MILITARY MUNITIONS RESPONSE PROGRAM
CLEANUP PLAN FOR
THE FORMER YORK NAVAL ORDNANCE PLANT
1425 EDEN ROAD, SPRINGETTSBURY TOWNSHIP
YORK, PENNSYLVANIA

Prepared for:

Former York Naval Ordnance Plant Remediation Team

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
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Hunt Valley, Maryland 21031
(410) 584-7000

November 2019

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11/27/2019

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November 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/L	Microgram(s) per Liter
ACM	Asbestos-containing material
amsl	Above mean sea level
AOC	Area of concern
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below ground surface
CSM	Conceptual site model
DGM	Digital geophysical mapping
DoD	Department of Defense
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
ERLC	Eden Road Logistics Center
ft	Foot (feet)
fYNOP	Former York Naval Ordnance Plant
fYNOP Team	Harley-Davidson and the USACE, representing the interests of DoD and the Department of the Navy (also referred to as fYNOP Remediation Team).
gpd	Gallon(s) per day
GIS	Geographic information system
GPS	Global positioning system
GSC	Groundwater Sciences Corporation
GW	Groundwater
GWTS	Groundwater Treatment System
H-D	Harley-Davidson or Harley-Davidson Motor Company Operations, Inc.
HE	High explosive
HHRA	Human Health Risk Assessment
in.	Inch(es)
LBP	Lead-based paint
LUC	Land use control
MC	Munitions constituents
MCL	Maximum contaminant level
MD	Munitions debris
MEC	Munitions and explosives of concern
MEC-HA	Munitions and Explosives of Concern – Hazard Assessment

mg/kg	Milligram(s) per kilogram
mm	Millimeter(s)
MMRP	Military Munitions Response Program
MPPEH	Material potentially presenting an explosive hazard
MRA	Munitions response area
MRS	Munitions response site
MSC	Medium-Specific Concentration
NMRD	Non-munitions-related debris
NorthPoint	NorthPoint 58 Limited Liability Corporation
NRG	Non-residential groundwater
PADEP	Pennsylvania Department of Environmental Protection
PNHP	Pennsylvania Natural Heritage Program
QA	Quality Assurance
QC	Quality Control
RAA	Remedial Alternatives Analysis
RI	Remedial Investigation
RSL	Regional Screening Level
SAIC	Science Applications International Corporation
SI	Site Inspection
SUXOS	Senior Unexploded Ordnance Supervisor
TCRA	Time-critical removal action
USACE	U.S. Army Corps of Engineers
UU/UE	Unlimited use and unrestricted exposure
UXO	Unexploded ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	Unexploded Ordnance Safety Officer
VSP	Visual Sampling Plan

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1. INTRODUCTION

This Military Munitions Response Program (MMRP) Cleanup Plan presents the proposed remedy for munitions related contamination at the former York Naval Ordnance Plant (fYNOP). The fYNOP is located in York, Pennsylvania and is shown on **Figure 1**. This Cleanup Plan does not address groundwater and other impacts at the Site which are the subject of a separate Site-Wide Cleanup Plan (Groundwater Science Sciences Corporation [GSC] 2019). The use of the term Site in this document refers to the fYNOP property.

The fYNOP is enrolled in the One Cleanup Program, a cooperative effort between the United States Environmental Protection Agency (USEPA) and the Pennsylvania Department of Environmental Protection (PADEP) for Site cleanup (https://yorksiteremedy.com). The Cleanup Plan addresses the requirements of the Pennsylvania Land Recycling and Environmental Remediation Standards Act, Act 2 of 1995, 35 P.S. § 6026.101 (Act 2), the corrective action requirements of the Resource Conservation and Recovery Act (RCRA), 40 CRF Part 264, Subpart F, and is substantially compliant with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as defined in 40 CFR Parts 9 and 300 (USEPA, 1994a).

Activities related to cleanup of munitions contamination, including previous investigations and future cleanup, are being funded and conducted under a November 2013 settlement agreement between Harley-Davidson Motor Company Operations, Inc. (Harley-Davidson or H-D) and the United States Government, represented by the Army Corps of Engineers (USACE) to address the cleanup of residual ordnance and explosive waste for site remedial actions.[1] AMO Environmental Decisions (AMO) facilitates the operation of the settlement agreement and provides review and guidance. Harley-Davidson, USACE and their consultants collectively constitute the "fYNOP Remediation Team."

RCRA, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and Act 2 have no special provisions for dealing with explosive safety associate with munitions and explosives of concern (MEC) and, therefore, the provisions in the Department of Defense (DoD) Ammunition and Explosives Safety Standards (DoD 6055.9-M), USACE (2008) Engineer Manual (EM) 385-1-97 and the Final U.S. Army MMRP Munitions Response RI/Feasibility Study Guidance (Department of the Army 2009) were adhered to during completion of the Remedial Investigation (RI) (Engineering, Science, and Technology, Inc., PBC [EA] 2018) and the Remedial Alternatives Analysis (RAA) (EA 2019). This Cleanup Plan addresses actions being taken in accordance with Act 2 and MMRP guidance to remediate the Site.

The organization of this document follows the suggested outline for a Cleanup Plan submitted under the Act 2 Site-Specific Standard in the Land Recycling Program Technical Guidance Manual (PADEP, 2019). After implementation of the Cleanup Plan, a Final Report will be completed and submitted to USEPA and PADEP.

[1] The term ordnance and explosive waste has been replaced with munitions and explosives of concern (MEC), munitions debris (MD), and munitions constituents (MC) in USACE terminology

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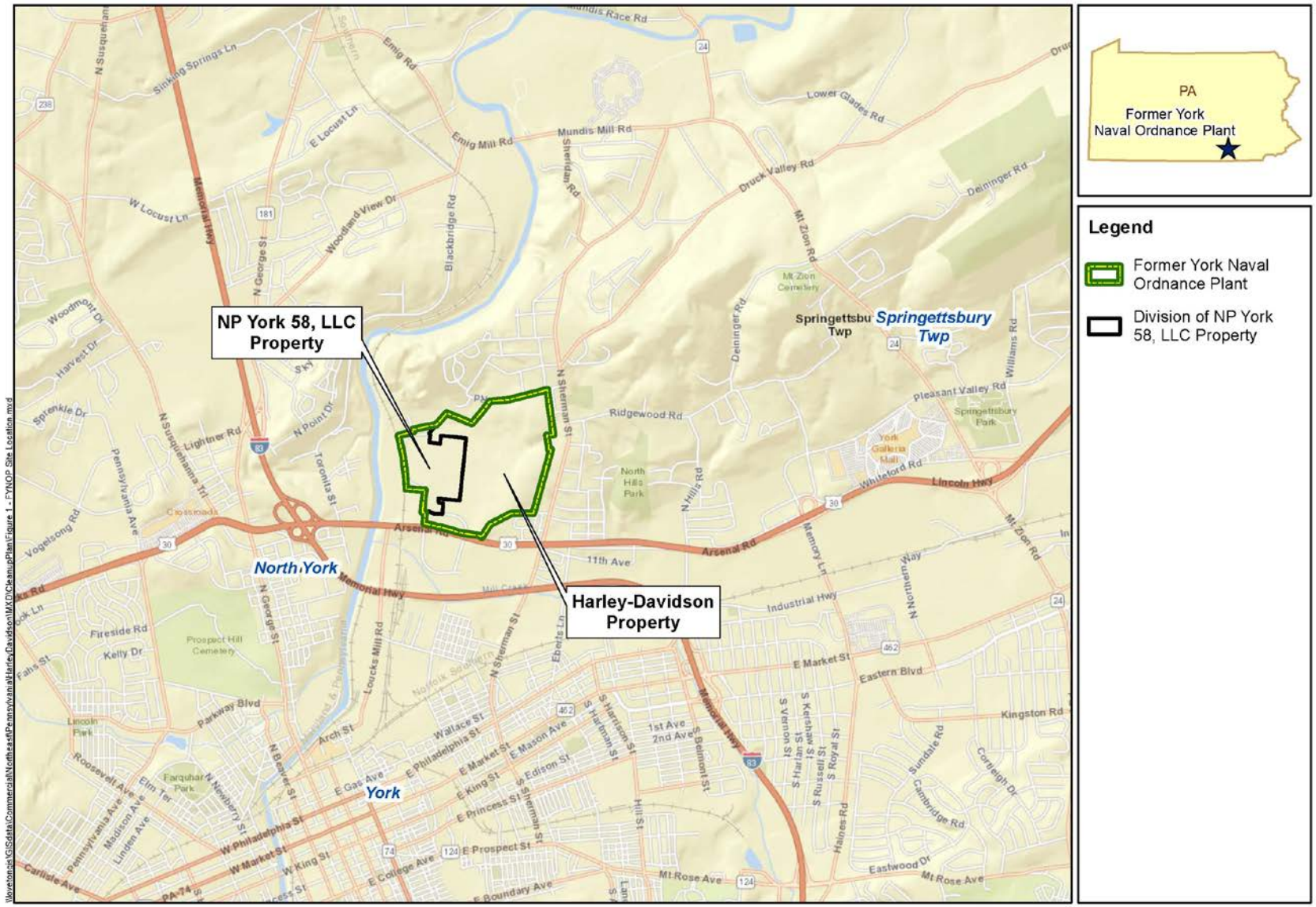
NP York 58, LLC Property
Harley-Davidson Property
North York
York
Springettsbury Twp
PA
Former York Naval Ordnance Plant
Legend
Former York Naval Ordnance Plant
Division of NP York 58, LLC Property
Figure 1 - Former York Naval Ordnance Plant Site Location
Street Map: ESRI, 2015
Projection: NAD 1983 State Plane Pennsylvania South Feet
Date: October 2019
0
0.5
1
Miles

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2. BACKGROUND

This section of the Cleanup Plan provides a summary of the Site setting and history, physical characteristics, summary of the remedial investigations and the Remedial Alternative Recommendation.

2.1 SITE SETTING AND HISTORY

The Site is located in central York County, north of the City of York, in Springettsbury Township, York, Pennsylvania. The 229-acre fYNOP property is divided into the East Campus and the West Campus (**Figure 1**)[2]. The 171-acre East Campus, currently owned by Harley-Davidson, is used as an active motorcycle manufacturing facility. In June 2012, Harley-Davidson sold the 58-acre West Campus to York County Industrial Development Authority which was followed by a sale in November 2015 to the Redevelopment Authority of the County of York, who in turn sold it in January 2017 to NP York 58, LLC. NP York 58, LLC built a 775,000 square-foot distribution center on the property called the Eden Road Logistics Center (ERLC). The fYNOP is bordered on the south by U.S. Route 30 and industrial/commercial properties and on the west by an industrial/commercial property (Heuristic, formerly 84 Lumber), a railroad line, uninhabited wetland/wooded areas, the Codorus Creek levee, and Codorus Creek. Residential properties are located along the north, east, and southeast sides of the fYNOP. Within the fYNOP boundary, the northeastern and eastern third of the property is undeveloped woodlands. The south-central area is occupied by the Harley-Davidson manufacturing facility. The ERLC building is located on the western third of the fYNOP along with the West Parking Lot (WPL), Central Plant Area (CPA), and numerous other Site features.

In 1941, York Safe and Lock Company constructed a plant on the Site for production of armaments for the United States Department of Defense (DoD) during World War II. Operations conducted on the Site included manufacturing and assembly of 20 and 40-millimeter (mm) twin/quadruple guns and mounts, 37-mm guns and carriages, 3-inch (in.) twin/quadruple guns and mounts, and Navy shields and gun slides. The York Safe and Lock Company constructed two proof testing ranges for the testing of the 40-mm, 3-in., and 37-mm manufactured guns. Facilities constructed in the proof testing area (referred to as the Magazine Area in 1959) included proof testing ranges (Buildings 14 and 16) and ammunition storage buildings/magazines (Buildings 17 through 23). By Executive Order, dated 21 January 1944, the Secretary of the Navy permitted the Government to possess and operate the facility. The facility was named the U.S. Naval Ordnance Plant, York, Pennsylvania. During the Korean War in the early 1950s, the Site was used to manufacture 3-in., 0.50-caliber guns, and 20-mm aircraft machine guns. Towards the end of 1955, the plant began to manufacture power drive units for the 5-in. and 0.54-caliber guns along with the 20-mm aircraft machine guns.

General production operations continued until 1964 when the plant was sold to American Machine & Foundry Company (AMF). AMF continued manufacturing operations to include rocket launchers, gun components, and other materials formerly manufactured at the facility for

[2] Note the Cleanup Plan outline includes site maps in Section 3; however, to make it easier for the reader the site maps appear as they are referenced instead of being included in Section 3.

several years before switching over to non-ordnance manufacturing such as snowmobiles and golf carts. In 1969 AMF and Harley-Davidson merged. In 1973 Harley-Davidson moved its motorcycle assembly operations to the Site. Besides motorcycles, the plant also produced bomb casings and other munitions-related items.

2.2 PHYSICAL CHARACTERISTICS

Hills rim the Site on the north and east, forming somewhat of a bowl-like topographical configuration. The eastern one-third of the Site is fairly steeply sloping to the west (4 to 20%), forming an upland area to the east of the flat-lying CPA. From the base of the hills to the Codorus Creek, the land surface underlying the CPA slopes very gently (0.5%) to the west (GSC 2019).

The surface of the Site is immediately underlain by either fill (associated with industrial and roadway construction), residual soil produced from the weathering of the underlying bedrock, or alluvium presumably from paleochannels of Codorus Creek. Natural residual soils are comprised of sandy silt, clayey silts, and silt loam from four primary soil series (Duffield, Glenelg, Elk and Chester). These soil series are derived primarily from parent bedrock formations consisting of quartzitic sandstone and limestone/dolostone (GSC 2019).

The solution-prone gray carbonate bedrock (limestone and dolostone) underlies the flat lowland (western) portion of the Site. Quartzitic sandstone underlies the more steeply sloping hills and upland area on the eastern part of the Site. The limestone is a karstic carbonate aquifer with groundwater migrating through solution-enhanced discontinuities. The quartzitic sandstone is a much less permeable aquifer with minimal primary porosity. Groundwater flows through tight bedding plane partings, joints and fractures in this rock type (GSC 2019).

Groundwater flow is generally westward, from the eastern upland area to Codorus Creek. In the southeast portion of the fYNOP, the groundwater gradient is southward toward the Southern Property Boundary Area (SPBA) and southwest towards U.S. Route 30. Groundwater flow in the western portion of the Site is controlled by the WPL groundwater extraction system that intercepts groundwater that may otherwise flow westward towards Codorus Creek.
The Codorus Creek, formed by a 237 square-mile drainage area above the point where it receives groundwater from the Site, lies to the west of fYNOP. Surface water at the Site flows toward Codorus Creek. The Codorus Creek enters the Susquehanna River 9.5 miles to the north of the fYNOP (GSC 2019).

2.3 PREVIOUS INVESTIGATIONS

Between 1984 and 2013, the USACE and Harley-Davidson conducted multiple investigations and cleanup/removal actions to address MEC, munitions debris (MD), and munitions constituents (MC) related to former proof testing operations in Buildings 14 and 16. Actions conducted include a removal action by Explosive Ordnance Disposal Detachment personnel in 1993, a time-critical removal action (TCRA) in 2004, and a site inspection (SI) in 2007/2008, as well as the removal of most of Building 16 that included the material present in the two backstop areas (i.e., MD and dust/soils with elevated concentrations of MC were present in the backstops). As a result of the multiple investigations and removal actions at the Site, five munitions response

sites (MRSs) and two areas of concern (AOCs) were designated by USACE as being present at the Site (**Figure 2**); collectively, these areas were identified as two separate munitions response areas (MRAs)[3]. A description of the MRSs and AOCs is as follows: a burial area in the west parking lot (MRS 1), a misfire pit associated with Building 14 (MRS 2), a 20-millimeter (mm) dump (MRS 3), a misfire pit associated with Building 16 (MRS 4), Building 14 proof range (MRS 5), suspect disposal area (AOC 1), and the Building 16 backstops (AOC 2) (**Figure 2**). The buffer area around MRSs 2–5, AOC 1, and AOC 2 is referred to as the Remainder Remedial Investigation (RI) Area, and the area encompassing MRSs 2–5 and AOCs 1 and the Remainder RI Area is referred to as the Military Munitions Response Program (MMRP) RI Study Area or the RI Study Area (EA 2018).

2.4 MILITARY MUNITIONS RESPONSE PROGRAM REMEDIAL INVESTIGATION

An RI was completed in the MMRP RI Study Area to identify the nature and extent of both MEC and MC associated with former operations at the fYNOP.

The RI was conducted in multiple phases, and Phase I activities included vegetation clearance, survey, and creating 100-foot (ft) by 100-ft grids and conducting a magnetometer-assisted surface clearance for MEC within each of the grids. Surface clearance activities also included anomaly counts to determine high-density and low-density grids. No MC sampling was performed during Phase I because no breached MEC were identified. Surface clearance for MEC was not performed in MRS 1 (due to the presence of a paved parking lot) or portions of the Remainder RI Area (i.e., Eastern Landfill). Phase II activities were completed that included digital geophysical mapping (DGM) of 13 select grids classified as high density, intrusive investigation of anomalies, and MC sampling. In addition, an investigation of Building 14 was conducted including the backstop area and ventilation dust bag room. This included an inspection of surface items in the backstop (to determine if MEC was present) and MC sampling. An RI Report documenting the nature and extent of the impacts at the MMRP RI Study Area, as well as the associated risks to human health and the environment, was prepared and submitted to PADEP and EPA (EA 2018) and approved on February 20, 2018.

The results of the RI are summarized in the following conclusions and recommendations:

- **Munitions Response Site 1—**No known impact from MEC or MC was identified for this MRS. No MEC had been found to date; however, MD has historically been found during intrusive investigations near MRS 1. No MC were identified during groundwater sampling in MRS 1. A protective covenant associated with environmental impacts to soil and groundwater restricts the use of groundwater and requires a soil management plan and worker health and safety plan for any intrusive activities. The covenant will be amended as part of the final remedy to require that any disturbance of the existing engineering controls (backfill and asphalt cap) be maintained and that any disturbance requires replacing the engineering controls. Potential for encountering MEC in this area is considered low. The RI recommended that the existing protective covenant be maintained

[3] The term munitions response area or "MRA" refers to separate areas on the fYNOP Site. MRA 1 is inclusive of MRS 1, which is isolated in the western part of the Site. MRA 2 encompasses MRSs 2–5, AOCs 1 and 2, and the RI Study Area.

and MRS 1 be evaluated in the RAA with consideration towards modifying the protective covenant to require unexploded ordnance (UXO) construction support during intrusive activities within the MRS.

- **Munitions Response Site 2—**MRS 2 is associated with a former disposal area identified as a misfire pit, which was located adjacent to a former firing range, Building 14. MEC identified within the former Building 14 misfire pit was removed in 1993 prior to completion of this MMRP RI. Based on removal of the MEC and MD within the former misfire pit and the fact that no MEC or MD was found during the MMRP SI or RI, the potential for encountering MEC in this area is considered low. This area was recommended for evaluation in the RAA with consideration towards UXO construction support during intrusive activities.

- **Munitions Response Site 3—**MRS 3 is associated with a location identified as a former disposal area for 20-mm projectiles. No MEC was identified within the presumed location of the 20-mm disposal area. One instance of MD being found was identified historically and no MD was found during MMRP RI investigations. The potential for encountering MEC in this area is considered low. This area was recommended for evaluation in the RAA with consideration towards UXO construction support during intrusive activities.

- **Munitions Response Site 4—**MRS 4 is associated with a suspect misfire pit associated with a former firing range, Building 16. No MEC or MD was identified within the location of the suspect misfire pit during historical investigations or the RI. The potential for encountering MEC in this area is considered low. This area was recommended for evaluation in the RAA with consideration towards UXO construction support during intrusive activities.

- **Revised Munitions Response Site 5—**MRS 5 is associated with the backstop area of a former firing range, Building 14. A large volume of 20-mm projectiles were identified within the backstop in the Building 14 proof range. This MD is similar in character to the 20-mm projectiles identified within the area to the east of Building 14, which were subsequently characterized as MEC following disposal by Pennsylvania State Police. In addition, the backstop and associated air handling systems contain sand and dust associated with former firing range operations (described as process materials in the RI and RAA reports). The sand and dust contain elevated concentrations of MC (specifically metals such as antimony and lead), which have impacted water in Building 14, and which have the potential to impact shallow groundwater. The potential for encountering MEC in this area is considered moderate. This area was recommended for evaluation in the RAA.

- **Revised Area of Concern 1**—AOC 1 (revised boundary as part of the RI) is an area to the east of the firing ranges (Buildings 14 and 16) where process materials were dumped. The original boundary of AOC 1 was moved southwest to encompass the terraced area investigated during the MMRP RI, which included the associated MD finds. Abundant MD comprised of 37-mm and 40-mm projectile fragments was identified within this former disposal area. Small arms casings and projectiles were also found in this area indicating

Legend

- Former York Naval Ordnance Plant Boundary
- Division of NP York 58, LLC Property
- RI Study Area
- Inactive Substation
- Access Gate
- MRS Boundary
- AOC Boundary

Notes:
AOC = Area of Concern
MRS = Munitions Response Site
RI = Remedial Investigation

\\lovetongis\GISdata\Commercial\Northeast\Pennsylvania\HarleyDavidson\MXD\CleanupPlan\Figure 2 - MRSs and AOCs.mxd

Figure 2 - Munitions Reponse Sites and Areas of Concern

Vicinity Aerial: Harris Corporation, 2018
FYNOP Aerial: Nutec Group, 2019
Projection: NAD 1983 State Plane
Pennsylvania South Feet

Date: October 2019

0 500 1,000
Feet

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- the area may have been briefly used as a small arms range. Most of the MD found is similar in character to the 37-mm and 20-mm projectiles found in AOC 2, which were characterized as MEC. The potential for encountering MEC in this AOC 1 is considered moderate. This area was recommended for evaluation in the RAA.

- **Revised Area of Concern 2—**AOC 2 (revised boundary as part of the RI) is the area encompassing the backstops of Building 16, which was expanded to include a larger area around the former Building 16 footprint as a result of the RI findings. MEC, MD, and process material disposal areas with sand and dust associated with former firing range operations were found in this area. MC impacts were mostly observed within the sand material which was co-located with abundant MD. Findings during the MMRP RI included four MEC items comprised of two 20-mm high explosive (HE)-containing projectiles and two 37-mm HE-containing projectiles. It was also noted that other MEC items were historically found within this area during previous investigations. The potential for encountering MEC in AOC 2 is considered moderate. This area was recommended for evaluation in the RAA.

- **Remainder RI Area—**The Remainder RI Area is comprised of the entire MMRP RI Study Area excluding the areas associated with the MRSs and AOCs. No MEC or material potentially presenting an explosive hazard (MPPEH) was identified in the remainder RI Area; however, a limited number of MD items were observed during historical investigations and during the RI. The potential for encountering MEC in this area is considered low. This area was recommended for evaluation in the RAA with consideration towards UXO construction support during intrusive activities.

2.5 REFINED CONCEPTUAL SITE MODEL

Following the RI, the conceptual site model (CSM) for each MRS and AOC was updated for the different MEC and MC-related contaminants onsite. The CSMs defined the source (e.g., the secondary source/media), interaction (e.g., the secondary release mechanism, the tertiary source, and the exposure route), and human receptors. Based on the results of prior investigations and the results of the RI, the existing MRS and AOC boundaries were redrawn and the CSMs refined to address the new classifications. The refined CSM from the RI is summarized below.

The pathway for direct contact to site surface soils by human receptors is incomplete in the Remainder RI Area as no surface soils exceeded screening criteria; therefore, no source exists. The pathway for human receptors to contact former process materials in MRS 5 (backstop sand and dust evaluated as surface soils for the purpose of the CSM) is potentially complete as these sources exist; however, access to these sources is limited by voluntary institutional controls onsite and building access maintained by Harley-Davidson. The components of the process materials including sand and dust are characteristically hazardous for lead. Process material (mainly sand) found in the 20-mm disposal area in the southern portion of AOC 2 and in the western portion of AOC 1 presents a potentially complete pathway as source material exists; however, access to this source is limited by site access controls and the presence of soils covering these areas (i.e., these areas are subsurface and not easily accessible unless they are excavated).

A potentially complete pathway exists for MEC in AOC 2. MEC was identified in the subsurface soils buried in the area between Buildings 14 and 16. Current land use controls voluntarily implemented by Harley-Davidson include control of site access, education programs, and minimal use of the area, which reduces the potential for human interaction with MEC; however, the potential exists for a complete pathway if this potential source remains.

The MMRP RI intrusive data for the Remainder RI Area and MRSs 2, 3, and 4 were re-evaluated using the statistical program Visual Sampling Plan (VSP 2014) to determine the probability of MEC occurring within this area. Using the total number of anomalies investigated within these areas (448 anomalies) with no MEC being identified, out of an estimated total of 5,200 anomalies, there is a 95 percent confidence that at least 99.37 percent of the remaining anomalies in MRSs 2, 3, and 4 and the Remainder RI Area are also not MEC. These calculations do not differentiate if non-MEC items are munitions-related or non-munitions-related (i.e., if all 448 negative anomalies were identified as MD versus NMRD such as bolts, scrap metal, etc.). Based on the general lack of source, lack of MD findings during historical activities, findings from the SI and the RI, and the statistical validity ignoring the results of the finds as MD or NMRD, the likelihood that the remaining anomalies are not MEC is likely higher. As no source of MEC was found to be present in the Remainder RI Area, MRS 1, MRS 2, MRS 3, and MRS 4, the pathway is considered incomplete. CSM conclusions for MEC and MC are summarized in **Tables 2-1 and 2-2** below.

Table 2-1: Conceptual Site Model Conclusions for Munitions and Explosives of Concern

Location	Source	Interaction Pathway[(a)]	Mitigating Factors	Conclusion
MRS 1	No	Not Evaluated	Not Applicable/No Source	Incomplete[(b)]
MRS 2	No	Not Evaluated	Not Applicable/No Source	Incomplete[(b)]
MRS 3	No	Not Evaluated	Not Applicable/No Source	Incomplete[(b)]
MRS 4	No	Not Evaluated	Not Applicable/No Source	Incomplete[(b)]
MRS 5	Potential	Direct Contact	Access to Building 14 Under Security Control	Potentially Complete[(c)]
AOC 1	Potential	Contact During Intrusive Activities	Area Under Security Control; Dig Permit Required	Potentially Complete[(c)]
AOC 2	Yes	Contact During Intrusive Activities	Area Under Security Control; Dig Permit Required	Potentially Complete
Remainder RI Area	No	Not Evaluated	Not Applicable/No Source	Incomplete[(c)]

Notes:

(a) The current and future receptors considered for MEC at fYNOP include authorized Harley-Davidson and NP York personnel, contractors, and visitors. Site use is not planned for change from industrial to residential. MC is only known to be present at concentrations posing a risk to human health or the environment within MRS 5; however, process materials were observed in several onsite areas and concentrations of MC may exceed screening levels.

(b) The areas comprising the Remainder RI Area, MRS 2, MRS 3, and MRS 4 were combined and re-evaluated using VSP to calculate the probability of non-MEC-item anomalies. There is a 95 percent confidence that at least 99.37 percent of remaining anomalies are not MEC within these areas; therefore, the pathway was noted as incomplete under conditions where no intrusive activities are occurring. During intrusive operations, it is possible that MEC remains and that source-receptor interaction may occur.

(c) The presence of anomalies indicates a potential for MEC to be present in these areas, but it has yet to be confirmed. For MRS 5 and AOC 1, the presence of subsurface anomalies in association with MD of the same caliber of onsite MEC indicates possible MEC.

Table 2-2: Conceptual Site Model Conclusions for Munitions Constituents

Area	Source	Interaction Pathway	Mitigating Factors	Receptors[a]	Conclusion
MRS 1	No	Not Evaluated/ No Source	Not Applicable/ No Source	Not Evaluated/ No Source	Incomplete
MRS 2	No	Not Evaluated/ No Source	Not Applicable/ No Source	Not Evaluated/ No Source	Incomplete
MRS 3	No	Not Evaluated/ No Source	Not Applicable/ No Source	Not Evaluated/ No Source	Incomplete
MRS 4	No	Not Evaluated/ No Source	Not Applicable/ No Source	Not Evaluated/ No Source	Incomplete
MRS 5	Yes – Process Materials present	Ingestion Direct Dermal Contact Inhalation	Access to Building 14 Under Security Control	Human Receptors	Potentially Complete
AOC 1	Yes – Process Materials present	Ingestion Direct Dermal Contact Inhalation	Area Under Security Control; Dig Permit Required	Human Receptors	Potentially Complete
AOC 2	Yes – Process Materials present	Ingestion Direct Dermal Contact Inhalation	Area Under Security Control; Dig Permit Required	Human Receptors	Potentially Complete
Remainder RI Area	No	Not Evaluated/ No Source	Not Applicable/ No Source	Not Evaluated/ No Source	Incomplete

(a) The current and future receptors considered for MC at fYNOP include authorized Harley-Davidson and NP York personnel, contractors, and visitors. Site use is not planned for change from industrial to residential. MC are only known to be present at concentrations posing a risk to human health or the environment within MRS 5; however, process materials were observed in several onsite areas and concentrations of MC in process materials may exceed screening levels in other areas.

2.6 HAZARD AND RISK ASSESSMENT

The Munitions and Explosives of Concern – Hazard Assessment (MEC-HA), prepared as part of the RI, is a tool used to assess the risk from MEC at an area on the Site where MEC is found. The MEC-HA assists in understanding the MEC-Hazards associated with an MRS if no action is taken and in evaluating the hazard reductions associated with munitions response alternatives. A MEC-HA was completed for AOC 2 where MEC was found. The results of the MEC-HA are summarized below.

Soil and groundwater samples were collected, analyzed, and screened to evaluate risk to human receptors. The Human Health Risk Assessment (HHRA) results are summarized below. As documented in the RI, no threatened or endangered species, exceptional value wetlands, habitats of concern, or species of concern are located within or adjacent to the MMRP RI study area; therefore, soils were not evaluated against ecological screening criteria as part of the MMRP RI as documented in the RI (EA 2018).

2.6.1 Munitions and Explosives of Concern – Hazard Assessment

The MEC-HA includes data/information available through the MMRP RI and it was developed for current and future land use scenarios. The MEC-HA was completed in accordance with EPA's

Interim MEC-HA Methodology and the accompanying automated scoring worksheets (EPA, DoD, and U.S. Department of the Interior 2008). Based on the data collected during the RI, MEC was identified at AOC 2. Therefore, a baseline MEC-HA was completed for AOC 2 to evaluate the MEC hazards. MEC-HAs were not completed for the following MRSs and AOCs:

- MRS 1 – Burial area in the west parking lot
- MRS 2 – Misfire pit associated with Building 14
- MRS 3 – 20-mm dump
- MRS 4 – Misfire pit associated with Building 16
- MRS 5 – Building 14 Proof Range
- AOC 1 – Suspect Disposal Area.

The MEC-HA evaluates risk through a review of three components of a potential explosive hazard:

- **Severity,** which relates to the potential consequences (e.g., death, severe injury, property damage) of MEC detonating

- **Accessibility,** which is the likelihood that a receptor will be able to contact MEC

- **Sensitivity**, which is the likelihood that a receptor will be able to interact with MEC such that it will detonate.

Each component is assessed using input factors that each have two or more categories associated with them, and each category is associated with a numeric score that reflects the relative contributions of the different input factors to the hazard assessment. The sum of the input factor categories is then assigned to one of four defined ranges, called hazard levels. Each of the four hazard levels reflects site attributes that describe groups of sites and site conditions ranging from the highest to lowest hazards. The four hazard levels and corresponding minimum and maximum scores for each level of the MEC-HA are shown in **Table 2-3**.

Table 2-3: Hazard Level Scoring Ranges (EPA, DoD, and U.S. Department of the Interior 2008

Hazard Level	Maximum MEC-HA Score	Minimum MEC-HA Score	Description
Highest Hazard 1	1,000	840	Highest potential explosive hazard condition
2	835	725	High potential explosive hazard condition
3	720	530	Moderate potential explosive hazard condition
4 Lowest Hazard	525	125	Low potential explosive hazard condition

Based on the presence of MEC in the revised boundary of AOC 2, a MEC-HA was completed. Results of the MEC-HA are dependent on usage and the historical presence or absence of MEC removal actions and land use controls. The MEC-HA used input factors including the energetic material type; location of human receptors; site accessibility and contact hours; amount of MEC; depth of MEC; migration potential; MEC classification; and MEC size. These factors were

evaluated for current use assuming minimal maintenance activities and the continued use of current site controls. Following the protocols of the MEC-HA, it was determined that there is a Hazard Level 3, which represents a moderate potential for an explosive hazard existing under current conditions with no intrusive activities and limited access (current use score of 715). In order to assess future land use, an additional assessment was completed during the RI to determine if future land use changes would increase exposure of onsite personnel to potential MEC. The future use scenario assumed that existing land use controls are removed due to future land use changes. The conclusion of the MEC-HA under the future use scenario is a Hazard Level 2, which indicated a high potential explosive hazard (future use score of 835) (EA 2018).

2.6.2 Human Health Risk Assessment

As part of the RI, soil and groundwater were sampled for MC (explosives and select metals associated with former firing range operations) to determine if there was an impact associated with past munitions use in the MMRP RI Study Area. No explosives were detected and only one subsurface soil sample collected from a depth of 24–26 inches (in.) below ground surface (bgs) between Buildings 14 and 16 had a value for total lead that exceeded the soil-to-groundwater screening value. This location exceeded the required buffer distance to groundwater indicating no risk is present; therefore, no risk assessment was performed for soils. No MC exceedances of explosives or select metals were identified in groundwater; however, lead and antimony were identified within historical groundwater spring samples associated with Building 14 (MRS 5). Based upon the results of risk-based screening, lead and antimony were identified as chemicals of potential concern. An HHRA was performed to evaluate potential concerns associated with MC in groundwater within MRS 5. The HHRA evaluated a residential exposure scenario for contact with groundwater. Based upon the results of the HHRA there are potential concerns associated with the spring water, which is sourced from the springs below Building 14 and which was evaluated as a source of groundwater. Residential exposure to groundwater revealed a non-carcinogenic hazard of 3 for antimony. Additionally, blood-lead modeling for concentrations of lead in groundwater revealed potential concerns. Actual exposures to receptors, especially to water from the springs, were most likely overestimated. A residential re-use of the site and the use of the springs as a tap water source is an unlikely scenario in the future. However, the results of the HHRA reveal potential impacts from process materials (sand and dust) remaining within Building 14. The calculated risk empirically proves the need for protective measures prohibiting use of onsite groundwater under the model for potential future use; however, removal of the source material in Building 14 is anticipated to mitigate the risk. As noted in Section 1.2, this cleanup plan does not address groundwater remaining at the Site after cleanup of soils, MEC, etc. Groundwater across the entire site is the subject of a separate cleanup plan.

2.7 REMEDIAL ALTERNATIVE RECOMMENDATION

EA conducted an RAA to develop and evaluate potential remedial alternatives for addressing MMRP impacts at fYNOP. The RAA was submitted to PADEP and EPA in January 2019 and approved on 19 March 2019.

The remedial alternatives were developed and screened with respect to the following nine evaluation criteria: (1) overall protection of public health, welfare, and the environment; (2) compliance with laws and regulations; (3) long-term effectiveness and permanence;

(4) reduction of toxicity, mobility, and volume of contamination; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state acceptance; and (9) community acceptance.

Based on the comparative analysis and the anticipated current and future site usage, Alternative 4 was recommended, and is presented below. This alternative removes process materials that present the only known onsite source of MC and will remove the most likely potential sources of MEC. UXO construction support requirements will be sufficiently protective of human health and the environment. This remedy is satisfactory for short-term and long-term effectiveness and can be implemented using commonly applied processes and technologies. This recommendation is accepted by regulators and anticipated to be accepted by the community. Alternative 4 is summarized below and discussed in more detail in Section 4.

Alternative 4 Remedial Action Summary:

A complete (100 percent) surface and subsurface MEC clearance will be performed to achieve unlimited use and unrestricted exposure (UU/UE) for soil within AOC 1 and the western portion of the RI Study Area (including MRSs 2, 3, 4, and 5 and AOC 2), and maintain land use controls (LUCs) in other areas. Depths expected to achieve UU/UE are up to 36 in. bgs for the entirety of AOC 2, 24 in. bgs for the entirety of AOC 1, and 12 in. bgs for the entirety of MRSs 2–4 and for the remaining area within the western portion of the RI Study Area. Clearance in MRS 5 includes removal of process materials, MD, and MPPEH within the impacted areas of Building 14. This alternative includes demolition of Building 14 and Building 16 remnants and other infrastructure that prevents MEC clearance operations.

The LUC components of the MMRP remedy include continued maintenance of the site security force and fencing, construction support (i.e., on-call oversite/support by qualified UXO personnel during excavation activities) for intrusive activities, and biennial ordnance awareness training for personnel entering and working in the MRS 1 and the eastern portion of the Remainder RI Area. Additional LUC components which are shared with the Site-Wide Cleanup Plan includes prevention of future residential site use, and prevention of the consumption of groundwater within MRS 1 and the eastern portion of the Remainder RI Area. Additional details on implementation of the shared LUCs is presented in the Site-Wide Cleanup Plan. LUCs will require annual inspections to ensure compliance and to assess the efficacy of the controls.

3. LIST OF CONTACTS

The following personnel collectively known as the fYNOP Remediation Team are responsible for the preparation, review and submittal of this Cleanup Plan (**Table 3-1**).

Table 3-1: Responsible Parties for the fYNOP Cleanup Plan

Agency or Individual	Address	Phone Number(s)
Sharon Fisher Harley Davidson	1425 Eden Road York, PA 17402	(717) 852-6544
Ralph T. Golia AMO Environmental Decisions	4327 Point Pleasant Pike PO Box 410 Danboro, PA 18916	(215) 230-8282
Hamid Rafiee U.S. Army Corps of Engineers Baltimore District	2 Hopkins Plaza Baltimore, MD 21201	(410) 962-7546
Scott A. Gould McNees Wallace & Nurick LLC	100 Pine Street Harrisburg, PA 17101	(717) 237-5304
Michael O'Neill EA Engineering, Science, and Technology, Inc., PBC	225 Schilling Circle, Suite 400 Hunt Valley, Maryland 21031	(410) 329-5142
Wanfang Zhou Hana Engineers	12710 Buttonwood Lane Knoxville, TN, 37934	(865) 919-8842
Rodney G. Myers Hydro-Terra Group	7420 Derry St. Harrisburg, PA 17111	(717) 980-5150

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4. SITE MAPS

Site maps are presented throughout this report in order to depict site conditions, previous investigation findings, and proposed remedial activities. The figures generally appear where they are referenced. The figures were selected to meet the following PADEP Act II Cleanup Plan criteria:

- The boundaries of the site
- The location of existing utilities, structures, and roads
- Areas where remedial action activities will be conducted
- Horizontal and vertical boundaries and respective concentrations of contamination in the soils.

Refer to the table of contents for a listing of figures. Also, please note that detailed drawings are provided as part of Appendix F.[4]

[4] Given the nature of the project which involves excavations, soil handling and demolition to address MMRP concerns, one set of drawings has been prepared. These drawings include cleanup activities and sediment and erosion control features. To prevent redundancy, the drawings are included with the Sediment and Erosion Control Plan in Appendix F.

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5. REMEDIAL ALTERNATIVES

EA prepared a RAA to develop and evaluate potential remedial alternatives to address the impacted MRAs at the fYNOP. The RAA was submitted to PADEP and EPA in January 2019. The document was accepted on 19 March 2019.

The proposed remedies were evaluated in accordance with the factors set forth in Section 304 (j) of Act 2 and the National Oil and Hazardous Substances Pollution Contingency Plan criteria. Remedial alternatives evaluated in the RAA were developed and screened with respect to the following nine evaluation criteria: (1) overall protection of public health, welfare, and the environment; (2) compliance with laws and regulations; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, and volume of contamination; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state acceptance; and (9) community acceptance.

Five remedial alternatives were developed for the fYNOP MRSs, AOCs, and the Remainder RI Area as documented in the RAA (EA 2019). The five alternatives evaluated by the fYNOP Remediation Team are as follows:

- **Alternative 1 – No Action**

  No additional actions undertaken at MRSs 1–5, AOCs 1 and 2, or the Remainder RI Area.

- **Alternative 2 – LUCs**

  The LUC components include continued maintenance of the site security force and fencing (maintain existing perimeter fence and add fencing for each applicable MRS/AOC), signage on fencing (as appropriate), biennial awareness training for personnel entering and working in the MRSs/AOCs/Remainder RI Area, prevention of future residential site use, prevention of the consumption of groundwater, construction support for intrusive activities within MRSs 1–4, AOCs 1 and 2, and the Remainder RI Area, and maintenance of locks/prevention of entry into MRS 5 (Building 14). LUCs require annual inspections to ensure compliance and assess the efficacy of the controls.

- **Alternative 3 – Focused Surface and Subsurface MEC Clearance, Removal of Process Materials, and LUCs**

  Perform a focused surface and subsurface MEC and process material clearance in MRSs 2–5, AOC 1, and AOC 2 and maintain LUCs in other areas. Depths to achieve focused surface and subsurface MEC and process material clearance vary based on location. Focused surface and subsurface clearance in AOC 1 and AOC 2 includes removal of process materials, MD, and MPPEH to depth. Depth of removal for the anomalies and/or process materials vary. Focused surface and subsurface clearance in MRS 5 includes removal of process materials, MD, and MPPEH within the impacted areas of Building 14. This alternative includes demolition of Building 14 and Building 16 remnants.

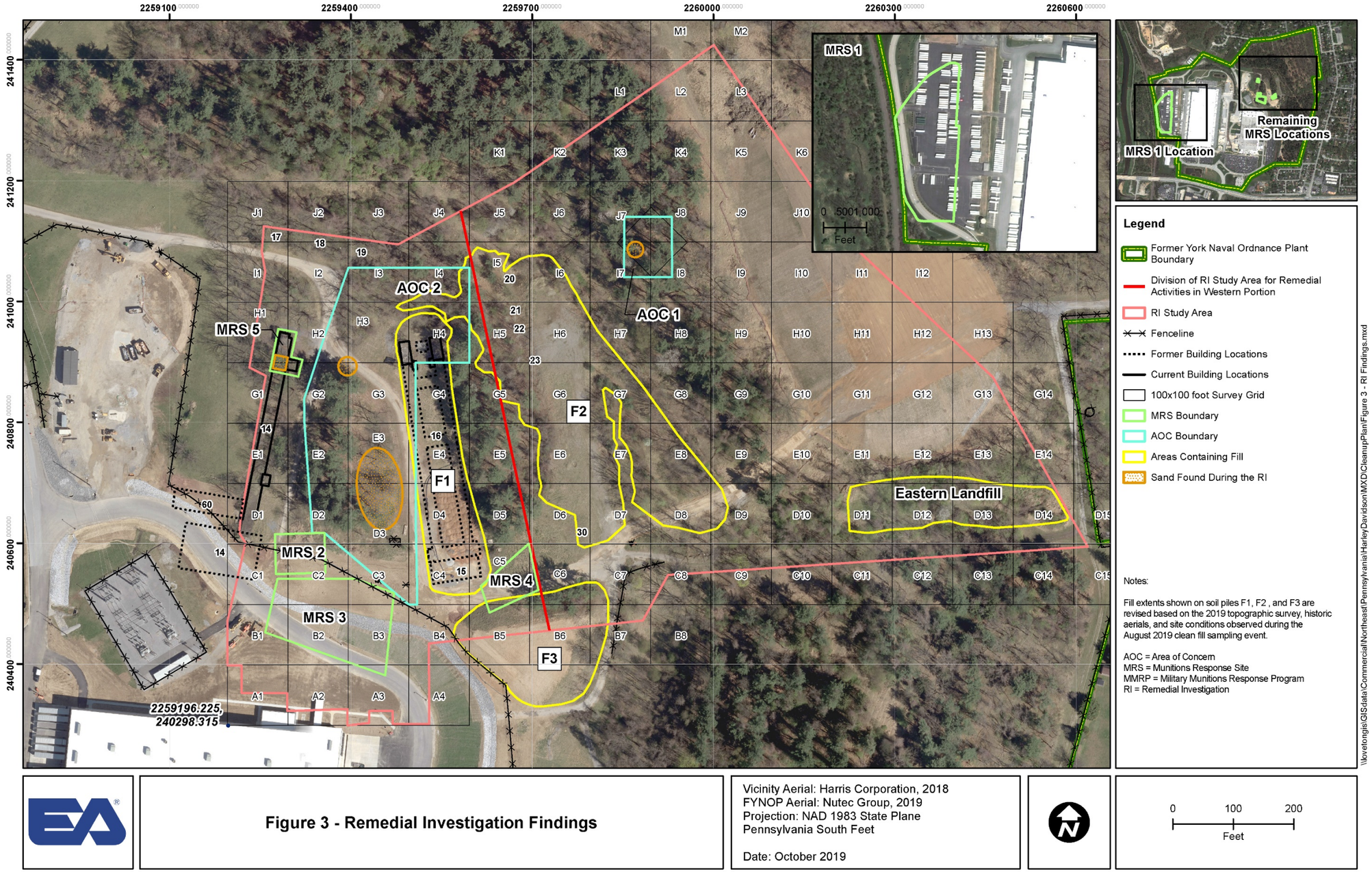
To complete the focused MEC clearance, perform vegetation clearance activities, excavation-sifting-processing of known process materials/backstop sand-containing disposal areas in MRS 5 (to foundation depth), AOC 1 (to 36 in. bgs) and AOC 2 (to 24 in. bgs), followed by 100 percent mag-and-dig of anomalies surrounding the sand-containing disposal areas in AOCs 1 and 2 using DGM data (collected during the RI) and 100 percent mag-and-dig of excavations to ensure removal to depth. Step out gridding using 100 percent mag-and-dig is performed in any area where MD is found along the boundary of AOCs 1 and 2. Remove and sift the existing soil/fill stockpiles within and to the east of AOC 2 (F1 and F2) and the existing soil stockpile to the south of MRS 4 (F3) as shown on **Figure 3**. Conduct 100 percent mag-and-dig of anomalies in the areas under these stockpiles.

The LUC components include continued maintenance of the site security force and fencing, signage on fencing (as appropriate), biennial awareness training for personnel entering and working in the MRSs/AOCs/Remainder RI Area, prevention of future residential site use, prevention of the consumption of groundwater, and construction support for intrusive activities within MRSs 1–4, AOCs 1 and 2 (for intrusive activities below clearance depths), and the Remainder RI Area. LUCs require annual inspections to ensure compliance and to assess the efficacy of the controls.

- **Alternative 4 – Surface and Subsurface MEC Clearance, Removal of Process Materials to Achieve UU/UE for Soil within AOC 1 and the Western Portion of the RI Study Area and LUCs**

  Perform a complete (100 percent) surface and subsurface MEC clearance to achieve UU/UE for soil within AOC 1 and the western portion of the RI Study Area (including MRSs 2, 3, 4, and 5 and AOC 2) and maintain LUCs in other areas. Depths expected to achieve UU/UE is up to 36 in. bgs for the entirety of AOC 2, 24 in. bgs for the entirety of AOC 1, and 12 in. bgs for the entirety of MRSs 2–4 and for the remaining area within western portion of the RI Study Area (as depicted on **Figure 3**). Clearance in MRS 5 includes removal of process materials, MD, and MPPEH within the impacted areas of Building 14. This alternative includes demolition of Building 14 and Building 16 remnants.

  To complete the clearance, perform vegetation removal activities in the western portion of the RI investigation area, fill areas (F1, F2 and, F3), and AOC 1 including the surrounding grids. Conduct excavation-sifting-processing of soils in AOC 1 and AOC 2. Conduct surface and subsurface clearance in the western portion of the RI Study Area including MRSs 2–4 that includes the use of DGM, followed by intrusive investigations and removal of all anomalies identified during DGM. Any disposal areas containing process materials in the Remainder RI Area are excavated to depth. Remove and sift the existing soil/fill stockpiles within and to the east of AOC 2 (F1 and F2) and the existing soil/fill stockpile to the south of MRS 4 (F3) as shown on **Figure 3**. Conduct 100% mag-and-dig of anomalies in the areas under these stockpiles to depth (expected to be 12 in. bgs). Any disposal areas containing process materials beneath the existing soil/fill stockpiles are excavated to depth.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Legend
Former York Naval Ordnance Plant Boundary
Division of RI Study Area for Remedial Activities in Western Portion
RI Study Area
Fenceline
Former Building Locations
Current Building Locations
100x100 foot Survey Grid
MRS Boundary
AOC Boundary
Areas Containing Fill
Sand Found During the RI
Notes:
Fill extents shown on soil piles F1, F2 , and F3 are revised based on the 2019 topographic survey, historic aerials, and site conditions observed during the August 2019 clean fill sampling event.
AOC = Area of Concern
MRS = Munitions Response Site
MMRP = Military Munitions Response Program
RI = Remedial Investigation
\\lovetongis\GIS\data\Commercial\Northeast\Pennsylvania\HarleyDavidson\MXD\CleanupPlan\Figure 3 - RI Findings.mxd
Figure 3 - Remedial Investigation Findings
Vicinity Aerial: Harris Corporation, 2018
FYNOP Aerial: Nutec Group, 2019
Projection: NAD 1983 State Plane
Pennsylvania South Feet
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The LUC components include continued maintenance of the site security force and fencing, signage on fencing (as appropriate), biennial awareness training for personnel entering and working in the MRS 1 and the eastern portion of the Remainder RI Area, prevention of future residential site use, prevention of the consumption of groundwater, and construction support (i.e., on-call oversite/support by qualified UXO personnel during excavation activities) for intrusive activities within MRS 1 and the eastern portion of the Remainder RI Area. LUCs require annual inspections to ensure compliance and to assess the efficacy of the controls.

- **Alternative 5 – Surface and Subsurface MEC Clearance and Removal of Process Materials to Achieve UU/UE[5] for the Complete RI Study Area and LUCs**

  Perform a complete (100 percent) surface and subsurface MEC clearance to achieve UU/UE for soil within the complete RI Study Area including MRSs 2–5 and AOCs 1 and 2 excluding the Eastern Landfill (as depicted in **Figure 3**) and maintain LUCs in MRS 1 and the Eastern Landfill. Depths expected to achieve UU/UE are up to 36 in. bgs for the entirety of AOC 2, 24 in. bgs for the entirety of AOC 1, and 12 in. bgs for the entirety of the remaining area within the RI Study Area. Clearance in MRS 5 includes removal of process materials, MD, and MPPEH within the impacted areas of Building 14. This alternative includes demolition of Building 14 and Building 16 remnants.

  To complete the clearance, perform vegetation removal activities in the entirety of the investigation area, fill areas (F1, F2 and, F3), and AOC 1 including the surrounding grids. Conduct excavation-sifting-processing of soils in AOC 1 and AOC 2. Conduct surface and subsurface clearance in the Remainder RI Area including MRSs 2–4 that includes the use of DGM, followed by intrusive investigations and removal of all anomalies identified during DGM. Any disposal areas containing process materials in the Remainder RI Area are excavated to depth. Remove and sift the existing soil/fill stockpiles within and to the east of AOC 2 (F1 and F2) and the existing soil/fill stockpile to the south of MRS 4 (F3) as shown on **Figure 3**. Conduct 100 percent mag-and-dig of anomalies in the areas under these stockpiles to depth (expected to be 12 in. bgs). Any disposal areas containing process materials beneath the existing soil/fill stockpiles are excavated to depth.

  The LUC components include continued maintenance of the site security force and fencing, signage on fencing (as appropriate), biennial awareness training for personnel entering and working in the MRS 1 and the Eastern Landfill in the Remainder RI Area, prevention of future residential site use, prevention of the consumption of groundwater, and construction support (i.e., on-call oversite/support by qualified UXO personnel during excavation activities) for intrusive activities within MRS 1 and the Eastern Landfill in the Remainder RI Area. LUCs require annual inspections to ensure compliance and to assess the efficacy of the controls.

[5] No groundwater issues are associated with the MMRP. Groundwater within this portion of the fYNOP was evaluated for hazardous substance corrective actions under the Site-Wide Corrective Action Objectives table from June 2017 (Groundwater Sciences Corporation [GSC] 2017).

A Detailed Analysis of Alternatives was performed, and the remedial alternatives were compared to each other to identify the advantages and disadvantages relative to one another so key decision-making tradeoffs could be identified. As part of this process, each alternative was compared against the threshold criteria (Overall Protection of Human Health and the Environment and Compliance with Applicable or Relevant and Appropriate Requirements [ARARs]) to determine if they met the statutory requirements necessary for further consideration. Then all other criteria were reviewed, comparing alternatives to each other. **Table 5-1** provides details on the comparison of alternatives for the evaluation criteria. Based on the comparative analysis and the anticipated current and future site usage, Alternative 4 was selected for implementation as shown on **Figure 3**, and this Cleanup Plan implements Alternative 4. This alternative will remove the most likely potential sources of MEC, it allows UU/UE for the portions of the Site likely to be developed in the future, it provides for removal of both existing MC and MEC source materials and UXO construction support in the remaining areas, and it is protective of human health and the environment. This remedy is satisfactory for short-term and long-term effectiveness and may be implemented using commonly applied processes and technologies.

Table 5-1: Summary of Comparative Analysis of Remedial Alternatives

National Oil and Hazardous Substances Pollution Contingency Plan and Pennsylvania Act 2 Evaluation Criteria	Alternative 1: No Action	Alternative 2: LUCs	Alternative 3: Alternative 3 – Focused Surface and Subsurface MEC Clearance, Removal of Process Materials, and LUCs	Alternative 4: Surface and Subsurface MEC Clearance, Removal of Process Materials to Achieve UU/UE for the Western Portion of the RI Study Area and LUCs	Alternative 5: Surface and Subsurface MEC Clearance and Removal of Process Materials to Achieve UU/UE for the Complete RI Study Area and LUCs
Threshold Criteria	***Result***	***Result***	***Result***	***Result***	***Result***
1. Overall Protectiveness of Human Health and the Environment	Not protective	Protective	Protective	Protective	Protective
2. Compliance with ARARs	Not compliant	Compliant	Compliant	Compliant	Compliant
Balancing Criteria	***Ranking***	***Ranking***	***Ranking***	***Ranking***	***Ranking***
3. Long-Term Effectiveness and Permanence	Not applicable	1	2	3	3
4. Reduction of Toxicity, Mobility, or Volume through Treatment	Not applicable	1	2	3	3
5. Short-Term Effectiveness	Not applicable	3	2	2	1
6. Implementability	Not applicable	3	2	2	1
7. Cost	3 $0	3 $789,439	2 $3,777,579	2 $4,813,740	1 $7,159,268
Balancing Criteria Score	Not applicable	11	10	12	9

Notes:

- Any alternative considered "not protective" for overall protectiveness of human health and the environment or "not compliant" for compliance with ARARs is not eligible for selection as the recommended alternative. Therefore, that alternative is not ranked as part of the balancing criteria evaluation.
- Scoring for the balancing criteria is as follows: Most favorable = 3, second most favorable = 2, least favorable = 1. The alternative with the highest total balancing criteria score is considered the most feasible.
- ARAR = Applicable and Relevant or Appropriate Requirement.
- UU/UE = Unlimited Use and Unrestricted Exposure.

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6. TREATABILITY STUDIES

No Treatability Studies are required for the proposed remedy. Therefore, this section was not utilized for this MMRP Cleanup Plan.

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7. DESIGN PLAN AND SPECIFICATIONS

This section summarized the remedial actions planned to address the remaining MMRP at the site. The design plans (Appendix A) summarize remedial activities including planned sediment and erosion controls. Specifications which will be used to guide contractor activities are presented in Appendix B.

7.1 REMEDIAL ACTION SUMMARY AND BASIS OF DESIGN

Multiple MMRP investigations and removal actions have occurred at the site. As a result, five MRSs and two AOCs were designated by USACE as being present at the Site (as shown on **Figures 1, 2, and 3**). Collectively these areas are referred to as MRAs. One MRA consists of MRS 1, which is isolated in the western part of the Site, and the second MRA encompasses the RI Study Area, which includes MRSs 2–5, AOC 1, and AOC 2. The five MRSs and two AOCs are described as follows: MRS 1 – a burial area in the west parking lot; MRS 2 – a misfire pit associated with the southern end/firing point of Building 14; MRS 3 – a former 20-mm dump; MRS 4 – a misfire pit associated with the southern end/firing point of Building 16; MRS 5 – the Building 14 proof range backstop area; AOC 1 – a suspect disposal area east of Building 16; and AOC 2 – the Building 16 backstop area. Since 2007, Harley-Davidson has had additional munitions-related findings outside the designated MRS and AOC boundaries but within the MMRP RI Study Area. These findings appear to be related to historic operations associated with the proof ranges (Buildings 14 and 16).

Between 2015 and 2017, an RI was conducted to evaluate MRSs 1 through 5, AOCs 1 and 2, and the Remainder RI Area comprised of buffer area around MRSs 2–5 and AOCs 1 and 2 and within the RI boundary area. The results of the RI indicate that abundant MD comprised of 20-mm projectiles was identified within the backstop sand in the Building 14 proof range. This MD is similar in character to the 20-mm projectiles within the area to the east of Building 14, which were subsequently characterized as MEC following disposal by Pennsylvania State Police. The presence of process materials with elevated concentrations of MC and the potential for metals, especially antimony and lead, to impact shallow groundwater indicate a source remains present in MRS 5 (Building 14). Impacts from MC, MEC, and/or MD were observed in AOC 2. MC impacts were mostly observed within the sand, which was co-located with abundant MD. Finds during the MMRP RI included four MEC items comprised of two 20-mm HE-containing projectiles and two 37-mm HE-containing projectiles while other MEC items were historically found within this area. Abundant MD comprised of 37-mm and 40-mm projectile fragments was identified within a likely disposal area and inferred small arms range area at AOC 1. This MD is similar in character to the HE-containing 37-mm projectiles and associated 20-mm items found in AOC 2 and characterized as MEC.

Following the RI, EA performed an MMRP RAA to evaluate technologies and remedial activities for addressing munitions-related media in the areas recommended by the RI. Five alternatives were developed based on the identified technologies, which included land use controls, MEC clearance, and excavation/removal. The alternatives were evaluated based on: (1) overall protection of public health, welfare, and the environment; (2) compliance with laws and regulations; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, and volume of contamination;

(5) short-term effectiveness; (6) implementability; (7) cost; (8) state acceptance; and (9) community acceptance.

The RAA recommended Alternative 4, which will achieve UU/UE in AOC 1 and the western portion of the RI Study Area (consisting of MRSs 2, 3, 4, and 5, AOC 2 and western portion of the Remainder RI Area) through 100 percent surface and subsurface MEC clearance. The clearance will include the use of DGM, followed by intrusive investigations and removal of all anomalies identified during DGM. This alternative includes the demolition of Building 16 and the remnants of Buildings 15 and 60 as well as the demolition of Building 14. Prior to demolishing Building 14, other activities including the removal of process materials associated with the firing ranges including backstop sand as well as hazardous materials inspections will be conducted. The remedial action includes sifting/screening of the backstop material, and the areas of sand/fill identified during the RI, as shown on Figure 4. The remedial action will also include the sifting of bottom 1 foot layer of the stockpiled fill material (F1, F2, and F3) prior to replacement or disposal. After removal of the fill from F1, F@, and F3 as shown on Figure 4, the areas underneath the fill areas will undergo 100 percent mag-and-dig. LUCs will be maintained for MRS 1 and the eastern portion of the Remainder RI Area, including continued maintenance of the site security force and fencing, signage (as appropriate), annual awareness training for personnel entering and working in the MRS 1 and the eastern portion of the Remainder RI Area, prevention of future residential site use, prevention of the consumption of groundwater, and construction support (i.e., on-call oversite/support by qualified UXO personnel during excavation activities) for intrusive activities within MRS 1 and the Eastern portion of the Remainder RI Area. LUCs will require annual inspections to ensure compliance and to assess the efficacy of the controls. The remedial activities planned under this alternative are depicted in **Figure 4**. The cleanup process is described below. All activities will be conducted in accordance with site owners' policies and Appendix E - Site Specific Health & Safety Plan and in accordance with the Sampling and Analysis Plan included as Appendix C of the Cleanup Plan.

7.2 DEMOLITION OF REMAINING STRUCTURES

7.2.1 Buildings 14 and 16 and Associated Infrastructure

Building 14 is located along the western edge of the MMRP RI Study Area. Based on schematic drawings, Building 14 runs north-south and is approximately 347 ft long by 18 ft wide, including a 100-yard firing range (subgrade tunnel), the associated sand-containing backstop area (approximately 20 ft by 18 ft), and a sand processing area behind the backstop (including a screenhouse which rises 25 ft above the ground surface and a two-story elevator system which goes from the basement up to the top of the screenhouse which were associated with the handling and sifting of backstop material). The building also has two side ventilation/fan rooms with elevated dust collectors. One is located to the south near the former range firing point and the second is located on the north end of the firing range above the main sand hopper and adjacent to the backstop (**Figure 4**). The firing range is mainly located subgrade with the elevator shaft extending from 43 ft bgs up to approximately 25 ft above the ground surface. The firing range tunnel emerges from the subsurface towards the south where it was formerly connected to another structure running east-west (the southern portion of Building 14) that was demolished in 2011. The footers on the southern end of Building 14 extend 6.5 ft bgs. Portions of the foundation wall associated with the east-west portion of Building 60 remain. Harley-Davidson secured all openings

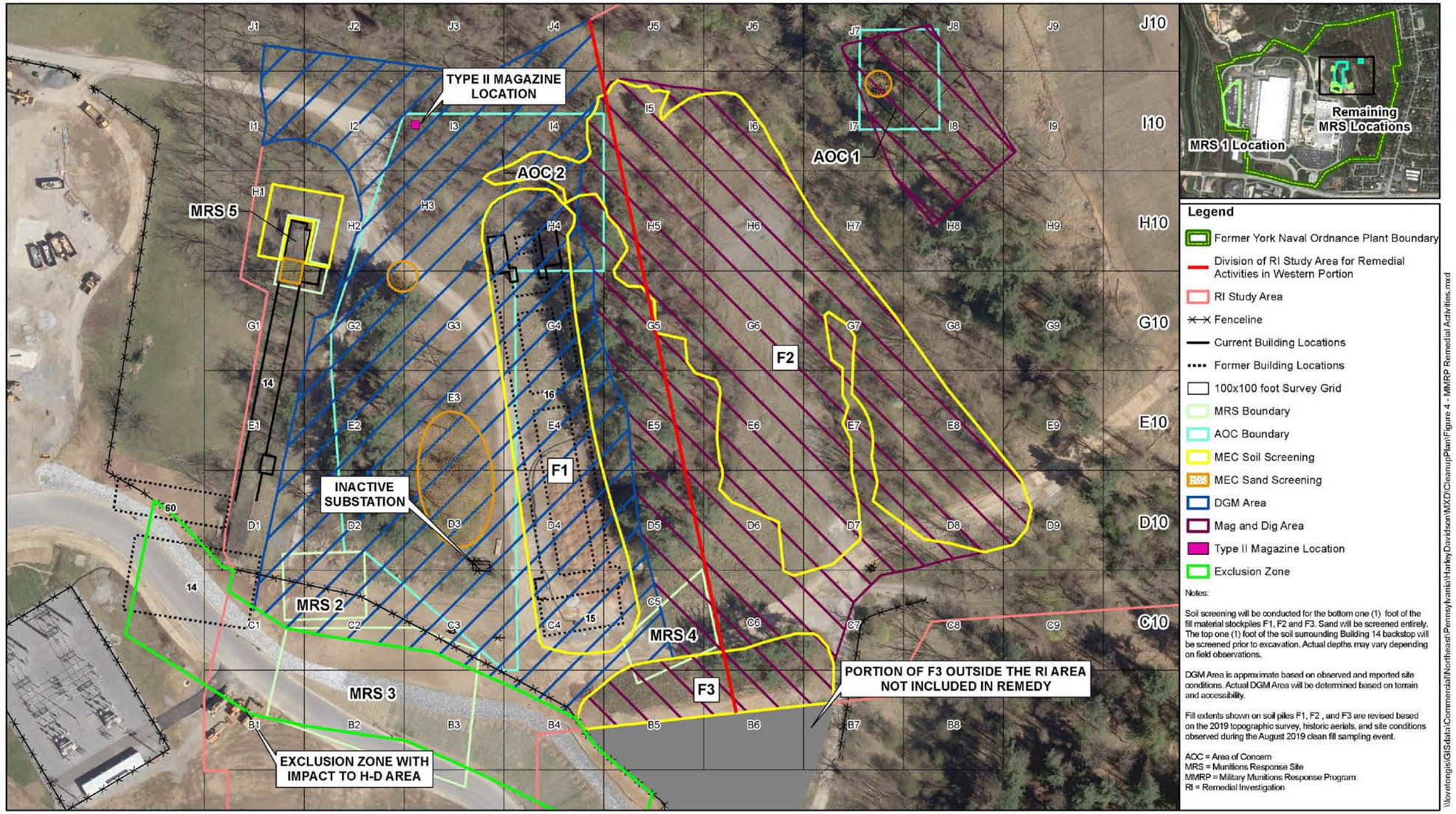

Figure 4 - MMRP Cleanup Plan Remedial Activities

Sitewide Aerial: Harris Corporation, 2018
FYNOP Aerial: Nutec Group, 2019
Projection: NAD 1983 State Plane Pennsylvania South Feet

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to the remaining portions of Building 14 in 2010. MRS 5 is comprised of the areas in Building 14 where MC or MEC was identified, including the sand-containing backstop area, sand processing area, and both side ventilation/fan rooms. The Harley-Davidson security team also controls access to Building 14 through a series of locks on the entrances to Building 14.

Building 16 (AOC 2) located to the east of Building 14 consists of the remnants of the two firing range backstops and potentially portions of the foundation walls. Building 16 was partially demolished in 2002. The Building 16 backstops were not removed during this effort. The concrete foundation from Building 16 was also reportedly left in place. Material present in the backstops, including MD and dust/soils with elevated concentrations of MC, were removed as part of the 2002 response and a 2004 TCRA. A supplemental soils investigation indicated that an interim remedial action was required to remove the dust piles and associated ventilation equipment in the remaining portions of the backstops of Building 16 and to secure all openings to the remaining portions of Building 16. These activities, which included the characterization and disposal of components of the ventilation system and associated dust that was characteristically hazardous for lead, were completed in 2010 by SAIC (EA 2018). Currently, the Harley-Davidson security team controls access to the larger eastern fenced area encompassing most of the MMRP RI study area.

Many buildings formerly located on the West Campus contained differing amounts of asbestos-containing material (ACM) and lead-based paint (LBP). An inspection survey of ACM and LBP was conducted in February 2010 by Cumberland Analytical Associates (Harley-Davidson 2011). The report indicated ACM and LPB in several buildings. The report noted that the ACM is typically found as transite siding, pipe insulation, window caulking, roof core, siding filler, mastic dots/adhesive, and floor tile. LBP was typically observed as paint on ceiling beams, ladders, safety railings, door frames, and floor striping.

Due to the identification of ACM and LBP in various buildings at the Site, a potential exists for the presence of ACM and LBP in Buildings 14 and 16. Prior to the demolition activities, a hazardous material inspection will be conducted for ACM and LBP or lead impacted dust in Buildings 14 and 16 according to the procedures detailed in the Sampling and Analysis Plan (Appendix C). If ACM and/or LBP materials are identified, abatement will be performed for ACM and potentially LBP (depending on the substrate), and materials disposed accordingly as discussed in the Sampling and Analysis Plan (Appendix C) and associated specifications (Appendix B). Disposal activities are discussed further in Section 7.5.7. Dust containing MC (including lead) associated with former firing operations is also present in Building 14 as discussed below in Section 7.2.5. Specifications for Building demolition are also provided in Appendix B.

7.2.2 MEC and MC Concerns

During the Phase I RI activities, a visual inspection for MEC, MD, and/or sources of MC was completed in Building 14 and the Building 16 backstops.

Building 16 backstops were cleaned out in 2004 during the TCRA and no evidence of surficial MEC or MD was observed on the ground surface in the backstops. The Building 14 backstop area was observed to contain sand and MD comprised of 20-mm and 40-mm training and practice projectiles and associated fragments. No intrusive investigation of the sand occurred and no MEC was identified on the surface of the backstop.

The ventilation/fan room to the east of the backstop area was observed to contain a dust pile beneath one of the existing hoppers. The dust pile was located at ground surface and was conically shaped, approximately 2.5 ft high with an approximately 6-ft radius, had a shallow angle of repose, and was very fine-grained. The room contained two degraded hoppers, which terminated approximately 4 ft above ground level. To the west of the hoppers and dust pile was a room which contained stairs that connected to the sub-grade backstop area of Building 14 (Appendix A, Sheet 9). Due to the elevator system in the northern portion of Building 14 being a confined space, no observations were made at depth. Observations made from the area adjacent to the catwalk showed the presence of pooled water in the elevator shaft/basement of Building 14, which is likely a combination of groundwater seepage and rainwater from the partially open roof. The backstop sand, dust, and pooled water all comprise sources of MC.

Abundant MD comprised of 20-mm projectiles was identified within the backstop sand in the Building 14 proof range. This MD is similar in character to the HE-containing 20-mm projectiles identified within the area to the east of Building 14, which was subsequently characterized as MEC following disposal by Pennsylvania State Police; therefore, the potential for encountering MEC in Building 14 backstop area is considered moderate. Remedial activities for MD and potential MEC are discussed in Section 7.2.5 and 7.3.1.

During the Phase II of the MMRP RI, soil samples were collected from the Building 14 backstop sand, dust pile, and surface and subsurface soils. No explosives were detected, and no polycyclic aromatic hydrocarbons were detected from the subset of samples analyzed for that analyte. Samples collected from the Building 14 backstop sand (YNOP-SS-BLDG14-1-00/02-0, YNOP-SS-BLDG14-2-00/02-0, and YNOP-SS-BLDG14-3-00/02-0) exceeded the PADEP soil-to-groundwater criteria for lead and zinc. Samples collected from the dust material associated with the Building 14 air handling unit in the ventilation/fan room (YNOP-SS-H2-01-00/02-0 and YNOP-SB-H2-01-24/26-0) exceeded the PADEP soil-to-groundwater criteria for antimony, lead, and zinc with concentrations of lead also exceeding the PADEP direct contact and EPA Regional Screening Level (RSL) for Industrial Soil criteria. The Building 14 soil sampling results are shown in **Table 7-1**. Remediation activities for dust and backstop sand are discussed in Section 7.2.5.

Table 7-1: Building 14 Soil Sampling Results

				Location ID	YNOP-BLDG14	YNOP-BLDG14	YNOP-BLDG14
				Sample Name	YNOP-SS-BLDG14-1-00/02-0	YNOP-SS-BLDG14-2-00/02-0	YNOP-SS-BLDG14-3-00/02-0
				Date Sampled	8/3/2016	8/3/2016	8/3/2016
Analyte	**EPA RSL Industrial Soil**	**PADEP Non-Residential Direct Contact for Surface Soil**	**PADEP Non-Residential Soil to Groundwater**	**Unit**	**Results**	**Results**	**Results**
Antimony	470	1300	27	mg/kg	14	2.6	23
Barium	220000	190000	8200	mg/kg	29	4.7	11
Copper	47000	120000	43000	mg/kg	670 D	150 D	410 D
Lead	800	1000	450	mg/kg	*660 D*	93 Q	*680 D*
Nickel	22000	64000	650	mg/kg	13	12	2.9
Zinc	350000	190000	12000	mg/kg	*17000 D*	1200 D	10000 D

				Location ID	YNOP-H2	YNOP-H2
				Sample Name	YNOP-SS-H2-01-00/02-0	YNOP-SB-H2-01-24/26-0
				Date Sampled	8/3/2016	8/3/2016
Analyte	**EPA RSL Industrial Soil**	**PADEP Non-Residential Direct Contact for Surface Soil**	**PADEP Non-Residential Soil to Groundwater**	**Unit**	**Results**	**Results**
Antimony	470	1300	27	mg/kg	*39*	*37*
Barium	220000	190000	8200	mg/kg	600 DQ	460
Copper	47000	120000	43000	mg/kg	26000 D	16000 D
Lead	800	1000	450	mg/kg	***3600 D***	***1900 D***
Nickel	22000	64000	650	mg/kg	24	14
Zinc	350000	190000	12000	mg/kg	*23000 D*	*14000 D*

Notes:
EPA RSL Industrial Soil = U.S. Environmental Protection Agency Regional Screening Level for Industrial Soil, June 2017.
PADEP Soil-to-Groundwater = Higher value of PADEP MSCs Non-Residential Soil to Groundwater, Used Aquifer with TDS < 2,500, Generic Values and Non-Residential Soil to Groundwater, Used Aquifer with TDS < 2,500, 100x Groundwater MSCs, both dated August 2016.
mg/kg = Milligrams per kilogram.
D = The reported value is from a dilution.
Q = One or more quality control criteria failed.
SB = Subsurface soil sample.
SS = Surface soil sample.
Results exceeding the EPA RSL Industrial Soil are shaded gray.
Results exceeding the PADEP Direct Contact for surface soil are bolded.
Results exceeding the PADEP Soil to Groundwater are in red font with italics.

7.2.3 Building 14 Dewatering

Building 14 extends 43 ft bgs. Shallow groundwater in the area has been observed at the surface at the southern end of Building 14 and 30.2 ft bgs in well MW-104, which is near the northern end of Building 14. Given the anticipated water levels and the known excavation levels (approximately 31 ft bgs), dewatering activities will be required during excavation of the sub-grade portions of Building 14.

Groundwater at the Site flows east to west from the high topographic areas underlain by quartzitic sandstone to the carbonate aquifer that underlies the western half of the site (GSC 2011). Groundwater elevations measured across the site in 2017 range from 530 ft above mean sea level (amsl) in the northeast portion to 340 ft amsl across the western edge of the property. Two monitoring wells are installed near Building 14 and will be used to assess the groundwater conditions for the Building 14 excavation. MW-86S and MW-104 are shallow monitoring wells installed in the quartzitic sandstone overburden adjacent to Building 14. MW-104 is located on the north end of Building 14 adjacent to the west wall of the sand elevator room, and MW-86S is located north of the former Building 60 beyond the western boundary of the RI Study Area. The elevation of the well MW-104 (which is adjacent to the foundation) is approximately 429 ft amsl and groundwater elevations for MW-86S and MW-104 are 397.85 ft and 399.76 ft amsl, respectively.

Transmissivity varies across the Site, with values of 100 to 200 gallons per day per foot (gpd/ft) for wells installed in the quartzitic sandstone and 8,000 to 28,000 gpd/ft for wells in the carbonate aquifer. The lower transmissivity measured in the quartzitic sandstone reflects the resistance of flow through the interconnected network of fractures, joints, and bedding planes (GSC 2011).

During the RI, one water sample was collected from the standing water in the elevator shaft of Building 14 concurrent with a groundwater sampling event completed by Leidos in October 2016. EA conducted a second round of sampling in March 2017 and collected a second water sample from the Building 14 elevator shaft and a groundwater sample from MW-86S. No concentrations of total or dissolved metals exceeded criteria in samples collected from MW-86S. No concentrations of total or dissolved antimony, barium, copper, nickel, or zinc exceeded criteria in water samples collected from behind the backstop Building 14 in October 2016 or March 2017. Concentrations of total lead from each sample exceeded the PADEP Non-Residential Screening Criteria, but dissolved concentrations were generally lower with only the dissolved lead from the October 2016 sample exceeding the PADEP Non-Residential Screening Criteria, as shown in **Table 7-2**.

Due to lead exceedances in samples from the Building 14 process materials and backstop sand, a potential exists for contamination of any water that enters the Building 14 excavation (i.e. perched water, runoff, or rainfall). Therefore, the demolition will occur in multiple stages intended to limit the amount of surface runoff and rainfall that enters Building 14 and its sump as discussed below in Section 7.2.5. As the contractor conducts the demolition, they will need to dewater Building 14 including the sump. As noted, previous sampling results indicate that elevated lead content reported in sump water samples was likely associated with particulate matter and suspended solids. It is noted that filtration was effective in reducing the amount of dissolved lead observed in the

Table 7-2: Building 14 Groundwater Sampling Results

				Location ID	BLDG14	BLDG14	MW-86S	MW-86S
				Sample Name	YNOP-GW-BLDG14-01-00/70-0	YNOP-GW-BLDG14-01-00/70-0	YNOP-GW-86S-01-17/27-00	YNOP-GW-86S-01-17/27-01
				Date Sampled	10/18/2016	3/6/2017	3/6/2017	3/6/2017
Analyte	**EPA MCL**	**EPA Tapwater RSL**	**PADEP NRG MSC**	**Unit**	**Results**	**Results**	**Results**	**Results**
Total Metals (SW6010C)								
Antimony	6	7.8	6	µg/L	< 12 U	2 J	< 1 U	< 1 UJ
Barium	2000	3800	2000	µg/L	50	220	53	51
Copper	1300	800	1000	µg/L	25	98	2.7	2.8
Lead	15	15	5	µg/L	***760***	***1700 J***	1.3 J	1.1 J
Nickel	NSL	390	100	µg/L	3.1	12	1.7 J	1.6 J
Zinc	5000	6000	2000	µg/L	370	1400 J	5.8 J	20
Dissolved Metals (SW6010C)								
Antimony	6	7.8	6	µg/L	< 12 U	0.88 J	0.63 J	< 1 U
Barium	2000	3800	2000	µg/L	31	32	43	44
Copper	1300	800	1000	µg/L	1.5 J	1.5 J	1.5 J	1.5 J
Lead	15	15	5	µg/L	*5.9*	1.3 J	< 0.7 U	< 0.7 U
Nickel	NSL	390	100	µg/L	0.36 J	0.36 J	0.95 J	0.74 J
Zinc	5000	6000	2000	µg/L	< 8 UB	5.1 J	3.6 J	2.3 J

Notes:
EPA MCL = EPA Regional Screening Level table's MCL (June 2017).
EPA Tapwater RSL = EPA Regional Screening Level for Tapwater (June 2017).
PADEP = Pennsylvania Department of Environmental Protection.
PADEP NRG MSC = PADEP NRG MSCs for a Used Aquifer with TDS < 2,500 (August 2016).
MCL = Maximum Contaminant Level.
MSC = Medium Specific Concentrations.
NRG = Non-Residential Groundwater.
RSL = Regional Screening Level.
J = Estimated Result.
U = Not detected.
µg/L = Micrograms per liter.
Bolded values exceed the EPA MCL screening criteria.
Shaded values exceed the EPA Tapwater screening criteria.
Red italics values exceed the PADEP Non-Residential Groundwater screening criteria.
Zinc EPA MCL concentration is a secondary MCL.
Values will be updated during each iteration of the project or whenever screening criteria are updated.

standing water in the backstop area of Building 14 (when comparing total and dissolved lead metals results),.
. Therefore, filtration is likely a viable option for reducing the concentrations of dissolved lead, to a level which will allow for disposal of water collected during dewatering activities.

Two options exist for disposal of water which include disposal offsite and disposal through the Harley-Davidson (H-D) groundwater treatment system (GWTS). It should be noted that the GWTS is intended for treatment of VOCs and no discharge limit for metals is specified in the GWTS NPDES permit; therefore, use of the treatment system for handling water from dewatering operations will require, storage, filtering, testing and H-D approval (based on acceptable test results). Discharging water to the treatment system will also need to be coordinated with H-D.

The following process will be used to collect, pre-treat, and sample water to determine disposal options. Water will be pumped from the building through a bag filter. Water will leave the bag filter and enter a series of baker tanks for storage and settling. The water will then be sampled and analyzed for metals only (GWTS is intended for treatment of other onsite contaminants i.e. VOCs). Sampling results will be evaluated again screening criteria (including PADEP Non-Residential Screening Criteria and criteria identified in 40CFR 122.42a). Water that has results below the screening criteria for metals will be discharged into a nearby existing GWTS access/cleanout manhole for conveyance to and subsequent treatment by the existing GWTS. In the event that the dissolved metal results from the dewatering samples exceed the screening criteria, the source water will be transported offsite for treatment and disposal. Screening criteria, and the comparison process is presented in Section 2.9.2 of the Sampling and Analysis Plan (Appendix C of the cleanup plan). Offsite disposal is discussed in Section 7.5.7 below.

7.2.4 Utilities

Existing utilities were identified in the MMRP RI study area based on engineering drawings and geographic information system (GIS) data provided by Harley-Davidson. The locations of several utilities were confirmed during Phase I activities. The most prominent underground utility is the natural gas pipeline, which runs from west to east starting near Gate 5 until turning south-southeast near the former magazine areas and exiting the MMRP RI study area between MRS 4 and the former landfill area. The other prominent feature is an underground stormwater conveyance, which runs from east to west prior to becoming a visible concrete-lined surface feature to the south of the demolished portion of Building 14 and running to the west beneath the access road entering the substation. Other mapped utilities are present within the MMRP RI study area and are mostly inactive. Known utilities are presented on **Figure 4**. Based on discussions with Harley-Davidson personnel all utilities are inactive. However, prior to the demolition, the contractor will confirm that all utilities to Building 14 and Building 16 have been cut and/or capped. The contractor will also confirm the location of the stormwater conveyance system and ensure protection and or replacement of the lines during any subsurface activities.

Several groundwater monitoring wells are present on the fYNOP property; however, there are no potable water wells located onsite. Potable water for fYNOP is obtained from the York Water Company or from bottled water suppliers. Monitoring wells are depicted on **Figure 4**. Any monitoring wells within the limit of disturbance (including MW-17, MW-19, MW-66S, MW-68, MW-69, MW-86S, and MW-104) will be protected or scheduled for abandonment prior to the start of intrusive work. MW-104 is located adjacent to the west wall of the Building 14 elevator shaft and will be impacted by the excavation. Well abandonment will be done in accordance with PADEP and Pennsylvania Department of Conservation and Natural Resources requirements. The remaining groundwater monitoring wells that are located throughout the remedial areas must be protected. Wells must be protected from damage, from collapse, or from intrusion of dirt, surface water, or any other foreign matter or chemical. The demolition contractor(s) will be responsible to repair or replace any well that is damaged.

7.2.5 Decontamination and Demolition

The sequence of the demolition activities discussed below are provided for reference only. Activities may occur in sequence or in parallel or it may become necessary to conduct partial

demolition of the elevator shaft or the firing tunnel to safely access air handling equipment or the backstop materials (including sand and MD) prior to completing the building demolition. However, it is expected that the demolition contractor will generally proceed in the following deconstruction sequence.

7.2.5.1 Initial Hazardous Material Inspection

Due to MEC and MC impacts within Building 14, the demolition will occur through a phased approach with multiple stages of cleaning and removal of building materials. The presence of metals including antimony, lead, and zinc in the dust in Building 14 has been documented during previous investigations (as shown in **Table 7-1**). Prior to the demolition activities, an initial hazardous material inspection will be conducted for ACM, LBP, and lead impacted dust in Buildings 14 and 16. The inspection will include wipe sampling of surfaces and potentially LBP and ACM sampling in the areas leading to and around the backstop. The inspection will be conducted according to the procedures detailed in the Sampling and Analysis Plan (Appendix C).

7.2.5.2 Removal of the Backstop Materials

Following the hazardous material inspection, ACM or lead dust identified during the inspections near the former target backstop will be addressed/mitigated under direction of UXO technicians to allow access to the backstop. Next the area will be secured by UXO technicians, and the contents of the backstop area will be transported from the Building 14 backstop to an area for screening (to be designated by UXO technicians but likely in proximity to the backstop). Next the material in the backstop (including sand, MD, etc.) will be removed and mechanically screened (2-in. screen size) by UXO technicians to separate MPPEH for inspection. Following inspection, MPPEH deemed MD or MEC will be secured and EA personnel will notify the fYNOP Remediation Team of the findings. If MEC is found, it will be handled as discussed in Section 7.4.3 below. Recovered sand which passes through the screen will be placed in a lined, 30-cubic-yard roll-off container and sampled. Samples will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) for lead and other metals. Sampling results will be used to determine if the material is considered hazardous waste or non-hazardous waste. The waste will be disposed offsite in accordance with the waste classification determination as discussed in Section 7.5.7. Precautions will be taken to minimize the disturbance of around the backstop during remediation of the backstop material. Residual sand will be cleaned from the building during dust removal activities discussed in Section 7.2.5.3 below. It is noted that based on the presence of impacted dust in the building, additional health and safety requirement (i.e. working in respirators) may be required during this step. Additional details related to health and safety and removal procedures are presented in Appendices B, C, and E.

7.2.5.3 Removal of the Residual Dust and ACM

Based on building inspections and previous sampling results, it was determined that dust remaining in the building from former range activities is likely impacted by lead and potentially other metals at levels exceeding TCLP values. Sampling results from the initial hazardous material inspection will be supplemented with additional wipe sampling results to characterize areas where dust removal activities will take place prior to building demolition. It is anticipated that dust will be removed from impacted materials, including concrete surfaces in the bag filter houses and the

firing range walls as well as from the air handling units and other equipment (elevator, steel plates, etc.) remaining in the building. Prior to dust removal activities, any ACM identified which may impact dust removal actions in Building 14 will be addressed/mitigated to allow access for dust cleaning. Cleaning will be performed using vacuums with high-efficiency particulate arrestor filters. Dust that is removed from the building will be placed in 55-gallon drums or other suitable containers for sampling and disposal.

Following lead dust removal, wipe samples will be collected from concrete surfaces in the bag filter houses and the firing range walls as well as from the air handling units, and other equipment (elevator, steel plates, etc.) to confirm lead dust removal. If lead dust remains affixed to equipment/materials and these materials can potentially be recycled, a wet-wash may be conducted or surfaces may be brushed and vacuumed and resampled if practical. If the fYNOP Remediation Team determines it is not practical to wet wash or brushed and vacuum the equipment or if lead remains following the wet-wash, brushing and vacuuming, the material will be marked for segregation and disposal as hazardous scrap metal. LBP or lead impacted dust that remains affixed to concrete surfaces after removal attempts will remain in place unless health and safety procedures require removal based on field determinations as discussed in the Sampling analysis Plan (Appendix C). After demolishing and containerizing the concrete (which may include some of the surfaces where LBP or dust remains fixed), TCLP sampling will be performed to determine disposal requirements. Sampling procedures, cleaning protocols and Quality Assurance and Quality Control (QA/QC) measures are noted in the Sampling and Analysis Plan (Appendix C).

7.2.5.4 Building Demolition Activities

Prior to demolition of the structure, the demolition contractor must complete the Subsurface Excavation Clearance Form (YS2.03.300.01) and receive approval from the Harley-Davidson "Plant" Engineering and Environmental team. Pursuant to completing the clearance form, the demolition contractor must also review Harley-Davidson's "Subsurface Protocol and Utility Clearance" work instruction (YS2.03.300) and notify PA OneCall prior to the start of intrusive work. Any utilities at the Building 14 terminus will be cut and capped prior to beginning demolition work. Prior to demolition activities, any ACM identified in Building 14 which may impact demolition will be addressed/mitigated to allow for demolition. Next removal of the bag filter houses, air handling units, elevator equipment, and any other equipment, will occur. Metal scrap will be separated as practical for recycling. The aboveground portions of Building 14 will then be demolished, including the screen house sand elevator and both fan houses.

Next soils around the Building 14 tunnel from the firing point to the backstop area will be excavated and the remaining building will be exposed and demolition will be initiated. Demolition will extend down to remove the foundation near the firing point and down to approximately 31 ft bgs towards screenhouse and sand elevator near the backstop area. As noted previously, the area containing the screenhouse and sand elevator has a basement area that extends down to approximately 43 ft bgs. This area will only be demolished down to approximately 31 ft bgs (i.e. due to dewatering challenges the foundation from 31 ft bgs to 43 ft bgs will be cleaned and will remain in place). After the aboveground portion of the building is demolished, the unexcavated concrete foundation below 31 ft bgs will be drilled or hammered to create holes in the remaining portion of the foundation/floor. As noted in the design drawings (Appendix A), shoring or sloping

of soils will be used in order to access and demolish Building 14 down to 31 ft bgs. Excavated soils will be stockpiled onsite for backfill, and backfilling is discussed below.

The target backstops for Building 16 will be demolished, including the walls, ceiling, floor, and foundation. Ceiling armor plates will be segregated for recycling. The remaining concrete foundation material between Building 16 and the former Building 15 location, to include the Building 15 foundation, will be demolished and removed, sized, and disposed of. Metal scrap will be separated as practical for recycling. Sampling and disposal procedures for demolition debris is outlined in Section 7.5.6. Specifications for Building demolition are provided in Appendix B.

7.3 SOIL MOVING AND SOIL SEGREGATION

7.3.1 Areas Containing Process Material and MD

UXO clearance will be conducted in the area beneath the existing soil piles and former concrete pad adjacent to Building 16. Following completion, these areas will undergo removal actions where these areas will be excavated (either by hand or mechanically with approved equipment) and the soils will be mechanically screened (2-in. screen size) to separate debris and MPPEH for inspection. Any MPPEH deemed MD or MEC following inspection will be secured and EA personnel will notify the Harley-Davidson Project Champion of the findings. If MEC is found, the UXO team will initiate the response procedures discussed in Section 7.4.3. The area will be backfilled and restored with remaining soils following completion of the activities.

Several areas within the boundaries of AOC 2 and AOC 1 were determined to have process material (i.e., backstop sand and dust from firing range operations) as well as MPPEH present. In addition, the area around the above grade elevator shaft associated with Building 14 which is partially asphalted may contain anomalies as the area formerly handled material from the backstop (Figure 4). These areas will undergo removal actions which includes excavation (either by hand or mechanically with approved equipment) and mechanical screening of the soils/dust and debris (2-in. screen size) to separate MPPEH or other debris for inspection. Any MPPEH deemed MD or MEC following inspection will be secured and EA personnel will notify the fYNOP Remediation Team of the findings. If MEC is found, it will be handled as discussed in Section 7.4.3. Recovered sand/dust will be placed in a lined, 30-cubic-yard roll-off container and sampled for lead. Sampling results with be used to determine if the material is considered hazardous waste or non-hazardous waste. The waste will be disposed offsite in accordance with the waste classification.

7.3.2 Fill Areas F1, F2 And F3

The fill material within the Remainder RI Area consists of stockpiles F1, F2, and the northern portion of F3 (as depicted on **Figure 4**). The southern portion of F3 is outside of the Remainder RI Area and will not be removed during the MMRP cleanup activities. The stockpiles within the Remainder RI Area will be excavated and used for backfill following the demolition and excavation activities associated with buildings 14, 15 and 16. Soils in excess of the backfill volume will be regraded within the footprint of the MMRP cleanup area after these areas have undergone removal actions. This applies to the top layers of the stockpiled fill areas F2 and F3 (down to 1 ft above the surrounding contour elevation) that will be removed and used as backfill (discussed below). The bottom foot of piles F2, and the northern portion of the F3) and F1 in its entirely will

be sifted to screen for MPPEH, as discussed in Section 7.4.3. After removal of the soils the footprints of F2 and the northern portion F3 will undergo an instrument-assisted survey/sweep of the ground. F1 is included in the area subject to DGM surveys. All anomalies will be investigated and removed as discussed in Section 6.4.3 below.

7.3.3 Backfilling

As noted in Section 7.3.2, most of the stockpiled soils within the Remainder RI Area (depicted as piles F1, F2 and northern portion of F3 on **Figure 4**) has been designated for use as backfill for the project. This fill material originated from an uncontaminated subsurface source; and environmental sampling was conducted to confirm the material can be used offsite as clean fill. Geotechnical samples (modified proctor) may be required to determine compaction factors for backfill purposes. As noted in Section 7.2.5, the remaining foundation of Building 14 in the area of the elevator will be drilled or hammered to create holes and then filled with concrete (if approved for disposal onsite) and/or soil. In general, backfilling will be performed in nominal 2-ft lifts and compacted up to 4 in. from ground surface. Subgrade will be rough graded to ensure positive drainage. Fill material will also be used to fill in any areas where Building 15 and 16 foundation are removed and any areas where backstop material (i.e., backstop sand and dust) has been removed. Excess fill material from F1, F2, and F3 will be graded throughout the footprint of the MMRP cleanup area. Certified clean topsoil will be imported and placed over the prepared subgrade using light mechanical compaction. The disturbed area will be hydroseeded using York County Conservation District approved seed mixes.

7.4 GEOPHYSICS AND REMOVAL ACTIONS

7.4.1 Preparation of Site Areas

All remedial areas will be prepared for clearance activities, including vegetation clearance, tree removal, surveying and staking of grids, and visual assessment of the remedial areas. Additional procedures for site preparation are provided in the Sampling and Analysis Plan (Appendix C).

Vegetation clearance will be conducted in all remedial areas to perform UXO clearance and provide access for construction activities. The degree of vegetation clearance needed in the work areas will vary within the grids. Vegetation clearance procedures are detailed in the Sampling and Analysis Plan (Appendix C). The western portion of the Remainder RI Area will undergo complete tree removal and brush clearance in all areas to perform DGM. Brush will be cleared from AOC 1 and tree clearance will be limited to the extent necessary for access, equipment staging, and screening of the sand pile. Additional tree clearance requirements may be determined in the field by the Senior Unexploded Ordnance Supervisor (SUXOS) to perform the anomaly investigation. The removal of vegetation will include tree roots and stumps that might contain MEC to allow for geophysics and intrusive investigations. During vegetation removal operations, a UXO Technician will search the cutting area and tree root balls using a magnetometer and visual techniques prior to removal to ensure that the area and tree debris is free of MEC items. If MEC is discovered, the SUXOS will stop work immediately and direct the vegetation removal crews to leave the immediate area. The UXO Team will assess the item as described in Section 7.4.3.

7.4.2 Digital Geophysics

DGM will be performed in the western portion of the Remainder RI Area, including beneath the fill material pile F1 and the foundation of Buildings 15 and 16. DGM will not be conducted over the footprint of Building 14. It is anticipated that the DGM will not extend beyond the concrete channel east of Building 16 due to inaccessible terrain in this area. DGM was previously performed on 100 percent of the accessible portions of nine grids (identified as Grids D3, E3, G3, H3, H4, D5, E5, G5, and H5) surrounding AOC 2; however, soil piles, debris and foundations did not allow for complete coverage. The purpose of the initial DGM was to identify and classify anomalies that may represent subsurface MEC or features that may be indicative of disposal areas to further refine the analog geophysical survey findings. To ensure consistency, this area will be included in the remedial DGM surveys after soil piles and foundations/debris is removed. The areas included in the DGM for this remedy are shown in **Figure 4**. DGM will be conducted on approximately 4.8 acres. QA/QC measures will be implemented for each definable feature of work related to DGM as noted in Appendix C Sampling and Analysis Plan. It is noted that as shown on Figure 4, a portion of MRS 3 and MRS 2 as well as the RI area surrounding those locations was remediated in June/August 2018. This was done as part of the utility and and road reconfiguration associated with the expansion of the Building 3. Activities included excavating the area from 2 to 4 ft bgs (down to native soils). Instrument-assisted survey/sweep of the ground in this area was conducted and all anomalies were investigated and removed. Several items identified as munitions debris non munitions related debris were found in the area. No evidence of backstop sand or MEC was found. The area to be remediated where geophysics will be conducted has been revised as a result of those activities.[6]

7.4.3 Removal of Anomalies

Prior to investigating anomalies, a portable ATF Type II magazine will be placed near Building 14 as shown on **Figure 4**. A Blasting Activity Permit and an Explosive Storage Inspection Report (if explosives are stored onsite) will be obtained from the State of Pennsylvania to accommodate the possible need to blow-in-place or detonate MEC. Exclusion zones will be established/marked in the field using caution tape and signs inside the Harley-Davidson fenced property in accordance with the Sampling and Analysis Plan in Appendix C. The magazine will be delivered, blocked, grounded, and verified in accordance with the Sampling and Analysis Plan. Explosives will be on call and delivered based on findings of MEC.

Following DGM, an intrusive investigation will be completed to remove all identified anomalies. Anomalies selected for intrusive investigation will be reacquired using an RTK GPS. Flags will be placed at the anomaly location derived through the data processing of the DGM data. The anomaly ID will be written in indelible marker on a surveyor flag placed at the anomaly location. Dig locations will be compared to processed DGM data to ensure all anomalies have been removed Analog geophysics will be utilized to locate anomalies in approximately 4.2 acres where DGM is not being performed (i.e. within AOC 1, between Building 16 and stock pile F2 and beneath stockpiles F2 and the northern portion of F3 [the portion of F3 in the RI area]). The UXO team will conduct a ferrous-detecting instrument-assisted (Schonstedt magnetometer or equivalent), or

[6] Information regarding the removal action in the area of MRS 2 and MRS 3 including the MD findings will be included as part of the closure report for the site.

mag-and-dig, survey/sweep within each of the lanes in the identified grids to identify all anomalies. All identified anomalies will be removed and inspected to determine their explosive hazard, as described below.

During the intrusive investigation, if the UXO team encounters MPPEH, the SUXOS and UXO Quality Control Specialist (UXOQCS)/Unexploded Ordnance Safety Officer (UXOSO) will inspect the item to determine condition of the item and to determine if the item is safe to move. If the item is determined to be MD, the SUXOS will direct the UXO Technician II or I to recover the MD and it will be removed from the area and stockpiled with other MD. If it determined that the item is MEC or cannot be certified as material documented as safe, the SUXOS will mark and record the location of the item and the UXOQCS/UXOSO will then notify the fYNOP Remediation Team with all the details and recommend a course of action for approval by Harley-Davidson (i.e., blow in place or storage and consolidation prior to detonation). Global positioning system (GPS) coordinates will be collected and recorded for each intrusively investigated anomaly.

The locations of MEC or MD will be mapped with GPS using electronic field tablets, and coordinates will be transmitted by the Task Manager to the GIS Specialist who will incorporate the data into the master GIS. Data will be reviewed for completeness and accuracy. All GIS data will be provided to the fYNOP Remediation Team and the designated ArcGIS database manager for incorporation into the fYNOP database.

Mechanical screening will be utilized to separate and inspect debris from the high-density sand and soil piles to identify MD and MEC. The material that will be screened includes the bottom foot of the stockpiled fill material within the Remainder RI Area (F1, F2 and northern portion of F3) and the entirety of any backstop sand piles. Additionally, the top 1 ft of the soil material in the area surrounding the Building 14 elevator shaft (used to load and unload materials screened from the firing range backstop) will be excavated prior to building demolition and screened for MEC/MD. Considerations for the screening locations are detailed in the Sampling and Analysis Plan (Appendix C). The debris will be loaded onto a slow-moving conveyor system and will be visually inspected by UXO Technicians. Any items visually identified as MPPEH by a UXO Technician II (or higher) will be removed from the conveyor and managed in accordance with this section. Recovered anomalies will be laid out for inspection and any identified MEC will be handled following the procedures outlined above. After removal, the UXO team will conduct an instrument-assisted survey/sweep of the ground beneath these piles. All anomalies will be removed and any MEC discovered will be handled using the procedures described above.

Following the completion of UXO clearance activities, post-dig verification surveys will be conducted to demonstrate 100% removal of anomalies. Anomalies identified through DGM will be resurveyed using DGM equipment. The areas inaccessible to DGM will be resurveyed through a ferrous-detecting instrument-assisted sweep of the grids. The verification data will be provided to the fYNOP Remediation Team and submitted with the Closure Plan to attain UU/UE in these areas.

7.5 CONSTRUCTION CONSIDERATIONS

7.5.1 Contractor Compliance Requirements

Contractors will adhere to all applicable environmental, safety, and confidentiality requirements, including H-D protocol and applicable laws. This section provides standard contractor requirements that will be implemented in agreements with the contractor prior to the start of work.

a. Contractor is engaged in the business of performing and has developed the requisite expertise to perform, the Services hereunder, and Contractor shall provide all necessary and suitable supervision, labor, equipment, vehicles, tools, services and materials as required to perform the Services in accordance with this Agreement;
b. Contractor shall maintain in full force and effect, and will comply with, all permits, licenses, certificates and other approvals required to perform the Services and otherwise shall be in full compliance with all Applicable Laws relating to the Services;
c. Contractor will perform the Services in a safe, timely and workmanlike manner according to generally accepted industry standards, using properly qualified personnel, and in compliance with Applicable Laws, including without limitation all applicable environmental and safety regulations;
d. Contractor shall not cause or permit to exist any unlawful, hazardous, unsafe, unhealthy or environmentally unsound condition over which Contractor has complete control at Harley-Davidson's facility(ies);
e. "Applicable Laws" means all local, state and federal ordinances, statutes, laws, administrative or judicial orders, rules and regulations applicable to the Services and the respective obligations of the parties hereunder.
f. Contractor shall procure and maintain throughout the term of this Agreement liability insurance and other insurance covering its activities under this Agreement in accordance with the coverages and limits set forth in the agreement, and Contractor shall also comply with all other requirements contained in the agreement.
g. Contractor will take all reasonable safety precautions customary in the industry or otherwise communicated by Harley-Davidson to Contractor (collectively, "Safety Precautions") in the performance of Contractor's obligations under this Agreement to protect the health and safety of Harley-Davidson and its employees and property, Contractor's employees and their property and members of the public and their property and to minimize danger from all hazards to life and property. Contractor will comply with all Applicable Laws relating to environmental, health, safety and fire protection, as well as all requirements (including reporting requirements) established and amended from to time to time by Harley-Davidson, including Harley-Davidson's policies with respect to drug and alcohol testing. Additionally, Contractor must have an established safety program and policy, and must ensure that all Contractor employees are properly trained, including but not limited to training relating to hazardous materials, lock-out/tag-out and fire protection laws and regulations. In the event that there is a legal or regulatory change, Contractor will be responsible for the compliance of Contractor's employees

h. Harley-Davidson shall have the right to review/audit any and all documents relating to Contractor's safety program, policy, training records and any other documents reasonably related to the requirement that Contractor take all reasonable Safety Precautions, and to request Contractor to supplement the Safety Precautions in those situations that Harley-Davidson deems appropriate, subject to compliance with all Applicable Laws. Contractor will obtain authorization from the Harley-Davidson's Project Champion prior to operation or use of any Harley-Davidson owned or leased equipment. In addition to the foregoing, Contractor will take such extraordinary Safety Precautions and measures as Harley-Davidson establishes and amends from time to time.

i. Assignment of Personnel. Contractor shall provide Harley-Davidson with a list of all Contractor personnel (whether a subcontractor, an employee, or an independent contractor) assigned prior to such personnel's commencement of Services ("Contractor Personnel"). Harley-Davidson may in its sole discretion request a change of any assigned Contractor Personnel by written notification to Contractor. Unless otherwise agreed to in writing by the parties, in such event, Contractor shall remove any such Contractor Personnel from the Services.

j. Subcontractors. Contractor may engage subcontractors to assist Contractor in meeting its obligations under this Agreement or any particular SOW, provided that the following conditions are met:
   a. Contractor remains responsible to Harley-Davidson for the obligations and liability of each subcontractor;
   b. Contractor hereby unconditionally guarantees to Harley-Davidson the complete and timely performance of all of each subcontractor's obligations under this Agreement;
   c. Contractor requires each subcontractor to enter into confidentiality agreements regarding Harley-Davidson’s Confidential Information (as that term is defined in the Confidentiality Agreement), the terms of which at least meet Contractor's obligations required under the Mutual Supplier Confidentiality Agreement (the "Confidentiality Agreement") which is part of the on-boarding process further discussed below in Section 7.5.8 and in Appendix C;
   d. Contractor obligates each subcontractor to assign all of subcontractor's right, title and interest in and to any and all work product produced in performing the Services to Contractor to ensure Harley-Davidson’s ownership of all Deliverables under this Agreement and obligates each subcontractor to cooperate with and assist Harley-Davidson, at FYNOP's expense, in securing any documents necessary or desirable to register or otherwise protect any such rights; and
   e. Contractor submits each subcontractor to Harley-Davidson for Harley-Davidson’s review and approval (not to be unreasonably withheld) prior to any such subcontractor commencing any Services under this Agreement and promptly removes same from the Services at Harley-Davidson’s request.

7.5.2 Site Natural Resources and Permitting

The fYNOP was previously reported to contain habitat that could potentially support federal or state threatened and endangered species such as the state endangered short-eared owl, the state threatened upland sandpiper, and the federal and state protected bald eagle (USACE 1995). Based

on a review of data from the Pennsylvania Natural Heritage Program (PNHP), no core habitat or significant natural areas are currently present on the fYNOP (PNHP 2019). Additionally, there are no identified wetlands within the designated RI study area at the fYNOP, and the site is in south-central Pennsylvania, and thus there are no coastal zones present on the site or in the study area (USACE 1995, PNHP 2019). No cultural and archaeological resources are present within the site boundaries of fYNOP (USACE 1995) and no active waste disposal sites currently exist. Therefore, no permitting associated with coastal zones, ecological, cultural, and archaeological resources are required.

Any remedial activities conducted under the Cleanup Plan will receive prior approval through all applicable regulatory agencies and follow the requirements of any relevant permits. The following permits are anticipated for the MMRP remedial activities:

- PADEP Asbestos Demolition/Renovation Notification (if applicable, to be completed/submitted prior to mobilization)
- Springettsbury Township Non-Residential Building Permit (for demolition)
- PADEP Erosion and Sediment Control Plan and Permit satisfying the requirements of Pennsylvania Code, Title 25, §102.4(b)(2)(i) for projects with earth disturbances of more than 5,000 square feet (as part of the Notice of Intent process to achieve coverage under General National Pollutant Discharge Elimination System Permit PAG-02)
- Blasting Activity Permit and an Explosive Storage Inspection Report from the State of Pennsylvania (if explosives are stored onsite).

7.5.3 Pre-Construction Activities

Several activities will be conducted prior to the start of demolition and intrusive activities. Erosion and sediment controls will be installed based on the Erosion and Sediment Control Plan. Clearing and grubbing will be conducted in compliance with any applicable regulations following the procedures in the Sampling and Analysis Plan (Appendix C). In addition to notifying PA OneCall, the demolition contractor will prepare and submit the YS2.03.300.01 "Subsurface Excavation Clearance Form" to the Harley-Davidson Environmental Manager, which is required for any subsurface soil work. The asbestos permit and demolition permits will be acquired prior to demolition.

7.5.4 Construction Access and Security

The East Campus is accessible from Arsenal Road (Route 30). A security fence was installed in 2012 to further restrict access to the northeast portion of fYNOP, which contains most of the RI Study Area. The Harley-Davidson security team controls the access to this fenced area through Gate 5. Currently, no Harley-Davidson employee or contractor accesses this area daily. The fYNOP Remediation Team conducts quarterly inspections of fencing, warning signs, barriers, and locks for the remaining buildings and backstops. Personnel and contractors entering this area must also participate in awareness training prior to entering the area. All intrusive activities are controlled.

The Remainder RI Area is accessible through Gate 5 or Gate I. Construction access will likely be permitted through Gate 5 or potentially Gate I if agreed to by Harley-Davidson. Construction equipment and vehicles will likely be stored in the Remainder RI Area or the contractor yard east of Gate 5, past the security checkpoint and inside the security fence. Additional staging areas will be coordinated if necessary.

7.5.5 Stormwater Management

Stormwater will be managed in accordance with the Erosion and Sediment Control Plan (Appendix F), as approved by the York County Conservation District and Springettsbury Township, as appropriate.

7.5.6 Environmental

The fYNOP is located adjacent to residential communities on the north and east property boundaries. Drinking water populations within 4 miles of the fYNOP include residents of York County, Pennsylvania, which has an estimated population of over 443,744 (U.S. Census Bureau 2016). Groundwater monitoring wells are currently present on the fYNOP property; however, no potable water wells are located onsite. Potable water for fYNOP is obtained from the York Water Company or from bottled water suppliers. No activities conducted under this Cleanup Plan are anticipated to impact the surrounding residencies. Any noise resulting from the operations will be during normal daytime hours. The remedial action areas are not located along the property boundary and, therefore, disruption to the adjacent residents is not anticipated.

7.5.7 Waste Management

Waste will be generated during the demolition and investigation activities. Disposal specifications prepared as part of the design include protocols to fulfill requirements discussed in this section (Appendix B).

Harley-Davidson will be listed as the generator and will retain custody of the waste manifests for any waste impacted with (or assumed to be impacted with) hazardous materials. The contractor will be responsible for coordinating the sampling and analyses of potential hazardous waste, if identified, assisting in the profiling, and for coordinating the transportation of hazardous waste (with a Pennsylvania Department of Transportation licensed hazardous waste hauler) and disposal upon approval by Harley-Davidson.

Concrete and non-ferrous debris will be broken into manageable pieces by equipment-mounted breakers and either live loaded or stockpiled. A portable crusher may be staged onsite to further break concrete debris into small sizes to further reduce disposal fees. The demolition contractor will arrange for transportation of construction debris. The contractor is responsible to use a transportation company approved by Harley-Davidson. The scrap metal is to be recycled at Consolidated Scrap Resources in York or a similar Harley-Davidson approved facility. Non-ferrous construction and demolition debris are to be recycled or repurposed or incinerated for energy as best possible in agreement with Harley-Davidson, and as a last resort will be disposed

offsite as non-hazardous material at Modern Landfill or at a similar Harley-Davidson approved facility.

For ACM and LBP, the demolition contractor will arrange for transportation with Republic Services or a similarly approved transport company. Harley-Davidson will assist in preparing waste manifests for the ACM and LBP. The roll-off containers must be lined and covered when not in use. Additionally, the liner must be adhered to the sides of the container and not allowed to fall in. Both friable and non-friable asbestos will be disposed of at Modern Landfill or a similar Harley-Davidson approved facility. If friable asbestos is shipped to Modern Landfill, then the demolition contractor must contact Modern Landfill to arrange for the disposal (burial) location to be surveyed. The disposal facility, Modern Landfill, requires a minimum of 24 hours' advanced notification of intent to dispose of friable asbestos to arrange for properly handling when arriving at the disposal facility. If LBP or lead dust is still affixed to the substrate during demolition, a representative sample of debris, composed of all surface and substrate materials present, will be collected and submitted for Toxicity Characteristic Leaching Procedure (TCLP) analysis to determine disposal requirements (TCLP analysis should include pulverizing composite materials in the lab for a representative sample). Following characterization, the debris will be shipped to the appropriate disposal facility. Sampling is discussed further in the SAP – Appendix C.

Dust and sand removed from Building 14 will also be sampled for TCLP analysis to determine disposal requirements. Hazardous-characterized material will be manifested with assistance by Harley-Davidson and the contractor will be responsible for transporting and disposing of the waste at a facility approved by Harley Davidson.

Water collected through Building 14 dewatering operations will be sampled to determine disposal requirements (i.e. onsite treatment or disposal offsite as discussed in Section 7.2.3). Water that is not approved for disposal onsite will be sampled for additional disposal parameters as required by the disposal facility and disposed of offsite at a Harley-Davidson approved facility as non-hazardous or hazardous depending on the sampling results.

7.5.8 H-D Contractor On-Boarding

All contractors are required to complete the H-D contractor on-boarding process prior to the start of work. The on-boarding instructions and materials will be provided to to each contractor's designated representative. The contractor's representative must complete and sign the Contractor Confidentiality Agreement and the Harley-Davidson Standardized Contractor Safety Pre-Qualification Form (SCSPF). Individual training will be completed by contractor personnel. Upon completion, all employees must complete and sign the Harley-Davidson Contractor/Supplier Employee Training Tracking Form. Individual employees must also review and sign the On-Site Confidentiality Acknowledgement. Additional information and example forms are provided in Appendix C.

7.5.9 Construction Quality Assurance and Quality Control

Construction QA/QC measures will be implemented for each definable feature of work as noted in Appendix D Construction QA/QC Plan.

7.6 RESTORATION

7.6.1 Site Restoration

Following the completion of remedial activities, any disturbed land will be restored to the grade shown on the restoration plan (Appendix F). Any disturbed area will be hydroseeded using approved seed mixes. Specifications for site restoration including seeding are provided in Appendix B.

7.6.2 Stormwater Management

Erosion and sediment control measures will remain in place during the restoration activities and will they will be removed upon approval of York County Conservation District. The Erosion and Sediment Control Plan is presented in Appendix F. Design Specifications are provided in Appendix B.

7.6.3 Imported Soil

General backfill requirements are discussed in Section 6.3.3. Certified clean topsoil will be imported and placed over the prepared subgrade using light mechanical compaction. Any imported soil must have satisfactory sample results to meet all applicable screening criteria for onsite use. Design specifications for site restoration including backfilling are provided in Appendix B.

8. POST-REMEDIATION CARE PLAN

The remedial activities presented in Chapter 6 will achieve UU/UE in AOC 1 and the western portion of the RI Study Area (consisting of MRSs 2, 3, 4, and 5, AOC 2, and western portion of the RI Reminder Area). Following remediation, no post-remediation requirements are necessary in these areas for the MMRP program. Any post-remediation requirements associated with the groundwater will be addressed in the Site-Wide Cleanup Plan. For MRS 1 and the eastern portion of the Remainder RI Area, LUCs must be maintained to prevent exposure to MEC. This includes maintenance of the site security force, fencing, and signage and requiring on-call oversite/support by qualified UXO personnel for intrusive activities. LUCs will require annual inspections to ensure compliance and to assess the efficacy of the controls.

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9. COOPERATION OR AGREEMENT OF THIRD PARTY

MRS 1 is located on the West Campus at 1445 Eden Road. The West Campus consists of 58 acres that was conveyed to the York County Industrial Development Authority (YCIDA) by deed dated in June 2012, and then transferred to NP York in January 2017. The West Campus was redeveloped into a 775,000 square foot warehouse distribution center called the ERLC. A Consent Order and Agreement ("Agreement") was entered on 22 July 2010 by Commonwealth of Pennsylvania, Department of Environmental Protection ("Department"), Harley-Davidson Motor Company Operations, Inc. ("Seller"), and York County Industrial Development Authority ("Buyer") covering the West Campus. This Agreement was subsequently assigned to NP York 58 LLC. This Agreement includes legal responsibilities for the Department, Buyer, and Seller to abide by in order to ensure remedial activities remain executable after transfer of ownership. As part of this Agreement, the Buyer committed to comply with any and all environmental covenants and/or other activity and use restrictions applicable to the West Campus Property.

MRS 1 encompassing approximately 10.7 acres as shown on Figure 2 is mainly located under a paved area known as the West Parking Lot within the West Campus. Future use as a parking area is not expected to change. The west parking lot is considered an environmental constraint area which indicates it has or may contain impacted soils or waste material with regulated substances at concentrations greater than Act 2 MSCs. Because of the likelihood of regulated substances in these areas, excavation should be avoided if possible, or additional precautions must be followed prior to and while conducting any excavation or subsurface work in this environmental constraint area. Occupational, Safety and Health Administration (OSHA) trained workers, and environmental monitoring/inspection is required for all subsurface work in this environmental constraint area. If encountered, impacted soils will have to be characterized and managed according to the restricted area guidelines in the Soil Management Guide (SMG). In addition, special training for workers or engineering controls (e.g., vapor barriers) may be needed during construction. The MMRP RI (EA 2018) recommended that personnel excavating in the area of MRS 1 have UXO construction support during intrusive activities. The SMG (GSC 2019) has been developed to inform owners, facility management, subcontractors and others (collectively known as contractors) that a soil management plan (SMP) must be prepared prior to disturbing soils on the Site. The SMG provides a general outline of the contents that should be included in a SMP based on existing conditions and restrictions. Each SMP will have to be tailored to the type of activity that is being performed and its location within the Site. Moreover, anyone who performs activities at the site that involve the movement of soil shall be fully aware of the land use restrictions that are in the Environmental Covenants that have been recorded for the West Campus. NP York 58 LLC and its contractors are expected to abide by the SMG and associated covenants when interacting with the soils within MRS 1/West Parking lot area. Proposed Activity and Use limitations for the East and West Campus Properties are included in Appendix C of the Site-Wide Cleanup Plan (GSC 2019).

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10. PUBLIC COMMENTS

10.1 PUBLIC INFORMATION AND INVOLVEMENT PLAN

In 2004, a Public Information and Involvement Plan (PIIP) was developed and implemented for the fYNOP. The objective of the PIIP was to establish a forum and procedures for informing the community of the findings of the planned and future investigation and remedial activities at fYNOP. The PIIP presents a summary of site history, previous work activities, and proposed future activities, community profile, and demographics. The PIIP includes stakeholders, plan objectives and responsibilities, and public information and involvement techniques. The PIIP has been routinely updated and a copy of the most recent version is included in the repository. A revised version of the PIIP is included in Appendix F of the Site-Wide Cleanup Plan (GSC 2019).

During 2004, an information repository was established at the Martin Library. The repository was maintained for several years. During 2005, a website (https://yorksiteremedy.com/) was established to serve as the information repository for the public, and ultimately replaced the information repository at Martin Library. The website has been continuously maintained and updated by the fYNOP Remediation Team from 2005 through present.

On June 23, 2004, a Public Meeting, facilitated and led by fYNOP representatives, was held at a public meeting room near fYNOP. The meeting presentation provided a summary of work completed and the anticipated path forward to the final site cleanup. Various news publications notifying the public of the meeting and summarizing the meeting discussions were published in the York Daily Record. A similar presentation was also provided to interested employees at the Harley-Davidson plant. No concerns were voiced during the Public Meeting or the meetings with Harley-Davidson employees. As part of the PIIP, a community hot line was established in 2004. To date there have been 45 calls to the hotline. The fYNOP Remediation Team has responded in a timely manner to all calls to the hotline.

The fYNOP Remediation Team has also issued annual newsletters to the nearby community and stakeholders to date. The first Newsletter was issued in 2004 and the most recent was issued in 2018. During implementation of this Cleanup Plan, information on the project will be periodically communicated via the Public Website.

In addition to the community involvement activities previously discussed, the fYNOP Remediation Team also conducted focused communications with adjacent property owners during activities performed near the fYNOP northern and southern property boundaries. These communications have consisted of door-to-door discussions, and mailing of flyers and letters to the community as outlined in the PIIP.

10.2 MUNICIPAL AND PUBLIC NOTIFICATIONS FOR ACT 2 SUBMITTALS

On February 7, 2005, a Notice of Intent to Remediate (NIR) soil and groundwater at the fYNOP was provided to PADEP. The NIR specified remediation would be to the Site-specific standard. The York County Planning Commission and Springettsbury Township were notified in writing of the NIR (which included a copy of the NIR) on February 28, 2005. Receipt of the NIR was

published by PADEP in Pennsylvania Bulletin (35 Pa. B. 1780, volume 35, No. 12) on March 19, 2005. On March 24, 2005, the legal notice for the NIR was published in the daily newspapers of general circulation in York (The York Dispatch/York Sunday News and York Daily Record).

Various technical reports have been submitted under the Act 2 Program for the Site (e.g., remedial investigation and risk assessment reports for soil and groundwater), along with the associated municipal and public notifications for the reports.

No comments on the NIR and technical reports were received from the public, county, and the municipality. Copies of the NIR, technical reports, municipal notifications and newspaper proof of publications are located on the public website, https://yorksiteremedy.com.

10.3 FUTURE NOTIFICATIONS FOR FYNOP

USEPA will provide the public notice in a York-area newspaper (it will also be posted on USEPA's website) early during the 90-day regulatory review period for the Act 2 Cleanup Plan. Based on the public comments received, USEPA will evaluate the need for a public meeting. The local municipality (Springettsbury Township) will also be notified of the Cleanup Plan submittal. USEPA's public notice will include a Statement of Basis (a summary of the Cleanup Plan) and will start the 30-day RCRA public comment period on the proposed remedy. After the 30-day public comment period ends, USEPA will collect all comments received and include them with USEPA and PADEP comments as part of the regulatory review under Act 2. Once all comments have been addressed and the proposed remedy is acceptable to the regulatory agencies, USEPA will publish a newspaper notice that the Final Decision and Response to Comments (i.e., USEPA's response to the public comments received during the public comment period, which will finalize the remedy) is available to the public in the information repository. PADEP will publish the necessary information in the Pennsylvania Bulletin pursuant to Act 2.

11. SIGNATURES

Signatures and seals for the registered Project Management Professional and the Professional Engineer who prepared this Cleanup Plan are provided on the signature sheet included before the table of contents.

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12. REFERENCES

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