

**PRELIMINARY ASSESSMENT OF PER- AND
POLYFLUOROALKYL SUBSTANCES AT
NEWPORT CHEMICAL DEPOT, NEWPORT, INDIANA**

Prepared for:



U.S. ARMY


ODCS, G-9, ISE BRAC

**Final
August 2023**

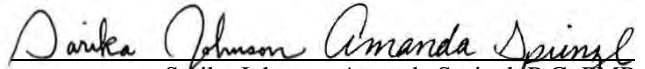
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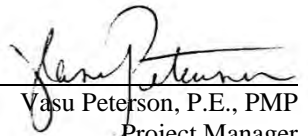
Prepared for:
**ODCS, G-9, BRAC ISE
600 Army Pentagon
Washington, DC 20310**


Prepared by:

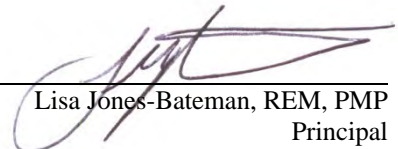

Leidos
**1750 Presidents Street
Reston, Virginia 20190**

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Sarika Johnson, Amanda Sprinzl, P.G., PMP
PFAS Preliminary Assessment Team


Vasu Peterson, P.E., PMP
Project Manager


Rita Schmon-Stasik
QA Manager


Lisa Jones-Bateman, REM, PMP
Principal

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---------|---|
| AFFF | Aqueous Film-Forming Foam |
| AOPI | Area of Potential Interest |
| Army | U.S. Army |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| BRAC | Base Realignment and Closure |
| bgs | Below Ground Surface |
| CDD | Construction Debris Dump |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CERFA | Community Environmental Response Facilitation Act |
| CFR | Code of Federal Regulations |
| COI | Constituent of Interest |
| CSL | Closed Sanitary Landfill |
| CSM | Conceptual Site Model |
| CWS | Community Water System |
| DERP | Defense Environmental Restoration Program |
| DI/SY | Demilitarization Incinerator/Scrap Yard |
| DoD | U.S. Department of Defense |
| DWBG | Decontaminated Waste Burial Ground |
| ECP | Environmental Condition of Property |
| EDC | Economic Development Conveyance |
| EDR | Environmental Data Resources, Inc. |
| EPIC | Environmental Photographic Interpretation Center |
| FOST | Finding of Suitability to Transfer |
| FTA | Fire Training Area |
| HFPO-DA | Hexafluoropropylene Oxide Dimer Acid (aka GenX) |
| HQ | Hazard Quotient |
| IDEM | Indiana Department of Environmental Management |
| IDNR | Indiana Department of Natural Resources |
| ITRC | Interstate Technology Regulatory Council |
| LHA | Lifetime Health Advisory |
| LTM | Long-Term Monitoring |
| LUC | Land Use Control |
| MCD | Memorial Chapel RDX Dump |
| msl | Mean Sea Level |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NECD | Newport Chemical Depot |
| NECDF | Newport Chemical Agent Disposal Facility |
| NPDES | National Pollutant Discharge Elimination System |
| NSP | Night Soil Pits |
| OSD | Office of the Secretary of Defense |
| PA | Preliminary Assessment |
| PAH | Polynuclear Aromatic Hydrocarbon |
| Parsons | Parsons Infrastructure and Technology |
| PCC | Pollution Control Center |
| PCCRP | Pollution Control Center Retention Pond |
| PFAS | Per- and Polyfluoroalkyl Substances |
| PFBS | Perfluorobutane Sulfonate |
| PFHpA | Perfluoroheptanoic Acid |
| PFHxS | Perfluorohexane Sulfonate |

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

| | |
|----------|--|
| PFNA | Perfluorononanoic Acid |
| PFOA | Perfluorooctanoic Acid |
| PFOS | Perfluorooctane Sulfonate |
| ppb | Parts per Billion |
| ppt | Parts per Trillion |
| RCRA | Resource Conservation and Recovery Act |
| RDX | 1,3,5-Trinitro-1,3,5-Triazine |
| RDX-BG | RDX Burning Ground |
| RDX-MA | RDX Manufacturing Area |
| RfD | Reference Dose |
| RI | Remedial Investigation |
| RSL | Regional Screening Level |
| SAIC | Science Applications International Corporation |
| SDWA | Safe Drinking Water Act |
| SVOC | Semivolatile Organic Compound |
| SI | Site Inspection |
| STP | Sewage Treatment Plant |
| SWMU | Solid Waste Management Unit |
| TNT | 2,4,6-Trinitrotoluene |
| TNT-BG | TNT Burning Ground |
| TNT-MA | TNT Manufacturing Area |
| U.S.C | United States Code |
| UCMR3 | Third Unregulated Contaminant Monitoring Rule |
| USACE | U.S. Army Corps of Engineers |
| USAEHA | U.S. Army Environmental Hygiene Agency |
| USAML | U.S. Army Medical Laboratory |
| USATHAMA | U.S. Army Toxic and Hazardous Materials Agency |
| USCG | U.S. Coast Guard |
| USEPA | U.S. Environmental Protection Agency |
| USGS | U.S. Geological Survey |
| VOC | Volatile Organic Compound |
| VX | O-Ethyl S-(2-Diisopropylaminoethyl) Methyl Phosphonothiolate |
| WWTP | Wastewater Treatment Plant |

EXECUTIVE SUMMARY

The objective of a Preliminary Assessment (PA) is to identify areas of potential interest (AOPIs) based on whether use, storage, or disposal of potential per- and polyfluoroalkyl substances (PFAS)-containing materials, including aqueous film-forming foam (AFFF), occurred in accordance with the 2018 U.S. Army (Army) *Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances* (U.S. Army 2018). A PA for PFAS-containing materials with a focus on perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt (“GenX” chemicals) was completed for the Base Realignment and Closure (BRAC) property at the Newport Chemical Depot (NECD), to assess potential PFAS release areas and exposure pathways. The entire former NECD, which is in Vermillion County, Indiana, was selected for closure under BRAC. The completion of this PA included the execution of the following tasks:

- Conducted a kickoff meeting with the BRAC Office and the U.S. Army Corps of Engineers (USACE) on May 21, 2021, to present all parties’ preliminary knowledge of the former NECD to provide information to guide the PA and site visit.
- Reviewed available records (e.g., aerial photography, historical maps, technical reports, previous studies, investigations) from online sources (i.e., Internet-based searches), environmental investigations and/or regulatory programs (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA]), and internal Army documents from the Administrative Record. In addition, an Environmental Data Resources, Inc. (EDR) Report for the former NECD and any listed sites within and up to a 2-mile search distance was conducted.
- Conducted a 2-day site visit on August 11 and 12, 2021, to identify potential sources of PFAS and gather information for developing conceptual site models (CSMs) at AOPIs.
- Interviewed individuals with historical and present-day knowledge of operations on the BRAC property.
- Identified AOPIs and developed preliminary CSMs for pathways of potential PFAS in soil, groundwater, surface water, and sediment.

In conducting the PA of the BRAC property at the former NECD, nine AOPIs were identified where a potential for release of PFAS exists resulting from site operational history. AOPIs were identified at potential PFAS-release locations on the BRAC property only.

Based on the potential PFAS releases at the AOPIs, the potential for exposure to PFAS contamination in soil exists. In addition, the potential for off-post exposure in groundwater exists, as on-post groundwater could influence downgradient drinking water sources. Given the findings of this PA, the AOPIs presented warrant further evaluation in a Site Inspection (SI).

1. INTRODUCTION

The U.S. Army (Army) conducted this Preliminary Assessment (PA) to investigate the potential presence of per- and polyfluoroalkyl substances (PFAS) at the former Newport Chemical Depot (NECD) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 United States Code [U.S.C.] §9601 et seq.); the Defense Environmental Restoration Program (DERP, 10 U.S.C. §2701 et seq.); the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 Code of Federal Regulations [CFR] Part 300); and guidance documents developed by the U.S. Environmental Protection Agency (USEPA) and the Department of the Army. The former NECD is not on the National Priorities List, and the Army is responsible for compliance with CERCLA in accordance with Executive Order 12580, as amended.

The purpose of this PFAS PA is to identify locations that are areas of potential interest (AOPIs) on the former NECD based on the use, storage and/or disposal of potential PFAS-containing materials, in accordance with the 2018 Army *Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances* (U.S. Army 2018). The PA was conducted in general accordance with 40 CFR §300.420(b) and the USEPA *Guidance for Performing Preliminary Assessments Under CERCLA* (USEPA 1991) and the Army *Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances* (U.S. Army 2018). This report presents findings from research conducted to assess past use of materials containing PFAS and identify areas where these materials were stored, handled, used, or disposed of at the former NECD.

The entire former NECD property was evaluated, including property that has been transferred, and will be herein referred to as NECD. NECD is located in Newport, Indiana, as shown in Figure 1-1.

1.1 PFAS BACKGROUND INFORMATION

PFAS are a group of synthetic compounds that have been manufactured and used extensively worldwide since the 1950s for a variety of purposes. PFAS are stable, man-made fluorinated organic chemicals that repel oil, grease, and water. Common industrial uses of PFAS include paints, varnishes, sealants, hydraulic fluid, surfactants, and firefighting foams. PFAS include both per- and polyfluorinated compounds. Perfluorinated compounds, such as perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA or GenX) are a subset of PFAS with completely fluorinated carbon chains, while polyfluorinated compounds have at least one carbon chain atom that is not fully fluorinated. These six PFAS together, and for the purposes of this PA, are referred to in this report as “Target PFAS.”

NECD was evaluated for all potential use, storage, and/or disposal of PFAS-containing materials. A variety of PFAS-containing materials are used in relation to current and historical Army operations. However, the use, storage, and/or disposal of aqueous film-forming foam (AFFF) is the most common potential source of PFAS at U.S. Department of Defense (DoD) facilities. As such, this section is organized to summarize the AFFF-related sources first followed by all of the remaining potential PFAS-containing materials in the subsequent paragraph. AFFF is used as a firefighting agent to suppress petroleum hydrocarbon fires and vapors. Firefighting foams like AFFF were developed in the 1960s (ITRC 2020a), but AFFF did not see widespread DoD use until the early 1970s. Older fire training facilities often were unlined and not constructed to prevent infiltration of firefighting foams and combustion products leaching into the subsurface. Large quantities of AFFF may have been released into the environment as a result of fire training exercises, fire responses, fire suppression system activations, and tank and pipeline leaks/spills.

Other potential PFAS sources considered include installation storage warehouses, some pesticide use, automobile maintenance shops, photographic processing facilities, laundry/water-proofing facilities, car washes, stormwater or sanitary sewer components, and biosolid application areas.

Many PFAS are highly soluble in water and have low volatility due to their ionic nature. The specific gravity/relative density for PFOS and PFOA is 1.8 (ITRC 2020b). Long-chain perfluorinated compounds have low vapor pressure and are expected to persist in aquatic environments. These compounds do not readily degrade by most natural processes. They are thermally, chemically, and biologically stable, and are resistant to biodegradation, atmospheric photooxidation, direct photolysis, and hydrolysis. The structure of these compounds increases their resistance to degradation; the carbon-fluorine bond is one of the strongest in nature, and the fluorine atoms shield the carbon backbone.

When PFAS are released to the environment, they can readily migrate into soil, groundwater, surface water, and sediment. Once in the environment, the compounds are persistent and may continue to migrate through airborne transport, surface water, groundwater, and/or biologic uptake. The amount of PFAS entering the environment depends on the type and amount of the PFAS material that may have been released, where and when it was used, the type of soil, and other factors. If private or public wells are located nearby, they potentially could be affected by PFAS. Similarly, surface water features may be impacted and may convey PFAS to downgradient receptors.

Of the thousands of PFAS, some are considered precursor compounds (typically polyfluoroalkyl substances). Precursor compounds can abiotically or biotically transform into PFOS and PFOA. PFOS and PFOA are referred to as terminal PFAS, meaning no further degradation products will form from them (ITRC 2020c).

1.2 PURPOSE AND OBJECTIVES

The purpose of a PA under the NCP is to 1) eliminate from further consideration those sites that pose no threat to public health or the environment; 2) determine if there is any potential need for removal action; 3) set priorities for Site Inspections (SIs); and 4) gather existing data to facilitate evaluation for the release pursuant to the Hazard Ranking System, if warranted (40 CFR §300.420(b)(1)).

The primary objective of the PA is to identify locations at NECD where PFAS-containing materials were used, stored, or disposed of, resulting in a potential release of PFAS to the environment, and conduct an initial assessment of possible migration pathways of potential contamination. This PA also includes development of a preliminary conceptual site model (CSM) for AOPIs related to PFAS.

1.3 PFAS REGULATORY OVERVIEW AND SCREENING CRITERIA

In May 2016, USEPA issued lifetime health advisories (LHAs) for PFOA and PFOS under the Safe Drinking Water Act (SDWA). To provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOS and PFOA in drinking water, USEPA established a health advisory level for PFOS and PFOA (individually or combined) of 70 ng/L (USEPA 2016).

In October 2019, the Office of the Secretary of Defense (OSD) issued guidance on investigating PFOS, PFOA, and PFBS at DoD restoration sites. The OSD guidance provided risk screening levels for PFOS, PFOA, and PFBS in groundwater, tap water, and soil, based on the USEPA regional screening level calculator for residential and industrial reuse and using the oral reference dose of 2E-05 mg/kg-day. These screening levels are used during an SI to determine if further investigation in a Remedial Investigation (RI) is warranted.

In April 2021, USEPA issued an updated toxicity assessment for PFBS. USEPA developed chronic (0.0003 mg/kg-day) and subchronic (0.001 mg/kg-day) oral reference doses (RfDs) for PFBS as part of USEPA's toxicity assessment. The RSL for PFBS was previously calculated using the RfD of 0.02 mg/kg-day. New toxicity values resulted in revisions to the RSLs for PFBS in May 2021 (USEPA 2021).

In September 2021, OSD issued a revision to Investigating Per- and Polyfluoroalkyl Substances within the DoD Cleanup Program (DoD 2021a). The revised memorandum accounts for the updated PFBS screening

levels attributable to USEPA’s reassessment of PFBS toxicity in 2021. Based on USEPA research, the RSLs for PFOS and PFOA are calculated using an RfD of 2E-05 mg/kg-day. The RSL for PFBS is calculated using an RfD of 3E-04 mg/kg-day. When multiple PFAS are encountered at a site, a 0.1 factor is applied to the screening level when it is based on noncarcinogenic endpoints.

In May 2022, based on continued evaluation of Target PFAS by the Agency for Toxic Substances and Disease Registry (ATSDR) and the USEPA Office of Water, USEPA provided new screening levels for PFOA, PFOS, PFNA, PFHxS, and HFPO-DA.

In July 2022, OSD issued a policy memorandum adopting these new screening levels to be used during the SI phase to determine whether further investigation in an RI is warranted. The screening levels for Target PFAS are listed in Table 1-1. This revised guidance is in effect as of July 2022 and is applicable to investigating PFOS, PFOA, PFBS, PFNA, PFHxS, and HFPO-DA at DoD restoration sites, including Base Realignment and Closure (BRAC) sites (DoD 2022). Currently, no legally enforceable Federal standards exist for PFAS in groundwater, surface water, soil, or sediment.

Table 1-1. Project Action Limits from the 2022 OSD Memorandum

| Chemical | Residential Tap Water HQ = 0.1 (ng/L or ppt) | Residential Soil HQ = 0.1 (µg/kg or ppb) |
|-----------------|---|---|
| HFPO-DA (GenX) | 6 | 23 |
| PFBS | 601 | 1,900 |
| PFHxS | 39 | 130 |
| PFNA | 6 | 19 |
| PFOA | 6 | 19 |
| PFOS | 4 | 13 |

Note: The Residential Tap Water PALs are used to evaluate groundwater and surface water data. The Residential Soil PALs are used to evaluate soil and sediment data.

The Army’s strategy is to continue to assess and investigate potential releases and implement necessary response actions in accordance with CERCLA to ensure that no human health-based exposures are greater than the CERCLA risk-based values in drinking water. Therefore, sites where human exposure to contaminated drinking water exists will be addressed first and as quickly as possible to eliminate the exposure, and then will be subsequently prioritized and sequenced to conduct the investigations and response actions necessary to characterize and, if necessary, remediate the source of PFAS contamination (U.S. Army 2018).

1.4 PA METHODOLOGY

The PA for NECD included a site visit, aerial photographic analysis, records review, and interviews that were conducted in accordance with the methods detailed in the Programmatic PA Work Plan (Leidos 2021). The Programmatic PA Work Plan outlines the approach and methodology for conducting the PFAS PA. As detailed in the Programmatic PA Work Plan, the PA activities focused on ascertaining and documenting the following information regarding PFAS history and use, storage, or disposal at NECD:

- On-post fire training activities
- Use of PFAS-based AFFF in fire suppression systems or other systems
- AFFF stored, used, and/or disposed of at buildings and crash sites
- Activities or use of materials that are likely to contain PFAS, such as metal plating operations
- Wastewater treatment plants (WWTPs) and landfills that may have received PFAS-containing materials
- Studies conducted to assess environmental impacts at the facility
- Potential PFAS use at parcels post transfer
- Potential off-post sources that may impact NECD.

The data gathered during PA activities are summarized in Section 3.

1.5 REPORT ORGANIZATION

The contents of this PA Report are summarized below:

- **Section 2. Site Background**—This section presents site-specific information related to site operational history and discusses the environmental setting. Demographics, land use, topography, geology, hydrogeology, hydrology, groundwater, potable wells, ecological receptors, and climate are described.
- **Section 3. PA Analysis**—This section provides observations and results from the PA site visit, aerial photographic analysis, records review, and interviews.
- **Section 4. Summary of PA Data**—This section provides an overview of the data collected during the PA for the different potential PFAS sources.
- **Sections 5. Summary of PA Results**—This section synthesizes all of the data gathered from the PA activities and determines whether each area evaluated during the PA is an AOPI or was not retained as an AOPI.
- **Section 6. Conclusions**—This section presents conclusions of the PA.
- **Section 7. References**—This section lists the references that were used in the preparation of this report.
- **Appendices**—Appendices A through F include data from field activities or related assessments:
 - Appendix A. Final Installation Kickoff Meeting Minutes
 - Appendix B. Sources/Documents Reviewed During PA
 - Appendix C. Aerial Photographs
 - Appendix D. Site Visit Photographs
 - Appendix E. Questionnaire Responses and Interview Notes
 - Appendix F. Environmental Data Resources, Inc. (EDR) Report.

2. SITE BACKGROUND

2.1 SITE LOCATION

NECD is a former Army facility that consisted of approximately 7,236 acres while in operation (SAIC 2008). NECD is located in west-central Indiana, in Vermillion County, near the town of Newport. In a regional context, NECD is approximately 65 miles west of Indianapolis and approximately 140 miles south of Chicago. The Indiana/Illinois state line is only 2 miles from the western boundary of NECD. Vermillion County is primarily agricultural in nature, with farmland dominating its rural landscape. NECD is surrounded by agricultural fields or, in a few areas, wooded areas. All properties adjacent to and surrounding NECD are located in unincorporated Vermillion County and have been zoned for agricultural use, with the exception of two county-owned properties, which are zoned for business use (NECDRA 2009). Several creeks flow through NECD, including Little Vermillion Creek, Buck Creek, and Jonathan Creek; all of these creeks are tributaries of the Wabash River. Figure 2-1 depicts the NECD site features, including the location of the creeks.

2.2 SITE OPERATIONAL HISTORY

NECD was established in 1942 on approximately 22,000 acres as the Wabash River Ordnance Works, a 1,3,5-trinitro-1,3,5-triazine (RDX) production facility. The RDX facility was operational beginning in 1942 and in 1943, production facilities for the manufacturing of heavy water related to the Manhattan Project were constructed at NECD for the Atomic Energy Commission. Operations continued until NECD was placed on standby status in 1946. After World War II, most of the land was sold and NECD was reduced to approximately 7,236 acres. The heavy water plant was placed on standby status in 1946 but was reactivated from 1952 through 1957 to support the Korean War effort.

A chemical plant for the production of the nerve agent O-ethyl S-(2-Diisopropylaminoethyl) methyl phosphonothiolate (VX) was constructed in 1958 by the Food Machinery Corporation near the former heavy water production facility. In 1964, the Wabash River Ordnance Works and the Newport Army Chemical Plant were combined and renamed the Newport Army Ammunition Plant and then Newport Chemical Depot. From 1960 to 1968, all of the United States' VX was produced at NECD until halted by President Richard Nixon. The VX was stored at NECD until its destruction at the Newport Chemical Agent Disposal Facility (NECDF) from 2002 until 2008. In 1970, a 2,4,6-trinitrotoluene (TNT) production facility was constructed to support the Vietnam War. Only two of the five production lines operated, and the production was discontinued in 1975.

In 1999, the Army built the NECDF to destroy NECD's stockpile of VX, and decommission the NECDF after demilitarization. Construction of the NECDF was completed in 2003, and the last container of VX was destroyed in 2008 (SAIC 2008).

The 2005 BRAC Commission recommended the closure of NECD upon completion of the chemical demilitarization mission. On October 4, 2006, 101 acres were transferred to the U.S. Coast Guard (USCG) via a Fed-to-Fed transfer. NECD was closed on July 18, 2010, and the chemical demilitarization mission was completed by 2011. Property was transferred via Economic Development Conveyance (EDC) to the Local Reuse Authority (NECDRA) in September 2011 (6,652 acres of Finding of Suitability to Transfer [FOST] 1 property), September 2012 (478 acres of FOST 2 property), and May 2015 (5 acres of FOST 3 property). In 2012, the Army completed environmental remediation activities in coordination with USEPA and the Indiana Department of Environmental Management (IDEM) (U.S. Army 2020).

2.3 DEMOGRAPHICS, PROPERTY TRANSFER, AND LAND USE

Most of the area surrounding NECD is agricultural cropland, woodlands, and pastures. Land use for the areas immediately adjacent to NECD is zoned agricultural (NECDRA 2009). Nearby towns and cities

include Newport, Montezuma, Dana, Clinton, and Cayuga. Land use in Vermillion County is heavily agricultural, with 119,318 acres or approximately 73 percent of the total land area of the county in farm production (U.S. Army 1998). The population of Vermillion County in 2019 was 15,498 persons with a population density of 63.1 persons per square mile according to U.S. Census survey data (U.S. Census Bureau 2019).

The 101-acre USCG property is immediately adjacent to the western boundary and contains a communications tower and related technical facilities. A few farmhouses and other detached residential structures, as well as two non-residential farm use structures, are located along Highway 63, which forms the eastern boundary. These properties are zoned as “A” (Agricultural). The Vermillion County Jail is located immediately across Highway 63 from the main gate, and a Vermillion County Public Works Garage is located across Highway 63 from the far northeastern corner of NECD; these two properties are zoned as “B2” (Business) (NECDRA 2009).

NECD has been redeveloped into Vermillion Rise Mega Park, an office and industrial park covering 7,100 acres with 2,806-acre deed restricted areas to support bat habitat for the federally endangered Indiana bat. To date, the Vermillion Rise Mega Park is home to six companies, including General Machine and Saw, Newport Pallet, Gypsum Express, Security Transport, J&R Used Tire Service, and Scott Pet Foods (DoD 2021b).

The NECD reuse plan was approved by the U.S. Department of Housing and Urban Development on April 7, 2010 (U.S. Army 2020). Figure 2-2 illustrates the environmental use restrictions in place to protect human health and the environment. The Army and NECDRA established an Environmental Service Cooperative Agreement to provide provisions for NECDRA to conduct long-term monitoring (LTM), conduct clay cap inspections, and enforce environmental restrictive covenants. LTM includes groundwater monitoring at the Decontaminated Waste Burial Ground (DWBG) and RDX Manufacturing Area (RDX-MA) (NECDRA 2022).

2.4 TOPOGRAPHY

The topography at NECD is flat, ranging from approximately 650 feet above mean sea level (msl) near the main entrance to NECD to 530 feet above msl in the drainage basin on the northwestern portion of NECD. The Ranney well area is approximately 480 feet above msl (USGS 1964, 1978a, 1978b, and 1979). Most of the land surface is characterized by slightly undulating to nearly level upland lying at elevations between 620 and 640 feet (all elevations refer to the National Geodetic Vertical Datum of 1929). NECD lies within the Tipton Till Plain section of the Central Lowland Province of the United States. It is a nearly featureless glacial plain dissected by old and newer stream drainages and dotted with glacial features such as end moraines. Several creeks flow through NECD, including Little Vermillion Creek and tributaries of Jonathan Creek, which flow off NECD in a northern direction; Little Raccoon Creek, which originates in the eastern portion of NECD and flows in a southerly direction off NECD; and southerly flowing Buck Creek, which is located in the southwestern portion of NECD. All of these creeks are tributaries of the Wabash River, which is located approximately 2 miles east of NECD (Earth Tech 2002).

2.5 GEOLOGY

This section provides information on the regional geology of Vermillion County and the geology that underlies NECD. This information is based on data from previous environmental investigations and reference documents, such as U.S. Geological Survey (USGS) documents.

NECD lies in the Central Lowland Plains physiographic division of the Central United States (USGS 1970). The facility is underlain by approximately 70 to 100 feet of unconsolidated glacial till (primarily a stratified ground moraine), capped by thin loess (wind deposited silt) that grades into morainal deposits along the escarpment formed by the Wabash River, approximately 2 miles to the east. The till is composed of poorly sorted clay, silt, sand, and minor gravel, and displays both vertical and lateral variability (Earth Tech 2002).

The glacial till was deposited by at least two Pleistocene ice sheets, during the Kansan and Wisconsin stages, and constitutes the major part of the Trafalgar Formation in Indiana. The Trafalgar Formation is composed of three members separated by thin (1 to 3 feet), frequently truncated sand and gravel deposits. From youngest to oldest, these members are the Snider Till, the Batestown Till, and the Glenburn Till. The younger till members are thinner and finer grained than the underlying older till members (USAEHA 1975).

Depth to the bedrock surface is typically from 45 to 140 feet below ground surface (bgs). The bedrock in Vermillion County lies near the edge of the Indiana Basin and dips slightly toward the southwest. The uppermost consolidated bedrock unit below the glacial deposits is the Carbondale Group, which is composed of shale and sandstone of Pennsylvanian age and ranges in thickness from approximately 10 to 100 feet. The Carbondale Group is part of the larger Allegheny Series. Other groups of the series outcrop along the Big Vermillion and Wabash Rivers.

Underlying the Carbondale Group is the Raccoon Creek Group. Comprising the basal Pennsylvanian unit, the Raccoon Creek Group varies in thickness from 145 to more than 200 feet and is composed primarily of shale and sandstone, with thinner beds of limestone, clay, and coal. These Pennsylvanian units lie unconformably above Mississippian-age sedimentary rocks that, in turn, overlie a series of very thick Paleozoic formations, which extend more than 1 mile down to pre-Cambrian granites and metamorphic rocks (USAEHA 1975).

The Pennsylvanian bedrock units form part of the western limb of a vast anticline, the axis of which strikes in a north-south direction, thus causing bedrock to dip slightly to the southwest. No evidence of significant faulting in the NECD area exists (USAEHA 1975).

2.6 HYDROGEOLOGY

The depth to groundwater typically ranges from 15 to 30 feet bgs. Surficial and shallow groundwater occurs in discontinuous sand and gravel lenses and sandy zones in the glacial till at NECD. Water-bearing zones exist under confined conditions surrounded by impermeable glacial till and may be poorly connected to other localized surficial or shallow groundwater. Groundwater flow is mostly horizontal and dictated by areas of high topographic relief and the effect from the proximity of streams and related tributaries that have eroded into the glacial till. In general, two major shallow groundwater basins are located within NECD. The shallow groundwater in the southern and southeastern portions of NECD flows toward the south and southwest and discharges into tributaries of Little Raccoon Creek, which flows into the Wabash River at a point approximately 5 miles southeast of the NECD boundary. Shallow groundwater in the northern and western portions of NECD moves north toward Little Vermillion River and ultimately flows east of Newport to the Wabash River. Within these groundwater basins, several shallow groundwater divides exist, coincident with topographic highs, in the central and western areas of NECD (Dames & Moore 1991a).

2.7 SURFACE WATER HYDROLOGY

NECD lies within the western half of the Wabash River watershed. Surface runoff in the NECD area flows into drainage ditches and creeks that empty into the Wabash River, located approximately 2 miles east of NECD. The Wabash River flows southward between Indiana and Illinois, and empties into the Ohio River near the John T. Myers Locks and Dam near the Posey/Gallatin county border (Tetra Tech 2001). Spring Creek and the Big Vermillion River drain the north portion of Vermillion County, with the Little Vermillion River draining the central part. In the NECD area, Little Raccoon, Norton, Feather, and Brouilletts Creeks provide drainage for the southern area of Vermillion County (Earth Tech 2002).

The land within NECD drains into one of four natural drainage basins. Most of the facility drains north into the Little Vermillion Creek watershed or south into the Little Raccoon Creek watershed. A small portion of NECD closest to the Wabash River drains directly into the Wabash-Montezuma watershed, with the far western end of NECD draining into the Jonathan Creek watershed (Matrix 2009).

NECD contains 213 acres of wetland habitat. This acreage amounts to 3 percent of the total land area. There are 24 miles of linear wetlands (USFWS 2001). A 1999 survey of NECD (EarthSource 1999) identified 12.5 acres of jurisdictional wetlands or other waters of the United States as defined by the Corps of Engineers Wetlands Delineation Manual (USACE 1987). Eight distinct sections of wetlands or wetland complexes were delineated during the survey. Both the eastern and western branches of Little Vermillion Creek were identified as waters of the United States that provide important buffers for water quality and valuable riparian habitat.

Soil types at NECD suggest that the flat upland portions of NECD once supported significant areas of depressional, slough-swale wet prairie wetlands, within a matrix of tallgrass prairie (EarthSource 1999). Virtually all of these rich prairie soils were converted to agricultural land uses during European settlement of the region (Hedge and Bacone 1994, Homoya et al. 1985). The hydrology of the wetland soils (specifically, the Sable and Ragsdale series) found on the uplands have been extensively manipulated through surface ditches and subsurface drain tiles to improve soil drainage and support row crop production. Consequently, many of the fragmented wetlands that remain on NECD are remnants of much larger systems, and the current vegetation types reflect an alteration of the natural hydrology that is more favorable to the development of drier, forested, and scrub-shrub wetland communities (EarthSource 1999). Despite their fragmentation, wetland areas at NECD still perform important water quality functions and provide valuable habitat for wildlife and avifauna, such as the Virginia rail, wood duck, and sora (Chandler and Weiss 1994).

2.8 WATER USAGE

The Ranney well area, which supplies all water to NECD, is located on the bottomlands of the Wabash River Valley, approximately 2 miles from the eastern boundary of NECD (Figure 2-1). Three of six original wells are now owned by a private citizen (Matrix 2009). The remaining three wells are owned and operated by NECDRA. These wells are registered with the Indiana Department of Natural Resources (IDNR) as significant water withdrawal facilities (Registration No. 00884); however, only one is currently active (Ranney Well #3). Ranney Well #3 was installed in 1942. The current pumping capacity of this well is approximately 3,260 gallons per minute (IDNR 2021).

Raw water from the Ranney well, owned and operated by NECDRA, is pumped directly into a 7 million gallon reservoir (Building 402A). Building 402A is the only active raw water storage facility at NECD. Two potable water pumps, two service water pumps, and two fire water pumps are located in the pump house (Building 412A) supplied by the reservoir. The potable water storage facility is the elevated tank (Water Tower 510), with a capacity of 100,000 gallons. A 60,000-gallon elevated tank in the former TNT Acid Area once served as a secondary raw water storage facility. Potable water is chlorinated and transferred to Water Tower 510 by two inline pumps located in the pump house. Potable water from Water Tower 510 is distributed via a 20-inch-diameter steel transmission main to industrial and shops area at NECD. This 20-inch main once provided water to the TNT Acid Area. The service water system is supplied directly from the 7 million gallon reservoir pump house. The service water system provides water to the Vermillion County Jail, the administration building (Building 7700), and Building 3005. Water is chlorinated for potable use at each of these facilities (Matrix 2009).

According to the IDEM, Division of Water Ground Water Database, approximately 135 water wells registered by IDNR are present within a 4-mile radius of NECD (IDNR 2021). An EDR report generated for NECD was reviewed to obtain offsite water supply well information. Figure 2-3 shows public water supply wells within 4 miles of NECD (IDNR 2021).

2.9 ECOLOGICAL PROFILE

NECD provides suitable habitat for a variety of species. While the property was functioning as a military facility, public access for wildlife viewing; nature photography; antler collection; and the gathering

of edible fruits, mushrooms, nuts, and berries was allowed in Hunt Areas 10 through 14 until September 11, 2001. Public access for outdoor recreation was restricted after September 11, 2001, due to the sensitive nature of VX stored at NECD and the associated high level of security. Hunting of deer, small game, and wild turkey also was previously allowed at NECD. Since transfer of the facility, NECDRA has operated a hunting lottery for select hunting seasons and has offered hunting leases (Clintonian 2022). Due to the limited amount of suitable aquatic habitat on NECD, hunting of migratory waterfowl is not permitted (SAIC 2008, Tetra Tech 2001).

Flora – NECD occupies an ecotone between the eastern deciduous forest and the tallgrass prairie. Several invasive plant species occur at NECD. Plants classified as noxious by the State of Indiana and that require control include Canada thistle (*Cirsium arvense*), shattercane (*Sorghum bicolor*), bur cucumber (*Sicyos angulatus*), and Johnson grass (*Sorghum halepense*). A number of non-native plants, such as multiflora rose (*Rosa multiflora*), bush honeysuckles (*Lonicera* spp.), Russian olive (*Elaeagnus angustifolia*), and garlic mustard (*Alliaria petiolata*), pose more serious threats to the ecological health of NECD plant communities. Garlic mustard (*A. petiolata*) was discovered in 1994 in the Jonathan Creek watershed in the northwestern corner of NECD. The negative impact of nonnative honeysuckle species and garlic mustard (*A. petiolata*) on native woodland flora, particularly spring geophytes, has been well-documented in the eastern United States (Tetra Tech 2001).

Virtually all of the wet-prairie and oak savanna vegetation on the uplands of NECD was converted to agricultural land uses during the settlement period. However, NECD also has restored more than 335 acres of tallgrass prairie communities in several areas in the southwestern portion of NECD; the restored prairies were once part of the pre-European settlement grasslands environment. Prairie restoration at NECD includes both establishment of new prairie areas and maintenance of planted sites (Mason & Hanger 2006).

With the redevelopment of NECD into Vermillion Rise Mega Park, 2,806 acres were designated as an Indiana bat (*Myotis sodalis*) protective zone of forested trees with restrictions on tree cutting to support bat habitat. In addition, approximately 1,640 acres were established as a conservation area, including 500 acres that could be used for prairie restoration (U.S. Army 2020).

Fauna – Previous investigations and surveys have documented the presence of at least 35 mammal species representing 14 different families at NECD. Common species include white-tailed deer (*Odocoileus virginianus*), coyotes (*Canis latrans*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), eastern cottontail rabbits (*Sylvilagus floridanus*), opossums (*Didelphis virginiana*), and various small rodents. NECD personnel also have reported sightings of badgers (*Taxidea taxus*), gray squirrels (*Sciurus carolinensis*), and thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*); however, the presence of these species has not yet been confirmed in formal investigations.

Approximately 157 bird species have been documented at NECD, either on a permanent, transient, or migratory basis. Some of the more common species present on a year-round basis include American kestrels (*Falco sparverius*), blue jays (*Cyanocitta cristata*), northern bobwhites (*Colinus virginianus*), downy woodpeckers (*Picoides pubescens*), northern flickers (*Colaptes auratus*), horned larks (*Eremophila alpestris*), American crows (*Corvus brachyrhynchos*), European starlings (*Sturnus vulgaris*), American goldfinches (*Spinus tristis*), and song sparrows (*Melospiza melodia*).

Fifteen species of reptiles (3 turtles, 2 lizards, and 10 snakes) have been documented at NECD. Eastern painted pond turtles (*Chrysemys picta picta*) and eastern box turtles (*Terrapene carolina carolina*) are common at NECD; snapping turtles (*Chelydra serpentina*) also are present but are less abundant. Common snakes include black rat snakes (*Pantherophis obsoletus*) and northern water snakes (*Nerodia sipedon*).

Fifteen amphibian species have been documented at NECD. Common species include spring peepers (*Pseudacris crucifer*), chorus frogs (*Pseudacris ocularis*), American toads (*Anaxyrus americanus*), and small-mouth salamanders (*Ambystoma texanum*). Suitable wetland habitat on the uplands at NECD is

limited, which may be a factor in the diversity of species and numbers of individuals detected during herpeto-fauna surveys.

Thirty-two fish species, representing eight families, occur within the streams of NECD or near the NECD boundary; these species have been detected during various survey efforts over the past 25 years. No species of live mussels or their shells have been collected in NECD waters to date (SAIC 2008). Aquatic habitat at NECD does not currently support a sport fishery.

Rare, Threatened, and Endangered Species – The federally and state-listed endangered Indiana bat (*M. sodalis*) and federally-listed endangered northern long-eared bat (*Myotis septentrionalis*) have been observed at NECD. Maternity colonies of both the Indiana bat and northern long-eared bat have been identified at NECD (NRC 2003). Biological surveys have confirmed that the Indiana bat (*M. sodalis*) and northern-long eared bat (*M. septentrionalis*) forage and roost at NECD. The state-listed endangered northern harrier (*Circus hudsonius*) has been observed at NECD (Audubon 2022). No Federal or state-listed reptile, amphibian, or fish species have been observed during any previous surveys at NECD.

The bald eagle (*Haliaeetus leucocephalus*) was delisted from the endangered species act but is protected under the Bald and Golden Eagle Protection Act. Wintering bald eagles (*H. leucocephalus*) have been observed along the Wabash River and near NECD's administration building area (NRC 2003). According to NECD personnel, the fact that the bald eagle (*H. leucocephalus*) is a transient visitor is evident by sightings in the winter months but not in the summer months. No new nests have been built on or near NECD in recent years.

2.10 CLIMATE

NECD is located in a region characterized by a temperate continental climate with humid to sub-humid moisture regimes, moderately cold winters, and long summers. Over the course of the year, the temperature typically varies from 21°F to 85°F and is rarely below 2°F or above 92°F (Weather Spark 2021).

Rainfall is sufficient for diversified agriculture uses except during short intervals during the height of summer, when evaporation from soils can exceed rainfall for brief periods and complicate farming activities. Rainfall during the springtime wet season is usually adequate to prepare the soil for the summer months. Average annual precipitation is 41 inches, ranging from 35 to 50 inches on a 10-year cycle (Matrix 2009). Newport experiences extreme seasonal variation in the perceived humidity. Humidity ranges from 0 percent in December to 63 percent in July. The average season snowfall is 24 inches, with most of the snow falling in December, January, and February. The windier part of the year occurs from October to May, with an average hourly wind speed of 12.3 miles per hour on the windiest day of the year (Weather Spark 2021).

3. PA ANALYSIS

The primary components of the PA are records reviews, analysis of aerial photographs, a site visit, and interviews. The following sections summarize the methods used and activities conducted for the NECD PA. The references to “on-post” refer to property that has been owned by the Army. Any references to “off-post” refer to areas that have never been owned by the Army.

3.1 RECORDS REVIEW

Prior to the records review, site visit, and interviews, a kickoff meeting was held between the BRAC Office, USACE, and Leidos on May 21, 2021. The purpose of the kickoff meeting was to present all parties’ preliminary knowledge of NECD to inform the PA and site visit. The final kickoff meeting minutes are presented in Appendix A.

Preliminary research was conducted prior to the site visit to determine the potential for use, storage, or disposal of PFAS-containing materials, including AFFF, if any of the following activities were conducted at NECD:

- On-post fire training
- Use of PFAS-based AFFF in fire suppression systems or other systems
- AFFF used, stored, or disposed of at buildings and emergency response sites
- Activities or materials used that are likely to include PFAS-containing materials
- Studies conducted to assess the environmental impacts of PFAS-containing materials
- Review of potential off-post sources.

The records review included a combination of Internet-based searches and reviews of aerial photography, historical maps, technical reports, previous studies, and investigations available online. In addition, an EDR search of state and Federal environmental databases for NECD and any listed sites within a 1-mile search distance was conducted (EDR 2021).

The PA included a records review of available environmental investigations conducted under CERCLA and Resource Conservation and Recovery Act (RCRA) regulatory programs. The review included internal Army documents that were available in the administrative record managed by IDEM, which included inspection reports, regulatory correspondence, Installation maps, and a Community Environmental Response Facilitation Act (CERFA) report. Table 3-1 lists the documents reviewed that are relevant to the evaluation of AOPIs in this PA. A complete list of documents reviewed is included in Appendix B.

Table 3-1. Summary of Relevant Records Reviewed

| Document Title | Author | Date | Relevance |
|---|----------------|--------------|---|
| <i>Report of Entomological Survey</i> | USAML | 1974 | Pesticides management |
| <i>Installation Assessment of Newport Army Ammunition Plant</i> | USATHAMA | 1979 | General Installation history and identification of environmental concerns |
| <i>Installation Assessment of Newport Army Ammunition Plant</i> | EPIC | 1985 | Aerial photographic review |
| <i>Spill Prevention, Control, and Countermeasures Plan</i> | Mason & Hanger | 2008 | Spill history and procedures |
| <i>Spill Contingency Plan</i> | Parsons | 2005 | Spill history and procedures |
| <i>RCRA Facility Investigation</i> | SAIC | August 2003 | Site history and identification of SWMUs |
| <i>Stormwater Pollution Prevention Plan</i> | Mason & Hanger | March 2005 | Stormwater discharge pollutants |
| <i>Land Use Control Implementation Plan</i> | SAIC | October 2005 | Identification of LUCs |

Table 3-1. Summary of Relevant Records Reviewed (Continued)

| Document Title | Author | Date | Relevance |
|---|--------|---------------------------|--|
| <i>Environmental Condition of Property</i> | SAIC | October 2008 | General Installation history, environmental setting, previous environmental investigations, and identification of SI sites |
| <i>Reuse Plan</i> | NECDRA | December 2009 | Land use |
| <i>SI Report and Supplemental SI Report</i> | SAIC | November 2009, March 2012 | Site history and sampling results for SI sites |

Information gathered during the records reviews helped identify data gaps and enabled elimination of several areas based on their historical use. Data gaps associated with facility operations; PFAS-containing material use, storage, or disposal; and current exposure receptors at NECD contributed to a conservative approach for identifying AOPIs. However, areas with little potential to result in a PFAS release, such as residential buildings, hospitals, cafeterias, and recreational areas, were eliminated from further evaluation early in the PA process.

Areas identified to have potentially used, stored or disposed of, or had recorded the potential for a release of PFAS-containing materials, including AFFF, were further evaluated.

3.2 AERIAL PHOTOGRAPHIC ANALYSIS

During the completion of the PA, a review of the 1985 U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) aerial photographic analysis, which included aerial photographs dating as far back as 1950 (EPIC 1985) and an additional six aerial photographs (dated 1953 to 2016) provided by EDR (EDR 2021) (Appendix C). The aerial photographs were analyzed to identify potential activities or developments that may suggest the potential use, storage, or disposal of PFAS-containing materials, including AFFF (e.g., evidence of fire training activities, such as fire pits or burn scars); however, no conclusions on AFFF use or storage were drawn from the aerial photograph review. The aerial photographic analysis is summarized as follows:

- **1950** – Several ground scars are visible near the Closed Sanitary Landfill (CSL). Probable open trenches are visible near the landfill. The landfill area shows sparse vegetation. Light-toned refuse is piled at the southwestern corner of the Construction Debris Dump (CDD). The five production lines at the RDX-MA are visible.
- **1955** – The CSL is covered with more vegetation. Several ground scars remain visible but are revegetating. The probable trenches are apparently filled and revegetated. Possible equipment and large objects are visible near the landfill area. Access roads to the DWBG are visible. Light-toned mounded material and burning cages for administrative waste are present. Light- and dark-toned refuse is piled throughout the CDD. Access roads to the DWBG have been established. Light-toned mounded material is present at the western end of the DWBG. Burning cages for administrative waste are present.
- **1962** – A dark-toned pit is visible in the northwestern area of the DWBG. The area in general is heavily scarred. The piled refuse at the CDD appears to have been either graded or removed. The CDD area appears almost flat. Two ground scars and an access road are still visible. Revegetation is occurring throughout the CDD.
- **1972** – The CSL has expanded to the east, where a trench with refuse, a patch of disturbed ground, and a series of linear ground scars are visible. The possible equipment and large objects are no longer on-post. The western side of the DWBG is revegetating but still appears scarred. A dark-toned area is visible along one access road. The pit has been filled. The TNT Manufacturing Area (TNT-MA) appears completely constructed but is reportedly not yet operating. The TNT lines were in active manufacturing status from April 1973 to April 1974.

- **1975** – The RDX-MA appears to have been inactive for several years. Several buildings were removed, but the foundations are visible. Pipelines and some buildings are still intact. At the TNT-MA, a probable dark-toned ground stain is visible near the red water destruction area, where a red water spill allegedly occurred in 1973 or 1974.
- **1981** – Scattered unidentified waste is visible in the western area of the CSL, and traces of old ground scars are prevalent throughout the eastern portion of the landfill. The DWBG and CDD areas are inactive and revegetating. The RDX-MA has the appearance of several years of inactivity. Several dark-toned areas have appeared around abandoned structures and lines. These dark areas probably represent new vegetation colonizing ground that was disturbed during the demolition of the RDX-MA in 1977. The TNT-MA has been inactive for several years. The facilities appear unchanged, but vegetation appears to have been cut back or removed. A ground stain and the location of an oleum spill are noted.
- **1992, 1998** – No significant development is noted in the aerial photographs from 1990 and 1996.
- **2016** – The NECDF was constructed west of the former VX production plant in the east-central portion of NECD. In addition, eight igloos were constructed for permitted hazardous materials storage.

3.3 PA SITE VISIT

Prior to the site visit, Vermillion Rise personnel were contacted to coordinate site visit dates, access to the facility, and identify potential interviewees. In addition, a PA questionnaire was provided to Vermillion Rise personnel and former Army personnel prior to the site visit (completed questionnaires are included in Appendix E).

The NECD PA site visit was conducted on August 11 and 12, 2021. The PA site visit included a site walk and visual inspection of all readily accessible areas at NECD to identify potential sources of PFAS and gather information for developing CSMs at AOPIs. Appendix D contains photographs from the PA site visit. During the site visit, documents were reviewed in the Building 7700 environmental file room, which related to facility history, installation assessment, and site maps. Additional documents to review were found in Building 716D file cabinets related to fire suppression systems and fire protection.

3.4 SUMMARY OF INTERVIEWS

Prior to the site visit, Vermillion Rise personnel completed a PA questionnaire focused on the current use of the property. The primary goal of the questionnaire was to identify whether PFAS-containing materials and/or AFFF were used on-post prior to or following property transfer, where they were used, how much was used, how much remains, and whether any releases may have occurred. Based on the input received, firefighting foam or other PFAS-containing materials currently are not being used on the property. Completed questionnaires are included in Appendix E.

In addition, former NECD personnel completed a PA questionnaire focused on the former Army use of the property. Former NECD personnel indicated that AFFF and protein-based firefighting foams were used on-post (see Appendix E). Interviews were conducted with former NECD personnel to obtain additional information on the use of firefighting foam. Table 3-2 summarizes the interviews conducted and the pertinent information provided.

Table 3-2. Interviews Conducted for PA

| Title | Date | Information Provided |
|---|---|---|
| NECD Former Environmental Supervisor – Mason & Hanger | In-person interview on August 11, 2021 | <p>Individual had 32 years of experience at NECD (until 2018). The following information was provided:</p> <ul style="list-style-type: none"> • A building in the TNT Acid Area Tank Farm was equipped with an AFFF fire suppression system that has since been removed. The TNT facility operated from 1972 to 1974. • AFFF was stored at the TNT Acid Area Tank Farm. AFFF was transferred to 55-gallon drums and disposed of as hazardous waste in the 1990s. • 55-gallon drums of AFFF were stored at the Former Locomotive House (Building 718A). |
| NECD Former Fire Chief | Telephone interview on August 12, 2021 | <p>Individual had 35 years of experience at NECD and was the Fire Chief from 1986 to 2004. The following information was provided:</p> <ul style="list-style-type: none"> • An AFFF fire suppression system was located in the TNT Acid Area (southern end) on the western side of the diked area. • At the TNT Acid Area, the AFFF was pumped from the tank into 55-gallon containers. • The NECD fire department only responded to one fire during individual’s time at NECD (1969-2004). The fire occurred during construction of the TNT Acid Area, and water was used to extinguish the fire. • Fire equipment was washed at the Fire Station (Building 709A). • Individual was not aware of any releases or incidents of dispensed foam. |
| NECD Former Fire Chief | Received input via email dated August 31, 2021 (see Appendix E) | <p>According to the ECP, individual had 28 years of experience at NECD and took the position of Fire Chief in 2004. The following information was provided:</p> <ul style="list-style-type: none"> • AFFF was stored in 5-gallon cans on the fire truck. • At one time, approximately 1,000 gallons of AFFF cans were stored at Building 733K. • All AFFF cans were likely shipped to Los Alamos for disposal, along with the fire trucks and other fire equipment. |
| NECD Former Fire Inspector | <p>Received input via email dated August 31, 2021 (see Appendix E)</p> <p>Telephone interview on September 23, 2021</p> | <p>Individual was a Fire Inspector at NECD. The following information was provided:</p> <ul style="list-style-type: none"> • Five 5-gallon cans of AFFF were stored on the fire truck with a Venturi system to mix AFFF with water. • Protein foam (referred to as “animal blood”) was used for fire training at the Facility 262D Loading Dock on Loading Dock Road and inside the fenced-in area immediately south of the Facility 262D Loading Dock. • The protein foam also was used inside the two PCC clarifiers at the TNT Industrial WWTP. |

4. SUMMARY OF PA DATA

4.1 PREVIOUS PFAS INVESTIGATIONS

From 2012 to 2015, USEPA evaluated the occurrence of PFOA, PFOS, and four other PFAS at nationwide public water systems (i.e., waterworks) as part of its Third Unregulated Contaminant Monitoring Rule (UCMR3) evaluation. UCMR3 required public water supplies across the country to sample for a list of 30 unregulated contaminants, including 6 chemicals of concern relevant to this PA (i.e., PFOS, PFOA, PFBS, PFNA, perfluoroheptanoic acid [PFHpA], and PFHxS). Because NECD serves a population less than 10,000, it was not sampled as part of UCMR3.

IDEM has established plans for a PFAS sampling project for community water systems (CWSs). IDEM will facilitate PFAS sampling at all raw water (i.e., wells and intakes) and finished (after treatment) water points in a CWS's supply. CWSs throughout the State of Indiana are scheduled to be sampled from March 2021 to May 2023, beginning with systems serving a population of less than 10,000 (i.e., NECD) as they have not been previously sampled as part of USEPA's UCMR3 sampling (IDEM 2021). No PFAS investigations have been conducted at NECD prior to this PA.

4.2 EVALUATED SITES

During the PA records reviews, interviews, aerial photographic analysis, and site reconnaissance, the PA team examined available documentation and physical evidence for areas having a potential historical PFAS release. The sites evaluated include fire stations; fire training areas (FTAs); landfills; WWTPs; pesticide facilities; vehicle maintenance shops, which used car washes and engine lubricants; paint shops; and laundry facilities, as shown in Figure 4-1 and described in the following sections.

4.2.1 AFFF Use, Storage, and Disposal

The PA development process included searches for evidence of current or historical AFFF use, storage, or disposal at the entire former NECD installation. Although AFFF is not currently being used or stored, historical AFFF storage and use were identified through data collected during the personnel interviews, site visit, and records review. The areas identified as potential areas of historical AFFF usage and/or storage at NECD are discussed below. All areas described below now belong to NECDRA.

During personnel interviews, a fire suppression system that generated foam was identified at Building 3063 at the TNT Acid Area; personnel interviews did not identify whether the materials used were AFFF or protein foam (which may contain PFAS). The TNT manufacturing plant was established in the early 1970s. The TNT Acid Area was built in 1972 but was used only for 1 year and operated until 1974. The TNT manufacturing plant in the 1970s was composed of five continuous production lines that protruded from the TNT Acid Area, including separate sulfuric and nitric acid production and storage areas, located directly to the south of the TNT-MA; however, only two lines were used for production (Lines 1 and 2). The plant only produced TNT between April 1973 and April 1974 (TLI 2007). According to personnel interviews, testing of the foam system may have been conducted by an outside contractor. The volume of the foam storage tank is unknown, and the foam system has since been removed. The foam was transferred from the tank into an unknown number of 55-gallon drums. Two of the 55-gallon drums were reportedly stored at the Former Locomotive House (Building 718A) and disposed of as hazardous waste in the 1990s (no records of disposal were available). The 55-gallon drums of foam were reportedly used for fire training exercises at the Facility 262D Loading Dock and disposed of at the Pollution Control Center (PCC) clarifiers. The Pollution Control Center Retention Pond (PCCRP) is an in-ground basin constructed of clay, sand, and gravel, and is lined with fiber-reinforced asphaltic panels. During active operations in 1973 and 1974, the PCCRP received wastewaters from the PCC clarifiers.

One historical Fire Station (Building 709A) and two additional Fire Department buildings (Buildings 255A and 733K) were identified during the PA. The Fire Station (Building 709A) was constructed in 1942 and operated as a fire station until 2010. According to personnel interviews, 5-gallon cans of AFFF, designed with a Venturi system to mix AFFF with water, were historically stored on the fire trucks and washed outside on the Fire Station ramp. In addition, fire equipment was washed inside Building 709A and the water reached the floor drain. The drain was subsequently sealed and removed. Based on the Environmental Condition of Property (ECP), Buildings 255A and 733K were constructed in 1942 and used to store fire training equipment (SAIC 2008). During the PA site visit, soot on the walls and a smoke odor were observed at Building 255A, indicating that the building may have been used for fire training exercises. Fire extinguishers were stored in Building 733K (Mason & Hanger 2008). According to personnel interviews, approximately 1,000 gallons of AFFF were once stored at Building 733K; the AFFF was stored in 5-gallon cans.

According to the ECP, fire training exercises were conducted at the Fire Training Pit, Scrap Yard, and Facility 262D Loading Dock. Use of the Fire Training Pit began in the late 1960s, and according to personnel interviews, usage continued until 1980. Diesel and gasoline were reportedly burned during training exercises. Fire training was also conducted at the Scrap Yard in the 1990s. Railroad ties were burned at the Scrap Yard (SAIC 2008). It is unknown whether firefighting foam was used for fire extinguishing at the Scrap Yard. According to personnel interviews, foam from the TNT Acid Area (AFFF or protein foam) was used for fire training at the Facility 262D Loading Dock.

In addition, two open burning grounds were identified at NECD; these burning grounds, the RDX Burning Ground (RDX-BG) and TNT Burning Ground (TNT-BG), were not used for fire training activities. The RDX-BG occupied an area of 14.92 acres in the southwestern portion of NECD. The site reportedly was used sporadically from 1942 to 1946, 1951 to 1957, and 1968 to 1976. Materials burned at the site included waste RDX and waste explosives components of M23 land mines and M55 rockets. Waste explosive components from M23 land mines and M55 rockets were disposed of by the U.S. Army Technical Escort Detachment at the RDX-BG. The TNT-BG encompassed approximately 4 acres in the southwestern portion of NECD. Three burial trenches reportedly were used within the fenced TNT-BG to dispose of burned explosive residues, beginning in approximately 1973. Various types of solid waste were brought to the TNT-BG for treatment (i.e., burning) and disposal during the mid-1970s. These materials included reject TNT, TNT residue from tanks and lines at the TNT production plant, contaminated floor sweepings, wood pallets, excelsior, oil or gasoline used to facilitate the burning, and contaminated debris from the inactive TNT plant during and after plant layaway in 1975 (SAIC 2003).

4.2.2 Metal Plating Operations

No current or historical metal plating operations were identified at NECD.

4.2.3 Wastewater Treatment Plants

Operations at NECD produced multiple wastewater streams. The most significant sources of wastewater at NECD were the Chemical Plant Area, RDX-MA, and TNT-MA. From 1960 to 1969, a deep well injection point was used to dispose of waste detoxification solution and wastewaters generated from equipment cleanup and industrial processes at the Chemical Plant. The well was deactivated in 1971 and, in 1985, it was plugged and abandoned in accordance with a USEPA-approved closure plan (SAIC 2008).

Sanitary wastes at NECD are currently processed by a central sewage treatment plant (STP). The STP has been in use since 1942. The STP consists of a primary settling tank, three aeration tanks, a secondary settling tank, a chlorine contact tank, and four sludge drying beds. Sludge was disposed of at an off-post permitted landfill. Treated effluent from the STP is discharged through a force main to the Wabash River (SAIC 2008). The STP is still active and not known to have received PFAS waste in the past.

Effluent discharges at NECD were regulated by National Pollutant Discharge Elimination System (NPDES) permit IN0003506. The permit addressed monitoring requirements for Outfall 001 (STP), Outfall 101 (mixed STP and retention basin discharge), and Outfall 004 (TNT-BG runoff). Two outfalls exclusively discharged stormwater runoff: Outfall 002 (stormwater discharge to Little Vermillion Creek) and Outfall 003 (stormwater discharge to Little Raccoon Creek) (SAIC 2003).

4.2.4 Landfills

NECD has two former sanitary landfill sites: the CSL and Sanitary Landfill. The CSL occupies approximately 4 acres on the southeastern boundary of NECD, north of South Boulevard and east of the Demilitarization Incinerator/Scrap Yard (DI/SY). The CSL was in operation between 1970 and 1977 and was used to dispose of nonhazardous construction debris from the TNT plant and office and shop waste with no salvage value (Dames & Moore 1991b). Aerial photographs taken of this area from 1940 through 1981 show disposal trenches excavated in a northwest-southeast direction. The waste disposal trenches within the landfill area were each approximately 8 to 10 feet long and 5 feet wide. The landfill was closed in 1977 and topped with cover material consisting of 3 feet of graded soil (Dames & Moore 1991b). The Sanitary Landfill, located east of West Patrol Road and north of South Boulevard, was permitted and was in operation from 1981 to 1987. According to personnel interviews, a minimum amount of solid waste was landfilled. The site encompasses approximately 30 acres, but only a small portion (0.67 acres) was used. Land use controls (LUCs) are in place at both the CSL and Sanitary Landfill (see Figure 2-2).

NECD has four known dump sites: DWBG, Memorial Chapel RDX Dump (MCD), CDD, and the Night Soil Pits (NSPs). The DWBG was historically used to dispose of decontaminated wastes associated with the production of VX (1961 to 1969). In the 1962 aerial photograph, a dark-toned pit is visible in the northwestern area of the DWBG (see Section 3.2). The MCD and CDD are in the eastern portion of NECD, south of the CSL, and both sites were used for construction debris disposal. The NSPs are in the northwestern corner of NECD and consist of a 250- by 250-foot fenced burial area containing two pits. The site was used in the 1940s to bury “night soils” (i.e., waste from privies). In 1968, these pits were used for disposing of decontaminated solid waste from the VX manufacturing process. The decontaminated waste included decontaminated sludge from Chemical Plant settling basin d30025 (Dames & Moore 1991b). In 1977, rubble and other burned materials resulting from the razing of the RDX manufacturing facility also were disposed of in the NSPs (USATHAMA 1979).

4.2.5 Other Potential Sources of PFAS

In addition to AFFF-related PFAS sources, other potential sources of PFAS may be associated with the use of some types of pesticides, car washes, engine lubricants, paint shops, laundry or water proofing facilities, and photographic processing facilities. Document research, site visit, and interviews resulted in identification of potential PFAS sources at NECD; locations are discussed below:

- **Vehicle Maintenance** – Buildings 716A was used for vehicle maintenance since 1942 (SAIC 2008). A removal action was conducted at Building 716A to address lead concentrations in soil at the southwestern corner of the building (SAIC 2012). No evidence was found that emergency vehicles were serviced at Building 716A.
- **Wash Rack** – Building 716D was used as a wash rack since 1942 (SAIC 2008). According to personnel interviews, Building 716D is a five-bay structure and was used for maintenance activities in addition to vehicle washing. Floor drains reached adjoining ditches until they were rerouted to the sanitary sewer in 1995. Although a complete list of products used for wash rack operations is not available, it is understood that common products used in vehicle washing may have contained minor amounts of PFAS-containing material and would not be considered a significant source of PFAS contamination. As a result, the potential PFAS impacts were determined to be unlikely.

Significant PFAS impacts would have been more likely from emergency vehicles being serviced at the wash racks; no evidence was found that emergency vehicles were serviced at Building 716D.

- **Pesticides** – Buildings 722A, 723A, and 726C were used for storage of pesticides, including herbicides, insecticides, rodenticides, and fungicides (SAIC 2008). Lessees of agricultural land tracts typically used Atrazine on corn crops. Chlordane was used for under-slab injection and foundation treatment of termites (USAML 1974). Pesticides were stored in Building 722A from 1988 to 2007; Buildings 723A and 726C were used for pesticide storage in the past for an unknown period (SAIC 2009). A removal action was conducted at Building 726C to address chlordane concentrations in soil (SAIC 2012). Historical disposal of pesticide containers at the CSL was reported in the 1973 U.S. Army Environmental Hygiene Agency (USAEHA) Solid Waste Survey. Although a complete list of pesticides used, stored, or disposed of at NECD is not available, the use of fluorinated pesticides was infrequent until approximately the mid-2000s (Alexandrino et al. 2022). Given the operational period of NECD, the likelihood of PFAS impacts due to pesticide use, storage, or disposal is assumed to be low.
- **Laundry** – Based on personnel interviews, Buildings 101 and 723A (east of Building 733K in the Chemical Plant Area) were used for laundry. Building 101 was an agent-protective clothing laundry; the building has been demolished. Building 723A was combined to handle both agent- and cotton-protective clothing. According to the ECP, Building 723A contained industrial washers and dryers for cotton laundry; the building also was used for mask fitting, testing, and sanitizing. No evidence was found that the laundry facilities at NECD were used to wash fire department clothing or equipment with AFFF.

During the document research and site visit, no additional potential PFAS-containing material use, storage, or disposal were identified.

4.3 POST TRANSFER AND POTENTIAL OFF-POST PFAS SOURCES

Based on information gathered during interviews and the site visit, no known PFAS releases have occurred post transfer on-post. An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at NECD) is not part of the PFAS PA program. However, a search of significant potential contributors (i.e., airports, landfills, WWTPs) was performed. During the site visit, most of the property surrounding NECD was noted to be agricultural, cropland, woodlands, and pastures. EDR conducted a search of state and Federal environmental databases for the NECD property and any adjacent properties (EDR 2021). The EDR search identified the following properties within 2 miles of the property boundary: Vermillion County Jail, Panhandle Eastern Pipeline, Lawrence Village STP, Southern Power Company, restricted-use pesticide dealers, and pesticide/fertilizer applicators. The closest solid waste facility to NECD is the former Vermillion County Landfill (½ mile east of NECD), as shown in Figure 4-1.

5. SUMMARY OF PA RESULTS

The areas evaluated for potential PFAS use and/or storage at NECD were further refined during the PA process and categorized either as an AOPI or not retained. Areas not retained as AOPIs are discussed in Section 5.1. AOPIs are discussed in Section 5.2.

5.1 AREAS NOT RETAINED AS AOPIs

Based on analysis of information obtained during this PA, the areas described below were not retained as AOPIs. These areas were previously identified as potential PFAS sources (e.g., AFFF storage, car washes, automobile maintenance, paint shops, photographic processing, pesticide use or storage, WWTPs, landfills) at NECD. However, PA research does not indicate that PFAS-containing material was used, stored, or disposed of at these areas. A brief site history and the rationale for eliminating the areas as AOPIs are presented in Table 5-1.

Table 5-1. Summary of Areas Not Retained as AOPIs at NECD

| Area Description | Dates of Operation | Relevant Site History | Rationale |
|------------------|---|---|---|
| TNT-BG | 1973 to 1986 | Reject TNT, TNT residue from tanks and lines at the TNT production plant, contaminated floor sweepings, wood pallets, and excelsior were burned, and oil or gasoline was used to facilitate the burning. | No evidence that PFAS-containing materials were used, stored, or disposed of. No indication of AFFF use during burning. |
| RDX-MA | 1943 to 1957 | Historical production of RDX. | No evidence of AFFF based on the dates of operation. |
| RDX-BG | Used sporadically from 1942 to 1946, 1951 to 1957, and 1968 to 1976 | Waste RDX and waste explosives components of M23 land mines and M55 rockets were burned. | No evidence that PFAS-containing materials were used, stored, or disposed of. No evidence of AFFF use during burning. |
| DWBG | Sporadic use reportedly in 1963, 1968, and 1974. | Historically used to dispose of decontaminated wastes associated with the production of VX. | No evidence that PFAS-containing materials were disposed of at the DWBG. |
| NSP | 1940s, 1968, and 1977 | The site was used in the 1940s to bury “night soils” (i.e., waste from privies). In 1968, these pits were used for disposing of decontaminated solid waste from the VX manufacturing process. The decontaminated waste included decontaminated sludge from Chemical Plant settling basin 30025 (Dames & Moore 1991b). In 1977, rubble and other burned materials resulting from the razing of the RDX manufacturing facility also were disposed of in the NSPs (USATHAMA 1979). | No evidence that PFAS-containing materials were disposed of at the NSP. |
| CSL | 1970 to 1977 | The CSL historically was used to dispose of construction debris from the TNT plant and office and shop waste. | No evidence that PFAS-containing materials were disposed of at the CSL. |

Table 5-1. Summary of Non-AOPIs at NECD (Continued)

| Area Description | Dates of Operation | Relevant Site History | Rationale |
|--|---|---|--|
| Sanitary Landfill | 1981 to 1987 | Permitted landfill encompassed approximately 30 acres, but only a small portion (0.67 acres) was used. | No evidence that PFAS-containing materials were disposed of at the Sanitary Landfill. |
| MCD | Unknown | Construction debris was disposed of. | No evidence that PFAS-containing materials were disposed of at the MCD. |
| CDD | Unknown | Construction debris was disposed of. | No evidence that PFAS-containing materials were disposed of at the CDD. |
| Deep Well | 1960 to 1969 | A deep well injection point was used to dispose of waste detoxification solution and wastewaters generated from equipment cleanup and industrial processes at the Chemical Plant. The well was deactivated in 1971 and, in 1985, it was plugged and abandoned in accordance with a USEPA-approved closure plan. | No evidence that PFAS-containing materials were disposed of in the Deep Well. |
| STP | Since 1942 | The STP consists of four sludge drying beds. The STP is currently active (NECD 2006). | No evidence that the STP received PFAS-containing waste materials. |
| Vehicle Maintenance (Buildings 715A and 716A) | 1942 to 2010 | Historically used for vehicle maintenance (e.g., lubricants), Building 716A was investigated during the SI/Supplemental SI; PAHs and metals were detected (SAIC 2009 and 2012). | No evidence that PFAS-containing materials were used, stored, or disposed of. No evidence that emergency vehicles were serviced. |
| Wash Rack (Building 716D) | 1942 to 2010 | Historically used as a wash rack. Floor drains reached adjoining ditches until they were rerouted to the sanitary sewer in 1995. | No evidence that PFAS-containing materials were used, stored, or disposed of. No evidence that emergency vehicles were serviced. |
| Pesticide Storage (Buildings 722A, 723A, and 726C) | Building 722A was used from 1988 to 2007 Building 723 – Unknown Building 726C – Unknown | Pesticide formulation and storage. Buildings 722A, 723A, and 726C were investigated during the SI. Building 726C was also investigated during the Supplemental SI. A removal action was conducted at Building 726C to address chlordane in soil. | No evidence that PFAS-containing materials were used, stored, or disposed of. Pesticides are not suspected to contain PFAS because dates of pesticide use at the facility predate the use of fluorinated pesticides. |
| Laundry (Buildings 101 and 723A) | 1942 to 2010 | Building 101 was an agent-protective clothing laundry. Building 723A was combined to handle both agent- and cotton-protective clothing. | No evidence that PFAS-containing materials were used, stored, or disposed of at the buildings. No evidence that fire department clothing or equipment with AFFF were washed at these laundry facilities. |

5.2 AOPIs

Based on analysis of information obtained during document research, personnel interviews, and/or site reconnaissance, nine areas were categorized as AOPIs and are presented in Table 5-2 and Figure 5-1. Site research conducted for this PA indicates that PFAS-containing material use, storage or disposal is suspected at these areas.

Table 5-2. Summary of AOPIs at NECD

| Area Description | Dates of Operation | Relevant Site History | Rationale |
|--|---------------------------|--|---|
| Fire Training Pit | Late 1960s to early 1980s | Fire training activities were conducted at the site. Diesel and gasoline were burned during fire training activities. | Fire training activities with likely use of AFFF and/or protein foam (AFFF and protein foam reportedly stored/used at NECD). |
| Scrap Yard (SWMU NAAP-65 DI/SY) | 1990s | Fire training activities conducted at the site. Contaminants related to fire training activities (i.e., explosives, VOCs, SVOCs, and metals) were also detected at the site. Intrusive activity, groundwater use, residential use, and agricultural use are restricted at the Scrap Yard. | Fire training activities with likely use of AFFF and/or protein foam (AFFF and protein foam reportedly stored/used at NECD). |
| Fire Department Training (Building 255A) | Unknown | Reported to have been used for storage of fire training and gas mask training equipment. During the site visit, a smoke odor and soot were observed within the building. | Fire training activities with likely use of AFFF and/or protein foam (AFFF and protein foam reportedly stored/used at NECD). |
| Foam House at TNT Acid Area | 1972 to 1980 | Building 3063 (active from 1972 to 1974) housed a foam-generating fire suppression system. The system may have been tested by an outside contractor. Prior to 1980, the foam was transferred from the fire suppression system tank into 55-gallon drums. | Releases of foam (likely AFFF or protein foam) may have occurred during building operations, fire suppression system testing, and/or transfer operations. |
| Facility 262D Loading Dock | 1980s | Firefighting foam from the 55-gallon drums of foam transferred from the Foam House at TNT Acid Area fire suppression system reportedly used for fire training activities. | Fire training activities with reported use of AFFF and/or protein foam. |
| PCC Clarifiers and PCCRP (SWMU NAAP-48 PCC and SWMU NAAP-49 PCCRP) | 1972 to 1980 | AFFF or protein foam from the 55-gallon drums transferred from the Foam House at TNT Acid Area fire suppression system reportedly disposed of at the PCC clarifiers. The PCC clarifiers potentially discharged to the PCCRP. Groundwater use and residential use are restricted for the PCCRP. | Reportedly received AFFF or protein foam during disposal activities. |
| Former Locomotive House (Building 718A) | 1980 | Building reportedly used for temporary storage of the 55-gallon drums of AFFF or protein foam transferred from the Foam House at TNT Acid Area fire suppression system. | Reportedly used for temporary storage of AFFF or protein foam. |
| Fire Station (Building 709A) | 1942 to 2010 | AFFF was reportedly stored in 5-gallon containers on the fire truck, which was washed and parked at the NECD Fire Station. | Reportedly used for storage of AFFF and washing the NECD fire truck. |
| Fire Equipment Storage (Building 733K) | Unknown | 1,000 gallons of AFFF were reportedly stored in 5-gallon containers within the building. Firefighting equipment was also stored within the building. | Reportedly used for storage of AFFF and firefighting equipment. |

5.2.1 Preliminary CSM

A preliminary CSM was prepared for each of the installation's AOPIs in accordance with the *USACE Engineer Manual on Conceptual Site Models, EM 200-1-12* (USACE 2012) and USEPA guidance. The preliminary CSMs identified potential human receptors and chemical exposure pathways based on current and/or reasonably anticipated future land uses. The preliminary CSMs identified soil, groundwater, surface water, and sediment pathways as potentially complete.

Based on the documented or potential historical use, storage, or disposal of PFAS-containing materials at NECD, affected media are likely to consist of soil, groundwater, surface water, and sediment. Release and transport mechanisms include dissolution/desorption from soil to groundwater, runoff/dissolution/adsorption with surface water or stormwater, and recharge to groundwater from surface water. While other potential exposure media (i.e., soil and sediment) besides drinking water sources (i.e., groundwater and/or surface water) may be impacted by PFAS, direct ingestion via drinking water is the most likely exposure route, and thus the Army's primary concern for human exposure. Therefore, the focus of the Army's PA program is on potential human exposures via drinking water ingestion. The potential for human exposures to PFAS through non-drinking water pathways has not yet been established and may be evaluated at a future date if it is determined that those pathways warrant further consideration. The CSMs presented in this report focus on drinking water pathways via groundwater and surface water that are known to be used as a source of potable water. Vermillion Rise obtains drinking water via the Ranney well, as described in Section 2.9.

A groundwater exposure pathway is considered potentially complete where a constituent of interest (COI) could migrate from the AOPI source area to groundwater that is used for drinking water. Otherwise, the groundwater exposure pathway is considered incomplete. The following parameters are used to determine if an AOPI source area had a potentially complete groundwater exposure pathway:

- AOPIs located upgradient or in the vicinity of drinking water sources and that have the potential to influence groundwater associated with these potable sources are considered to have a potentially complete groundwater exposure pathway for on-post drinking water receptors.
- AOPIs that have the potential to influence groundwater that flows off-post are considered to have a potentially complete exposure pathway for off-post receptors.

The soil exposure pathway is considered potentially complete where COIs could be present in soil. A surface water exposure pathway is considered potentially complete where COIs could be present in a surface water body (e.g., a reservoir or large river) that serves as a potable water source. No on-post surface water features are used as a drinking water source. Off-post, the Wabash River is known to be used as a drinking water source. Therefore, surface water is a potential exposure medium for off-post receptors. Figure 5-1 presents the locations of the AOPIs. AOPI-specific CSM summaries are provided in Tables 5-3 through 5-11. All AOPIs are on property that has been transferred to NECDRA.

5.2.2 Fire Training Pit – AOPI Rationale and CSM

The Fire Training Pit was identified as an AOPI following records review, interviews, aerial photograph review, and site reconnaissance. Because the NECD Fire Department stored and used AFFF and/or protein foam, these materials were likely used during fire training activities. According to Interstate Technology Regulatory Council (ITRC) guidance, protein foams were often fluoroprotein foams and may contain PFAS (ITRC 2020b). Fire training occurred at the site in the late 1960s. Based on personnel interviews, the use of the site continued until the early 1980s. Diesel and gasoline were burned during fire training exercises. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

SI sampling was conducted in November 2008 and March 2009 to determine whether fuel-related chemical constituents have been released to the environment as a result of previous fire training activities.

Five surface and five subsurface soil samples were collected and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and lead. Eight VOCs (including benzene, toluene, ethylbenzene and xylene) and eight polynuclear aromatic hydrocarbons (PAHs) were detected in soil at the Fire Training Pit. No VOCs in the surface or subsurface soils were detected at concentrations greater than the reporting limits. PAHs were detected in the surface soil at four of the five locations; PAH concentrations in the subsurface soil were limited to the westernmost sampling location. VOC and PAH concentrations were less than human health screening levels. The low concentrations of PAHs detected appeared to be consistent with the area's use as a fire training pit (SAIC 2009). Since contaminants related to fire training activities were detected in soil at the site, AFFF may have also been released to site media.

A visual inspection of the Fire Training Pit was conducted during the site visit. The area is an uneven grassy field and an area of depression; no structures are present (Building 710 is to the north).

Table 5-3. AOPI CSM Information Profile – Fire Training Pit

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|---|---|
| Site Profile | AOPI site structures/description | Grassy field |
| | Latitude, longitude | 39.85037, -87.418 |
| | Size | 0.11 acres |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the Fire Training Pit. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |
| | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Although on-post water wells are not used for drinking water at NECD a potential exposure pathway exists on-post because no groundwater use restrictions are in place at this AOPI. In addition, an off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.3 Scrap Yard – AOPI Rationale and CSM

The Scrap Yard is identified as an AOPI following records review, interviews, aerial photograph review, and site reconnaissance. Because the NECD Fire Department stored and used AFFF and/or protein foam, these materials were likely used during fire training activities. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

Fire training was conducted at the Scrap Yard in the 1990s. Railroad ties were burned at the Scrap Yard (SAIC 2008). These activities at the Scrap Yard were confirmed during interviews with former Army personnel. The Scrap Yard was previously investigated as part of the DI/SY (Solid Waste Management Unit [SWMU] NAAP-65). The western boundary of the DI/SY was used as the Scrap Yard. Since contaminants related to fire training activities (e.g., explosives, VOCs, SVOCs, and metals) were detected in soil at the site (Dames & Moore 1991b), AFFF may have also been released to site media.

A visual inspection of the Scrap Yard was conducted during the site visit. The area is overgrown and was inaccessible by vehicle due to roadblocks. A sign was posted to indicate the LUCs in place at the DI/SY.

Table 5-4. AOPI CSM Information Profile – Scrap Yard

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|---|---|
| Site Profile | AOPI site structures/description | Grassy field, not maintained |
| | Latitude, longitude | 39.84191, -87.4238 |
| | Size | 7.12 acres |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the Scrap Yard. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |
| | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Because groundwater use is restricted at this site, no drinking water exposure pathway exists at this AOPI for the duration that the LUC remains on the property. An off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.4 Fire Department Training (Building 255A) – AOPI Rationale and CSM

Building 255A is identified as an AOPI following records review, interviews, and site reconnaissance. Fire training activities are suspected to have occurred inside the building, and because the NECD Fire Department stored and used AFFF and/or protein foam, these materials would have likely been used during fire training activities. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

According to the ECP, Building 255A was constructed in 1942. It was constructed of corrugated steel on a concrete foundation and is 2,032 ft². During the time of the ECP, the building was being used for storage of fire training and gas mask training equipment. A visual inspection of Building 255A was conducted during the PA site visit. A smoke odor was detected inside the building, and soot was observed on the walls. The exact dates of fire training activities are unknown.

Table 5-5. AOPI CSM Information Profile – Fire Department Training (Building 255A)

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|-------------------------------------|--|
| Site Profile | AOPI site structures/description | Structure is present; surrounded by asphalt and other structures. |
| | Latitude, longitude | 39.83962, -87.4367 |
| | Size | 2,032 ft ² |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at Building 255A. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |

Table 5-5. AOPI CSM Information Profile – Fire Department Training (Building 255A) (Continued)

| Profile Type | Information Needs | Preliminary Assessment Findings |
|-------------------------|---|---|
| CSM Profile (Continued) | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Although on-post water wells are not used for drinking water at NECD a potential exposure pathway exists on-post because no groundwater use restrictions are in place at this AOPI. In addition, an off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.5 Foam House at TNT Acid Area – AOPI Rationale and CSM

The Foam House at the TNT Acid Area was identified as an AOPI following records review, interviews, and site reconnaissance. AFFF or protein foam was stored in a foam-generating fire suppression system at Building 3063 (Foam House). Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

A foam-generating fire suppression system was housed in Building 3063 at the TNT Acid Area. The TNT manufacturing plant was established in the early 1970s. The TNT Acid Area was built in 1972 and operated until 1974. The TNT manufacturing plant in the 1970s was composed of five continuous production lines that protruded from the TNT Acid Area, including separate sulfuric and nitric acid production and storage areas, located directly to the south of the TNT-MA; however, only two lines were used for production (Lines 1 and 2). The plant only produced TNT between April 1973 and April 1974 (TLI 2007). According to personnel interviews, testing of the foam system may have been conducted by an outside contractor. The volume of the foam storage tank is unknown, and the foam system has since been removed. The foam was transferred from the tank into an unknown number of 55-gallon drums; according to personnel interviews, this occurred prior to 1980. The foam may have been released from the fire suppression system or during transfer between containers.

A visual inspection of the TNT Acid Area was conducted during the site visit. The structures remain in place; however, the buildings are inactive, and the surrounding grassy area is not maintained.

Table 5-6. AOPI CSM Information Profile – Foam House at TNT Acid Area

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|-------------------------------------|--|
| Site Profile | AOPI site structures/description | The inactive building is still in place. Some surrounding structures. Grassy field not maintained. |
| | Latitude, longitude | 39.83298, -87.4504 |
| | Size | 0.22 acres |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the TNT Acid Area. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |

Table 5-6. AOPI CSM Information Profile – Foam House at TNT Acid Area (Continued)

| Profile Type | Information Needs | Preliminary Assessment Findings |
|----------------------------|---|--|
| CSM Profile (Continued) | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Although on-post water wells are not used for drinking water at NECD, a potential exposure pathway exists on-post because no groundwater use restrictions are in place at this AOPI. In addition, an off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.6 Facility 262D Loading Dock – AOPI Rationale and CSM

The Facility 262D Loading Dock was identified as an AOPI following records review and personnel interviews. AFFF or protein foam was reportedly used during fire training activities. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

According to personnel interviews, firefighting foam was used in the 1980s during fire training activities at the Facility 262D Loading Dock on Loading Dock Road and inside the fenced-in area immediately south of the Facility 262D Loading Dock. The foam that was used at this site came from the 55-gallon drums that were filled at the TNT Acid Area Tank Farm.

Table 5-7. AOPI CSM Information Profile – Facility 262D Loading Dock

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|---|--|
| Site Profile | AOPI site structures/description | Grassy area near the wooden loading dock; intersection of Broadway and Loading Dock Road. |
| | Latitude, longitude | 39.85206, -87.4722 |
| | Size | 0.39 acres |
| Land Use | Current/future land use | Recreational |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the Loading Dock. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |
| | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Although on-post water wells are not used for drinking water at NECD, a potential exposure pathway exists on-post because no groundwater use restrictions are in place at this AOPI. In addition, an off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.7 PCC Clarifiers and PCCRP – AOPI Rationale and CSM

The PCC clarifiers and PCCRP were identified as an AOPI following records review and personnel interviews. AFFF or protein foam was reportedly disposed of at the PCC clarifiers, which potentially discharged to the PCCRP. The foam that was used at this site came from the 55-gallon drums that were filled at the TNT Acid Area Tank Farm. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

Table 5-8. AOPI CSM Information Profile – PCC Clarifiers and PCCRP

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|---|--|
| Site Profile | AOPI site structures/description | Concrete clarifiers and a retention pond. |
| | Latitude, longitude | 39.83692, -87.4516 |
| | Size | 2.44 acres |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Surface Water |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface water related to historical operations at the PCC clarifiers and PCCRP. The secondary contaminant migration and fate and transport considerations include downward contaminant migration to sediment to deeper subsurface soil and groundwater through leaching and percolation. |
| | Exposure pathways, media, and human receptors | Surface water is considered a complete exposure pathway at NECD. Because groundwater use is only restricted within the limits of the PCCRP area, a drinking water exposure pathway exists at a majority of this site. An off-post exposure pathway also exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.8 Former Locomotive House (Building 718A) – AOPI Rationale and CSM

The Former Locomotive House was identified as an AOPI following records review, personnel interviews, and site reconnaissance. According to personnel interviews, 55-gallon drums of AFFF or protein foam were temporarily stored at the building; the 55-gallon drums were the ones that were filled at the TNT Acid Area Tank Farm. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

According to the ECP, contaminated soil and surface water were discovered near the Former Locomotive House in July 2000 during construction of the NECDF. The Former Locomotive House was investigated during the SI because of the possibility of contamination from release of solvents and petroleum products associated with locomotive maintenance. Five subsurface soil samples were collected. Seven VOCs and eight metals were detected at concentrations greater than background in the subsurface soil at the Former Locomotive House (former Building 718A) and surrounding area. VOC concentrations were less than the reporting limits and/or several orders of magnitude less than the screening levels. Metals detected at concentrations greater than background were limited to one sampling location. None of the VOCs or metals that were detected at concentrations greater than background exceeded human health screening criteria. Since chemicals were released to the subsurface soil at the site, PFAS may have also been released to site media.

A visual inspection of the Former Locomotive House location was conducted during the site visit. The site was vacant with the structure removed, but the concrete pad was still in place.

Table 5-9. AOPI CSM Information Profile – Former Locomotive House (Building 718A)

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|----------------------------------|---|
| Site Profile | AOPI site structures/description | Structure was demolished; concrete pad is still in place. |
| | Latitude, longitude | 39.85069, -87.4263 |
| | Size | 0.12 acres |
| Land Use | Current/future land use | Commercial/Industrial |

**Table 5-9. AOPI CSM Information Profile – Former Locomotive House (Building 718A)
(Continued)**

| Profile Type | Information Needs | Preliminary Assessment Findings |
|---------------------|---|---|
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the Locomotive House. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |
| | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Because groundwater use is restricted at this site, no drinking water exposure pathway exists at this AOPI for the duration that the LUC remains on the property. An off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.9 Fire Station (Building 709A) – AOPI Rationale and CSM

The Fire Station was identified as an AOPI following records review, interviews, and site reconnaissance. According to personnel interviews, AFFF was stored on the fire truck, which was parked and washed at the Fire Station. The fire truck had five 5-gallon cans of AFFF, designed with a Venturi system to mix AFFF with water. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

According to the ECP, Building 709A was constructed in 1942. It was constructed of shingled siding on a concrete foundation and is 2,580 ft². No other uses for the building were identified other than as the Fire Station. The exact dates of AFFF storage at the Fire Station are unknown. A visual inspection of the Fire Station was conducted during the site visit. The Fire Station structure was present, and the surrounding area is level with well-maintained grass.

Table 5-10. AOPI CSM Information Profile – Fire Station (Building 709A)

| Profile Type | Information Needs | Preliminary Assessment Findings |
|---------------------|---|--|
| Site Profile | AOPI site structures/description | Structure is present and surrounded by asphalt and grassy area. |
| | Latitude, longitude | 39.85239, -87.4228 |
| | Size | 2,580 ft ² |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the Fire House. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |
| | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Although on-post water wells are not used for drinking water at NECD, a potential exposure pathway exists on-post because no groundwater use restrictions are in place at this AOPI. In addition, an off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.2.10 Fire Equipment Storage (Building 733K) – AOPI Rationale and CSM

The Fire Equipment Storage building was identified as an AOPI following records review, interviews, and site reconnaissance. According to personnel interviews, 1,000 gallons of AFFF were stored in 5-gallon cans at Building 733K. Releases or leaks of AFFF may have occurred at the site. Due to the likely use of AFFF and/or protein foam, the site is identified as an AOPI.

According to the ECP, Building 733K was constructed in 1942. It was constructed of yellow corrugated siding on a concrete foundation and is 12,800 ft². During the time of the ECP, the building was being used for emergency vehicle storage and emergency responder training. The building had been used for storage of firefighting equipment, masks, and air cylinders. The building was historically used to store unfilled reject land mine components. The exact dates of AFFF storage at Building 733K are unknown.

Table 5-11. AOPI CSM Information Profile – Fire Equipment Storage (Building 733K)

| Profile Type | Information Needs | Preliminary Assessment Findings |
|--------------|---|--|
| Site Profile | AOPI site structures/description | Structure is present and surrounded by asphalt and other structures. |
| | Latitude, longitude | 39.85326, -87.4248 |
| | Size | 12,800 ft ² |
| Land Use | Current/future land use | Commercial/Industrial |
| CSM Profile | Source media | Soil |
| | Migration routes/release mechanisms | The primary release mechanism is the potential release of AFFF to surface soils related to historical operations at the Fire Equipment Storage Building. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through leaching and percolation, and to surface water and sediment via runoff of precipitation. |
| | Exposure pathways, media, and human receptors | Soil is considered a complete exposure pathway at NECD. Although on-post water wells are not used for drinking water at NECD, a potential exposure pathway exists on-post because no groundwater use restrictions are in place at this AOPI. In addition, an off-post exposure pathway exists because drinking water is obtained from the Ranney well located approximately 2 miles downgradient from the site, near the Wabash River. |

5.3 DATA LIMITATIONS

The data limitations relevant to the development of this PA for PFAS at NECD are discussed below.

A comprehensive well survey was not completed as part of this PA; therefore, the information reviewed regarding off-post wells is limited to the desktop survey completed. No off-post water supply wells were found in the EDR well search report (Appendix F) or in the online Indiana state database (IDNR 2021).

The searches for ecological receptors and off-post PFAS sources were limited to readily identifiable and readily available information.

Records reviewed during the PA process were limited in information regarding PFAS-containing materials, including AFFF use, procurement records, and firefighter training records. Generally, interviews were crucial to understanding past practices and identifying the potential for use, storage, or disposal of PFAS-containing materials because records are often not available after installation closure.

Finally, the records review was limited to available Administrative Record and online resources. Waste and chemical inventories, historical drawings, blueprints, and as-built drawings were not available. Therefore, conclusions and recommendations presented in this report are based on available information, professional judgment, and industry best practices.

6. CONCLUSIONS

This PA was conducted in accordance with DoD, Army, and USEPA guidance documents. Programmatically, the Army has focused its PFAS PA efforts on identifying locations where a potential for a release of PFAS exists (i.e., those locations where PFAS-containing materials were used, stored, or disposed of). Locations identified on NECD with the greatest likelihood of releases of PFAS were evaluated as part of this PA, including FTAs, AFFF storage locations, aircraft crash sites, fuel farms, and sites associated with aviation assets. However, other potential sources of PFAS at the installation were considered and have been documented in this PA. A combination of document review, Internet searches, interviews with NECD personnel, and a site visit were used to identify specific areas of suspected PFAS use and releases at NECD.

The entire former NECD installation was assessed; 24 preliminary areas were identified and evaluated for potential use, storage and/or disposal of PFAS-containing materials; and these areas were further refined during the PA process and then either identified either as an area not retained for further investigation or as an AOPI. In accordance with the established process for the PA, nine of the preliminary areas have been identified as AOPIs. The AOPIs identified during this PA at NECD are listed below:

- One fire suppression system (Foam House at TNT Acid Area)
- One former fire station (Building 709A)
- Four former FTAs (Fire Training Pit, Scrap Yard, Building 255A, and Facility 262D Loading Dock)
- Former AFFF/protein foam disposal areas (PCC clarifiers/PCCRP)
- Former AFFF/protein foam storage areas (Buildings 718A and 733K).

A site-specific CSM was developed for each AOPI based on an assessment of existing records, personnel interviews, and site reconnaissance trips. CSMs developed for this PA did not identify any of the nine AOPIs as impacting or having the potential to impact on-post drinking water receptors. However, the exposure pathway for off-post drinking water receptors is potentially complete for the nine AOPIs.

Given the findings of this PA, the AOPIs presented warrant further evaluation in an SI (40 CFR 300.420(c)).

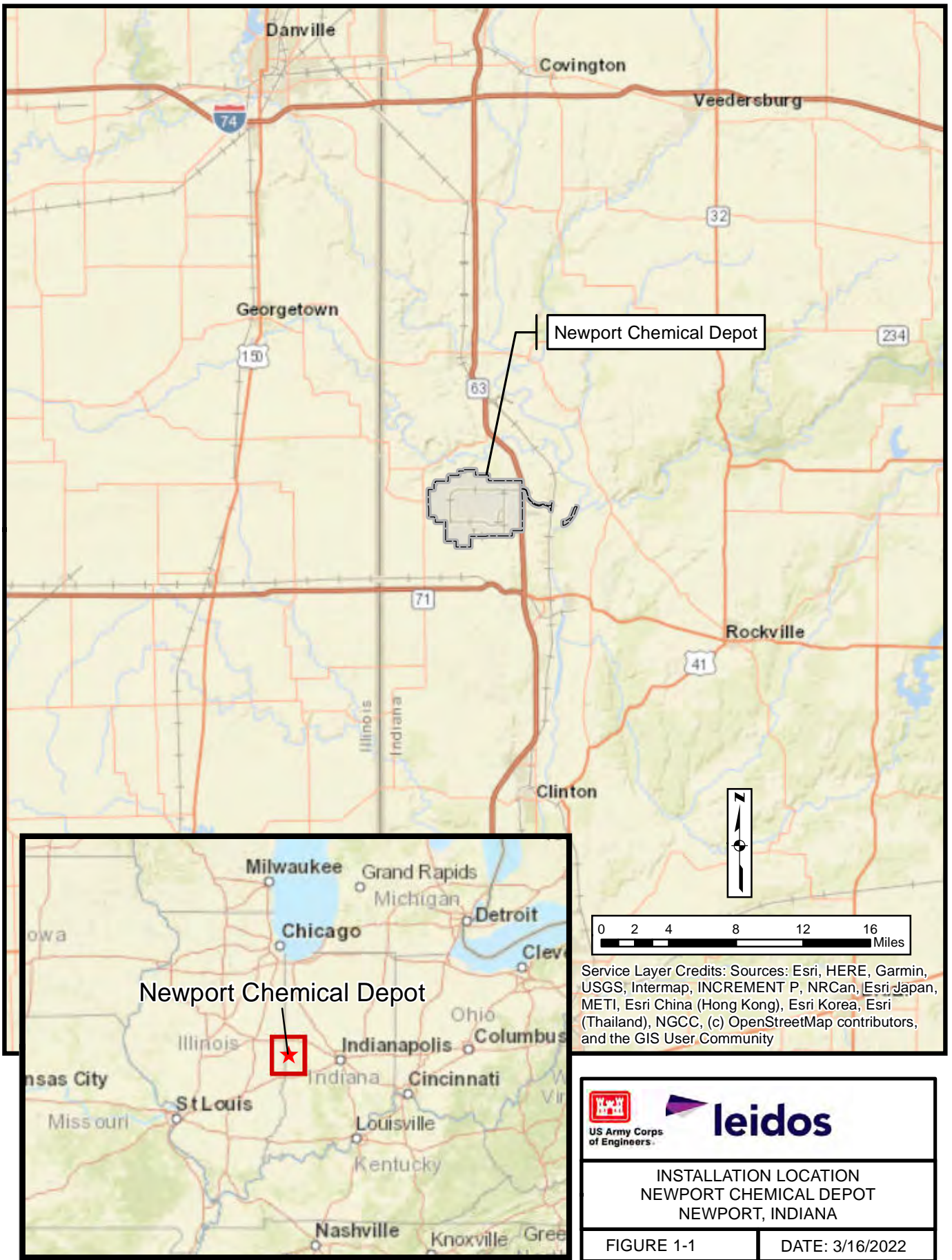
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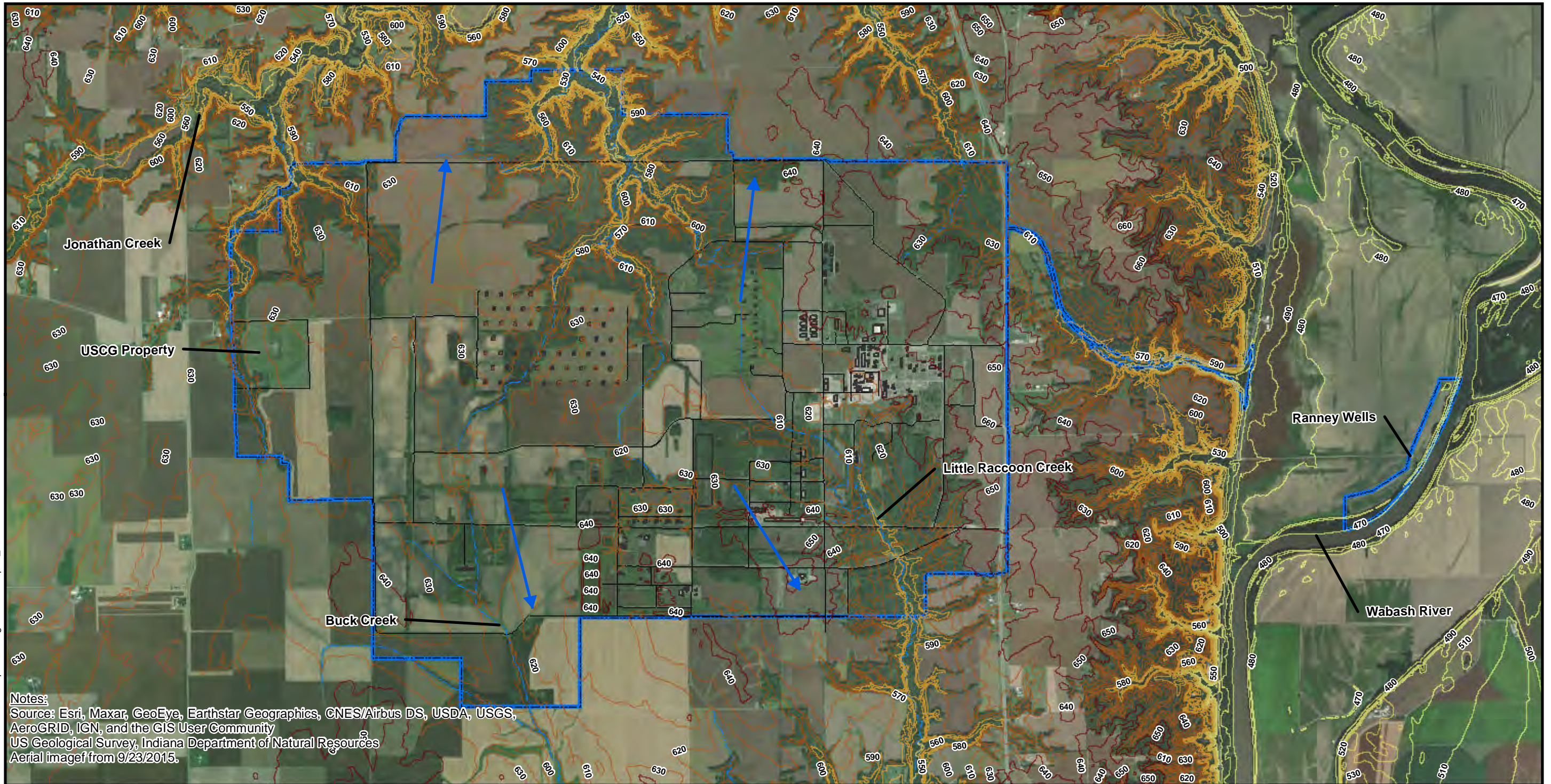
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FIGURES

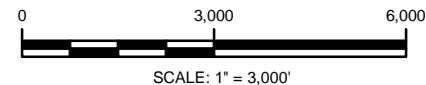


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Notes:
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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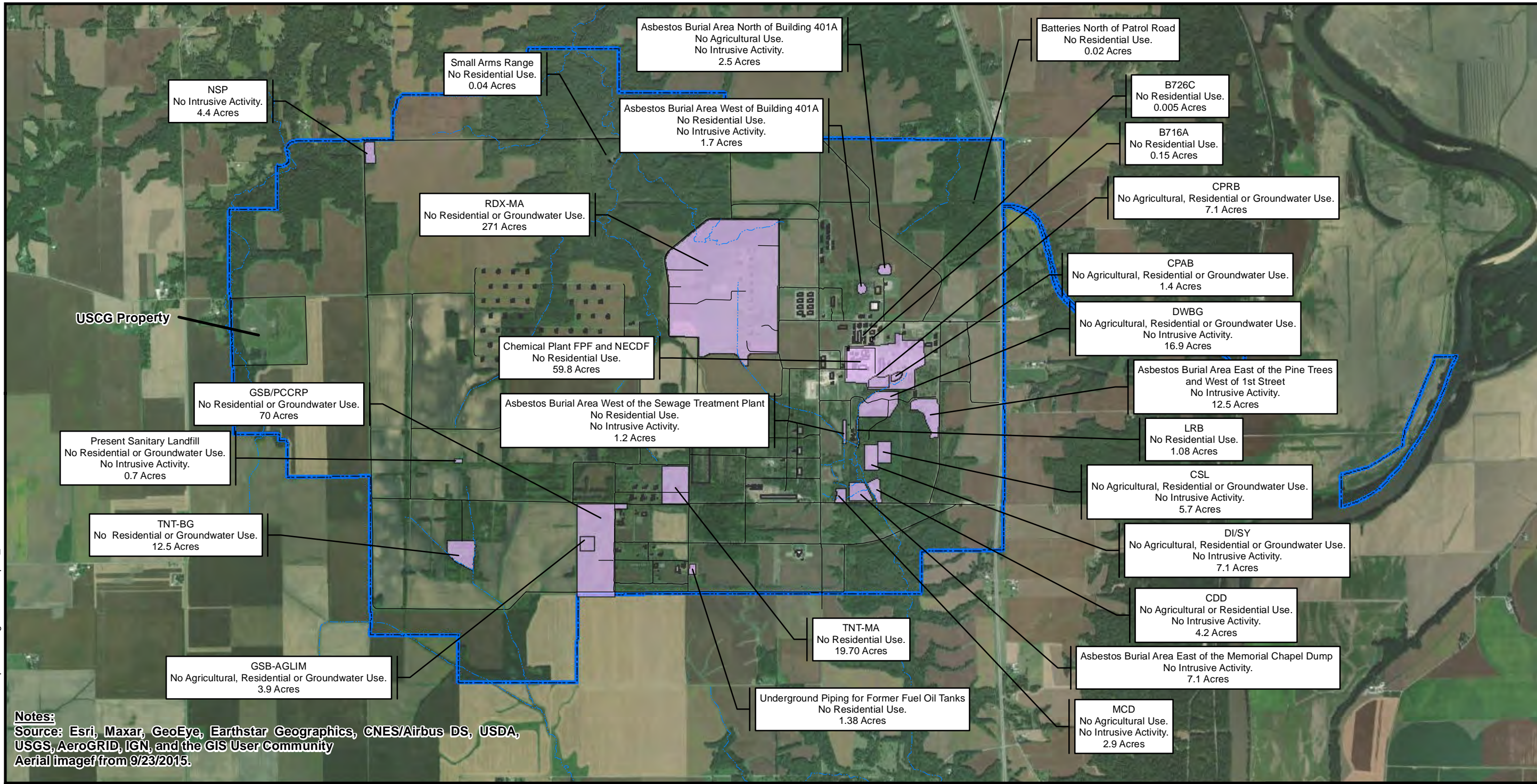
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|--------|-----------------------|
| | Roads |
| | Buildings |
| | Surface Water Feature |
| | Installation Boundary |
| | Groundwater Flow |
| | 10-foot Contours |
| | 470 - 510 |
| | 510 - 550 |
| | 550 - 590 |
| | 590 - 630 |
| | 630 - 670 |



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(NAD83)

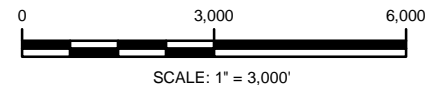
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| SITE FEATURES NEWPORT CHEMICAL DEPOT NEWPORT, INDIANA | |
| FIGURE 2-1 | DATE: 3/16/2022 |

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Notes:
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Aerial image from 9/23/2015.

- Legend**
- Roads
 - ▭ Buildings
 - Surface Water Feature
 - ▭ Land Use Control
 - ▭ Installation Boundary



IN STATE PLANE EAST
 (NAD83)

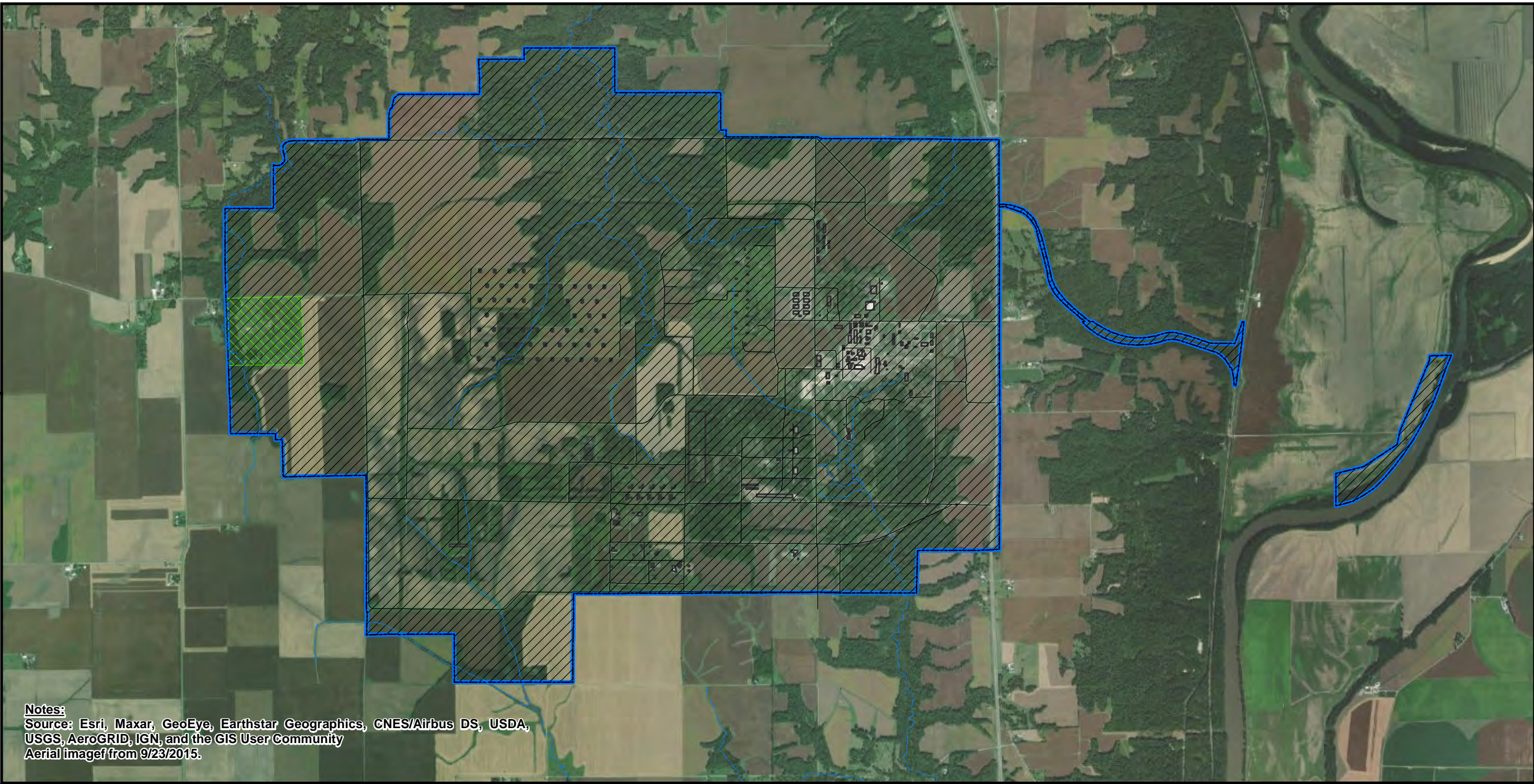


LAND USE CONTROLS
 NEWPORT CHEMICAL DEPOT
 NEWPORT, INDIANA

FIGURE 2-2

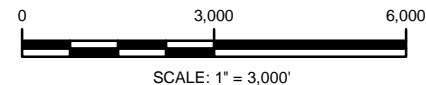
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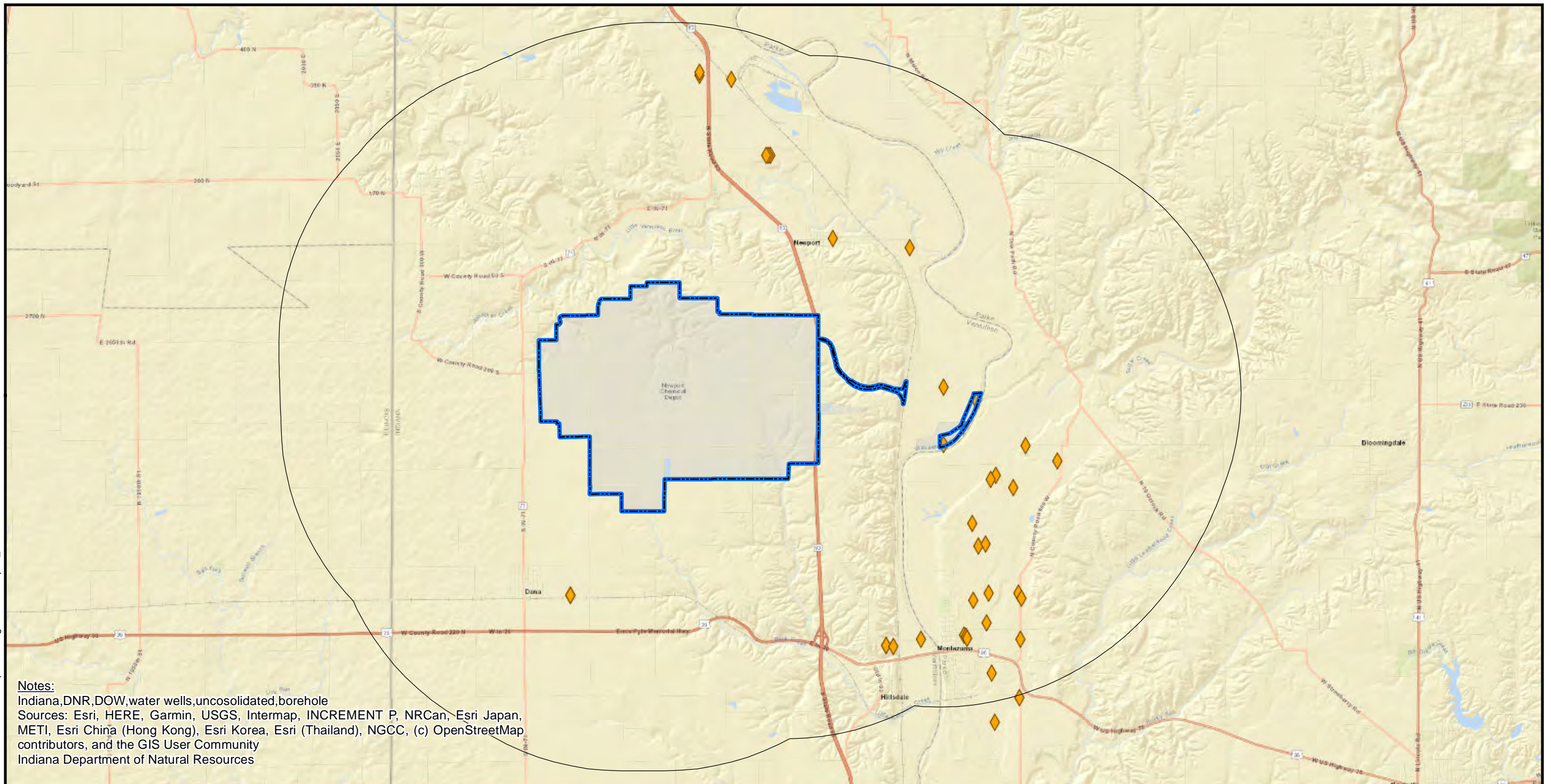
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- Roads
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 - Surface Water Feature
 - ▭ Installation Boundary
 - ▨ Transferred to NECDRA
 - ▩ Transferred to US Coast Guard






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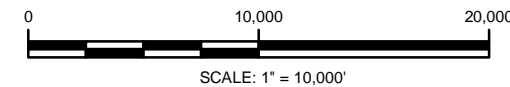
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|--|---|
|  US Army Corps of Engineers |  |
| PARCEL TRANSFER MAP NEWPORT CHEMICAL DEPOT NEWPORT, INDIANA | |
| FIGURE 2-3 | DATE: 3/16/2022 |



C:\Users\woodley\Documents\Work\BRAC PFAS\Newport\PA\Figure 2-4 Newport_Wells.mxd

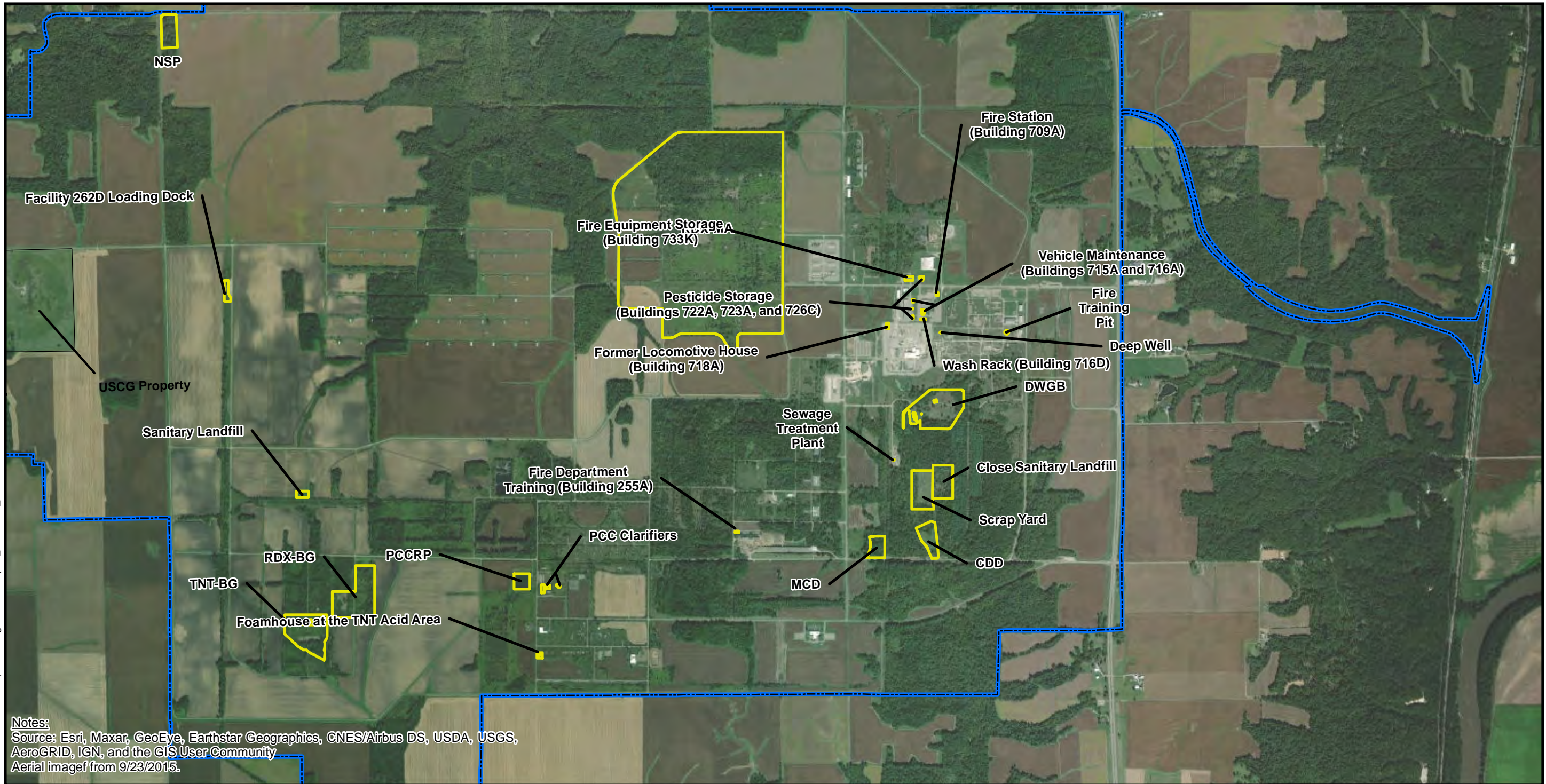


Notes:
 Indiana, DNR, DOW, water wells, unconsolidated, borehole
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
 Indiana Department of Natural Resources

- Legend**
-  Installation Boundary
 -  4-mile Radius
 -  Water Supply Wells

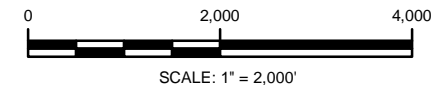


| | |
|---|-----------------|
|   | |
| POTABLE WELLS WITHIN A 4-MILE RADIUS NEWPORT CHEMICAL DEPOT NEWPORT, INDIANA | |
| FIGURE 2-4 | DATE: 3/16/2022 |



Notes:
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Aerial image from 9/23/2015.

Legend
 [Blue dashed line] Installation Boundary
 [Yellow outline] Evaluated Sites
 PCCRPs - Pollution Control Center Retention Pond

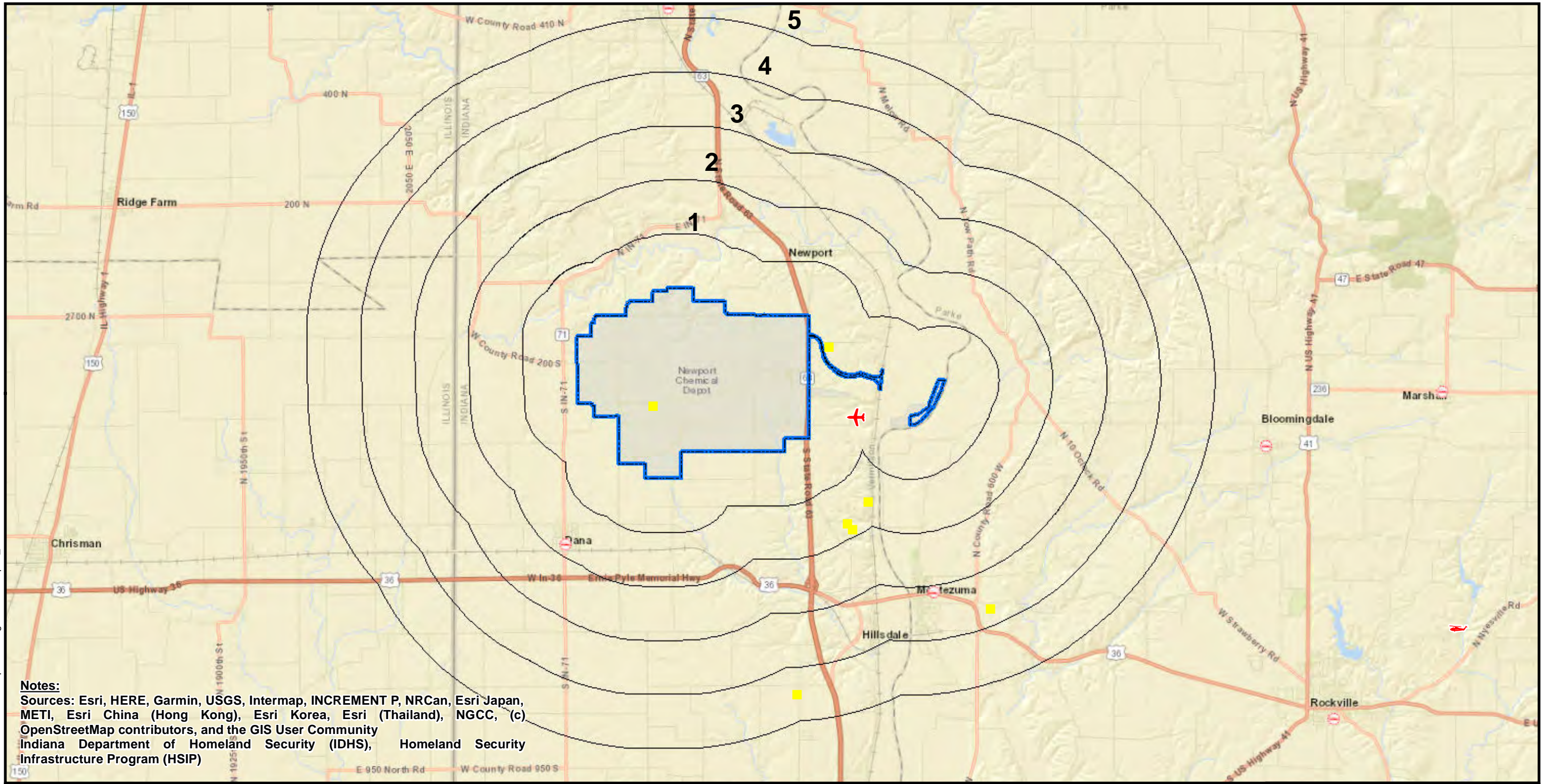


IN STATE PLANE EAST
 (NAD83)

| | |
|------------|-----------------|
| | |
| | |
| FIGURE 4-1 | DATE: 3/16/2022 |

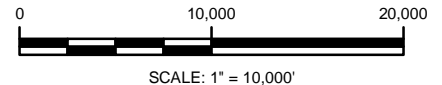
C:\Users\woodley\Documents\Work\BRAC PFAS\Newport\PA\Figure 4-1 Newport_Evaluated_Sites.mxd

C:\Users\woodley\Documents\Work\BRAC PFAS\Newport\PA\Figure 4-2 Newport_Offsite.mxd



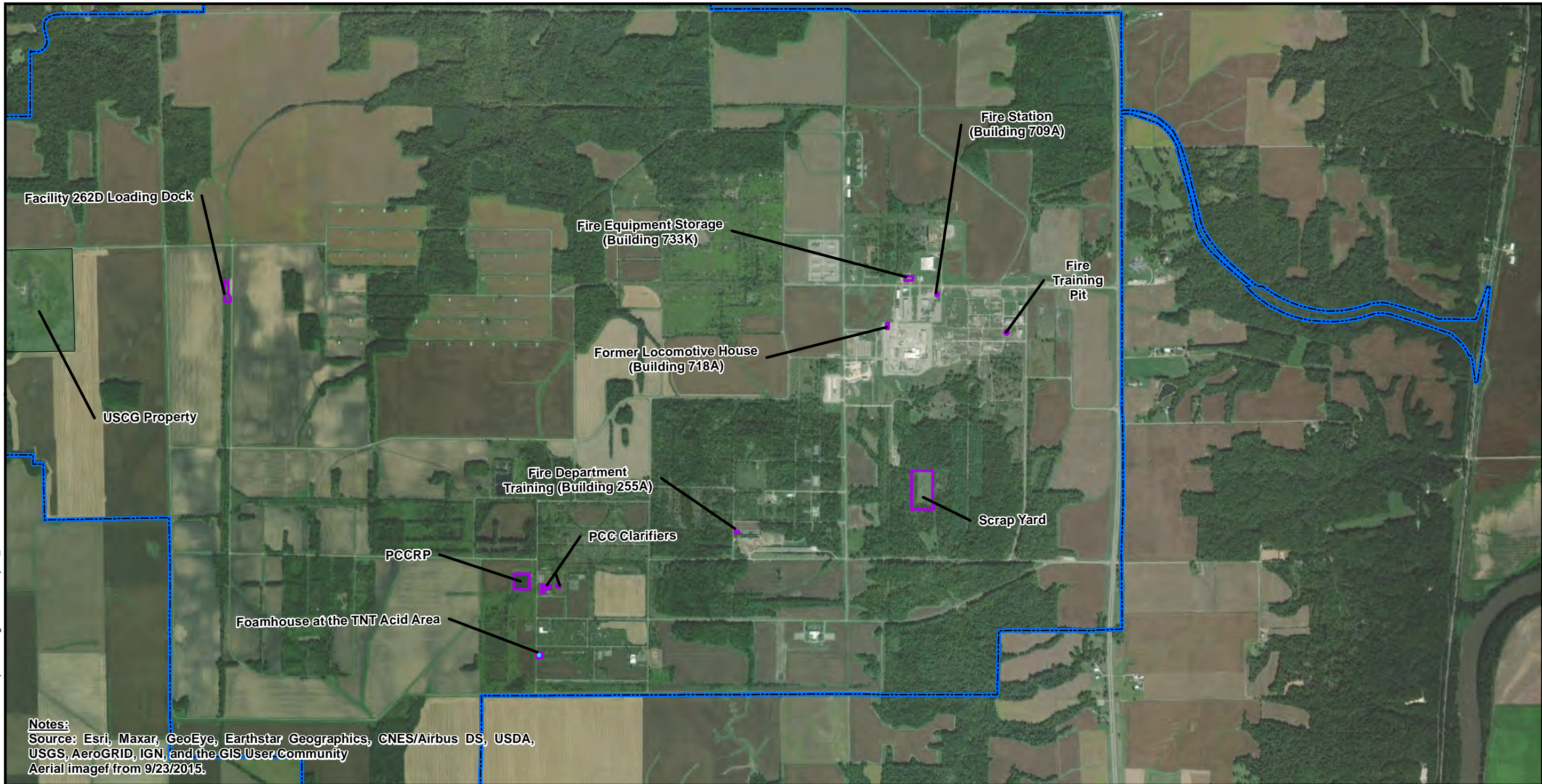
Notes:
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
 Indiana Department of Homeland Security (IDHS), Homeland Security Infrastructure Program (HSIP)

- Legend**
- Installation Boundary
 - Wastewater Treatment Plants
 - Airport
 - Helipad
 - Fire Stations (IDHS)
 - Solid Waste Facilities



N STATE PLANE EAST
(NAD83)

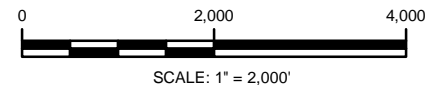
| | |
|--------------------------------|-----------------|
| US Army Corps of Engineers | |
| | |
| FIGURE 4-2 | DATE: 3/16/2022 |



Notes:
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Aerial imagef from 9/23/2015.

- Legend**
- Installation Boundary
 - Areas of Potential Interest (AOPI)

PCCRP - Pollution Control Center Retention Pond



IN STATE PLANE EAST
 (NAD83)



US Army Corps
of Engineers



AOPI MAP
 NEWPORT CHEMICAL DEPOT
 NEWPORT, INDIANA

| | |
|------------|-----------------|
| FIGURE 5-1 | DATE: 3/16/2022 |
|------------|-----------------|

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