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September 20, 2018

VIA PRIVATE CARRIER

Mr. James R. Carroll
Program Administrator
Land Restoration Program
Land Management Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 625
Baltimore, Maryland 21230

Subject: Transmittal of the Infrastructure Abandonment Report
Lockheed Martin Corporation; Middle River Complex
2323 Eastern Boulevard, Middle River, Baltimore County, Maryland

Dear Mr. Carroll:

For your information please find enclosed two hard copies with a CD of the above-referenced document. This report documents the abandonment of six infrastructure pipes at the Lockheed Martin's Middle River Complex in Middle River, Maryland. This report is provided to MDE for your information; that is, we are making no request for MDE to comment on this report, unless you wish to do so.

I am available for your questions; my office phone is (301) 548-2209.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom D. Blackman".

Thomas D. Blackman
Project Lead, Environmental Remediation

cc: (via email without enclosure)

Gary Schold, MDE
Mark Mank, MDE
Christine Kline, Lockheed Martin
Norman Varney, Lockheed Martin
Dave Brown, MRAS
Michael Martin, Tetra Tech
Cannon Silver, CDM Smith

cc: (via Secure Information Exchange)

Jann Richardson, Lockheed Martin
Scott Heinlein, LMCPI
Christopher Keller, LMCPI
Glen Harriel, LMCPI

cc: (via mail with enclosure)

Tom Green, LMCPI
Mike Musheno, LMCPI

**INFRASTRUCTURE ABANDONMENT REPORT
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
2323 EASTERN BOULEVARD
MIDDLE RIVER, MARYLAND**

Prepared for:
Lockheed Martin Corporation

Prepared by:
Tetra Tech, Inc.

September 2018

Revision: 0



Michael Martin
Regional Manager

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
Block	tax block
CIP	cast iron pipe
CMP	corrugated metal pipe
cy	cubic yard
EESH	energy, environment, safety, and health
ESH	environment, safety, and health
GPR	ground-penetrating radar
HASP	health and safety plan
IDW	investigation-derived waste
LMCPI	LMC Properties, Inc.
Lockheed Martin	Lockheed Martin Corporation
MAG	magnetic
MD	metal detection
MRAS	Middle River Aircraft Systems
MRC	Middle River Complex
MW	monitoring well
NPDES	National Pollutant Discharge Elimination System
OF	outfall
PVC	polyvinyl chloride
RCP	reinforced concrete pipe
REC(s)	recognized environmental condition(s)
Tetra Tech	Tetra Tech, Inc.
UCC	utility cross-connection
USDOT	United States Department of Transportation
UST	underground storage tank

SECTION 1 INTRODUCTION

1.1 GENERAL INTRODUCTION

On behalf of Lockheed Martin Corporation (Lockheed Martin), Tetra Tech, Inc., (Tetra Tech) has prepared the following report documenting the abandonment of six infrastructure pipes at the Lockheed Martin Middle River Complex (MRC) in Middle River, Maryland (Figure 1). Unidentified outfalls, not listed in the Middle River Complex National Pollutant Discharge Elimination System permit, were discovered during visual inspections of the Middle River Complex-Cow Pen Creek shoreline. Inspection and field assessment findings are summarized in the *Infrastructure Assessment Report* (Tetra Tech, 2017); this report indicates that six pipes along the Cow Pen Creek shoreline are no longer active and provides rationale for their subsequent abandonment.

1.2 REPORT ORGANIZATION

This report is organized as follows:

Section 2—Middle River Complex Background: Briefly describes the background of the Middle River Complex and the associated pipes.

Section 3—Field Methodology: Describes the field methodologies employed during the infrastructure abandonment.

Section 4—Infrastructure Abandoned: Presents in-depth descriptions of pipe excavation and abandonment activities.

Section 5—References: Cites references used to compile this report.

SECTION 2 MIDDLE RIVER COMPLEX BACKGROUND

In 1929, the Glenn L. Martin Company, a predecessor entity of Lockheed Martin Corporation (Lockheed Martin), acquired contiguous parcels of undeveloped land in Middle River, Maryland, on which to manufacture aircraft for the United States government and commercial clients. In the early 1960s, Glenn L. Martin Company merged with American-Marietta Company to form Martin Marietta Corporation. In the mid-1990s, Martin Marietta Corporation merged with Lockheed Corporation to form Lockheed Martin, in turn focusing its on-site operations at the Middle River Complex (MRC) on equipment construction and testing for the United States government and commercial clients. Shortly after the merger, General Electric Company acquired most of Lockheed Martin's aeronautical business in Middle River; those operations subsequently have been conducted under the General Electric Company subsidiary, MRA Systems, Inc., also known as Middle River Aircraft Systems.

The MRC is part of the Chesapeake Industrial Park at 2323 Eastern Boulevard in Middle River, Maryland, approximately 11.5 miles northeast of downtown Baltimore. The MRC is composed of several tax blocks and covers approximately 161 acres; it includes 12 main buildings, an active industrial area and yard, perimeter parking lots, an athletic field, vacant lots, and numerous green spaces along its perimeter. The MRC is bounded by Eastern Boulevard (Route 150) to the north, Dark Head Cove to the south, Cow Pen Creek to the west, and Martin State Airport to the east. Figure 2 is a layout of the MRC. This map shows the active industrial facility (Block I) and the external Blocks A, B, D, E, F, G, and H surrounding Block I. LMC Properties, Inc. (LMCPI) manages the MRC, leases a significant portion to MRA Systems, Inc., and periodically leases space to other parties for storage and parking.

Twelve previously unnamed outfalls were observed in Cow Pen Creek during visual inspections of the MRC-Cow Pen Creek shoreline in 2015 (CDM Smith, 2016). These unnamed outfalls are shown as Outfalls Alpha through Lambda in Figure 3. The *Infrastructure Assessment Report* (Tetra Tech, 2017), summarized in Table 1, provides rationale for abandoning six of those 12 outfalls

(i.e., Zeta, Eta [with two outlets], Theta, Kappa, Lambda, and an unidentified/unnamed six-inch corrugated metal pipe [CMP]), as they no longer serve a purpose. These outfalls were originally installed to support no longer active historical operations, and most of their associated surficial infrastructure has been removed. The remnants of these pipes could therefore be properly abandoned.

SECTION 3 FIELD METHODOLOGY

Before starting any fieldwork, the assigned Tetra Tech, Inc. (Tetra Tech) field personnel became familiar with the site-specific health and safety plan (HASP) and the respective “Safe Work” permits and emergency response plan. Tetra Tech conducted mandatory health and safety tailgate meetings before each day’s fieldwork. The Tetra Tech site health and safety officer documented the topics covered and personnel in attendance. Safety requirements are addressed in detail in the site-specific Tetra Tech HASP.

3.1 SITE ACCESS, NOTIFICATIONS, AND PERMITS

Before beginning work, Tetra Tech notified and coordinated arrangements through Lockheed Martin Corporation security to gain access to Blocks F and G. Tenants at the Middle River Complex (MRC) were informed and updated about the project at the LMC Properties, Inc. (LMCPI) biweekly meetings. LMCPI was notified of the proposed tasks and schedule, and the work and schedule were approved by LMCPI before mobilization to the field. Site access, notifications/approvals, and documentation conformed to the provisions of *Lockheed Martin’s Remediation Contractor’s Environment, Safety and Health (ESH) Handbook, Revision 4*, January 12, 2016 (Lockheed Martin, 2016). Site access at the Total Industrial Group property was coordinated through the Lockheed Martin project lead and legal counsel. A signed access agreement was secured before implementing any field activities.

Intrusive work was completed in MRC Blocks G and F, as well as on Total Industrial Group property. Before starting any intrusive work, Tetra Tech performed the following tasks:

- notified the underground utility-location center “Miss Utility” (1-800-257-7777; www.missutility.net)
- notified applicable on-site parties, including Lockheed Martin Security, EMCOR maintenance, and the tenant leads, including MRA Systems, Inc. (MRAS)
- reviewed facility and site utility maps

-
- completed the “Dig Permit” (EO-28-1) and “Risk Handling Checklist” (EO-28-2) per Enterprise Operation-28 and *Lockheed Martin Minimum Requirements for Intrusive Fieldwork Work Plans*, and obtained the required signatures
 - obtained signatures from the following Lockheed Martin representatives:
 - building/facility manager
 - telecommunications
 - Lockheed Martin ESH

3.2 UTILITY CLEARANCE

The excavation locations in Blocks G and F and on Total Industrial Group property were cleared of subsurface utilities before any intrusive field activities began. In addition to calling in a “Miss Utility” ticket, RETTEW (a utility-locating firm) marked any underground utilities and anomalies within the intrusive work areas. The area cleared was extensive enough to clear any potential area that could have been excavated. Tetra Tech followed the procedures outlined in the Corporate Staff Procedure EO-28 “Digging Projects.”

RETTEW used standard utility-locating equipment representing the best available technology. Located utilities were marked on the ground with the appropriate paint color. Utility clearance work and documentation conformed to the provisions of Lockheed Martin’s *Remediation Contractor’s ESH Handbook, Revision 4*, January 12, 2016, (Lockheed Martin, 2016) or its latest update. Copies of permits, “Miss Utility” tickets, and the report prepared by the utility-locating company are in Appendix A.

3.3 ABANDONMENT PROCEDURES

Pipe abandonment was completed in the areas described in Section 4. Generally, abandonment included excavation as close as safely possible to the pipes and to the Cow Pen Creek bank. The pipes were cut by saw, the landside was plugged with non-shrink grout, and the protruding piece of pipe was then removed. All soil generated from the pipe abandonment was backfilled at the pipe abandonment excavations on the same day, in accordance with the Lockheed Martin Corporation *Soil Management Plan* (Tetra Tech, 2018). At Outfall Theta, a brick-lined catch basin was also removed, and the associated excavation was backfilled on the same day.

No soil showed visual signs of contamination during this work. No personnel were allowed entry into excavations more than four feet deep without proper safety measures in place, and excavations did not remain open overnight. Excavated soils were managed and stockpiled in a manner such that subsurface soils were backfilled first; topsoil was then backfilled and graded to match surrounding contours. Photo documentation reports were generated for each abandonment and are in Appendix B.

3.4 SITE RESTORATION

Following formal pipe abandonment, the site areas were restored to their previous condition. Stabilization matting (Curlex[®] or similar) and seeding were used during the restoration. The security fence in three areas also needed repairs, which were completed as soon as possible after work had been completed.

3.5 WASTE CHARACTERIZATION AND DISPOSAL

Investigation-derived waste (IDW), consisting of construction debris (excavated concrete and brick), cut pipe pieces, residual soil adhering to construction debris, and personal protection equipment (PPE), was generated during pipe abandonment. Most of the IDW was generated when abandoning Outfall Theta and removing its brick catch basin. Construction debris was segregated so that excavated soil could be used as backfill for the excavations. PPE IDW was put in trash bags and placed in a facility trash receptacle to be disposed of as general refuse.

Brick, concrete, steel, cast iron, terra cotta, and corrugated metal (with soil waste minimized) were collected and stored in a United States Department of Transportation (USDOT)-approved 20 cubic yard (cy) roll-off. The roll-off was appropriately labeled and logged on an IDW inventory form. Wastes were characterized and disposed of in accordance with applicable state and federal regulations, and with the MRC waste management plan (Lockheed Martin, 2009).

The roll-off was staged on firm ground in Block G, in an area identified and approved by Lockheed Martin personnel, for easy loading access and mobilization/demobilization. The generated IDW contained in the 20-cy roll-off was removed from the facility on July 11, 2018 and properly disposed of in accordance with federal, state, and local regulations. The waste manifest received upon roll-off removal, as well as the waste profile used for this work, is attached as Appendix C.

SECTION 4

INFRASTRUCTURE ABANDONED

This report describes the methods used to abandon the six pipes identified in Section 1. This section describes the investigation that was completed and the physical condition of each abandoned item. Table 1 summarizes the findings of the *Infrastructure Assessment Report* (Tetra Tech, 2017) and the results of this document. Field reports, including photo documentation, are included as Appendix B.

4.1 OUTFALL ZETA

Outfall Zeta consists of a six-inch-diameter pipe that was first observed during the 2011 utility cross-connection (UCC) survey (Tetra Tech, 2012). The Geonic, Inc. model electromagnetic 31MK2 instrument used during the UCC survey detected variations in soil conductivity and subsurface metallic objects. The pipe was traced to the center of the concrete foundation of the former Aero-Physics Lab/Wind-Test Building. Flow from the pipe was not observed during the 2015 visual inspections of the MRC-Cow Pen Creek shoreline (CDM Smith, 2016).

The discharge point at Outfall Zeta was visually inspected during low tide. The inspections revealed that a three-foot section of pipe had apparently dislodged from the bank and was sitting in the water. This section of pipe was removed during the Cow Pen Creek sediment remediation project. A semicircular hole filled with sediment was once visible in the bank near the pipe, but that feature is no longer evident.

No flow was observed during rainfall on July 6 and July 24, 2017, but the outfall area was mostly obscured by tidewater. No flow was observed from the bank during an exceptionally low tide on August 1, 2017. The location of Outfall Zeta is shown on Figure 4. Although no active flow was observed from this outfall (and it is therefore not currently an active pathway for contaminants), abandonment was recommended to prevent it becoming a groundwater or drainage preferential pathway in the future.

On June 19, 2018, a mini-excavator was used to attempt to locate Outfall Zeta. A trench (approximately four feet long by two feet wide) was excavated to a total depth of five feet inside the fence that borders Block G and Cow Pen Creek. This area of Block G was previously excavated to a depth of six feet during soil remediation, and stone was used as backfill in the original excavation. The trench was excavated to five feet below ground surface (bgs); however, water was encountered at 3.5 feet bgs.

Water inflow was rapid and the sidewalls of the excavation were collapsing. The depth of Outfall Zeta was estimated to be at least eight feet bgs, so excavation was halted, as shoring and extensive water handling would be necessary to locate, cut, and cap the pipe. The excavation was backfilled and restored to previous conditions with Curlex[®] and grass seed.

On June 21, 2018, a brush trimmer was used to clear minimal vegetation from the bank of Cow Pen Creek and to locate the cleanout pipe for Outfall Zeta. The outfall's six-inch cast-iron pipe was found filled with grout (and therefore likely abandoned previously), approximately 10 feet from the Block G fence towards Cow Pen Creek. The remnants of the grouted cast-iron cleanout pipe were broken up and placed in a roll-off for disposal, and the area was restored.

4.2 OUTFALL WITH UNIDENTIFIED SIX-INCH-DIAMETER CORRUGATED METAL PIPE

A six-inch-diameter corrugated metal pipe (CMP) was observed during the 2011 UCC survey (Tetra Tech, 2012). It was traced from the outfall and ended within the former sewage treatment plant leaching-field in Block G. It was likely associated with the historical sewage treatment plant (Figure 4).

No surface drains connect to this pipe, and whether it ever collected drainage water is unknown. The pipe was observed during two significant rainfalls (July 6 and July 24, 2017), and no water flow was observed. Although no active flow was observed, abandonment was recommended to prevent this pipe's use as a preferential pathway in the future.

Personnel were mobilized on June 19, 2018. The pipe's location on the creek side of the Block G fence necessitated the removal of a small section of the fence to allow mini-excavator access. The mini-excavator dug a trench (approximately four-feet-long by two-feet-wide by three-feet-deep) to

locate the pipe along the bank. When the pipe was located, it was saw cut, and the protruding pipe was removed and placed in a roll-off. The remaining pipe was abandoned in place by sealing with non-shrink grout, and the excavation was backfilled and restored to previous conditions with Curlex[®] and grass seed. The displaced fencing was restored on June 21, 2018.

4.3 OUTFALL ETA

Outfall Eta consisted of two pipes: a four-inch-diameter cast iron pipe (CIP) drain (north) and a 12-inch-diameter CMP drain (south). The outfalls are shown on Figure 4. Outfall Eta pipes were observed during the 2011 UCC survey, and a geophysical survey was also completed at that time (Tetra Tech, 2012). During the UCC survey, the four-inch pipe was traced back to the features of the former sewage treatment plant, and the 12-inch pipe was traced back to the concrete foundation of the former Vibration and Fuel-Test Lab buildings. A visual inspection of the pipes was performed during two significant rains (July 6 and July 24, 2017) and no water flow was observed. Although no active flow was observed at these pipes, abandonment was recommended to prevent their becoming a groundwater or drainage preferential flow pathway in the future.

On June 19, 2018, a mini-excavator was used to dig a trench approximately four-feet-long by three-feet-wide by three-feet-deep. Both Outfall Eta pipes were located, saw cut, and their protruding pieces were removed and placed in a roll-off. The remaining pipes were abandoned in place by sealing with non-shrink grout and the area was restored with Curlex[®] and grass seed.

4.4 OUTFALL THETA

A small amount of water flow was observed at Outfall Theta on July 31 and August 1, 2017. A portable camera was used to map the line from the outfall to approximately 30 feet inland. Excavation at this point found that a manhole cover had been placed over a brick catch basin. A pipe running from the outfall was also observed, as well as another pipe entry to the east, toward former structures in Block G. The line was traced approximately 30 additional feet east to its terminus. The pipe was approximately four feet below grade.

This pipe appears to have been a discharge line associated with former buildings in the area; however, it was terminated in the past, perhaps as the land use changed over time. Flow at the outfall appears to be stormwater flowing into the catch basin; alternatively, the catch basin or pipe

bedding might be intercepting groundwater. Although the abandoned utility did not appear to be an active pathway for contaminants, it is transmitting water and discharging to Cow Pen Creek, so it was recommended for abandonment.

On June 20, 2018, a mini-excavator was used to dig an excavation (approximately seven-feet-long by seven-feet-wide by 3.5-feet-deep) around the brick-lined manhole structure connected to Outfall Theta. This structure was uncovered, and the influent cast-iron pipes were saw cut. The mini-excavator then removed the entire manhole and placed it in a roll-off for disposal. The remaining influent and effluent pipe (terra cotta) were abandoned in place by sealing with non-shrink grout, and the excavation was backfilled and restored with Curlex[®] and grass seed.

On June 21, 2018, a mini-excavator was used to remove the protruding terra cotta effluent pipe on Outfall Theta's bankside via straps attached to the pipe. This method was used so that the existing perimeter fence could remain undisturbed. The removed section of pipe was placed in a roll-off for disposal. Soil and Curlex[®] were used to restore the area.

4.5 OUTFALL KAPPA

The discharge point of the Outfall Kappa pipe (see Figure 5) was observed during two significant rains on July 6 and July 24, 2017, and no flow was observed. A geophysical survey could not be completed along the creek bank in this area due to heavy vegetation and a steep slope. A geophysical survey conducted farther inland was unable to trace the pipe. Outfall Kappa was near a sanitary sewer manhole that was behind the rear of the former barracks area in recognized environmental condition (REC) #13 (Former Boat Dock Area). Although the abandoned utility did not appear to be an active pathway for contaminants, abandonment was recommended to eliminate its potential for becoming a groundwater or drainage preferential pathway in the future.

On June 20, 2018, a mini-excavator was used to dig a trench (approximately three feet by three feet by three feet) inside the Block F perimeter fence to locate Outfall Kappa. The 1.5-inch steel pipe was found approximately 1.5 feet bgs and was cut using a saw; the protruding piping was then removed from the bank. The protruding piece, approximately 21-feet-long, was cut into smaller three-foot sections and placed into a roll-off. The remaining pipe was abandoned in place by

sealing with non-shrink grout, and the trench was backfilled. The disturbed area was restored with Curlex® and grass seed.

4.6 OUTFALL LAMBDA

Outfall Lambda (see Figure 5) was detected during a geophysical survey. It is a linear feature that traced from Outfall Lambda and ended approximately 160 feet inland. The outfall was in Block F and was partially submerged in Cow Pen Creek. The discharge point of Outfall Lambda is typically under the tide level, and a low tide and significant rainfall did not occur simultaneously during the field investigation.

Photographs in the *Outfall and Drainage Areas in Cow Pen Creek and Dark Head Cove* technical memorandum (CDM Smith, 2016) indicate that water flow does not typically occur within this pipe. The outfall consisted of eight-inch terra cotta with two 12-inch-diameter extensions on its terminus. Although this utility does not appear to be an active pathway for contaminants, abandonment was recommended to eliminate potential for becoming a groundwater or drainage preferential pathway in the future.

Low tide conditions on June 20, 2018 were targeted for abandonment of Outfall Lambda. Once low tide conditions were observed, a small section of the Block F perimeter fence was removed to allow mini-excavator access. The excavator removed two 12-inch-diameter terra cotta extensions of Outfall Lambda after a trench (two-feet-wide by two-feet-long by two-feet-deep) was dug on the fence line. The pipe was located, cut, and the protruding section was removed.

All sections of piping were placed in a roll-off. The remaining piping was abandoned in place by sealing with non-shrink grout, and the excavation was backfilled and restored with Curlex® and grass seed. The disturbed fence was restored to its original condition after work was completed. The unidentified outfall east of Outfall Lambda shown on Figure 5 could not be found in the field investigation associated with *Infrastructure Assessment Report* (Tetra Tech, 2017). No further action was taken.

SECTION 5 REFERENCES

- CDM Smith, 2016. *Outfall and Drainage Areas in Cow Pen Creek and Dark Head Cove, Middle River Complex*. Report prepared by CDM Smith, Boston, Massachusetts for Lockheed Martin Corporation, Bethesda, Maryland. July.
- Lockheed Martin Corporation (Lockheed Martin), 2009. *Energy, Environment, Safety, and Health (EESH) Remediation Waste Management Procedure No: EROP 03, Revision 4*, effective April 17.
- Lockheed Martin Corporation (Lockheed Martin), 2016. *Remediation Contractor's Environment, Safety, and Health Handbook, Revision 4*, effective January 12.
- Tetra Tech, Inc. (Tetra Tech), 2012. *Utility Cross-Connection Investigation Report, Lockheed Martin Middle River Complex, Middle River, Maryland*. Prepared by Tetra Tech, Inc., Germantown, Maryland for Lockheed Martin Corporation, Bethesda, Maryland. March.
- Tetra Tech, Inc. (Tetra Tech), 2016. *Block G Underground Storage Tank Closure Report, Lockheed Martin Middle River Complex, Middle River, Maryland*. Prepared by Tetra Tech, Inc., Germantown, Maryland for Lockheed Martin Corporation, Bethesda, Maryland. September.
- Tetra Tech, Inc. (Tetra Tech), 2017. *Infrastructure Assessment Report, Lockheed Martin Middle River Complex, Middle River, Maryland*. Prepared by Tetra Tech, Inc., Germantown, Maryland for Lockheed Martin Corporation, Bethesda, Maryland. November.
- Tetra Tech, Inc. (Tetra Tech), 2018. *Soil Management Plan, Middle River Complex, Middle River, Maryland*. Prepared by Tetra Tech, Inc., Germantown, Maryland for Lockheed Martin Corporation, Bethesda, Maryland. March.

FIGURES

Figure 1 Middle River Complex Location Map

Figure 2 Site Layout and Tax Blocks

Figure 3 Cow Pen Creek and Dark Head Cove Outfall Locations

**Figure 4 Geophysical Survey Area—Outfall Theta and
Historical Features in Southern Area of Block G**

**Figure 5 Geophysical Survey Area—REC #4, REC #13,
Outfalls Kappa and Lambda, and Unidentified Outfall East of Lambda**



Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2013 ESRI and its data suppliers).

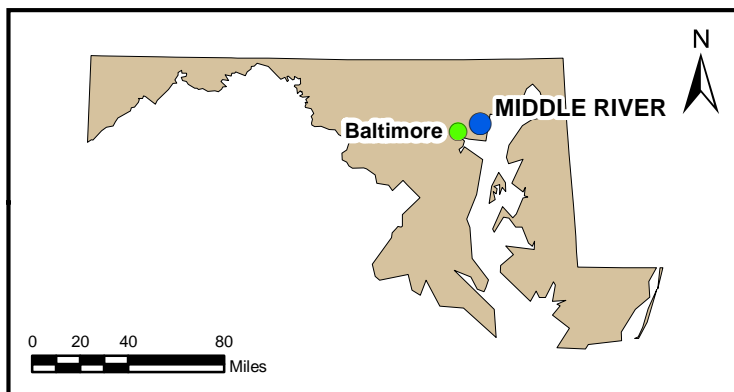


FIGURE 1

**MIDDLE RIVER COMPLEX
LOCATION MAP**

*Lockheed Martin Middle River Complex
Middle River, Maryland*


DATE MODIFIED: 10/29/15

CREATED BY: JEE







FIGURE 2
SITE LAYOUT AND TAX BLOCKS
MIDDLE RIVER COMPLEX

LEGEND
 TAX BLOCK
 2014 aerial photograph provided by U.S. Geological Survey.

Lockheed Martin Middle River Complex
Middle River, Maryland

0 225 450 Feet 

DATE MODIFIED: 11/03/16 CREATED BY: JEE

 TETRA TECH

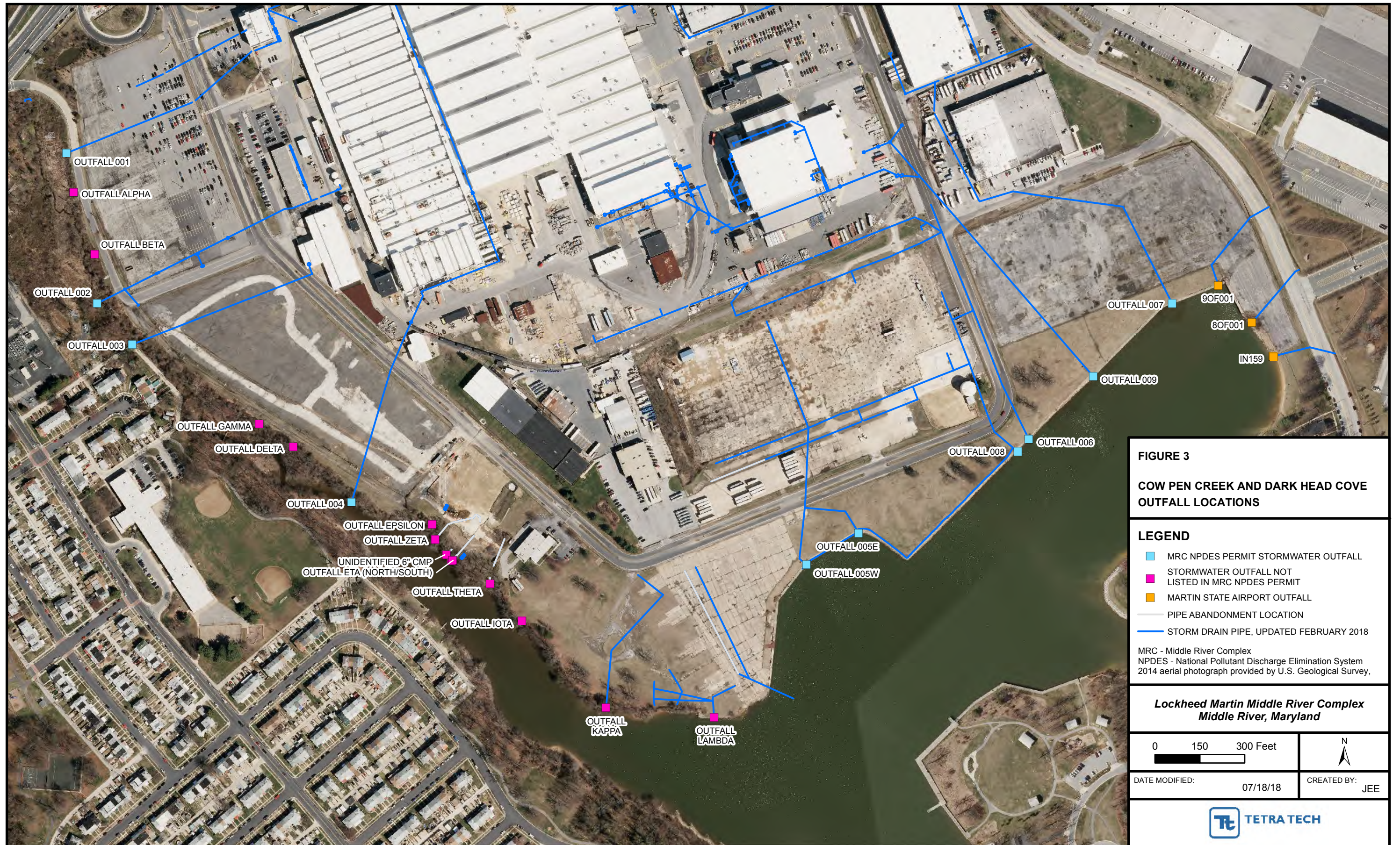


FIGURE 3
COW PEN CREEK AND DARK HEAD COVE
OUTFALL LOCATIONS

LEGEND

- MRC NPDES PERMIT STORMWATER OUTFALL
- STORMWATER OUTFALL NOT LISTED IN MRC NPDES PERMIT
- MARTIN STATE AIRPORT OUTFALL
- PIPE ABANDONMENT LOCATION
- STORM DRAIN PIPE, UPDATED FEBRUARY 2018

MRC - Middle River Complex
 NPDES - National Pollutant Discharge Elimination System
 2014 aerial photograph provided by U.S. Geological Survey,

Lockheed Martin Middle River Complex
Middle River, Maryland

0 150 300 Feet

N

DATE MODIFIED: 07/18/18 CREATED BY: JEE



s:\GIS\CADD\MRC\121008076\Report Figures\Figure 4-6.dwg IVANNA.GOLDSBERRY 7/18/2018 1:14:11 PM



- LEGEND:**
- BLOCK BOUNDARY
 - SANITARY SEWER*
 - FORMER SEWAGE TREATMENT PLAN FEATURES*
 - HISTORICAL STORM DRAIN PIPING*
 - [Cross-hatch] UNDERGROUND STORAGE TANK REMOVAL AREA
 - [Diagonal lines] UNDERGROUND STORAGE TANK PIPING REMOVAL AREA
 - [Solid] GEOPHYSICAL SURVEY AREA
 - [Star pattern] TEST PIT AREA

NOTE: * - LOCATIONS ARE BASED ON HISTORICAL DRAWINGS OF MIDDLE RIVER COMPLEX. LOCATIONS HAVE NOT BEEN SURVEYED.



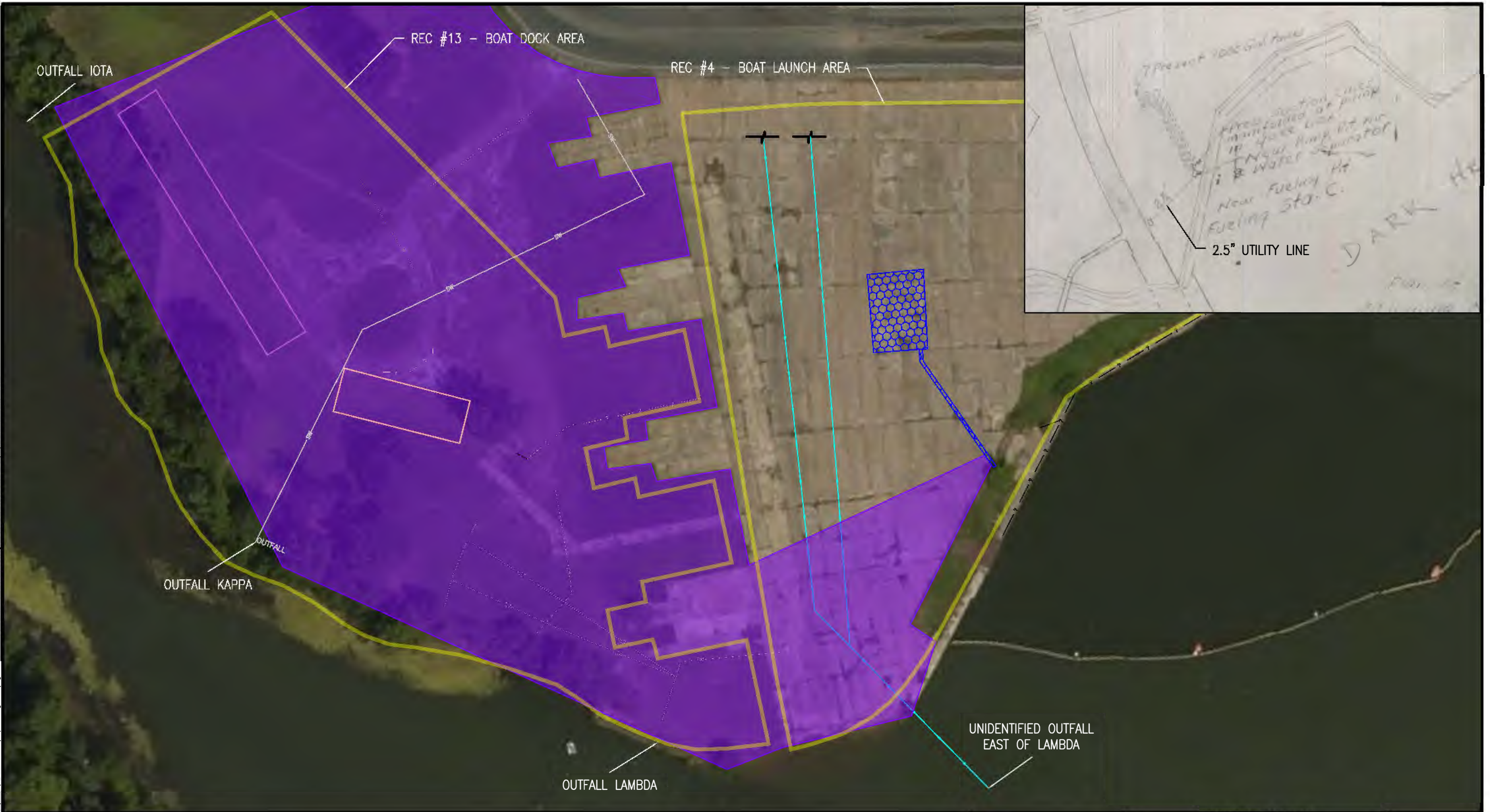
20251 CENTURY BLVD SUITE 200
 GERMANTOWN, MD 20874
 T: (301) 528-5552
 F: (301) 528-3000

LOCKHEED MARTIN
 MIDDLE RIVER COMPLEX

GEOPHYSICAL SURVEY AREA -
 OUTFALL THETA AND HISTORICAL FEATURES
 IN SOUTHERN AREA OF BLOCK G

DATE:	9/11/2017
PROJECT NO.:	112008076
DESIGNED BY:	SBC
DRAWN BY:	SBC
CHECKED BY:	
SHEET:	OF
COPYRIGHT TETRA TECH INC. FIGURE 4	

\\Tis0941s\GIS\CADD\MRC\112008076\Report Figures\Figure 4-7 MRC 2010 Utilities Plan.dwg VANNA GOLDSBERRY 10/3/2017 2:49:52 PM



LEGEND:

- ? — UNIDENTIFIED UTILITY LINE*
- SW — STORM WATER LINE*
- — REC BOUNDARY
- FORMER NAVAL BARRACKS AND STORAGE BUILDING
- GEOPHYSICAL SURVEY AREA
- UNDERGROUND STORAGE TANK AND PIPING EXCAVATION AREA

NOTES:

REC — RECOGNIZED ENVIRONMENTAL CONDITION



20251 CENTURY BLVD SUITE 200
 GERMANTOWN, MD 20874
 T: (301) 528-5552
 F: (301) 528-3000

LOCKHEED MARTIN
 MIDDLE RIVER COMPLEX
 GEOPHYSICAL SURVEY AREA — REC #4, REC #13, OUTFALLS KAPPA, LAMBDA, AND UNIDENTIFIED OUTFALL EAST OF LAMBDA

DATE:	9/11/2017
PROJECT NO.:	112008076
DESIGNED BY:	SBC
DRAWN BY:	SBC
CHECKED BY:	
SHEET:	OF
COPYRIGHT TETRA TECH INC.	
FIGURE 5	

TABLES

**Table 1 Summary of Characteristics, Infrastructure Assessment Results,
and Infrastructure Abandonment Results**

Table 1
Summary of Characteristics, Infrastructure Assessment Results, and Infrastructure Abandonment Results
Infrastructure Abandonment Report
Page 1 of 7

Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Outfalls Listed on Middle River Complex National Pollutant Discharge Elimination System (NPDES) Permit												
001	yes	Cow Pen Creek	Western Part of Block A; Building M and P area of Block I; Northern part of Parking Lot 2 in Block H.	Outfall is not visible. There is wet area evidence of flow.		Middle River Complex	None - Correct delineation is noted on Plate 2 of Outfall and Drainage Areas in Cow Pen Creek and Dark Head Cove technical memo (CDM Smith, 2017)	No records review was needed per the Outfall and Drainage Study.	None	--	Typical of storm water quality, no action recommended.	OF-001 sign installed to mark outfall location
002	yes	Cow Pen Creek	Block H Southern part of Parking Lot 2, Block I Maintenance Shop Area.			Middle River Complex	None	No records review was needed per the Outfall and Drainage Study.	None	--	Typical of storm water quality, no action recommended.	OF-002 sign installed to mark outfall location
003	yes	Cow Pen Creek	Drop Hammer Building area; Northern part of Parking Lot 3.	Southeast divide no known. Drainage from Storage and southern HA buildings may discharge to 004.	Pipe size and material. Exact surface drainage boundaries.	Middle River Complex	Review delineation with LMCPI. Follow up with record search and field inspection including observation during rain as necessary. Determine outfall diameter and material.	Topography (Figure 1-H Building, Storage Building, and HA Building Topography in Appendix A) suggests water runoff from the Storage Area and HA Building would flow through Block G towards Cow Pen Creek.	1. Observe area during a rain event to determine if it is receiving sheet flow from the Storage building, H Building, and HA Building. 2. Record outfall pipe size and material.	1. Block G is not receiving sheet flow from Storage building, H Building, and HA Building located in Block I. Sheet flow is traveling down the drainage swale along the eastern side of Chesapeake Park Plaza. 2. Outfall is an 18-inch diameter reinforced concrete pipe.	Typical of storm water quality, no action recommended.	OF-003 sign installed to mark outfall location
004	yes	Cow Pen Creek	Has metering station; South end of Building A and B; Between Buildings A and B-full length; Block G middle to southern part of Parking Lot 3.		Exact surface drainage boundaries.	Middle River Complex	Confirm abandoned status of 48 inch drain.	See Abandoned 48" Outfall	None	--	Typical of storm water quality, no action recommended.	OF-004 sign installed to mark outfall location
005	yes	Dark Head Cove	County Road Ditch (Block E Diverted to 008 because of plug at County Road).	Plug has diverted Block E flow to Outfalls 006 and 008.	Drainage Divide in Road Ditch.	Middle River Complex	None unless exact catchment area of road ditches must be defined.	No records review was needed per the Outfall and Drainage Study.	1. Verify Outfall 005 plug remains effective.	1. CCTV verified plug remains intact.	Not active if plug remains intact, no action recommended.	Not applicable
008	yes	Dark Head Cove	Block E slab (North and South and central [by flow backup]) and Block E Roads. Block E North may go directly to 006.	Assumed flow divide runs east-west. Flow to north discharges to Outfall 006, flow to south discharges to Outfall 008.	Exact limit of catchments in Block E. Catchments are determined by grading and its effect on sheet flow.	Middle River Complex	None. Note that Block E remediation currently assumes removal of old drains and replacement with new drains.	No records review was needed per the Outfall and Drainage Study.	None. Outfall repair and access manhole added near Dark Head Cove as part of the sediment remediation project.	--	Typical of storm water quality, no action recommended.	Not applicable
006	yes	Dark Head Cove	Overflow from 008. May also drain northern part of slab.	Assumed flow divide runs east-west. Flow to north discharges to Outfall 006, flow to south discharges to Outfall 008.	Exact limit of catchments in Block E. Catchments are determined by grading and its effect on sheet flow.	Middle River Complex	None. Note that Block E remediation currently assumes removal of old drains and replacement with new drains.	No records review was needed per the Outfall and Drainage Study.	None. Outfall repair and access manhole added near Dark Head Cove as part of the sediment remediation project.	--	Typical of storm water quality, no action recommended.	Not applicable
009	yes	Dark Head Cove	VLS Area and Block I south of Building C. LMC area north of this discharges to Outfall 007. Part of Block D, Parking Lot 6.		None of significance.	Middle River Complex	None	No records review was needed per the Outfall and Drainage Study. A 4-inch diameter pipe with a heavy flow of water was observed in the 24-inch diameter CMP leading to Outfall 009. The 4-inch pipe was discovered during a CCTV inspection of the 24- inch CMP during sediment remedial action activities in February 2017. The origin of the pipe is unknown. The pipe has not been detected during previously completed geophysical surveys in the area.	1. Possible geophysical survey to locate the origin of the 4-inch pipe that discharges into the 24-inch CMP leading to Outfall 009.	1. Geophysical survey of unknown pipe unsuccessful due to presence of out of service communication line. 2. Excavation was completed in the area, pipe was found to be 6-inch diameter terra cotta pipe that appears to have been installed to drain groundwater in the area. The pipe was broken during excavation due to its fragile condition, repairs were made and the pipe remains in place acting as a groundwater conduit. The full extent of the pipe was not identified at this time.	Drain line appears to transmit groundwater directly into the storm drain line. There is no known significant groundwater impacts in this area. No action recommended.	Not applicable

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Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Outfalls Receiving Flow from Martin State Airport												
9OF001	yes	Dark Head Cove	MSA Terminal Area and ditches both sides of Wilson Pt Rd.	Martin State Airport catchments are defined in the MSA Stormwater Pollution Prevention Plan (EA Engineering, Science and Technology, June 2014).	Exact flow boundaries in Wilson Point Road - a minor point.	Outfall and some piping is on Middle River Complex. Catchment is Wilson Point Road and Martin State Airport.	None except the scheduled repairs to 36 inch Outfall and twin 24 inch drains under soil remedy and sediment remedy contracts.	No records review was needed per the Outfall and Drainage Study.	None. Twin 24-inch drain lines were replaced as part of the sediment remediation project. Outfall repairs will be completed in the fall of 2017 when the bulkhead rehabilitation project is completed.	--	Typical of storm water quality, no action recommended.	Not applicable
8OF001	yes	Dark Head Cove	MSA entry road and ditches Wilson Pt Road.		Exact flow boundaries in Wilson Point Road - a minor point.	Outfall and some piping is on Middle River Complex. Catchment is Wilson Point Road and Martin State Airport.	None	No records review was needed per the Outfall and Drainage Study.	None	--	Typical of storm water quality, no action recommended.	Not applicable
IN159	yes	Dark Head Cove	Ditches Wilson Pt Road.		Exact flow boundaries in Wilson Point Road - a minor point.	Outfall and some piping is on Middle River Complex. Catchment is Wilson Point Road.	None	No records review was needed per the Outfall and Drainage Study.	None. Note, PCBs were detected in this storm drain line on Martin State Airport property at a concentration of 1.71 mg/kg during sampling conducted in December 2013.	--	Typical of storm water quality, no action recommended.	Not applicable
Outfalls Not Listed on Middle River Complex NPDES Permit												
Alpha A	yes	Cow Pen Creek	Likely drains Block H parking lot and off-ramp one-way road.	Storm grate on east side of road; evidence of water on west side of road. No pipe visible.	Pipe diameter. Not shown on utility plan. Exact Limits of Drainage. Where are inlets? No inlets shown in Block H parking lot but does it collect runoff from parking lot?	Middle River Complex	Stormwater sources need to be determined. Examine geophysical record to see if the pipe can be identified. If the pipe is not found, perform a new geophysical survey to locate the pipe and flow contributions. Observe during a rain event.	Requested available EM data from Enviroscan.	1. Conduct a geophysical survey of the pipe. 2. CCTV 24" pipe to locate endpoint and outfall. 3. Test pit excavation to locate pipe.	1. Geophysical survey detected linear feature originating from catch basin in the grass area between the fence and the access road and ending at the outfall. 2. CCTV confirmed that the catch basin collects water and the 15-inch diameter pipe discharges west towards the outfall. No pipe exists running east towards Parking Lot No. 2. 3. No test pit excavation was necessary as the geophysical survey and CCTV data were conclusive.	Typical of storm water quality, no action recommended.	Not applicable
Beta B	yes	Cow Pen Creek	Likely drains Block H parking lot and off-ramp one-way road.	Rock swale; no pipe visible.	Not shown on utility plan. Exact Limits of Drainage.		Stormwater sources need to be determined. Examine geophysical record to see if the pipe can be identified. If the pipe is not found, perform a new geophysical survey to locate the pipe and flow contributions.	Requested available EM data from Enviroscan.	1. Conduct a geophysical survey of the pipe. 2. Possible test pit excavation to locate pipe.	1. Geophysical survey detected a linear feature that runs a foot west of the Block H fence and extends approximately 200 feet east under the parking lot. 2. Test pit confirmed the presence of a French drain that terminates at the fence line (pipe estimated at 12-inch diameter steel pipe with 0.5-inch diameter drilled weep holes). Accumulated water appears to be the source of the water seepage located in the roadway. 3. No outfall pipe (Beta) was found along the creek during this investigation.	Drain line appears to transmit groundwater directly into the storm drain line. There is no known significant groundwater impacts in this area although investigation of chlorinated solvents is ongoing west of Building A under separate contract. Defer action to findings of ongoing groundwater study.	Not applicable
Gamma G	no	Cow Pen Creek	Concrete Rubble - Sheet flow when it rains?	No intact outfall, just concrete pieces (debris); no indication of an outfall. It is a swale.	No pipe seen in field or shown on utility plan. Do not know origins of concrete.	Middle River Complex	Observe during rain to determine if this a drainage swale.	No records review was needed per the Outfall and Drainage Study.	1. Observe during a rain event to determine if concrete rubble is a drainage swale.	1. Field investigation determined the concrete rubble does not represent an outfall, no significant drainage noted during rain events. Debris was removed as part of the sediment remediation project.	No outfall exists, action taken to remove debris during sediment remediation project.	Not applicable

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Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Outfalls Receiving Flow from Martin State Airport												
Delta D	Intermittent	Cow Pen Creek	Near old storm grates located on far side of old road; may drain road.	Partially buried; water visible suggesting it does flow.	Concrete Pipe with diameter ~14". No pipe shown on utility plan.	Middle River Complex	Stormwater sources need to be determined. Conduct a records search and observe during a rain event. Conduct a geophysical survey if necessary.	No historical maps depicting the outfall or utility line were found during records search.	1. Observe during rain event to see if flow is coming from pipe. 2. Conduct a geophysical survey of the pipe to determine where it ends.	1. Flow was observed from the pipe during a significant rain event. 2. Geophysical survey showed a linear feature running from a catch basin located along the fence line between the access road and Parking Lot No. 3. 3. CCTV inspection was performed using the catch basin as an access point. CCTV confirmed the presence of a 15-inch diameter pipe running from the catch basin to the outfall.	Typical of storm water quality, no action recommended.	Not applicable
Abandoned 48 inch Outfall	Not Seen	Formerly Cow Pen Creek	Formerly much of area of Outfall 004.		Site Utility Plan (Figure 1) shows a 48-in CMP between δ and ε. Detailed utility plans do not show this pipe. We don't know if it exists.	Middle River Complex	Confirm status by records search and observe during rain to see if there is a discharge at Cow Pen Creek.	CCTV completed in January 2013 as part of the cleaning of Outfalls 004 and 009 confirmed that a pipe does not connect to the 36" Outfall 004 line. The "January 2013 Jet-Cleaning and Video Inspection of Outfall 04 and 09 Storm Drain Segments" technical memo contains photos of the 36-inch Outfall line between IL-17-04 and IL- 18-04.	1. Conduct a geophysical survey in Block G to determine if a 48-inch pipe runs through Parking Lot No. 3.	1. The geophysical survey did not detect the 48-inch diameter pipe transecting Parking Lot No. 3.	No utility exists. Line removed from 2017 Site Utility Plan.	Not applicable
Epsilon E	Flows	Cow Pen Creek	This is a swale modified during GW Remedy Construction in Block G to bypass GW remedy injection field. Influent flow and discharge location remain the same. Collects from ditch along Chesapeake Park Plaza and drainage behind Tilley building and sheet flow in immediate area of Block G.	Swale modified during GW Remediation. Because of Tilley oil spill we know contributions are from back side of Tilley, drain under the building, roadside ditches and sheet flow from Lockheed Martin Block G.	Does it collect other parts of the Tilley property?	Outfall is on Middle River Complex. Catchment includes and Tilley Chemical Company.	None. Unknown does not affect mix of flows from Tilley-only volume.	No records review was needed per the Outfall and Drainage Study	None	--	Typical of storm water quality, no action recommended.	Not applicable
Zeta Z	Not Seen	Cow Pen Creek	Legacy Drainage in fuel test and treatment plant area.	At base of slope. Know area it collects.	Pipe diameter 6". No drain inlets so how did it collect? Active collection of rainfall to be determined.	Middle River Complex	Must observe during rain to see if outfall still collects drainage.	Outfall Z pipe was observed during the 2011 Utility Cross Connection (UCC) Survey (Figure 4- 3 in Appendix A). Geonic, Inc. model EM 31MK2 instrument was used to detect variations in soil conductivity and detect subsurface metallic objects to determine where the pipe originated. The end of the storm drain was traced to the center of the concrete foundation of the former Aero Physics Lab/Wind Test Building.	1. Observe during a rain event to determine if storm water flows from the pipes. 2. Observe during low tide to determine if storm water flows from the pipe.	1. Outfall Zeta was observed during two significant rain events and during an exceptionally low tide, no flow indicators (i.e. upwelling and/or bubbles) were observed. 2. During a low tide, the field crew noted that a 3-foot section of the pipe from the outfall had dislodged from the bank and is sitting in the sediment. Flow was not observed from the hole from which the pipe presumably had fallen.	Soil cleanup to industrial use standards was completed in Block G. In addition, groundwater remediation is ongoing in this area. It is possible contaminants could be migrating into this piping and then transmitted to Cow Pen Creek. Recommend abandonment of this line.	Attempted to excavate pipe June 19, 2018. Excavated to 5 feet and encountered groundwater with no sign of pipe. Excavation ceased due to significant measures needed to continue excavation. Located vertical cleanout pipe June 21, 2018 which was previously filled with concrete/grout unknown to Tetra Tech. Vertical cleanout pipe dug out 1 foot, broken off, and soil/brush was used to restore area.

Table 1

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Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Outfalls Not Listed on Middle River Complex NPDES Permit												
Unidentified 6" CMP between Zeta and Eta					Pipe diameter 6".	Middle River Complex	Not identified during the Outfall and Drainage Study	6" CMP Storm drain pipe was observed during the 2011 Utility Cross Connection (UCC) Survey (Figure 4-3 in Appendix A) but not identified in the Outfall and Drainage Area Study. Geonic, Inc. model EM 31MK2 instrument was used to detect variations in soil conductivity and detect subsurface metallic objects to determine where the pipe originated. During the UCC survey, the 6" CMP was traced from the outfall and ended in the location of the former leach field in Block G. Based on the location of the 6" CMP, and the location where it is depicted on the UCC Figure 4-3 (Appendix B), it is assumed that the pipe was connected to historical leach field activities.	1. Perform visual inspection during a rain event to determine if storm water flows from the pipe.	1. This outfall was observed during two significant rain events and there was no flow observed on either occasion.	While the abandoned utility does not appear to be an active pathway for contaminants, in order to assure this does not potentially happen in the future, abandonment of this pipe is recommended.	The unidentified 6" CMP was abandoned June 19th, 2018 using a mini-excavator. The pipe was saw cut, protruding piece removed, and remaining pipe abandoned with non-shrink grout. No further action required.
Eta H	Not Seen	Cow Pen Creek	Legacy Drainage: two pipes in fuel test and treatment plant area	Pair of elevated 4 and 12-in drains at creek. Drains Block G area.	No drain inlets so how did it collect? Active collection of rainfall to be determined. Relationship to GW plume?	Middle River Complex	Must observe during rain to see if outfall still collects drainage.	The Outfall H pipes were observed during the 2011 Utility Cross Connection Survey (Figure 4- 3 in Appendix A). Geonics, Inc. model EM 31MK2 instrument was used to detect variations in soil conductivity and detect subsurface metallic objects to determine where the pipe originated. During the soil remedial action activities, the construction team did not observe any flow from Outfall H North or South. Outfall H is comprised of two pipes: a 4" CIP storm drain (North) that ends in the leach field and a 12"CMP storm drain (South) that was traced back to the concrete foundation of the former Vibration and Fuel Test Lab buildings. Part of the concrete foundation was removed during soil remedial activities between 2015 and 2016.	1. Observe during a rain event to confirm if storm water flows from the pipes.	1. Eta North and South were observed during two significant rain events and there was no flow observed from either pipe.	While the abandoned utility does not appear to be an active pathway for contaminants, in order to assure this does not potentially happen in the future, abandonment of this pipe is recommended.	Eta South and Eta North were abandoned on June 19th, 2018 using a mini-excavator. The pipes were located, saw cut, protruding piece removed, and remaining pipes abandoned with non-shrink grout. No further action required.

Table 1

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Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Outfalls Not Listed on Middle River Complex NPDES Permit												
Theta 0	Yes	Cow Pen Creek	Unknown.	6-in pipe at creek; water is clear; no odor or PID reading.	Drainage area; geophysics indicate 0 may be connected to Block G Fuel Test Lab UST (suspected to be oil/water separator). Flow was observed before and after UST removal. Orange staining, often an indicator of groundwater infiltration, has been observed inside of the pipe.	North American Electric	Search Lockheed Martin records. Follow up with NAE interview to determine how NAE drainage Discharges and if they know of H.	A drawing titled "Outside Utility Plan" dated 2/15/1940 (Appendix A) depicts a 12" T.C. outfall in the location of Outfall 0. The line is marked as sanitary sewer and is present all the way up into Block I. The pipe on the drawing runs parallel to the former sewage treatment plant leach field in Block G and extends to an outfall that appears to discharge to Cow Pen Creek. The line is labeled as an 8" pipe inland, and as a 12" T.C. pipe at the outfall. Geophysics conducted during the soil remedial action (to determine if the 6" pipe was connected to the 10,000 gallon storage tank in Block G) was only effective in tracing the line a short distance inland. However the trajectory of the traced portion of the 6" pipe was consistent with the depiction of the 12" T.C. pipe on the 1940 utility plan.	1. Conduct a geophysical survey to locate 6-inch and 8-inch pipes. 2. Test pit excavation to trace the 6- inch pipe and determine if it connects to the historical 12-inch sanitary sewer.	1. The geophysical survey detected linear features in the locations of the 6-inch pipe leading to Outfall Theta and the 12-inch terra cotta pipe. 2. Use of a portable camera and excavation traced the 6- inch line approximately 60 feet inland (east) and included a catch basin. The line terminated suddenly. No connections were noted to any other piping.	The abandoned utility does not appear to be an active pathway for contaminants, however it is transmitting water that is discharged to Cow Pen Creek. Abandonment of this pipe is recommended.	Outfall Theta was abandoned June 20 and 21, 2018 using a mini-excavator. An excavation was dug around the brick manhole structure and the influent and effluent pipes were uncovered and saw cut. The brick manhole structure was then removed by the mini-excavator and the influent and effluent pipes were abandoned with non-shrink grout. The protruding piece of piping was also removed via mini-excavator and all areas disturbed were backfilled and restored. No further action required
Iota I	Yes	Cow Pen Creek	Possibly Tilley stormwater pond, Tilley entrance catch basin, Chesapeake Park Plaza catch basin and storm flow from NAE.	18-in outfall Observed. Flow has odor characterized as chemical by community samplers. Tetra Tech characterizes odor as similar to stormwater pond on Tilley property. This is the so-called "hidden outfall" noted and sampled by the community. Sampled offshore in November 2015.	Pipe is not shown on utility plan and historical documents differ on location. Area collected is unknown. It is unknown if the Outfall receives stormwater flow from the NAE property.	North American Electric	Field inspection to trace piping at the corner of the road and to determine if there are drain inlets on NAE property is recommended. Follow-up flow testing with dechlorinated water may be required. At the same time, another search of records should be done. We should think about asking Tilley what they know about their pond and its discharge if the recent MDE audit did not clearly identify a source.	One inlet was observed during visual inspection performed in April 2016. Observation concluded there is one inlet present on NAE property directly within the property fence. One manhole was observed within the fence line. Drawing titled "Plot Showing Locations of Hydraulic Vibration and Fuel Testing Areas – Plant No. 1, Building & Field Eng'r Dept." dated 8/12/1943 (Appendix A) depicts a second manhole along the pipe run that cannot be visually located in the field. It is assumed that this manhole is buried.	1. Initiate meeting with Tilley Chemical personnel to discuss the pond located on their property.	At the time this report was prepared, no action had occurred on this issue	Initiate meeting with Tilley Chemical personnel to discuss the pond located on their property.	Not applicable

Table 1
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Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Outfalls Not Listed on Middle River Complex NPDES Permit (continued)												
Kappa K	No	Cow Pen Creek	Legacy drain of former Martin and Navy activity?	"Small" diameter noted.	Active collection of rainfall to be determined.	Middle River Complex	Observe during a rain event to determine if the outfall collects stormwater. If it does, stormwater sources need to be determined. Records search and geophysics may be required to trace the pipe to stormwater sources. Try observing at low tide. Verify Position on Outfall study map. It looks like it is plotted where K was found.	Outfall Kappa could possibly be the 8" T.C. storm sewer depicted on the "Naval Aviation Facilities-Receiving Barracks showing conditions June 30 1944.". The storm sewer depicted in the naval barracks drawing originates from an inlet that is depicted approximately 190 feet inland from the pipe discharge point.	1. Observe during a rain event to determine if storm water flows from the pipes. 2. Conduct a geophysical survey to locate the drain in Block F.	1. Outfall Kappa was observed during two significant rain events and no flow was observed during either occasion. 2. The geophysical survey could not be completed near the bank due to heavy vegetation and a steep slope but the line was not traceable further inland.	While the abandoned utility does not appear to be an active pathway for contaminants, in order to assure this does not potentially happen in the future, abandonment of this pipe is recommended.	The 1.5" steel pipe of Outfall Kappa was abandoned June 20, 2018 using a mini-excavator. The pipe was located, saw cut, and protruding piece removed. The remaining pipe was abandoned with non-shrink grout. No further action required.
Lambda L	No. Cannot observe because Outfall is under water.	Cow Pen Creek	Unknown. Legacy drain of former Martin and Navy activity?	2nd "hidden outfall" noted by team and shared with MDE and sampled offshore in November 2015.	Pipe diameter. Active collection of rainfall to be determined.	Middle River Complex	Observe during low tide to determine if flow occurs. Conduct records search. If necessary observe during rain and conduct a geophysical survey to trace the pipe.	No historical maps depicting the outfall or utility line were found during records search.	1. Conduct a geophysical survey to locate the drain in Block F. 2. Determine pipe diameter size during low tide and check for flow.	1. A linear feature was detected during the geophysical study. The feature ended approximately 160-feet inland from the outfall. 2. The pipe is an 8-inch diameter RCP with two 12-inch diameter RCP extensions of unknown origin.	While the abandoned utility does not appear to be an active pathway for contaminants, in order to assure this does not potentially happen in the future, abandonment of this pipe is recommended.	Low tide conditions were targeted to locate and abandon Outfall Lambda on June 20, 2018 using a mini-excavator. The pipe was located, saw cut, protruding pieces removed, and remaining pipe abandoned with non-shrink grout. No further action required.
Unidentified East of Lambda L	Not Known	Dark Head Cove	Unknown. Legacy drain of former Martin and Navy activity?		Utility plan shows an outfall East of the K location. Size is not documented but it is shown as collecting flow from two 8-in tile pipes. Could be old leach field, could be groundwater depression system, could be not real.	Middle River Complex	Confirm status by records search and observe during rain to see if there is a discharge at Cow Pen Creek.	No historical maps depicting two 8" tile utilities were found during records search.	1. Conduct a geophysical survey to try and locate any discharge points.	The geophysical survey did not indicate any anomalies near where the unidentified outfall was once observed. The bulkhead in this area has been repaired in early 2017 and the pipe was likely covered at that time.	No further action recommended.	Not applicable
Recognized Environmental Conditions (RECs)												
REC #4	NA	NA	NA	The Boat Launch Area is covered by a concrete tarmac which defines the boundaries of REC #4. No other structures were historically present within the REC. Concrete tarmac is still in place. The 2.5-inch utility line running from the feature labeled "New Pump Pit, Air Water Separator" on the undated drawing titled "Plan of Roadways adjoining Navy Building" (Figure 3-8) is likely still in place.		Middle River Complex	NA	Piping associated with the seven USTs in REC #5 was removed during a soil remedial action in March 2016. The piping ran from REC #5, through REC #4, to the former structure on the bulkhead. An undated drawing titled "Plan of Roadways adjoining Navy Building" (Appendix A) was found during a records search of the Naval Archives in College Park, MD. The drawing depicts a 2.5-inch utility line running from a feature labeled "New Pump Pit, Air Water Separator".	1. Conduct geophysical survey to determine if the 2.5-inch diameter pipe is present.	1. Geophysical survey did not detect a linear feature in the area depicted on the historical figure.	No further action recommended.	Not applicable

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Outfall	Flow Observed In 2015	Discharge Receptor	Catchment Description	Known	Unknown	Land Ownership	Actions	Infrastructure Updates Found during Records Review	Infrastructure Assessment Field Activities	Infrastructure Assessment Results	Possible Contaminant Pathway/ Recommendation	Action / Abandonment Completed
Recognized Environmental Conditions (RECs) (continued)												
REC #13	NA	NA	NA	REC #13 is an open, relatively flat grass- covered parcel of land in Block F. The REC is covered with a well maintained grass lawn with shrubs and trees thickly growing along the Cow Pen Creek shoreline. The REC is currently inactive although lawn care maintenance is conducted routinely.		Middle River Complex. A portion of REC #13 is slated to be used as part of the Critical Area Commission Mitigation Area for the Dump Road groundwater remediation.	NA	A metallic pipe leaking an oily, grease-like substance was discovered during soil remedial action activities in July 2015. The pipe was found in Area A depicted on Figure 4-1 - Verification Sampling Locations Block F in Appendix A. A foundation wall and piping network were also discovered in Area A during excavation. The foundation wall was parallel to Cow Pen Creek and extended approximately 10 feet across the excavation area. The piping network consisted of several 1.5-inch inside-diameter steel-pipes that extended vertically into the ground. An exploratory excavation was advanced to a depth of 8.5 feet bgs outside of the foundation wall to follow the piping. Fill material consisting of brick, wood, concrete, and rock fragments was observed in the excavation and no evidence of a sump, underground storage tank (UST), or other structures was found. Historical site drawings from the 2003 environmental site assessment (Earth Tech, 2003) indicate that the piping and foundation features may be remnants of former naval barracks. A drawing depicting the former naval barracks and other buildings was found during a records search at the Naval Archives in College Park, MD. The drawing shows water, sewer, storm sewer, steam, and the G.L. Martin A.D.T signal system utility lines, as well as the barracks, mess, recreation, storage, and other buildings in the western portion of REC #13.	1. Conduct geophysical survey to locate historical underground features associated with the Naval Barracks.	1. Geophysical survey detected a historical drinking water line that ran from the barracks towards the tarmac. No other historical features were detected by the geophysical survey.	No further action recommended.	Not applicable

APPENDICES

Appendix A—Permits and Utility Clearance

Appendix B—Field Reports


Appendix C—Waste Removal Manifest

Appendix A—Permits and Utility Clearance

Risk Handling Checklist



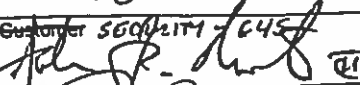

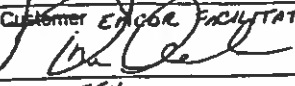

Project Manager: Use this checklist to develop risk handling plans before the dig starts. You must also review Enterprise Operations Procedure [EO-28](#), Digging Projects.

General Questions	<input checked="" type="checkbox"/> What Lockheed Martin processes could be affected by the dig? No Lockheed Martin processes or operations are expected to be impacted as all work will be conducted outside the secured area within Blocks G (inc Lot 3), F (inc old sea plane ramp), and H (Lot 2). Tetra Tech will work with Lockheed Martin and their tenants to minimize potential impacts.
	<input checked="" type="checkbox"/> What are the safety hazards? Utilities, slips/trips/falls, vehicle traffic, drill rig safety, pinch points
	<input checked="" type="checkbox"/> What could fail? Excavator components
	<input checked="" type="checkbox"/> How could it fail? A component of the excavation equipment could potentially fail. An inspection of the equipment will be conducted daily to ensure proper working condition.
	<input checked="" type="checkbox"/> Does the area need to be returned to its normal state when the work is complete? Yes, excavation area will be backfilled with excavated soil and seeded with straw cover.
	<input type="checkbox"/> How could the dig affect operations/test/production? No operations will be affected
	<input type="checkbox"/> Have potential risks been addressed with area management? No risks identified
	<input checked="" type="checkbox"/> Am I comfortable with any risk handling plans, understanding the potential impact? YES
Traffic Control	<input checked="" type="checkbox"/> Ensure proper signage and communication. Proper signage, traffic cones etc... will be placed to safely divert traffic around the work area when working on the public roadway.
	<input checked="" type="checkbox"/> Coordinate road or access closures through Industrial Security before starting the dig. LMCPI, Security, EMCOR and the site tenant leads will be notified of the field schedule.
	<input checked="" type="checkbox"/> Ensure the work area is isolated from foot traffic by placing barriers and warning lights as required by EO-28 .
	<input checked="" type="checkbox"/> Ensure that vehicle traffic will be safe. Use of traffic cones, barriers and/or caution tape
	<input type="checkbox"/> Ensure that product transport will be safe. N/A
Excavation	<input checked="" type="checkbox"/> Review facility drawings to identify utilities. Research old drawings as necessary. Available site engineering and utility maps
	<input checked="" type="checkbox"/> Discuss the project with Facility Engineering/Maintenance staff that may have unique knowledge about the construction area not documented in facility drawings.
	<input checked="" type="checkbox"/> Process form EO-28-1 , Dig Permit. Use this opportunity to explain the process and relate expectations to the contractor/LM organization that will perform the dig.
	<input checked="" type="checkbox"/> Have LM Telecommunications and the local utility identification service locate and mark utilities/underground obstacles.
	<input checked="" type="checkbox"/> Coordinate with other ongoing projects in the affected area. Will coordinate with any utility work in the area if present.
	<input type="checkbox"/> Make every effort not to excavate around live utilities in service. Schedule an outage in advance or have Maintenance temporarily shut down and isolate the utilities while excavating. Underground utilities marked by Miss Utility and private utility locating service, no utilities identified close to excavations.
	<input type="checkbox"/> If live utilities cannot be shut down while excavating, know where to isolate or shut them down if they are damaged while excavating. N/A
	<input type="checkbox"/> Have a spotter(s) work with the equipment operator. Hand dig when necessary. N/A
	<input type="checkbox"/> Excavate along the side of the utility; not on top. N/A
	<input type="checkbox"/> Weather may affect the dig. Ensure water pipes are protected during freezing weather, especially if the trench will be left open over night. Rain may cause the side of the trench to slough, which can undermine and break pipes/conduit. N/A
	<input type="checkbox"/> Ensure care when moving trench boxes in and out of trenches so pipes/conduit aren't damaged by the boxes. N/A
	<input checked="" type="checkbox"/> Ensure surface drainage is controlled so that water doesn't get into the excavation and undermine soil supporting utilities.
	<input checked="" type="checkbox"/> Ensure stocked material is kept far enough back (minimum 2 feet) so that material and rocks don't fall on utilities in the open hole. Excavated soil will be stockpiled a safe distance from the excavation.
	<input checked="" type="checkbox"/> Ensure backfilling is done carefully: Re-bed utilities with proper material, filling all voids below. Keep inappropriate material from falling on or being placed in the trench. Be careful when compacting backfill in the two feet directly above the utility. Backfilling will be completed with excavator including compaction.
<input checked="" type="checkbox"/> Keeps the as-built utility drawing in the field while the excavation site is open. Take pictures if possible (horizontal alignment and elevations), if known utilities deviate from facility drawings or if utilities are found that are not on facility drawings. Give the modified as-built drawings to the Building/Facility Manager, who will update the drawing database. Field geologist will maintain site maps onsite and photographs will be taken to document all phases of the project	
<input checked="" type="checkbox"/> Ensure that the equipment operator digs slowly and remains in control. Excavation equipment will be operated by and experienced person.	
Final	<input type="checkbox"/> Ensure that trenching and shoring methods comply with the applicable OSHA regulations and are overseen by a "Competent Person," as defined in those regulations. N/A

	<input checked="" type="checkbox"/> Regularly inspect methods to prevent violations.
	<input type="checkbox"/> Ensure LM employees do not dig or enter any excavation that is more than four feet deep. N/A
Project Manager signature indicating completion of checklist review Michael Martin 	Date June 7, 2018

Dig Permit

See Enterprise Operations Procedure EO-28, Digging Projects, for instructions.

Date June 7, 2018		Project Manager Tom Blackman (Lockheed Martin EESH) Mike Martin (Tetra Tech)	
Building/Location Tax Block F (inc old sea plane ramp), G (inc Lot 3), and H (Lot 2).			
Purpose of work: 1. Install 4 sign posts to mark outfalls 001, 002, 003, and 004 along Cow Pen Creek 2. Excavate to try and locate a buried groundwater monitoring well (MW09A) 3. Remove 6 pipes from old operational infrastructure that protrudes from Cow Pen Creek and grout seal the remaining intact pipe.			
Company/LM organization performing dig Tetra Tech overseeing Elite Environmental Services			
Planned dig date June 18, 2018		Duration Two Weeks	Start time 0700
Expected depth Approximately 5 to 6 feet below grade maximum		Width Up to 5 ft.	Length Up to 15 ft.
Underground utilities identified? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Overhead utilities? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Electrical lines? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Gas lines? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sewer? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Water? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Telecommunications? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Other? Specify: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Site-specific or customer utility locating requirements completed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Sketch of dig project (or attach drawing) See Attached A private utility locating contractor (Retnew) was used to mark subsurface utilities. Confirmation letter is attached. Miss Utility Ticket will be called in the week of June 11 and documentation will be provided at that time. The locations of the proposed work are presented in the enclosed map, Figure 1.			
Project Manager Michael Martin 		Date June 7, 2018	Customer SECURITY - PLANT PROTECTION  Date 6/8/18
Telecommunications N/A		Date —	Customer SECURITY - EESH  Date 6/8/18
ESH 		Date 6/7/18	Customer EMERGENCY FACILITATOR  Date 6/12/18
Building/Facility Manager 		Date 6/9/18	LMC ESH Sara Henli Date 6/8/18

AGREEMENT FOR ACCESS TO NORTH AMERICAN ELECTRIC PROPERTY

This Agreement for Access to North American Electric ("Agreement") is made and entered into the 18th day of June, 2018, between Lockheed Martin Corporation ("Lockheed Martin") and North American Electric Company ("Owner").

RECITALS

Lockheed Martin desires access to the site described in the attached Exhibit B ("Site") to engage in the activities specified in the scope of work attached as Exhibit A.

In consideration of mutual promises and other valuable consideration, the receipt and adequacy of which are hereby acknowledged, Owner and Lockheed Martin agree as follows:

TERMS AND CONDITIONS

1. Site Access

Subject to the terms of this agreement, Owner grants to Lockheed Martin a limited, nonexclusive license to enter the Site and engage in the activities specified in Exhibit A.

If the Site is sold or otherwise conveyed to a third party, Owner will request that such third party grant to Lockheed Martin reasonable and necessary nonexclusive access to the Site for the purpose of allowing Lockheed Martin to fulfill its activities and obligations hereunder. Owner shall immediately notify Lockheed Martin if Owner is unable to obtain necessary access in a timely manner. However, Owner shall have no liability or continuing obligation to Lockheed Martin if such third party refuses to grant such access.

2. Release

As consideration for being afforded access to the Site, Lockheed Martin hereby waives, releases, and discharges Owner, its parent and subsidiaries, affiliates, and their respective shareholders, directors, officers, and agents from all present or future claims, causes of action, or demands that Lockheed Martin now has or may hereafter accrue on account of or in any way growing out of any and all known and unknown or seen and unforeseen bodily and personal injuries or property damage and the consequences thereof resulting, or which may result, from Lockheed Martin's presence upon the Site or Lockheed Martin's use of any equipment or procedures while on, entering, or leaving the Site. Claims arising out of the negligence or willful misconduct of Owner, its parent and subsidiaries, and their respective shareholders, directors, officers, and agents are excluded from this release.

3. Data and Reports

Owner understands and agrees that Lockheed Martin does not have any obligation or duty to disclose or report to Owner any information, data, reports, or findings resulting from any activities or investigations on the Site.

4. Governing Law

This Agreement and the legal relations of the parties shall be governed by the laws of the State of Maryland applicable to agreements negotiated, executed, delivered, and fully performed in such state.

5. Counterparts

To facilitate execution, this Agreement may be executed in as many counterparts as may be convenient. It shall not be necessary that the signature on behalf of a party hereto appear on each counterpart. All counterparts hereof shall collectively constitute a single agreement.

6. Indemnity

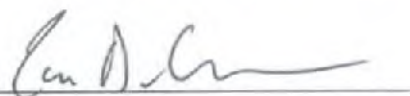
Lockheed Martin shall indemnify and hold harmless Owner, its parent and subsidiaries, affiliates and their respective shareholders, directors, officers, and agents (collectively, the "Indemnified Parties") from any and all claims, liabilities, losses, and lawsuits on account of property damage or personal injury, including reasonable attorney's fees, which the Indemnified Parties may incur as the result of Lockheed Martin's performance hereunder.


7. Insurance

Lockheed Martin shall maintain (a) comprehensive general liability insurance in the minimum aggregate amount of \$3 million, (b) property damage insurance in the minimum aggregate amount of \$300,000, and (c) Worker's Compensation insurance as required by law. Lockheed Martin shall provide Owner with Certificates of Insurance with respect to the foregoing, naming Owner as additional insured, but only for activities on Owner's property described in Exhibit B.

LOCKHEED MARTIN CORPORATION

NORTH AMERICAN ELECTRIC COMPANY

By: 
Thomas D. Blackman

By: 

Title: Protect LEAD
Lockheed Martin Corporation

Title: VP

SUBSURFACE UTILITY ENGINEERING JOB COMPLETION REPORT



TO: Mike Martin - Tetra Tech
 FROM: Robert Krause, RETTEW Field Services, Inc.
 CC: Felicia Bechtel, RETTEW Associates, Inc.

DATE: 06/07/2018

CLIENT: Tetra Tech	PROJECT LOCATION: Cow Pen Creek Middle River, MD
PROJECT NO: 019872005	
PROJECT NAME: Middle River	
TECHNICIAN: Robert Krause	

UTILITIES LOCATED:	EQUIPMENT:
<ul style="list-style-type: none"> • Storm Lines along Cow Pen Creek 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> EM Locator (RD8000/Metrotech) <input checked="" type="checkbox"/> Ground Penetrating Radar (GPR) <input checked="" type="checkbox"/> M-Scope (metal detector) <input checked="" type="checkbox"/> C.A.T. Passive Locator <input type="checkbox"/> Acoustic Leak Detector <input type="checkbox"/> Magnetometer <input type="checkbox"/> Integrity Assessment Camera <input type="checkbox"/> Traceable Rodder <input type="checkbox"/> Concrete GPR

SCOPE OF WORK

RETTEW completed a subsurface utility survey to mark-out utilities within 10 client-designated areas along a portion of Cow Pen Creek (**Figure 1**).

METHODOLOGIES

RETTEW first traced utilities with visible surface features (i.e. manhole covers, valves, utility poles, hydrants) utilizing the EM locator. RETTEW then searched the survey area for unknown utilities with the GPR, M-scope, and the passive utility locator.

RESULTS/CONCLUSIONS

On June 4, 2018, Robert Krause arrived on-site and met with Mike Martin of Tetra Tech to identify the survey areas and mark utilities. At Outfall Locations 001 through 004 an approximate 5-foot x 5-foot area was cleared for sign post installation. Near Well Location MW09 an approximate 20-foot x 30-foot area was cleared. There were no conflicts identified in these areas.

RESULTS/CONCLUSIONS CONT.

At Outfall Locations ETA, Zeta, Theta, Kappa, and Lambda, outfall piping was traced approximately 15 feet from the pipe terminus in Cowpen Creek. Additionally, 10 feet on either side of the pipe was cleared to allow for pipe excavation and removal.

Outfall pipes at Locations Zeta and Lambda could not be identified.

ATTACHMENTS: A location map is provided as **Figure 1**.

RETTEW, strives to provide quality and accurate locating services to all of its customers, but due to the nature of underground facilities, RETTEW will not be held liable for any damaged facilities. All customers are advised that they are required to follow their state's One-Call-Law before beginning excavation. The marks placed during this investigation are temporary markings for utility mapping purposes. The marks are not intended, nor should they be used for construction; legal and/or recommended construction tolerance zones associated with the identified utilities were not marked by RETTEW. Prior to construction activities, RETTEW should be contacted for remarking of the utilities and construction tolerance zones.

RETTEW, will not guarantee the longevity of utility markings, due to activities on site that may destroy, or otherwise alter, the markings that were placed on the ground by RETTEW, if the marks have been altered or destroyed, the customer is advised to contact RETTEW for remarkings. Any electronically determined depths provided to the client are estimates only and due to limitations equipment cannot be guaranteed. Client acknowledges that due to the limitations of the equipment used, safe exposure and measurements are the only methods which can precisely determine location and depth of structures marked.

PREPARED BY:

Robert J. Krause – Senior Geophysicist

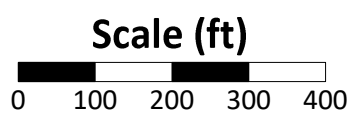


(Name and Title)


RECEIVED BY:

(Name and Title)

FIGURES




Geophysical Survey Legend

 Survey Locations

Notes:

Basemap from Google Earth Pro and RETTEW field notes.

Coordinates displayed in State Plane - Maryland (feet).

Prepared by:  RETTEW Associates, Inc. 3020 Columbia Avenue, Lancaster, PA 17603 Phone (717) 394-3721 • Fax (717)394-1063	Title: Utility Survey Locations	Project Location: Cow Pen Creek Lockheed Martin Middle River, MD		Figure 1	
		Project Number 019872005	Revision/Issue 06/05/2018	Drawn by: RJK	Approved by: FKB
		Approximate Scale 1" = 40 ft	Survey Ending Date 06/04/2018		

From: md@occinc.com
To: [Mullis, Josh](#)
Subject: Ticket: 18369245
Date: Monday, June 11, 2018 9:55:21 AM

NOTICE OF INTENT TO EXCAVATE

STANDARD

Ticket No: 18369245
Transmit Date: 6/11/18 **Time:** 9:55 AM
Release Date: 6/11/18 **Time:** 9:55 AM **Type:** WEB
Response Due By: 6/13/18 **Time:** 11:59 PM
Expiration Date: 6/27/18 **Time:** 11:59 PM

Caller Information

Company: TETRA TECH, INC **Type:** NON-MEMBER
Contact Name: JOSHUA MULLIS **Fax:**
Phone: (410) 279-2700
Caller Address: 20251 CENTURY BLVD SUITE 200 GERMANTOWN, MD 20874
Email Address: josh.mullis@tetrattech.com
Job Site Contact: JOSH MULLIS **Phone:** (410) 279-2700

Dig Site Information

Type of Work: ABANDONED PIPE EXCAVATION NEAR COW PEN CREEK
Work Done For: LOCKHEED MARTIN
Permit #: **Explosives:** N
Contract Job#:

Dig Site Location

State: MD **County:** BALTIMORE
Place: MIDDLE RIVER
Subdivision:
Address / Street: 474 CHESAPEAKE PARK PLAZA
Nearest Intersecting Street: MARTIN BLVD

Extent of Work:

LOCATE/MARK: UTILITIES WITHIN 40 FEET OF WORK ACTIVITIES AS SHOWN ON ATTACHED FIGURE. 6 PIPES FROM OLD OPERATIONAL INFRASTRUCTURE PROTRUDING INTO COW PEN CREEK WILL BE REMOVED, ONE MONITORING WELL WILL BE LOCATED, AND 4 SIGN POSTS WILL BE INSTALLED

GO TO [LINK](#) TO OBTAIN ADDITIONAL INFORMATION THAT WAS PROVIDED BY THE EXCAVATOR REGARDING THIS LOCATION.

Comments:

WORK WILL BE COMPLETED NEAR EDGE OF COW PEN CREEK. SEE ATTACHMENTS

Excavation Coordinates for # Polygons: 1

Poly 1: NW Lat: 39.3290681 Lon: -76.4376959 SE Lat: 39.3242949 Lon: -76.4306810

Members Notified

District	Company Name	Phone Number
BGEBA	BGE ELECTRIC-USIC	(800) 778-9140
BGEBAG	BGE GAS-USIC	(800) 778-9140
CBW04	BALTIMORE CITY DPW-OCCLS	(410) 712-0202
HTV02	COMCAST- FIBER/UTILIQUEST	(410) 536-0070
MAA02	MD AVIATION ADMIN/OCCLS	(410) 712-0202
TDEX01	TERRADEX	(650) 227-3254
VBT	VERIZON	(410) 536-0070

Excavator Responsibilities

* EXCAVATORS MUST ENSURE ACCURACY OF TICKET AND MAPPING BY CLICKING ON [THIS LINK](#)

From: md@occinc.com
To: [Mullis, Josh](#)
Subject: Ticket Check Status for MD Ticket 18369245
Date: Thursday, June 14, 2018 1:52:13 PM

Ticket Number: 18369245

Location: 474 CHESAPEAKE PARK PLAZA MIDDLE RIVER, MD

As of 6/14/18 13:52 EDT, participating facility owners have responded to Ticket Check as follows:

District Code	Status
BGE ELECTRIC-USIC	Clear/No conflict
BGE GAS-USIC	Clear/No conflict
BALTIMORE CITY DPW-OCCLS	Clear/No conflict
COMCAST- FIBER/UTILIQUEST	Clear/No conflict Response by Utiliquest
MD AVIATION ADMIN/OCCLS	Clear/No conflict
TERRADEX	Clear/No conflict
VERIZON	Clear/No conflict

To review this ticket in its entirety, visit Search and Status on www.managetickets.com.

Appendix B—Field Reports

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID: Eta South/North

Tt Personnel: J. Mullis

Date : June 19, 2018

Contractor: Elite Env.

Project #: 112IC08547

Description of Work Completed:

A mini excavator was utilized to dig a trench approximately 4' long by 3' wide by 3' deep to locate pipes eta north and south. Once pipes were located they were saw cut and the pieces protruding the bank were removed and placed in a rolloff. The pipes were then sealed with non shrink grout and the excavation was backfilled. Curl-x and grass seed were placed in the disturbed area.

Original Condition



Work Completed



Eta north and south located via mini excavator and hand digging.



Eta piping removed from the bank



Eta north and south saw cut and filled with concrete.

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID: Kappa

Tt Personnel: J. Mullis

Date : June 20, 2018

Contractor: Elite Env.

Project #: 112IC08547

Description of Work Completed:

The 1.5" steel pipe protruding from the bank was traced to inside the perimeter fence. A 3'x3'x3' trench was dug inside the fence perimeter to locate the pipe which was located approximately 1.5' bgs. The uncovered pipe was saw cut and the pipe length protruding from the bank was removed (approximately 21' long) and placed in a roll-off. The remaining land side of the pipe was filled with nonshrink grout. The grout was allowed to set and the area was then backfilled. The area disturbed was restored with curl-x and grass seed.

Original Condition

Work Completed



1.5" steel pipe located approx 1.5' bgs.



Steel pipe saw cut and removed.



Non-shrink grout used to seal pipe prior to backfilling.

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID: Lambda

Tt Personnel: J. Mullis

Date : June 20, 2018

Contractor: Elite Env.

Project #: 112IC08547

Description of Work Completed:

Low tide conditions were targeted for completion of this work. A mini excavator and skid steer were used to clear minimal brush. Four pieces of 3' long terra cotta piping were removed from the bank. A 2'x2'x2' trench was then dug to locate the pipe inside the perimeter fence. The pipe was located, cut, and sealed with non shrink grout. All terra cotta piping removed was placed in a rolloff with a skid steer. The disturbed soil area was restored with curl-x and grass seed. The fence was put back in place.

Original Condition



Work Completed



Bank after protruding terra cotta piping was removed



Terra cotta pipe located inside perimeter fence



Pipe was broken, bank side removed, land side filled and sealed with concrete.

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID: Unidentified 6" CMP

Tt Personnel: J. Mullis

Date : June 19, 2018

Contractor: Elite Env.

Project #: 112IC08547

Description of Work Completed:

The unidentified 6" CMP was located in the field and it was determined that the site fence needed to be cut to remove the pipe. Once the fence was cut a mini excavator dug an approximate 4ft long by 2ft wide by 3ft deep trench to locate the 6" CMP. The pipe was located and saw cut. The pipe protruding from the bank was removed and placed in a rolloff. The remaining pipe was sealed with non shrink grout and the area was then backfilled. Curl-x and grass seed was placed on the disturbed area and a new section of fencing was installed.

Original Condition



Work Completed



6" pipe located via mini excavator



Elite personnel saw cutting 6" CMP



6" CMP sealed with concrete.

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID: Zeta

Tt Personnel: J. Mullis

Date : June 19, 2018

Contractor: Elite Env.

Project #: 112IC08547

Description of Work Completed:

A mini excavator was utilized to attempt to locate outfall Zeta. An approximate 4'x2'x5' deep trench was excavated, however, water was encountered at 3.5' and it was decided that the excavation would be unsuccessful if continued due to water infiltration. The excavation was backfilled and restored with curl-x and grass seed. Investigation resumed 6/21; a weed whacker cleared brush from the suspected area on the bank where a vertical pipe connected to zeta was located. Vertical pipe was indeed found and observed to be already filled with grout. A 1' hole was dug around the pipe and the pipe was broken apart with a sledgehammer so that nothing was visible from surface. Area was filled with soil and brush.

Original Condition



Work Completed



Disturbed area restored with curl-x and grass seed



Surface vertical pipe to zeta located and already filled with grout



Surface vertical pipe dug down 1' and broken up with sledgehammer so that no pipe is visible from surface.

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID:

Tt Personnel:

Date :

Contractor:

Project #: 112IC08547

Description of Work Completed:

A mini-excavator was used to dig a 7ftx7ftx3.5ft excavation around the manhole structure for manhole Theta. The influent and effluent pipes were uncovered, saw cut, and removed from the excavation. The brick manhole structure was removed in one piece by the miniexcavator, then broken up outside of the excavation. All brick and piping was placed in a rolloff. The remaining pipes were sealed with non-shrink grout and allowed to set. The excavation was then backfilled. Due to rain in the afternoon the bank side pipe removal will be completed 6/21/2018.

Original Condition



Work Completed



Elite personnel saw cut cast iron pipe.



Mini-excavator removing brick manhole structure in its entirety



View of pipe running into bankside. Water seen is from groundwater seepage.

Infrastructure Abandonment Blocks G/F Middle River, MD

Outfall/Pipe ID:

Tt Personnel:

Date :

Contractor:

Project #: 112IC08547

Description of Work Completed:

A mini excavator was used to remove a 5' section of cast iron pipe from outfall Theta using straps and a chain to pull the pipe from the bank. The pipe was placed in a rolloff and the bank was restored with soil and straw. The fence was not disturbed for this portion of the work. The land side excavation was restored with curl-x and grass seed.

Work Completed



Influent and effluent pipes sealed with non-shrink grout on 6/20

Work Completed



Bankside protruding pipe removed



Pipe removed and bankside restored



Disturbed area restored with curl-x and grass seed

Appendix C—Waste Removal Manifest

NON-HAZARDOUS WASTE MANIFEST

RB126081RT

Please print or type (Form designed for use on elite (12 pitch) typewriter)

D4 1B03479229

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. MDR000524413		Manifest Document No. NH0711248CP		2. Page 1 of 1			
3. Generator's Name and Mailing Address Middle River Complex 195 Chesapeake Park Plaza Rd Middle River MD 21220				Site Address: 195 Chesapeake Park Plaza Rd Baltimore, MD 21220					
4. Generator's Phone (301) 528-3021									
5. Transporter 1 Company Name Clean Harbors Environmental Services, Inc.		6. US EPA ID Number MAD039322250		A. State Transporter's ID		B. Transporter 1 Phone (701) 792-6000			
7. Transporter 2 Company Name		8. US EPA ID Number		C. State Transporter's ID		D. Transporter 2 Phone			
9. Designated Facility Name and Site Address Clean Harbors of Baltimore Inc 1910 Russell Street Baltimore, MD 21230				10. US EPA ID Number MDD980555139		E. State Facility's ID A-151			
						F. Facility's Phone (410) 244-8200			
11. WASTE DESCRIPTION						Containers		13. Total Quantity	14. Unit Wt./Vol.
						No.	Type		
a. NON HAZARDOUS, NON D.O.T. REGULATED						001	CM	20	Y
b.									
c.									
d.									
G. Additional Descriptions for Materials Listed Above 11a.CH1660601B						H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information						EMERGENCY PHONE #: (800) 463-3718 GENERATOR: Middle River Complex			
18. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.									
Printed/Typed Name <i>Christopher Kellie</i>						Signature <i>[Signature]</i>		Date Month Day Year 7/11/2018	
17. Transporter 1 Acknowledgement of Receipt of Materials									
Printed/Typed Name CUEA PHAY						Signature <i>[Signature]</i>		Date Month Day Year 7/11/2018	
18. Transporter 2 Acknowledgement of Receipt of Materials									
Printed/Typed Name						Signature		Date Month Day Year	
19. Discrepancy Indication Space									
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.									
Printed/Typed Name						Signature		Date Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY



WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. CH1669601B

A. GENERAL INFORMATION
 GENERATOR EPA ID #/REGISTRATION # **MDR000524413** GENERATOR NAME **Middle River Complex**
 GENERATOR CODE (Assigned by Clean Harbors) **M13240** CITY **Baltimore** STATE/PROVINCE **MD** ZIP/POSTAL CODE **21220**
 ADDRESS **195 Chesapeake Park Plaza Rd** PHONE **(301) 528-3021**
 CUSTOMER CODE (Assigned by Clean Harbors) **TE0740** CUSTOMER NAME **Tetra Tech Inc**
 ADDRESS **20251 Century Boulevard Suite 200** CITY **Germentown** STATE/PROVINCE **MD** ZIP/POSTAL CODE **20874**

B. WASTE DESCRIPTION
 WASTE DESCRIPTION **Concrete Debris**

PROCESS GENERATING WASTE **Site demolition in support of remedial activity**

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER? **No**

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE <input checked="" type="checkbox"/> SOLID WITHOUT FREE LIQUID POWDER MONOLITHIC SOLID LIQUID WITH NO SOLIDS LIQUID/SOLID MIXTURE % FREE LIQUID % SETTLED SOLID % TOTAL SUSPENDED SOLID SLUDGE GAS/AEROSOL	NUMBER OF PHASES/LAYERS 1 2 3 TOP 0.00 % BY VOLUME (Approx) MIDDLE 0.00 BOTTOM 0.00				VISCOSITY (if liquid present) 1 - 100 (e.g. Water) 101 - 500 (e.g. Motor Oil) 501 - 10,000 (e.g. Molasses) > 10,000		COLOR Varies					
	ODOR <input checked="" type="checkbox"/> NONE MILD STRONG Describe		BOILING POINT °F (°C) <= 95 (<= 35) 95 - 100 (38-38) 101 - 129 (38-54) >= 130 (>54)		MELTING POINT °F (°C) < 140 (<60) 140-200 (60-93) <input checked="" type="checkbox"/> > 200 (>93)			TOTAL ORGANIC CARBON <input checked="" type="checkbox"/> <= 1% 1-9% >= 10%				
	FLASH POINT °F (°C) < 73 (<23) 73 - 100 (23-38) 101 - 140 (38-60) 141 - 200 (60-93) > 200 (>93)		pH <= 2 2.1 - 6.9 <input checked="" type="checkbox"/> 7 (Neutral) 7.1 - 12.4 >= 12.5		SPECIFIC GRAVITY < 0.8 (e.g. Gasoline) 0.8-1.0 (e.g. Ethanol) 1.0 (e.g. Water) 1.0-1.2 (e.g. Anthracite) <input checked="" type="checkbox"/> > 1.2 (e.g. Methylene Chloride)				ASH < 0.1 0.1 - 1.0 1.1 - 5.0 5.1 - 20.0		BTU/LB (MJ/kg) <input checked="" type="checkbox"/> < 2,000 (<4.8) 2,000-5,000 (4.8-11.8) 5,000-10,000 (11.8-23.2) > 10,000 (>23.2) Actual	

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable if a trade name is used. Please supply as MSDS. Please do not use abbreviations.)

CHEMICAL	MIN	MAX	UOM
BRICK	10.0000000	50.0000000	%
CONCRETE	10.0000000	50.0000000	%
DEBRIS	5.0000000	15.0000000	%
REBAR	5.0000000	10.0000000	%
SOIL	5.0000000	15.0000000	%

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX. METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")? YES NO

If yes describe including dimensions:

DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM? YES NO

DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING, ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL? YES NO

I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:

The waste was never exposed to potentially infectious material. YES NO

Chemical disinfection or some other form of sterilization has been applied to the waste. YES NO

I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS. YES NO

I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED. YES NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE **G19** SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE **W319**

E. CONSTITUENTS

Are these values based on testing or knowledge? Knowledge Testing

If based on knowledge, please describe in detail, the rationale applied to identify and characterize the waste material. Please include reference to Material Safety Data Sheets (MSDS) when applicable. Include the chemical or trade name represented by the MSDS, and/or detailed process or operating procedures which generate the waste generator process knowledge and past history.

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLICABLE
D004	ARSENIC	50				<input checked="" type="checkbox"/>
D005	BARIUM	1000				<input checked="" type="checkbox"/>
D006	CAESIUM	10				<input checked="" type="checkbox"/>
D007	CHROMIUM	50				<input checked="" type="checkbox"/>
D008	LEAD	50				<input checked="" type="checkbox"/>
D009	MERCURY	0.2				<input checked="" type="checkbox"/>
D010	SELENIUM	1.0				<input checked="" type="checkbox"/>
D011	SILVER	50				<input checked="" type="checkbox"/>
VOLATILE COMPOUNDS				OTHER CONSTITUENTS		
D018	BENZENE	0.5			MAX	UOM
D019	CARBON TETRACHLORIDE	0.5				NOT APPLICABLE
D021	CHLOROBENZENE	100.0				<input checked="" type="checkbox"/>
D022	CHLOROFORM	6.0				<input checked="" type="checkbox"/>
D028	1,2-DICHLOROETHANE	0.5				<input checked="" type="checkbox"/>
D029	1,1-DICHLOROETHYLENE	0.7				<input checked="" type="checkbox"/>
D035	METHYL ETHYL KETONE	200.0				<input checked="" type="checkbox"/>
D039	TETRACHLOROETHYLENE	0.7				<input checked="" type="checkbox"/>
D040	TRICHLOROETHYLENE	0.5				<input checked="" type="checkbox"/>
D043	VINYL CHLORIDE	0.2				<input checked="" type="checkbox"/>
SEMI-VOLATILE COMPOUNDS				OTHER CONSTITUENTS		
D023	o-CRESOL	200.0				<input checked="" type="checkbox"/>
D024	m-CRESOL	200.0				<input checked="" type="checkbox"/>
D025	p-CRESOL	200.0				<input checked="" type="checkbox"/>
D026	CRESOL (TOTAL)	200.0				<input checked="" type="checkbox"/>
D027	1,4-DICHLOROBENZENE	7.5				<input checked="" type="checkbox"/>
D030	2,4-D-NITROTOLUENE	0.13				<input checked="" type="checkbox"/>
D032	HEXACHLOROBENZENE	0.13				<input checked="" type="checkbox"/>
D033	HEXACHLOROBUTADIENE	0.5				<input checked="" type="checkbox"/>
D034	HEXACHLOROETHANE	3.0				<input checked="" type="checkbox"/>
D036	NITROBENZENE	2.0				<input checked="" type="checkbox"/>
D037	PENTACHLOROPHENOL	100.0				<input checked="" type="checkbox"/>
D038	PYRIDINE	5.0				<input checked="" type="checkbox"/>
D041	2,4,5-TRICHLOROPHENOL	400.0				<input checked="" type="checkbox"/>
D042	2,4,6-TRICHLOROPHENOL	2.0				<input checked="" type="checkbox"/>
PESTICIDES AND HERBICIDES				OTHER CONSTITUENTS		
D012	ENDRIN	0.02				<input checked="" type="checkbox"/>
D013	LINDANE	0.4				<input checked="" type="checkbox"/>
D014	METHOXYCHLOR	10.0				<input checked="" type="checkbox"/>
D015	TOXAPHENE	0.5				<input checked="" type="checkbox"/>
D016	1,4-D	10.0				<input checked="" type="checkbox"/>
D017	2,4,5-TP (S-LVEX)	1.0				<input checked="" type="checkbox"/>
D020	CHLORDANE	0.03				<input checked="" type="checkbox"/>
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008				<input checked="" type="checkbox"/>
				HOCS		
				<input checked="" type="checkbox"/> NONE		
				< 1000 PPM		
				≥ 1000 PPM		
				PCBs		
				<input checked="" type="checkbox"/> NONE		
				< 50 PPM		
				≥ 50 PPM		
				IF PCBs ARE PRESENT IS THE WASTE REGULATED BY TSCA 40 CFR 7817		
				YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		

ADDITIONAL HAZARDS
 DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?
 YES NO (If yes, explain)

CHOOSE ALL THAT APPLY

<input type="checkbox"/> DEA REGULATED SUBSTANCES	<input type="checkbox"/> EXPLOSIVE	<input type="checkbox"/> FUMING	<input type="checkbox"/> OSHA REGULATED CARCINOGENS
<input type="checkbox"/> POLYMERIZABLE	<input type="checkbox"/> RADIOACTIVE	<input type="checkbox"/> REACTIVE MATERIAL	<input checked="" type="checkbox"/> NONE OF THE ABOVE



F. REGULATORY STATUS

YES NO USEPA HAZARDOUS WASTE?

YES NO DO ANY STATE WASTE CODES APPLY?
Texas Waste Code _____

YES NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?

YES NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
LDR CATEGORY VARIANCE INFO Not subject to LDR

YES NO IS THIS A UNIVERSAL WASTE?

YES NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS VERY SMALL QUANTITY GENERATOR (VSQG) OR A STATE EQUIVALENT DESIGNATION?

YES NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(ii))?

YES NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?

YES NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >= 500 PPM?

YES NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= 3KPA (044 PSIA)?

YES NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 77 KPA (11.2 PSIA)?

YES NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE?

YES NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?
Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)

YES NO IF THIS IS A US EPA HAZARDOUS WASTE DOES THIS WASTE STREAM CONTAIN BENZENE?
YES NO Does the waste stream come from a facility with one of the S.C codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?
YES NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) > 10 Mg/year?
What is the TAB quantity for your facility? _____ Megagram/year (1 Mg = 2,200 lbs)
The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing
Describe the knowledge _____

G. DOT/TDG INFORMATION

DOT/TDG PROPER SHIPPING NAME
NON HAZARDOUS, NON D.O.T. REGULATED

H. TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY OTHER Project Driven work

CONTAINERIZED		BULK LIQUID		<input checked="" type="checkbox"/> BULK SOLID			
CONTAINERS/SHIPMENT		GALLONS/SHIPMENT	0 Min - 0 Max	GAL	SHIPMENT UOM	<input checked="" type="checkbox"/> TON	YARD
STORAGE CAPACITY				TONS/YARDS/SHIPMENT		<u>8.00 Min - 12.00 Max</u>	
PORTABLE TOTE TANK	BULK TANK						
CUBIC YARD BOX	DRUM						
OTHER	DRUM SIZE						

I. SPECIAL REQUEST

COMMENTS OR REQUESTS

GENERATOR'S CERTIFICATION

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge. I will certify that any samples submitted are representative of the actual waste if Clean Harbors discovers a discrepancy during the approval process. Generator grants Clean Harbors the authority to amend the profile as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE Michael Mishano NAME (PRINT) Michael Mishano TITLE Sr. Site/ESH Engineer DATE 6-19-18