WISCONSIN AIR NATIONAL GUARD, MILWAUKEE

FIGURE
6.2

FINAL

ENVIRONMENTAL BASELINE SURVEY

PROPERTY ACQUISITION FOR THE 128 AIR REFUELING
WING
WISCONSIN AIR NATIONAL GUARD



GENERAL MITCHELL INTERNATIONAL AIRPORT
MILWAUKEE, WI

JULY 2009

Note: Guard East is shown in the below figure.

Figure 3-4. Water Features Map





HSI GEOTRANS

A TETRA TECH COMPANY

175 N. Corporate Drive
Suite 100
Brookfield, Wisconsin
53045

414-792-1282 FAX 414-792-1310

July 11, 1997
(F036)

Mr. Bizhan Sheikholeslami
Wisconsin Department of Natural Resources
4041 N. Richards Street
P. O. Box 12436
Milwaukee, WI 53212

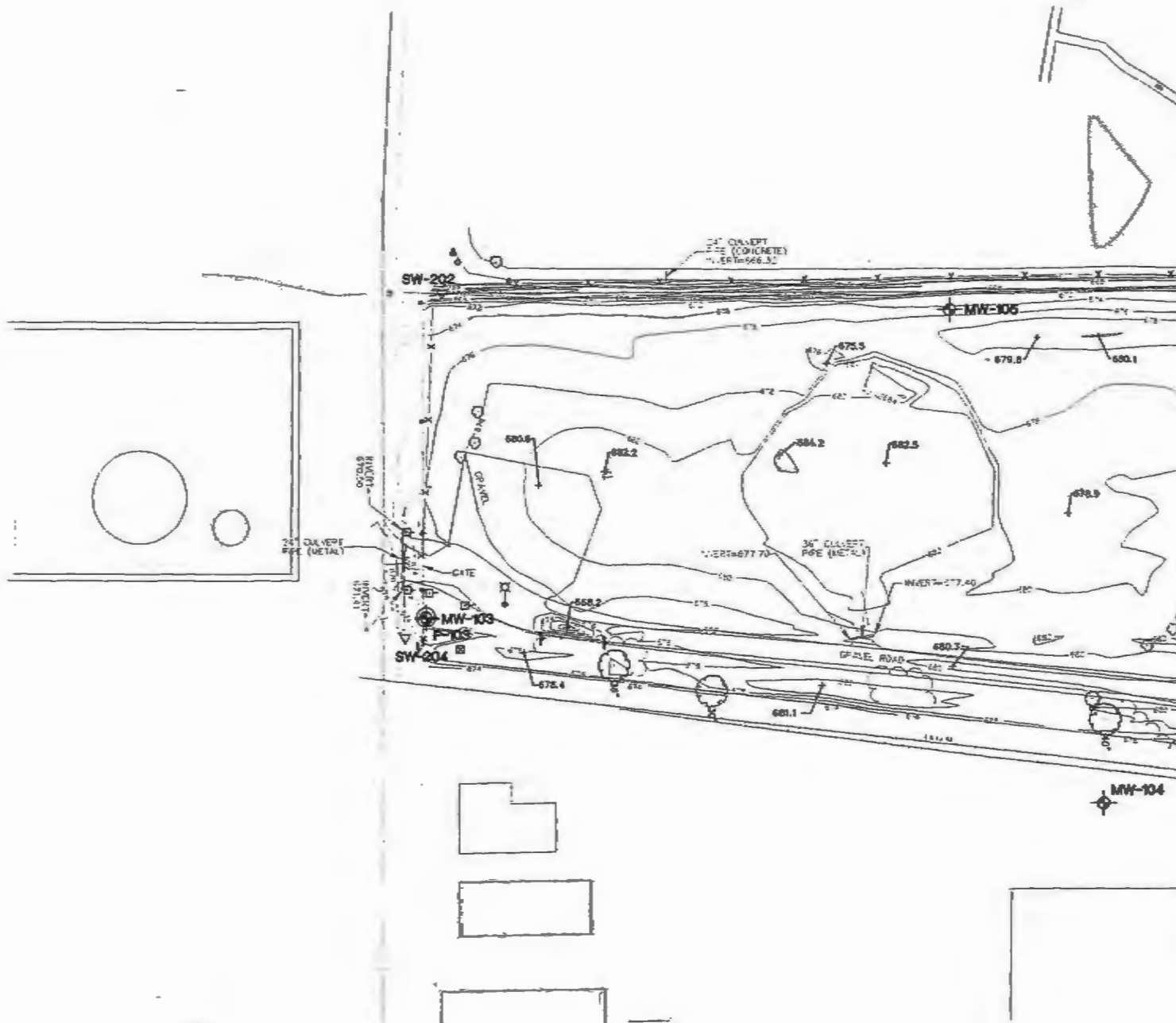
RE: North College Avenue Landfill

Dear Mr. Sheikholeslami:




HSI GeoTrans has prepared this report on behalf of the City of Milwaukee for the North College Avenue Landfill. This report provides documentation of the construction of groundwater monitor wells at the landfill, and results from the initial sampling of surface water and groundwater. This report also includes a water table map, as well as calculations of groundwater gradients and hydraulic conductivities. Because no significant groundwater or surface water impacts were detected, HSI GeoTrans is asking that the 18-inch cover soil layer above the proposed 2-foot clay cap be waived from the closure requirements for this site.

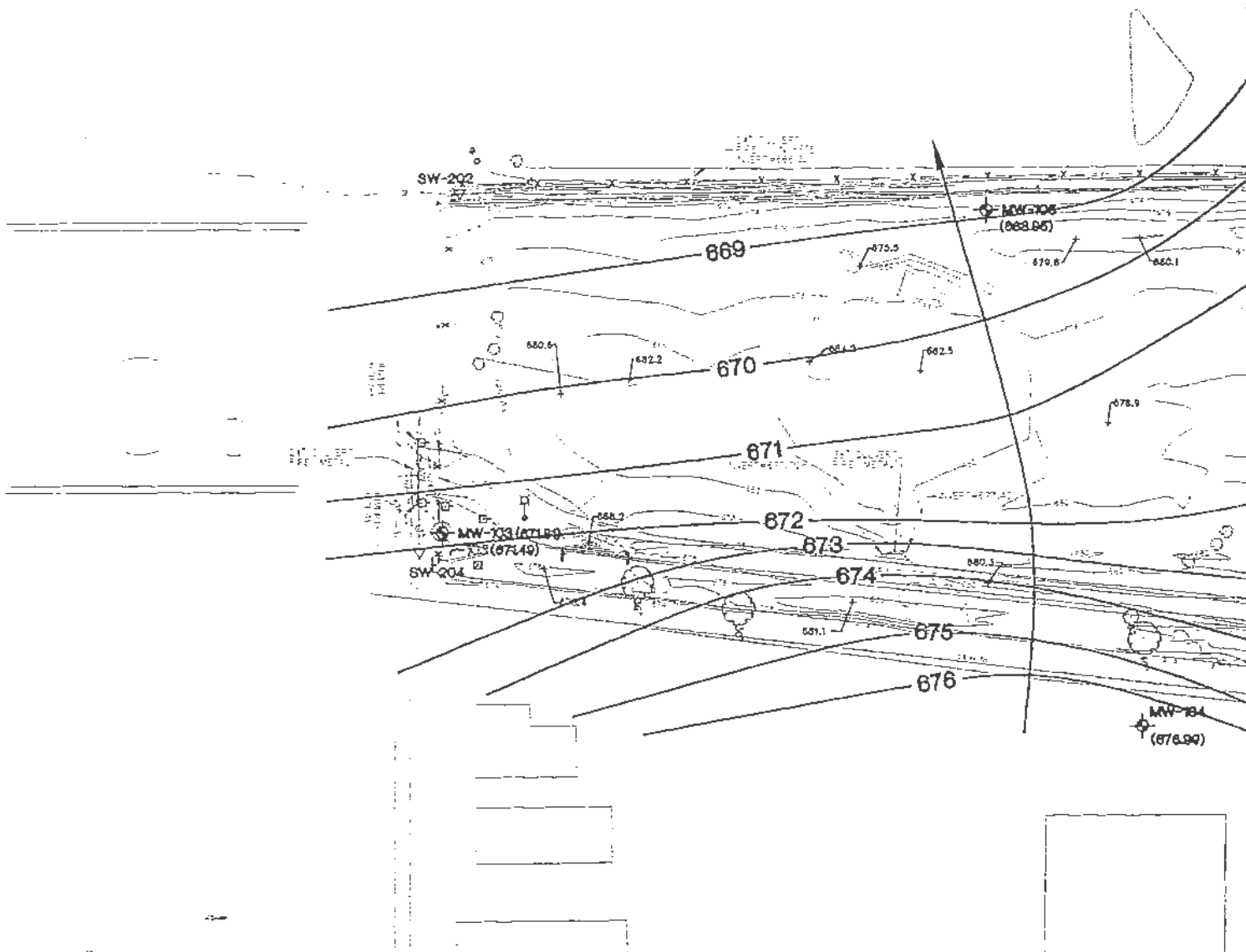
WELL INSTALLATION

In accordance with the July 3, 1996 Closure Plan, six water table monitor wells and three deeper piezometers were installed for determining the hydrologic conditions and quality of groundwater at the landfill (Figure 1). Soils & Engineering Services of Madison, Wisconsin was subcontracted to drill and install the wells under HSI GeoTrans' supervision. Wells MW-101, MW-102, and MW-103 were installed in November 1996. Based on the data collected from these wells, three additional wells (MW-104, MW-105, MW-106) and three piezometers (P-101, P-103, and P-106) were installed in May 1997. All nine well locations are shown on Figure 2.








EXPLANATION

- 
MW-101 WATER TABLE MONITOR WELL LOCATION AND DESIGNATION
- 
SW-201 SURFACE WATER SAMPLE LOCATION AND DESIGNATION
- 
P-103 PIEZOMETER LOCATION AND DESIGNATION



EXPLANATION

- 
MW-101
 (868.01) WATER TABLE MONITOR WELL
 LOCATION, DESIGNATION, AND GROUND W.
- 
SW-201
 SURFACE WATER SAMPLE
 LOCATION AND DESIGNATION
- 
P-103
 PIEZOMETER
 LOCATION AND DESIGNATION
- 
675 GROUND WATER CONTOUR (ft msl)
- 
 FLOW DIRECTION

APPENDIX C-4

INSTALLATION RESTORATION PROGRAM SITE LOCATION MAP (MWH, 2015)

**Record of Decision
Installation Restoration Program
Sites 1 through 9**

FINAL

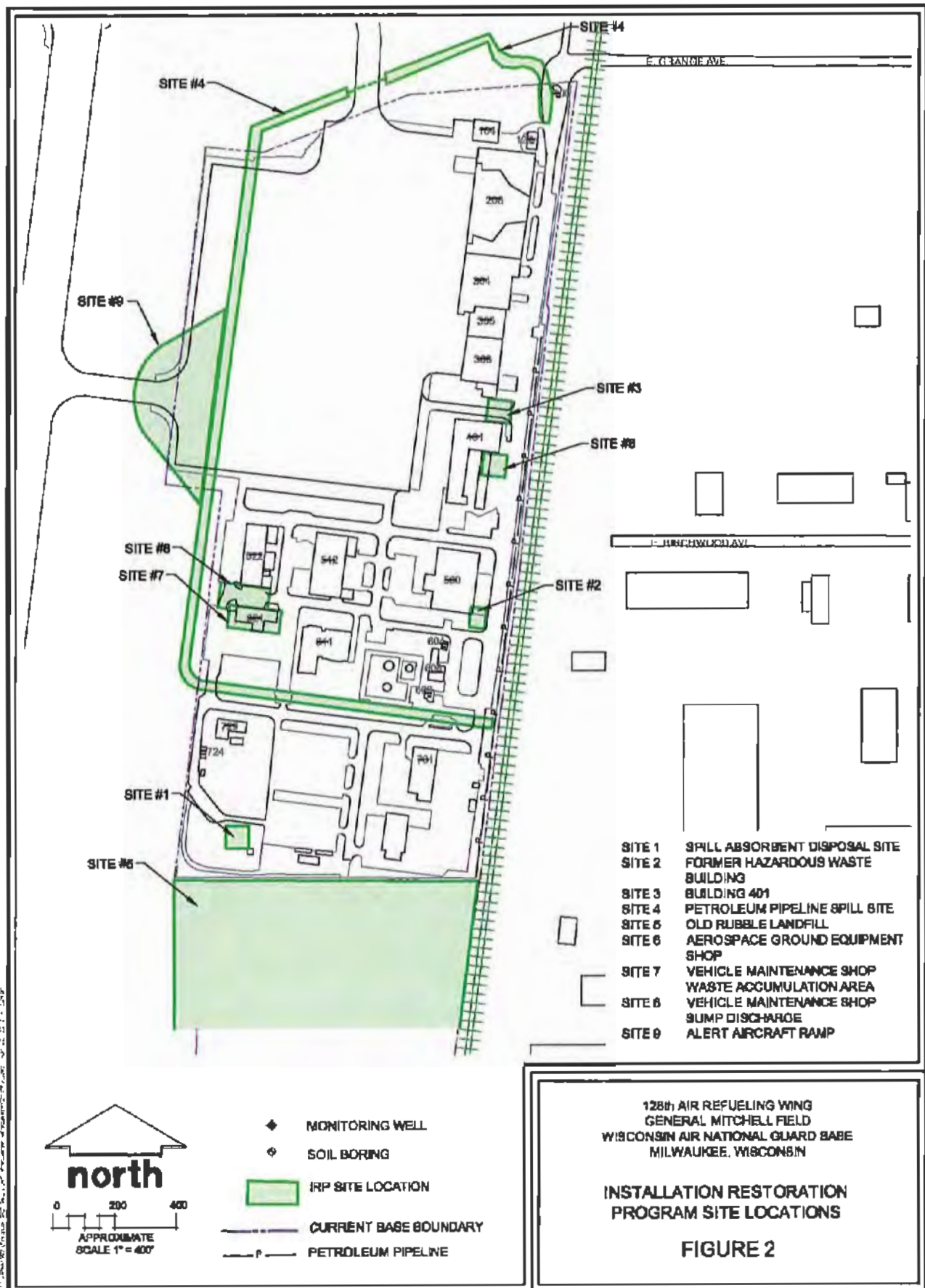


**128th Fighter Wing
Wisconsin Air National Guard
General Mitchell International Airport –
Milwaukee, Wisconsin**

Prepared For

**NGB/A7OR
Joint Base Andrews, Maryland**

February 2015



APPENDIX C-5

**BASE PHOTO DOCUMENTATION OF AFFF RELEASES (GUARD CENTRAL) –
CIRCA 2000s**





APPENDIX C-6

FIRE SUPPRESSION SYSTEM TESTING LOGS

128TH ANG Fire Alarm Systems

UFC 3-601-02 ITM Tasks 2/year

Building 208 September 2012

Foam Spray

1. Control Valve

a) operate and lubricate valves to ensure operability

of Control Valves 4 DELUGE VALVES

NOTES :

2. Foam Proportioning System

a) Conduct full flow test to ensure system function

b) Verify proper concentration

NOTES : CONDUCTED FULL FLOW FOAM PROPORTIONING TEST THRU NORTH DELUGE/W.C.M.

3. Actuators

a) Verify operability of manual and automatic actuators

of Actuators ①

NOTES : SINGLE HYDRAULIC ACTUATOR @ FOAM TANK

4. Distribution System

- a) Verify nozzle coverage during flow test

NOTES: W.O.M.S CYCLED MANUALLY & VISUALLY INSPECTED FOR COVERAGE

5. Deluge Valves

- a). Clean and reset manual valves

of Valves 4

NOTES: 4 DELUGE VALVE / W.O.M. COMBINATION

128TH ANG Fire Alarm Systems

UFC 3-601-02 ITM Tasks 2/year

Building 308 September 2012

High-Expansion Foam System

1. Foam Generator

a) Conduct test to verify operability (water powered may be done with water only)

of Foam Generators 5 OF ~~12~~ 12

NOTES: WATER TEST DONE ON 308
304 RECOMMISSIONED ~~AND~~ IN 2011

2. Actuators

a) Verify that all manual and automatic actuators function

of Actuators 2

NOTES: FOAM ACTUATORS CYCLED DURING REFUGIE
VALVE TRIP TESTING

128TH ANG Fire Alarm Systems

UFC 3-601-02 ITM Tasks 2/year

Building 208 September 2012

Fire Pump

1. Control Valve

a) operate and lubricate valves to ensure operability

of Control Valves 7

NOTES :

2. Controllers

a) Calibrate pressure switches

b) Exercise circuit breakers and switches to verify operability

c) Inspect fuses

of Controllers 1

NOTES :

3.Pumps

- a) Check shaft coupling and alignment
- b) Check pump shaft end play
- c) Lubricate bearing
- d) Lubricate coupling
- e) Lubricate right angle drives *NA*

NOTES :

4. Fuel (engine driven pumps)

- a) Sample fuel to verify quality

NOTES:

5. Relief Valves

- a) Calibrate valves

NOTES:

6. Emergency Power Supply *NA*

- a) Test to verify availability and capacity for pump motor

NOTES:

128TH ANG Fire Alarm Systems

UFC 3-601-02 ITM Tasks 2/year

Building 308 September 2012

Fire Pump

1. Control Valve

a) operate and lubricate valves to ensure operability

of Control Valves 2

NOTES: (1) EA. OS&Y VALVE AT SUCTION SIDE OF
(2) VARI-SPEED ELECTRIC FIRE PUMPS

2. Controllers

a) Calibrate pressure switches

b) Exercise circuit breakers and switches to verify operability

c) Inspect fuses

of Controllers 2

NOTES: ISOLATING MEANS & CIRCUIT BREAKERS
EXERCISED DURING FULL FLOW TESTING.

3. Foam Proportioning Systems

a) Conduct full flow test to ensure proper system function. (Test connection may be used or through foam generators. Flow only until foam appears from each generator, then end foam).

b) Verify proper concentration

NOTES: PROPORTIONING SYSTEM VERIFIED DURING
SYSTEM RE COMMISSIONING IN 2011

4. Control Valve

a) operate valve through entire travel to verify function

b) Lubricate stem

foam control valves 2

NOTES: (1) CONTROL VALVE @ TANK
(1) CONTROL VALVE @ ACTUATOR HEADERS ON
DELUGE VALVES (2)

*Strainers

a) Inspect and clean after system actuation or flow test

of strainers (5)

NOTES: (5) FOAM GENERATOR STRAINERS REMOVED
AND INSPECTED AFTER "WATER ONLY" TEST IN
BLDG 308

3.Pumps

- a) Check shaft coupling and alignment
- b) Check pump shaft end play
- c) Lubricate bearing
- d) Lubricate coupling
- e) Lubricate right angle drives

NOTES :

4. Fuel (engine driven pumps) *N/A - 17-000K 17MPS*

- a) Sample fuel to verify quality

NOTES:

5. Relief Valves

- a) Calibrate valves

NOTES:

6. Emergency Power Supply *N/A*

- a) Test to verify availability and capacity for pump motor

NOTES:

128TH ANG Fire Alarm Systems

UFC 3-601-02 ITM Tasks 2/year

Building 308 September 2012

Deluge sprinkler

1. Control valves

- a) Operate valve through entire travel to verify function
- b) Lubricate valve stem

of valves 2

NOTES :

2. Deluge valves

- a) Trip to verify operability
- b) Verify that manual actuators are operable
- c) Inspect the internal condition and clean valve seat before resetting

of valves 2

NOTES : DELUGE VALVES TRIP TESTED DURING "WATER ONLY" FOAM GENERATOR TEST

3. Low point drains

- a) Drain all low point drains after deluge test and before cold weather

NOTES : N/A

128TH ANG

ANNUAL

SPRINKLER

INSPECTION 9.28.12



WCA
3120639

13.304 - 308

B308 WATER-ONLY FOAM GENERATOR TEST WAS PERFORMED

13304 FOAM GENERATOR FULL FLOW TEST WAS PERFORMED IN 2011 DURING RE-COMMISSIONING

13304 - 308

(2) PRE ACTION & (2) DELUGE SYSTEMS WERE FUNCTIONALLY TRIPPED

FOAM CONCENTRATE SAMPLES WERE TAKEN AND WILL BE FORWARDED TO A LAB FOR ANALYSIS

13208

FULL FLOW FOAM TEST WAS PERFORMED THRU SINGLE DELUGE VALVE. PROPORTIONED FOAM WAS SAMPLED DURING TEST AND WILL BE SENT TO LAB FOR TESTING

ALL DELUGE VALVES WERE TRIP TESTED AND INSPECTED



TYCO FIRE PROTECTION PRODUCTS
 ONE STANTON STREET
 MARINETTE, WI 54143-2542
 PHONE: (715) 732-3600
 FAX: (715) 732-3603

Customer Name: GRUNAU
 Location: 1100 ANDERSON COURT - OAK CREEK WI 53154
 File No.: CF12797
 Date: OCTOBER 17, 2012
 Tested By: BEVERLY MOBERG

Foam Conc. Type / Lot No.: 3%AFFF - X2714 - BLDG 208 - NORTH W. O. M.

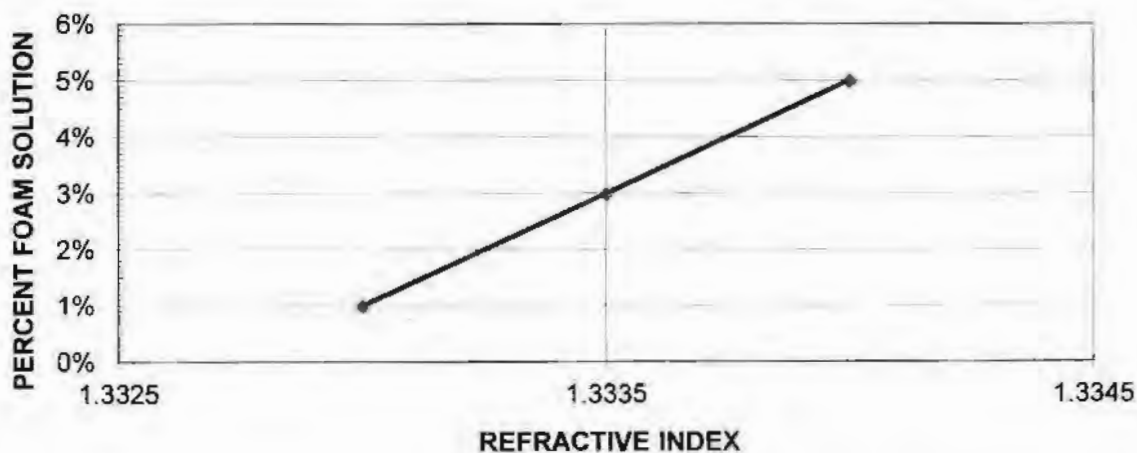
CALIBRATION STANDARDS

$$Y=MX+B$$

REFRACTIVE INDEX	STANDARD SAMPLE	SLOPE	INTERCEPT
	Premix Solutions at:	40.0000	-53.3100
1.3328	0% WATER		
1.3330	1%		
1.3335	3%		
1.3340	5%		
1.3656	100% FOAM CONC.		
SYSTEM DISCHARGE SAMPLE	REFRACTIVE INDEX	PERCENT FOAM SOLUTION	
3%AFFF	1.3335	3.0%	

CALIBRATION CURVE

$$y = 40.000x - 53.310$$



---●--- Series1 — Linear (Series1)



ANSUL INCORPORATED
ONE STANTON STREET
MARINETTE, WI 54143-2542
PHONE: (715)732-3600
FAX: (715) 732-3603

AGENTS LABORATORY OUTSIDE FOAM ANALYSIS REPORT

Report No. CF12797
Sample No. 1
Page: 1 OF 2

SEND TO:

Requestor: GRUNAU
Address: 1100 ANDERSON COURT – OAK CREEK WI 53154
Attention: MIKE SZABELSKI Phone # 414-406-3159 Fax #
Date Received: OCTOBER 04, 2012
Date Completed: OCTOBER 17, 2012
Technician: BEVERLY MOBERG

TEST(S) REQUESTED:

Standard Quality: X

Proportioning:

Coast Guard Required:

SAMPLE: Dilution: Concentrate: 2³/₄% Premix:

Description: 2³/₄%JET-X – JX8111 ANSUL 10/08 – B304-308 – MIXTURE – 9/18

RESULTS:

pH: (AFP 451)	6:20	Density @ 25°C: (AFP 454)	1.023 g/ml
Refractive Index @ 25°C: (AFP 460)	1.3731	Sedimentation: (USCG O-F-555C)	N/A
Foam Quality (Expansion): (AL-81)	N/A	50% Drain Time:	N/A
Lab Scale Fires: (AL-83) or (AL-92)		1st Fire	2nd Fire
Extinguishment:		N/A	X
100% Burnback:		N/A	X
Fires Run: N/A	Seconds	Application On: N/A	

Proportioned Refractive Index @ 25°C (UL-162 Latest Edition)

Sample Refractive Indices	H ₂ O	Foam/H ₂ O	Foam Concentrate
	N/A	N/A	N/A

System is proportioning at approximately: N/A%

OTHER TESTS: HIGH EXPANSION RATIO = 707 : 1

Comments: RESULTS ARE ACCEPTABLE. SAMPLE IS VIABLE.



ANSUL INCORPORATED
ONE STANTON STREET
MARINETTE, WI 54143-2542
PHONE: (715)732-3600
FAX: (715) 732-3603

AGENTS LABORATORY OUTSIDE FOAM ANALYSIS REPORT

Report No. CF12797
Sample No. 2
Page: 2 OF 2

SEND TO:

Requestor: GRUNAU
Address: 1100 ANDERSON COURT – OAK CREEK WI 53154
Attention: MIKE SZABELSKI Phone # 414-406-3159 Fax #
Date Received: OCTOBER 04, 2012
Date Completed: OCTOBER 17, 2012
Technician: BEVERLY MOBERG

TEST(S) REQUESTED:

Standard Quality:

Proportioning: X

Coast Guard Required:

SAMPLE: Dilution: Concentrate: Premix: 3%

Description: 3%AFFF – BLDG 208 – NORTH W. O. M. 9/19

RESULTS:

pH: (AFP 451)	N/A	Density @ 25°C: (AFP 454)	N/A
Refractive Index @ 25°C: (AFP 460)	N/A	Sedimentation: (USCG O-F-555C)	N/A
Foam Quality (Expansion): (AL-81)	N/A	50% Drain Time:	N/A
Lab Scale Fires: (AL-83) or (AL-92)		1st Fire	2nd Fire
Extinguishment:		N/A	X
100% Burnback:		N/A	X
Fires Run:	N/A Seconds	Application On:	N/A

Proportioned Refractive Index @ 25°C (UL-162 Latest Edition)

Sample Refractive	H ₂ O	Foam/H ₂ O	Foam Concentrate
Indices	1.3328	1.3335	1.3797

System is proportioning at approximately: 3.0%

OTHER TESTS:

Comments: RESULTS ARE ACCEPTABLE. SAMPLE IS VIABLE.



TYCO FIRE PROTECTION PRODUCTS
ONE STANTON STREET
MARINETTE, WI 54143-2542
PHONE: (715) 732-3600
FAX: (715) 732-3603

MARINETTE AGENTS LABORATORY OUTSIDE FOAM ANALYSIS REPORT

Report No. CF141010
Sample No. 1
Page: 1 OF 2

SEND TO:

Requestor: GRUNAU COMPANY
Address: 1100 ANDERSON COURT - OAK CREEK WI 53154

Attention: MICHAEL SZABELSKI Phone #: 414-406-3159
Date Received: OCTOBER 29, 2014 Fax #: 414-768-7955
Date Completed: NOVEMBER 12, 2014
Technician: BEVERLY MOBERG CRAIG GENSLE

TEST(S) REQUESTED:

Standard Quality: ☒ Proportioning: ☐ Coast Guard Required: ☐

SAMPLE: Dilution: 2.75% Concentrate: ☐ Premix: ☐
Description: 2.75%JET-X - JX811 ANSUL 10/08 - B304-308 PUMP RM - BOTTOM - 10/14

RESULTS:

Appearance:	GREEN		
pH: (AFP 451)	6.30	Density @ 25°C: (AFP 454)	1.0234 g/ml
Refractive Index @ 25°C: (AFP 460)	1.3724	Sedimentation: (USCG O-F-555C)	N/A
Foam Quality (Expansion): (AL-104)	N/A	25% Drain Time:	N/A
Lab Scale Fires: (AL-83) or (AL-92)		1st Fire	2nd Fire
Extinguishment:		N/A	X
100% Burnback:		N/A	X
Fires Run: Seconds	N/A	Application On:	N/A

OTHER TESTS: HIGH EXPANSION RATIO (AL-103) = 779 : 1

COMMENTS: RESULTS ARE ACCEPTABLE.

The test results and any recommendations contained in this report are based upon analysis results of the samples received. No statements of quality are intended to include product other than that which was received by Tyco Fire Protection Products for testing. Tyco Fire Protection Products makes no express or implied warranties, including that of product viability or of fitness for a particular purpose.



TYCO FIRE PROTECTION PRODUCTS
ONE STANTON STREET
MARINETTE, WI 54143-2542
PHONE: (715) 732-3600
FAX: (715) 732-3603

MARINETTE AGENTS LABORATORY OUTSIDE FOAM ANALYSIS REPORT

Report No. CF141010
Sample No. 2
Page: 2 OF 2

SEND TO:
Requestor: GRUNAU COMPANY
Address: 1100 ANDERSON COURT - OAK CREEK WI 53154

Attention: MICHAEL SZABELSKI Phone #: 414-406-3159
Date Received: OCTOBER 29, 2014 Fax #: 414-768-7955
Date Completed: NOVEMBER 12, 2014
Technician: BEVERLY MOBERG CRAIG GENSLER

TEST(S) REQUESTED:

Standard Quality: ☒ Proportioning: ☐ Coast Guard Required: ☐

SAMPLE: Dilution: 3.00% Concentrate: ☐ Premix: ☐
Description: 3%AFFF - ANSUL X2714 - B208 PUMP RM - BOTTOM - 10/14

RESULTS:

Appearance:	AMBER		
pH: (AFP 451)	7.74	Density @ 25°C: (AFP 454)	1.0258 g/ml
Refractive Index @ 25°C: (AFP 460)	1.3653	Sedimentation: (USCG O-F-555C)	N/A
Foam Quality (Expansion): (AL-104)	6 4	25% Drain Time:	4:14
Lab Scale Fires: (AL-83) or (AL-92)		1st Fire	2nd Fire
Extinguishment:		27	X
100% Burnback:		> 20:00	X
Fires Run: Seconds	45	Application On: 500 MLS HEPTANE/500 MLS WATER	

OTHER TESTS: NONE

COMMENTS: RESULTS ARE ACCEPTABLE.

The test results and any recommendations contained in this report are based upon analysis results of the samples received. No statements of quality are intended to include product other than that which was received by Tyco Fire Protection Products for testing. Tyco Fire Protection Products makes no express or implied warranties, including that of product viability or of fitness for a particular purpose.

APPENDIX C-7

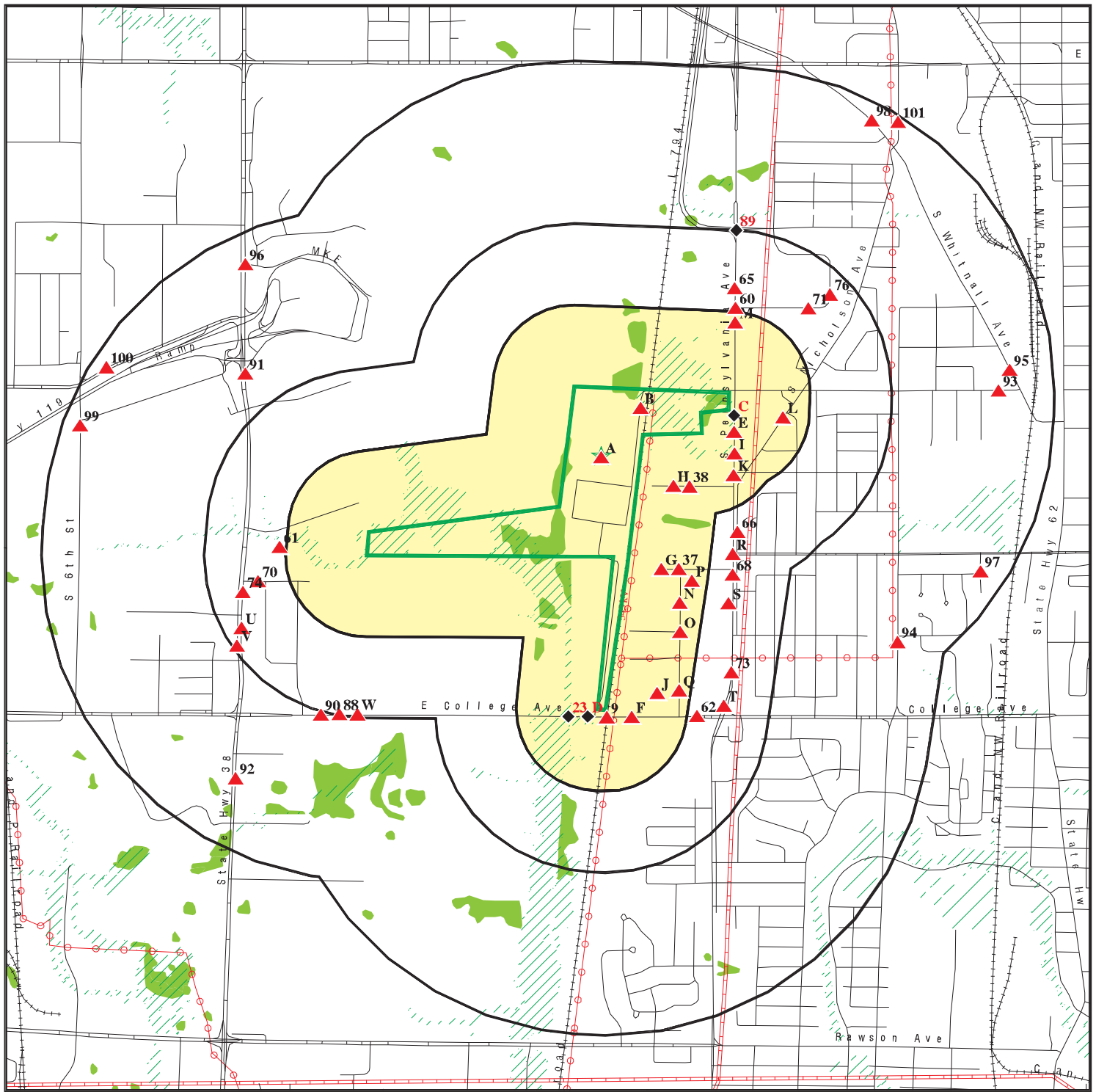
FORMER BASE FIRE STATION PHOTO



APPENDIX C-8

EDR MAPS (EDR, 2015)

OVERVIEW MAP - 4359477.2S



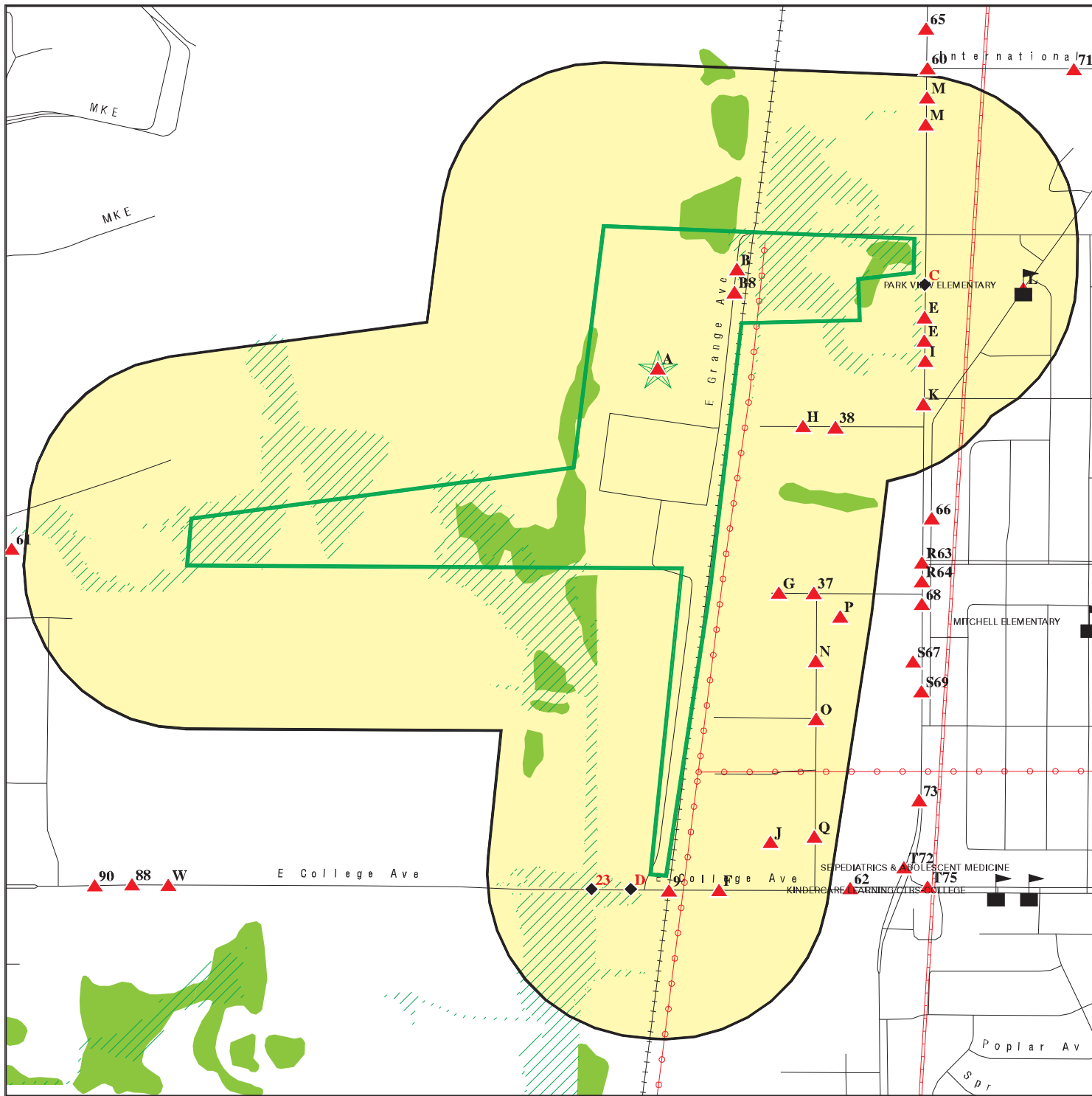
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: General Mitchell ANGB
 ADDRESS: 1685 E. Grange Avenue
 Milwaukee WI 53207
 LAT/LONG: 42.9416 / 87.888

CLIENT: B.B. & E
 CONTACT: Veronica Allen
 INQUIRY #: 4359477.2s
 DATE: July 21, 2015 9:06 am

DETAIL MAP - 4359477.2S



- Target Property**

 - Sites at elevations higher than or equal to the target property
 - Sites at elevations lower than the target property
 - Manufactured Gas Plants
 - Sensitive Receptors
 - National Priority List Sites
 - Dept. Defense Sites

Scale: 0 to 1/8

 - Indian Reservations BIA
 - Power transmission lines
 - Pipelines
 - 100-year flood zone
 - 500-year flood zone
 - National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: General Mitchell ANGB
ADDRESS: 1685 E. Grange Avenue
Milwaukee WI 53207
LAT/LONG: 42.9416 / 87.888

CLIENT: B.B. & E
CONTACT: Veronica Allen
INQUIRY #: 4359477.2s
DATE: July 21, 2015 9:08 am

PHYSICAL SETTING SOURCE MAP - 4359477.2s



- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Closest Hydrogeological Data

SITE NAME: General Mitchell ANGB
 ADDRESS: 1685 E. Grange Avenue
 Milwaukee WI 53207
 LAT/LONG: 42.9416 / 87.888

CLIENT: B.B. & E
 CONTACT: Veronica Allen
 INQUIRY #: 4359477.2s
 DATE: July 21, 2015 9:09 am