



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Wurtsmith ESI Summary and Comments

Beth Place

EGLE Superfund

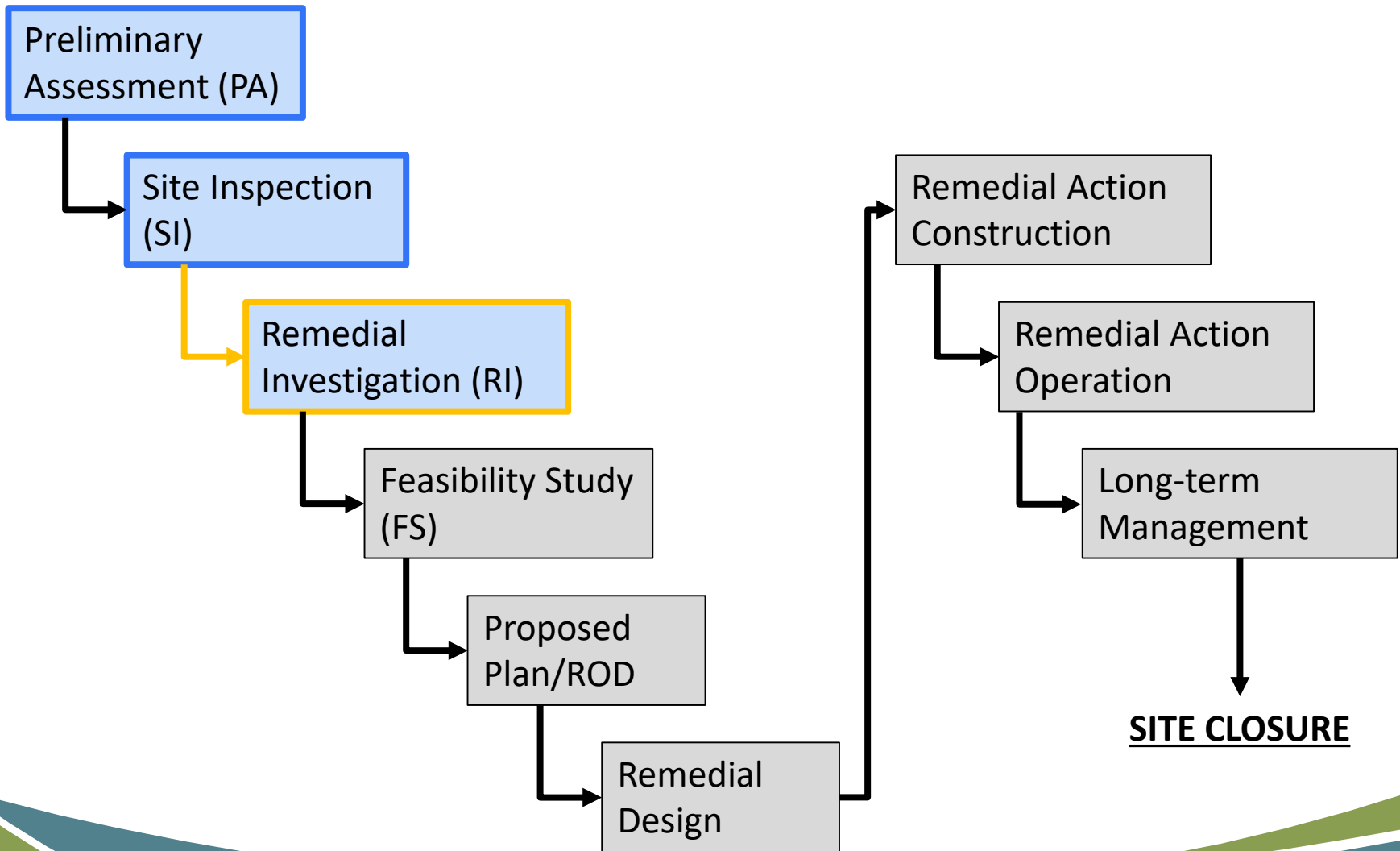
(517) 899-7524 | placeb1@michigan.gov



Presentation Outline

- CERCLA Process
- Summary of ESI Report and Recommendations

CERCLA Process





Why ESI Was Conducted

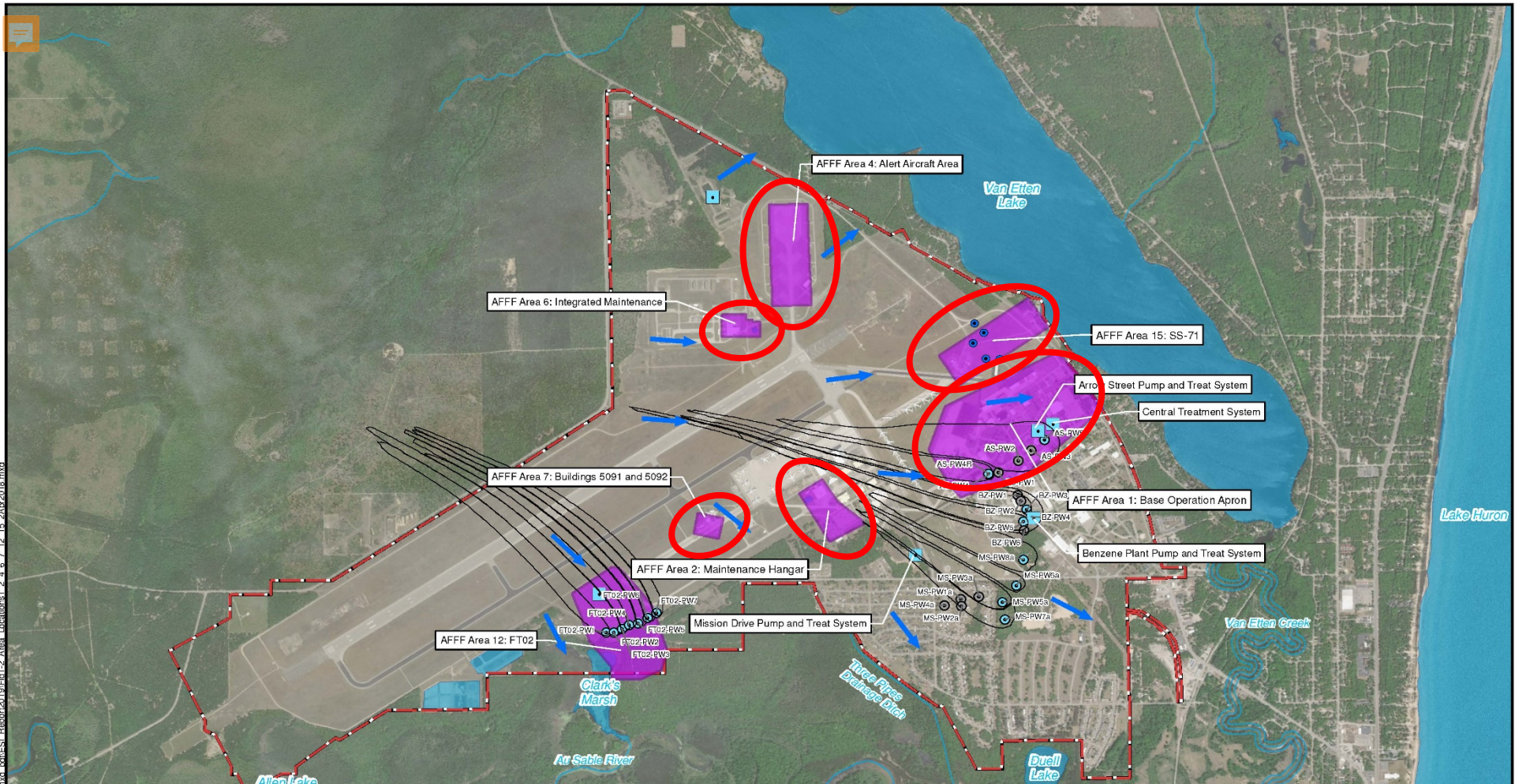
- Further evaluate the potentially complete drinking water pathways identified during the Site Investigation (SI)

ESI Report Summary



Air Force ESI Objective #1

- Delineate AFFF plumes
- Identify sources areas.



Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JBSA Lackland, Texas 78236

Project: 775329301

By: DGJ Date: 01/17/2020

0 1,000 2,000 4,000
 Feet

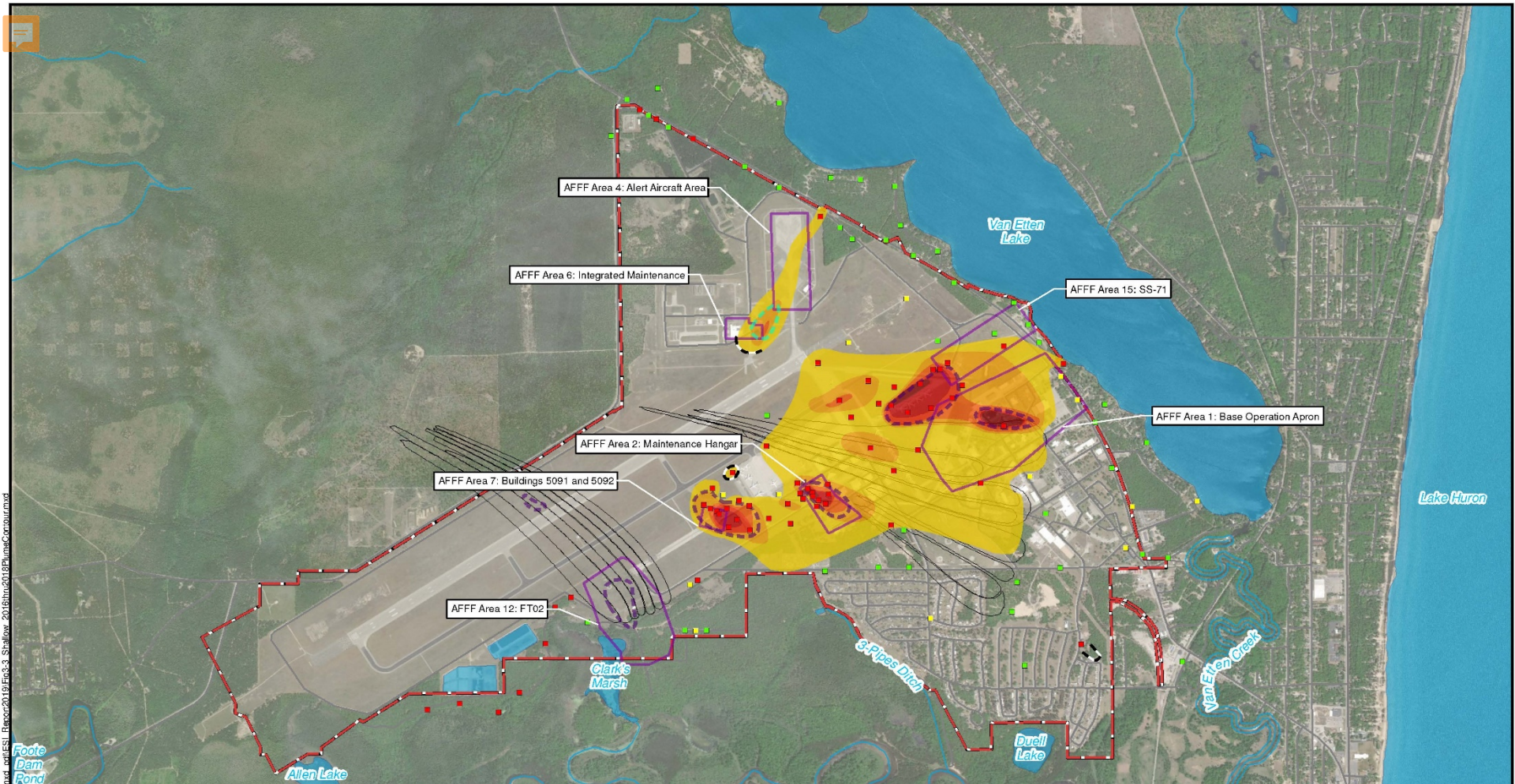
SYMBOL KEY

Estimated Capture Zone (Baywest 2018)	Active Purge Well	Former Wurtsmith AFB Installation Boundary
Groundwater Treatment System	Inactive Purge Well	Stream
Former Base Supply Well	Estimated Groundwater Flow Direction	Surface Water
AFFF ESI Priority		

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 1-2
AFFF Areas 1, 2, 4, 6, 7, 12, and 15
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report



Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JBNSA Lackland, Texas 78236

Project: 775329301

By: DGJ

Date: 01/17/2020

SYMBOL KEY

VAS Sample

- PFOS < 12 ppt and PFOS + PFOA < 70 ng/L
- PFOS > 12 ppt and PFOS + PFOA < 70 ng/L
- PFOS + PFOA > 70 ng/L
- * Extrapolated Contour

- PFOS+PFOA Concentration Contour (ng/L)**
- 70-700
 - 700-2,000
 - 2,000-5,000
 - 5,000-7,000
 - 7,000-70,000
 - >70,000

- ▭ Former Wurtsmith AFB Installation Boundary
- Stream
- ▭ Surface Water
- ▭ Capture Zones (Baywest 2018)
- ▭ Potential Release Area
- ▭ Suspected Source Area

Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 3-3
Approximate Extent of PFOS+PFOA Concentration Shallow Groundwater (10-25ft Below Ground Surface) Based on Vertical Aquifer Sampling
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report

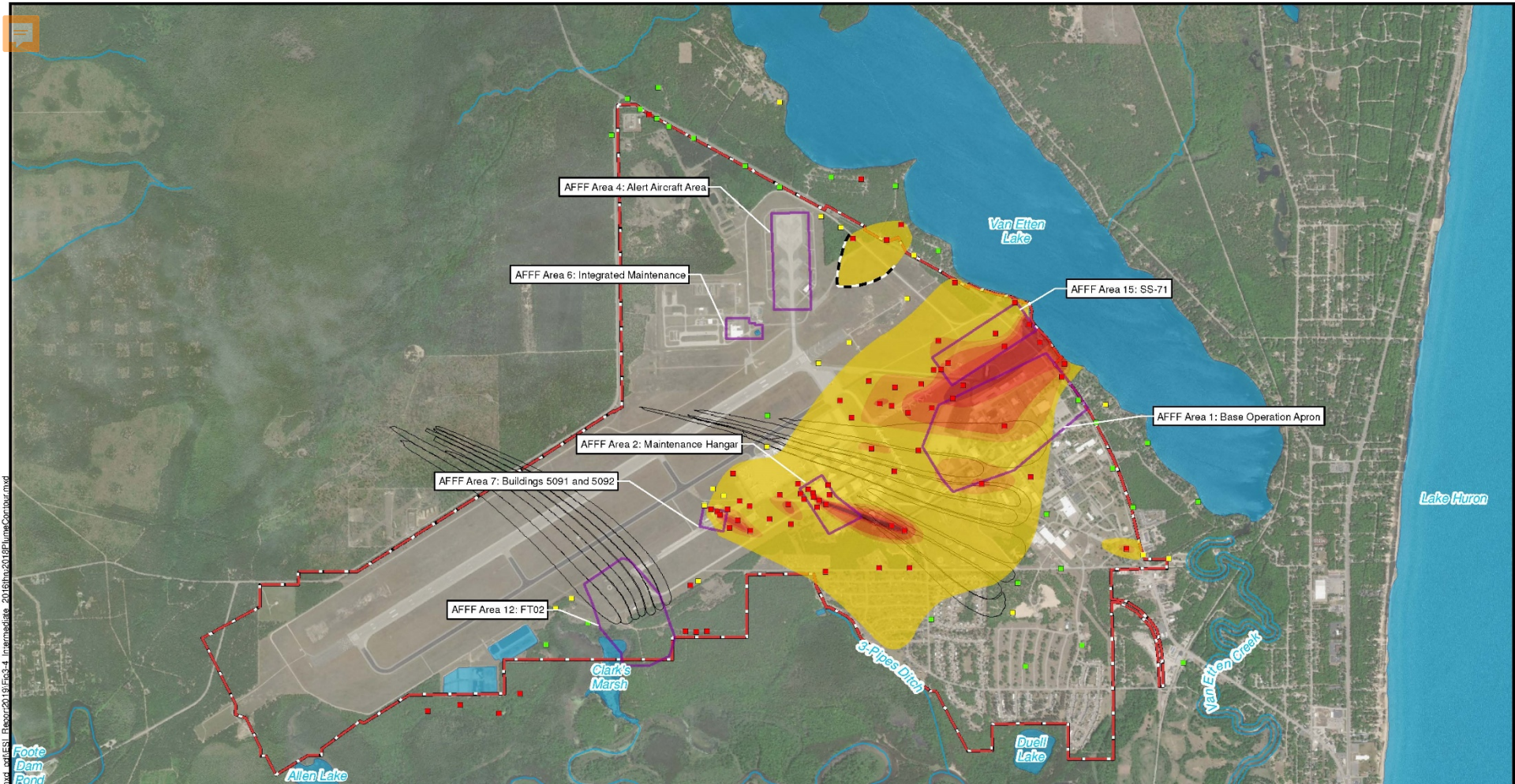


FIGURE 3-4
Approximate Extent of PFOS+PFOA Concentration
Intermediate Groundwater (25-40ft Below Ground Surface)
Based on Vertical Aquifer Sampling
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JESA Lackland, Texas 78236

SYMBOL KEY
VAS Sample
 ■ PFOS < 12 ppt and PFOS + PFOA < 70 ng/L
 ■ PFOS > 12 ppt and PFOS + PFOA < 70 ng/L
 ■ PFOS + PFOA > 70 ng/L
 - * Extrapolated Contour

PFOS+PFOA Concentration Contour (ng/L)
 70-700
 700-2,000
 2,000-5,000
 5,000-7,000
 7,000-70,000
 >70,000

■ Former Wurtsmith AFB
 ■ Installation Boundary
 ■ Stream
 ■ Surface Water
 ■ Capture Zones (Baywest 2018)

Note: AFFF Area 12 results are shown on Figure 3-21

Project: 775329301
 By: KEH Date: 01/17/2020

0 1,000 2,000 4,000
 Feet

Disclaimer: For general reference purposes only. This is not a survey product.
 DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar
 Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS
 User Community

Expanded Site Inspection Report

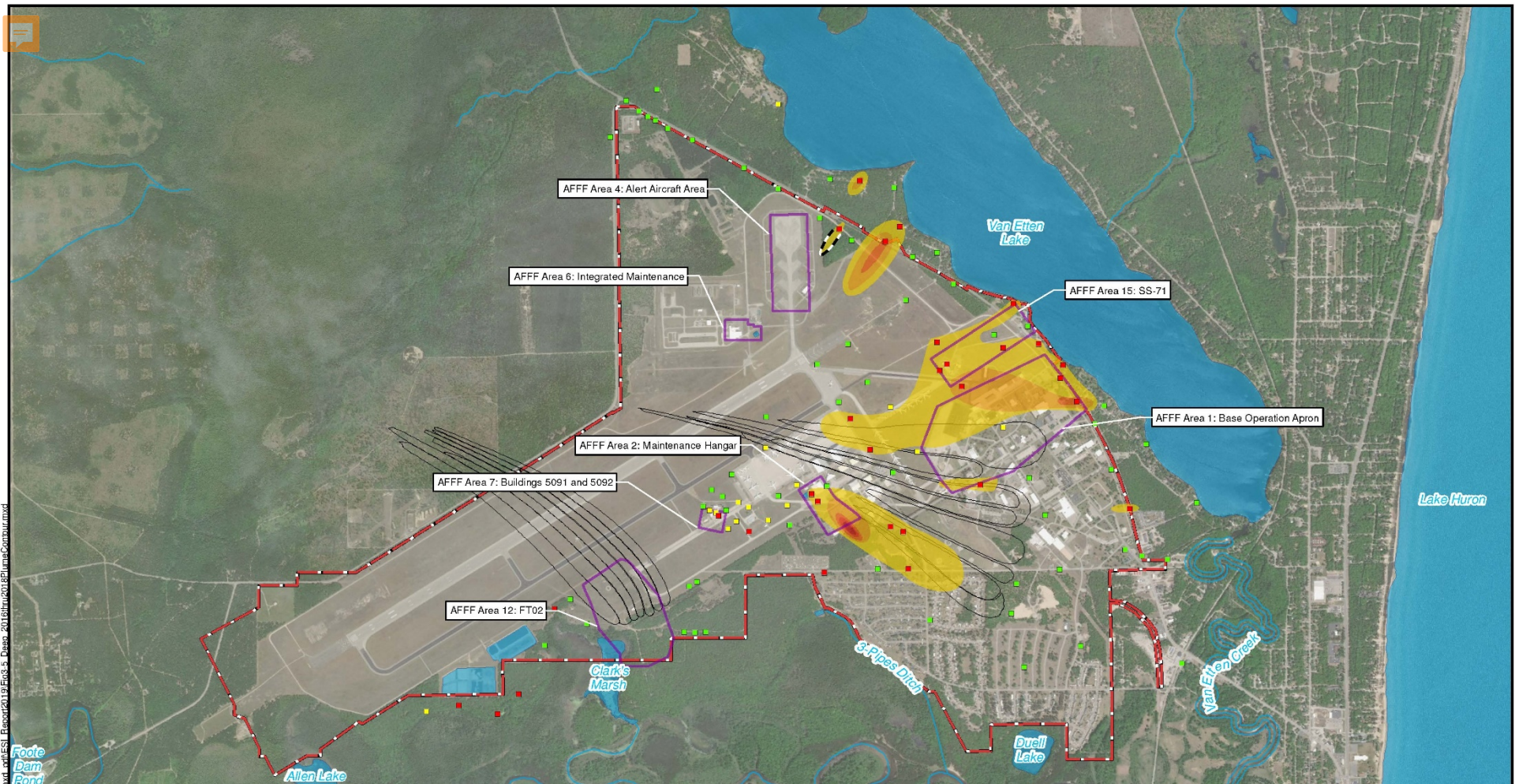


FIGURE 3-5
Approximate Extent of PFOS+PFOA Concentration
Deep Groundwater (40+ft Below Ground Surface)
Based on Vertical Aquifer Sampling
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Site 155
 JBASA Lackland, Texas 78236

Project: 775329301
 By: KEH
 Date: 01/17/2020

SYMBOL KEY	
■ VAS Sample	PFOS+PFOA Concentration Contour (ng/L)
■ PFOS < 12 ppt and PFOS + PFOA < 70 ng/L	70-700
■ PFOS > 12 ppt and PFOS + PFOA < 70 ng/L	700-2,000
■ PFOS + PFOA > 70 ng/L	2,000-5,000
■ Extrapolated Contour	5,000-7,000
	7,000-70,000
 Former Wurtsmith AFB	 Installation Boundary
— Stream	— Surface Water
 Capture Zones (Baywest 2018)	

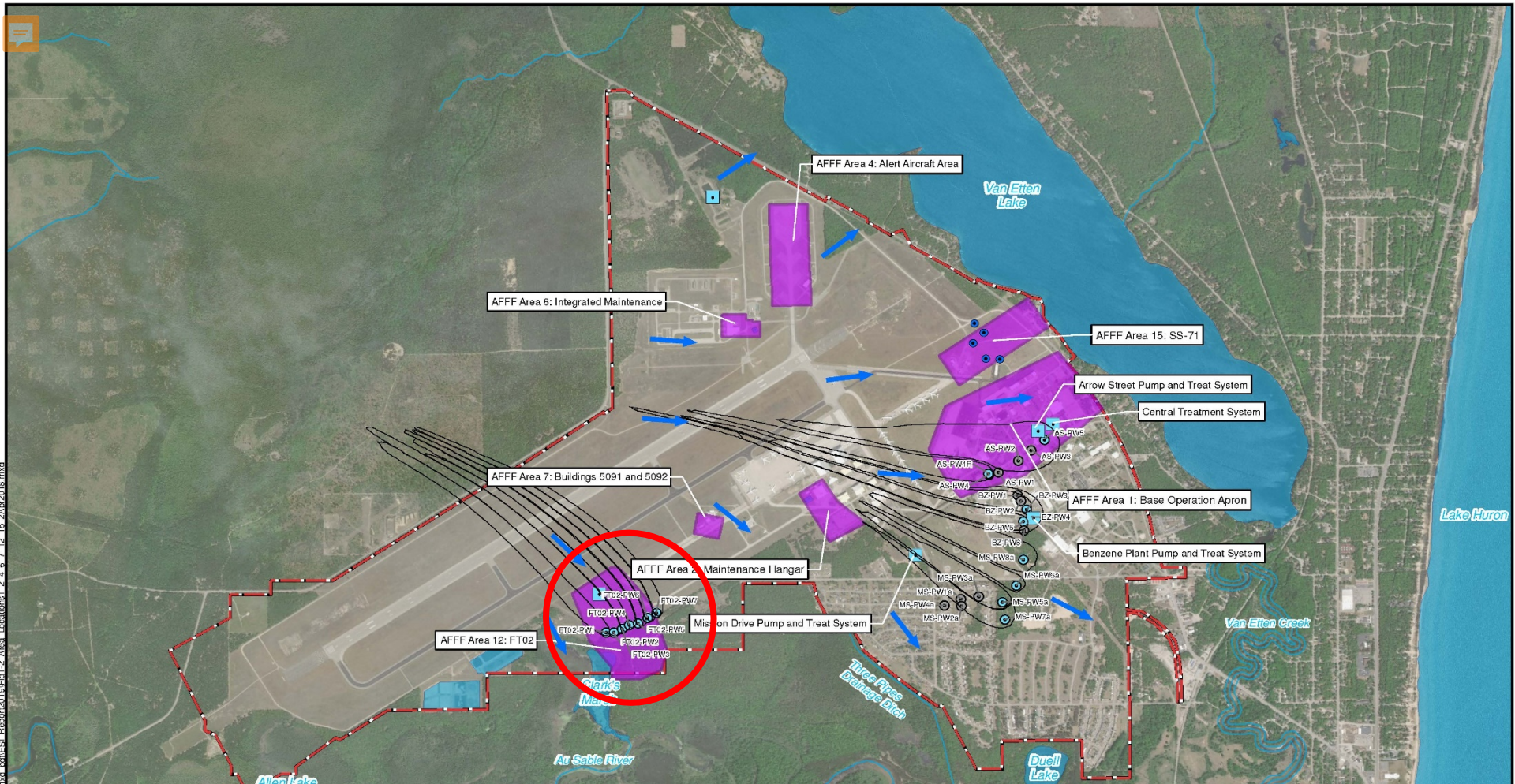
Disclaimer: For general reference purposes only. This is not a survey product.
 DO NOT USE to determine, certify, or verify map features, scale and/or other information.
 Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Expanded Site Inspection Report



Air Force ESI Objective #2

- Evaluation of FT-02 (Area 12)



Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JBSA Lackland, Texas 78236

Project: 775329301

By: DGJ

Date: 01/17/2020



SYMBOL KEY

Estimated Capture Zone (Baywest 2018)

Groundwater Treatment System

Former Base Supply Well

Active Purge Well

Inactive Purge Well

Estimated Groundwater Flow Direction

AFFF ESI Priority

Former Wurtsmith AFB Installation Boundary

Stream

Surface Water

AFFF Area 1 - Base Operation Apron
 AFFF Area 2 - Maintenance Hangar
 AFFF Area 4 - Alert Aircraft Area
 AFFF Area 6 - Integrated Maintenance
 AFFF Area 7 - Building 5091 and 5092
 AFFF Area 12 - FT02
 AFFF Area 15 - Site SS-71

Disclaimer: For general reference purposes only. This is not a survey product.
 DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

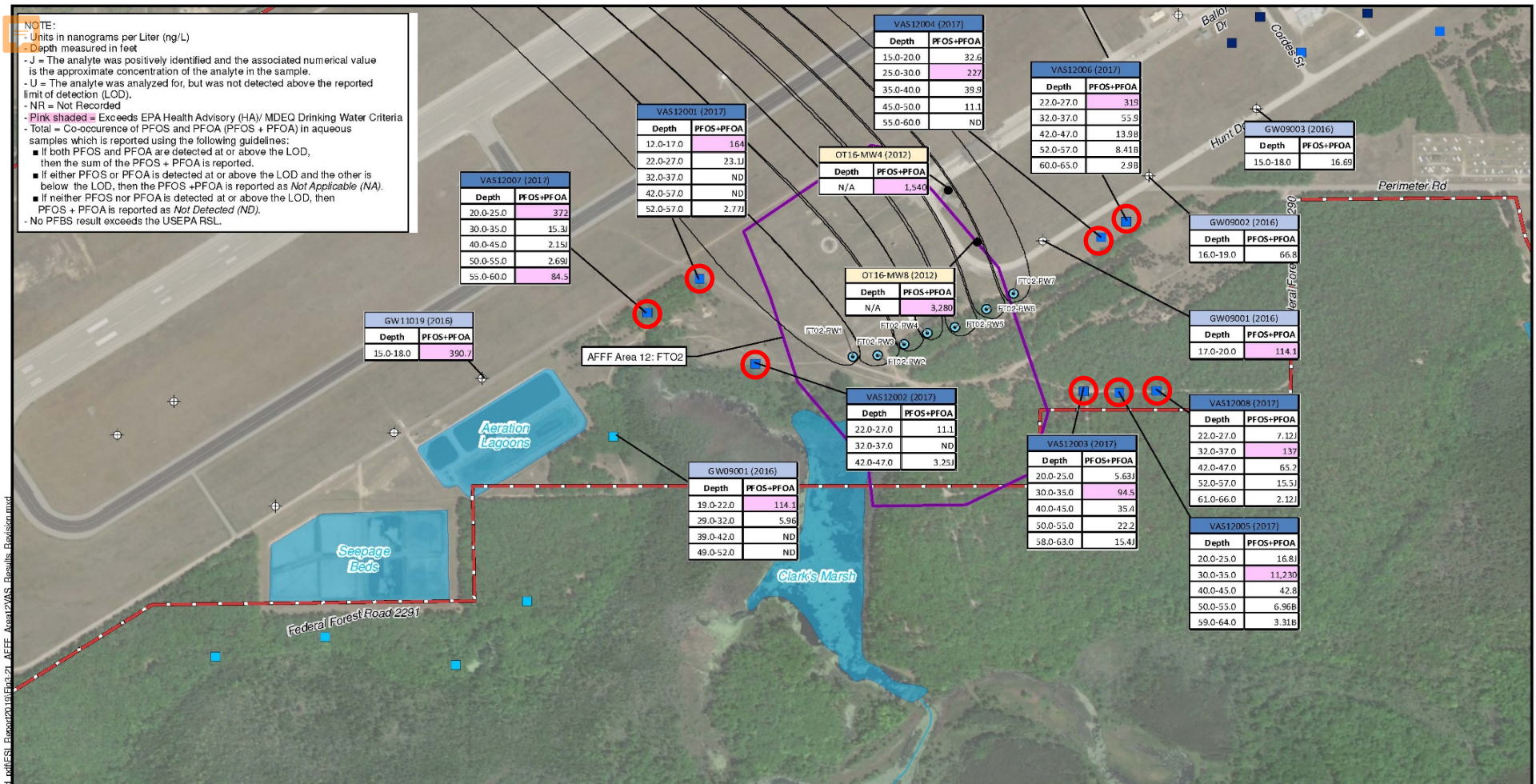
FIGURE 1-2

AFFF Areas 1, 2, 4, 6, 7, 12, and 15
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report

NOTE:

- Units in nanograms per liter (ng/L)
- Depth measured in feet
- J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
- U = The analyte was analyzed for, but was not detected above the reported limit of detection (LOD).
- NR = Not Recorded
- Pink shaded = Exceeds EPA Health Advisory (HA)/ MDEQ Drinking Water Criteria
- Total = Co-occurrence of PFOS and PFOA (PFOS + PFOA) in aqueous samples which is reported using the following guidelines:
 - If both PFOS and PFOA are detected at or above the LOD, then the sum of the PFOS + PFOA is reported.
 - If either PFOS or PFOA is detected at or above the LOD and the other is below the LOD, then the PFOS + PFOA is reported as *Not Applicable (NA)*.
 - If neither PFOS nor PFOA is detected at or above the LOD, then PFOS + PFOA is reported as *Not Detected (ND)*.
- No PFBS result exceeds the USEPA RSL.



*SPECIFIC FEATURES AND LABELS ARE SHOWN ONLY WITHIN AREA OF INTEREST

Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Site 155
 JBSSA Lackland, Texas 78236

Project: 775290177

By: DGJ Date: 11/19/2019

SYMBOL KEY

- 2018 VAS Sample Location
- 2017 VAS Sample Location
- + Direct Push Groundwater Sample
- Historical Sampling Location
- 2016 Sampling Results
- Historical Sampling Results
- AFFF Area
- Capture Zones (Baywest 2018)
- Surface Water
- Former Wurtsmith AFB Installation Boundary
- ⊙ Active Purge Well

Groundwater monitoring data reported in Revised Final Site Inspection Report for Aqueous Film Forming Foam (AFFF) Areas at Former Wurtsmith AFB (Wood, 2018a)

Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Service Layer Credits: Aerial Imagery obtained through ESRI Online Services

PFOS = Perfluorooctanoic acid
 PFOS = Perfluorooctane sulfonate
 PFBS = Perfluorobutane sulfonate

FIGURE 3-21
AFFF Area 12 VAS Analytical Results
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report

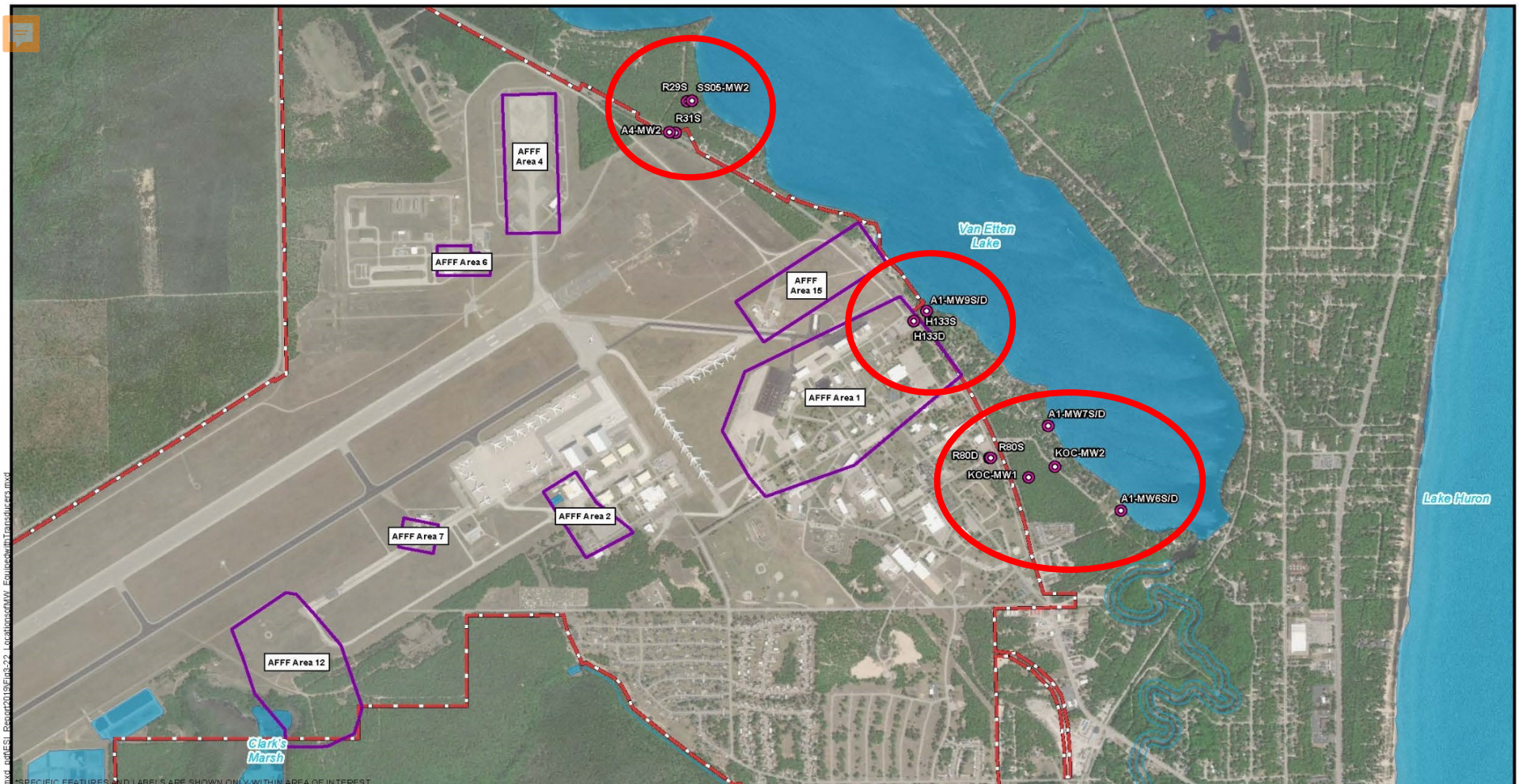
Air Force ESI Objective #3

- Historic review of reports and documentation of PFAS on the former base.



Air Force ESI Objective #4

- Update and revise site-wide groundwater numerical model.



SPECIFIC FEATURES AND LABELS ARE SHOWN ONLY WITHIN AREA OF INTEREST



Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JBSA Lackland, Texas 78236

Project: 775329301

By: DGJ

Date: 11/19/2019

SYMBOL KEY

- Transducer Location
- Surface Water
- AFFF Area
- Former Wurtsmith Installation Area

Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar, Geographic, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

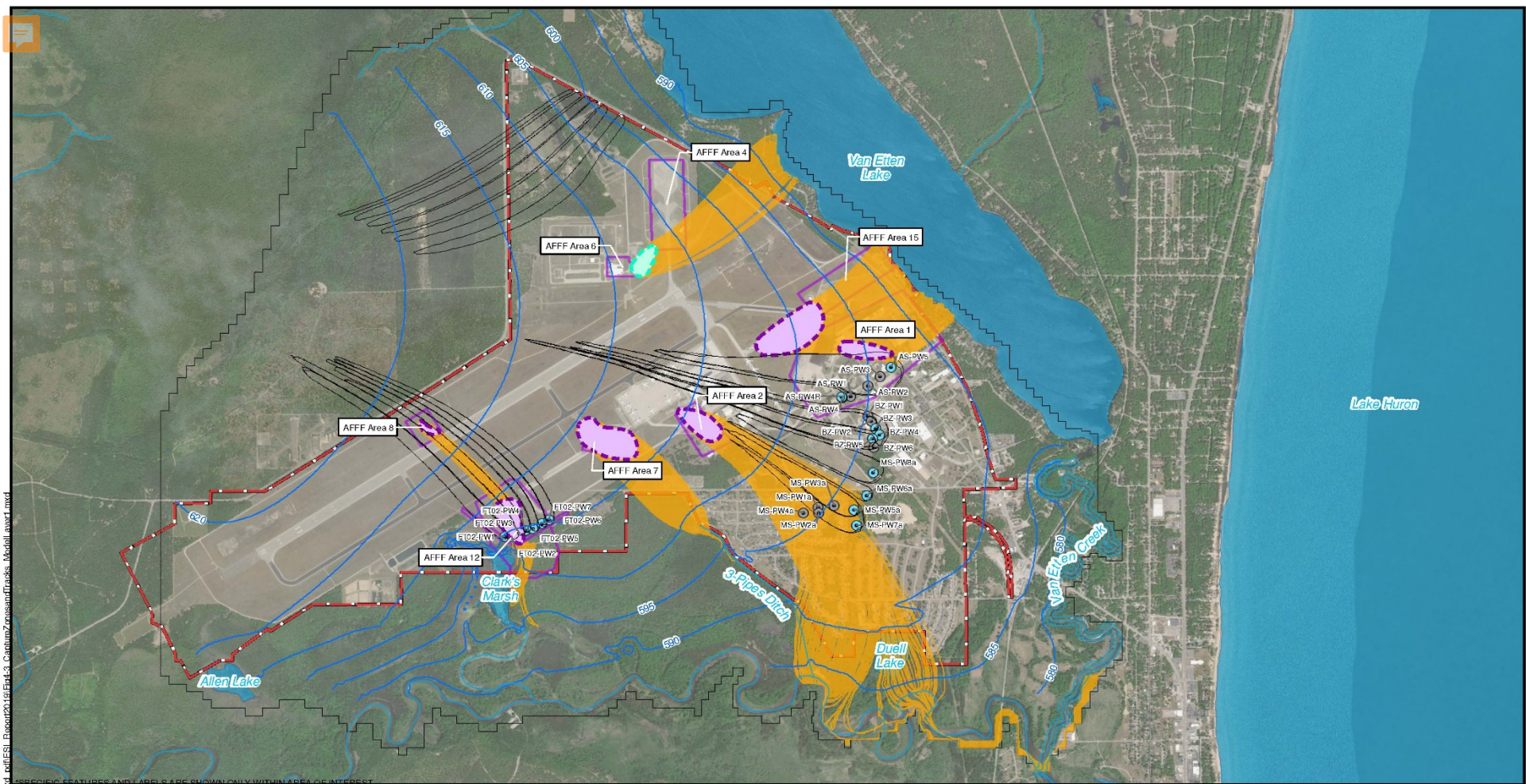
PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 VAS = Vertical Aquifer Sample

- AFFF Area 1 - Base Operation Apron
- AFFF Area 2 - Maintenance Hangar
- AFFF Area 4 - Alert Aircraft Area
- AFFF Area 6 - Integrated Maintenance, Building 5091 and 5092
- AFFF Area 12 - FT02
- AFFF Area 15 - Site SS-71

FIGURE 3-22

Locations of Monitoring Wells Equipped with Transducers
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report



Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JCSA Lackland, Texas 78236

Project: 775329301

By: DGJ Date: 01/17/2020

0 1,000 2,000 4,000
 Feet

SYMBOL KEY

- Simulated Groundwater Levels (Model Layer 1)
- Potential Release Area
- Suspected Source Area (PFOS-PFOA >5,000 ng/L)
- Particle Track
- Active Purge Well
- Inactive Purge Well
- AFFF Area
- Modeled Groundwater Capture Zone
- Surface Water

Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

AFFF Area 8 was not investigated as part of this ESI; however, it was identified as a potential source area in the SI. It is shown on this figure because it is within the modeled capture area for the FT02 Pump and Treat System.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PFOS = Perfluorooctanoic acid
 PFOA = Perfluorooctanoic acid
 VAS = Vertical Aquifer Sample

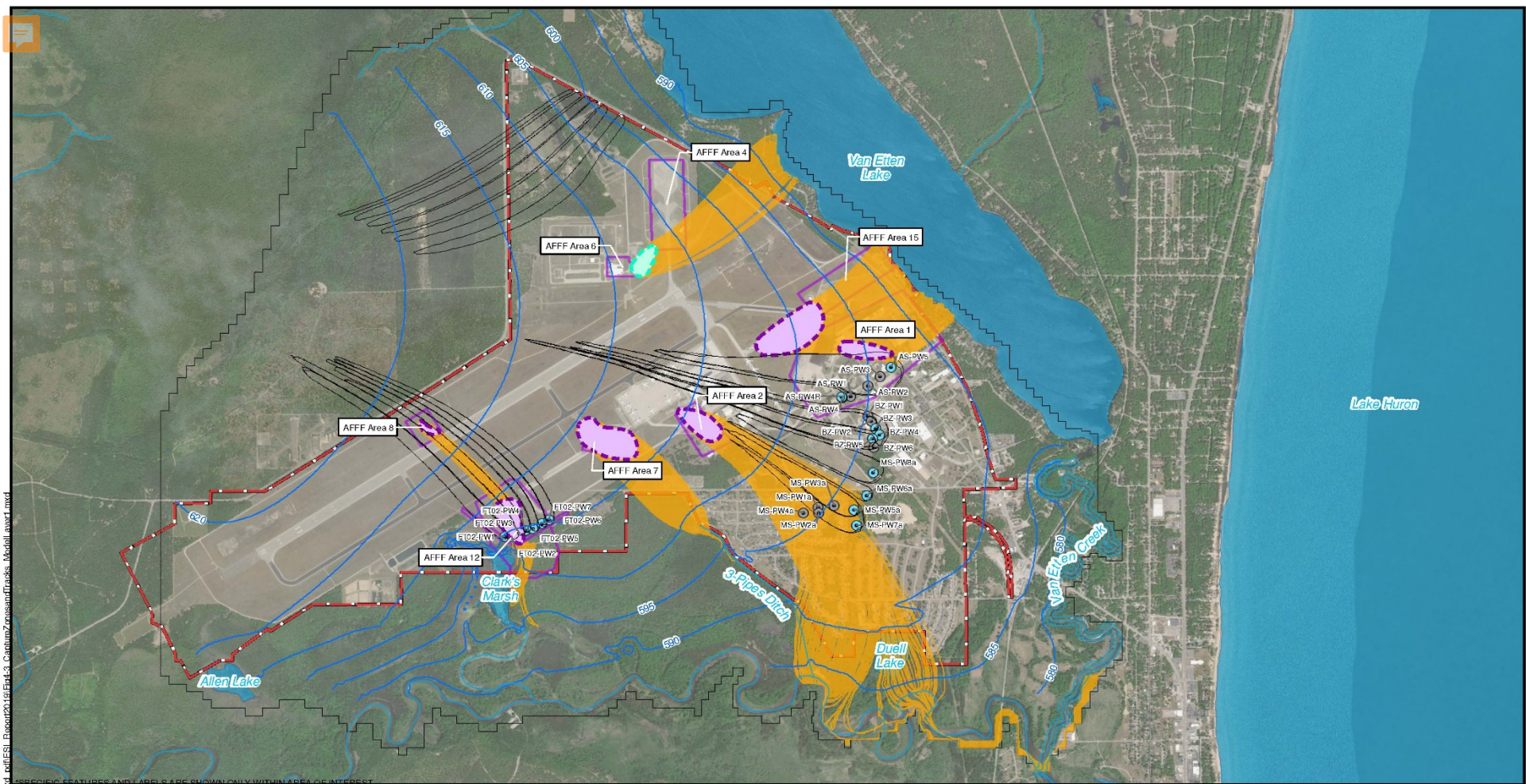
FIGURE 4-3
Capture Zones and Tracks for Particles Released into Model Layer 1
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report



Drinking Water Exposure Pathways

- Private Well Survey
- Drinking Water Pathway



Air Force Civil Engineer Center
 2261 Hughes Avenue
 Building 171, Ste 155
 JCSA Lackland, Texas 78236

Project: 775329301
 By: DGJ
 Date: 01/17/2020

0 1,000 2,000 4,000
 Feet

SYMBOL KEY

- Simulated Groundwater Levels (Model Layer 1)
- Potential Release Area
- Suspected Source Area (PFOS-PFOA >5,000 ng/L)
- Particle Track
- Active Purge Well
- Inactive Purge Well
- AFFF Area
- Modeled Groundwater Capture Zone
- Surface Water

Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

AFFF Area 8 was not investigated as part of this ESI; however, it was identified as a potential source area in the SI. It is shown on this figure because it is within the modeled capture area for the FT02 Pump and Treat System.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PFOS = Perfluorooctanoic acid
 PFOA = Perfluorooctanoic acid
 VAS = Vertical Aquifer Sample

FIGURE 4-3
Capture Zones and Tracks for Particles Released into Model Layer 1
 Former Wurtsmith Air Force Base
 Oscoda, Michigan

Expanded Site Inspection Report



Air Force ESI Objective #5

- Evaluate ESI results to address potential exposure pathways.



Air Force Proposed Scope for Remedial Investigation

- Delineate the nature and extent of PFOA and PFOS in all media.
- Complete the identification of applicable or relevant and appropriate requirements.
- Delineated PFOA and PFOS discharging into surface water to GSI.



Air Force Proposed Scope for Remedial Investigation

- Perform Risk Assessment.
- Update the CSM for all AFFF Areas.
- Fate and transport desk-top evaluation.



Air Force Proposed Scope for Remedial Investigation

- Storm water system evaluation.
- AFFF fingerprinting evaluation.
- PFOS+PFOA trend analysis.



Air Force Proposed Response Actions

- Evaluate a Sentinel Well Monitoring Plan.
- Evaluate Mission Street Pump and Treat system expansion.
- Evaluate FT-02 Pump and Treat system expansion.

Michigan Department of
Environment, Great Lakes, and Energy

800-662-9278

Michigan.gov/EGLE



Follow us at: Michigan.gov/EGLEConnect