BUILDING A BASEMENT MH-D18 SAMPLING REPORT
LOCKHEED MARTIN MIDDLE RIVER COMPLEX
2323 EASTERN BOULEVARD
MIDDLE RIVER, MARYLAND

Prepared for:
Lockheed Martin Corporation

Prepared by:
Tetra Tech, Inc.

May 2021

Revision: 0

Michael Martin, P.G.
Regional Manager

Josh Mullis
Project Scientist

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ACRONYMS AND ABBREVIATIONS

ESH	environment, safety, and health
IDW	investigation-derived waste
LDPE	low-density polyethylene
LMCPI	LMC Properties, Inc.
Lockheed Martin	Lockheed Martin Corporation
µg/L	microgram(s) per liter
MH	manhole
mL	milliliter
MRAS	MRA Systems, Inc.
MRC	Middle River Complex
PPE	personal protective equipment
QA	quality assurance
QC	quality control
Tetra Tech	Tetra Tech, Inc.
TCE	trichloroethene
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

SECTION 1
INTRODUCTION

This report summarizes field activities related to the characterization of water seepage at manhole D18 (MH-D18) in Building A basement at the Middle River Complex (MRC). The sampling was conducted following the protocol described in the approved *Groundwater Leachate Management Block I Flow Testing and Additional Sump Sampling Work Plan* (Tetra Tech, 2018) as well as the *Building A Basement MH-D18 Sampling Letter Work Plan* (Tetra Tech, 2020). The objective of the sampling was to determine if any contamination (primarily chlorinated solvents or hexavalent chromium), possibly resulting from former plating operations formerly located at the southwest end of Building A, are potentially impacting stormwater discharge from the Building A basement storm drain line (Figure 1-1). The activities documented in this report include:

- a description of field procedures and basement conditions at the time of sampling
- sampling of water in Building A basement MH-D18 targeting the six-inch plug observed to be leaking
- laboratory analysis for volatile organic compounds and hexavalent chromium analyses

The information obtained from this investigation is provided to help determine the potential presence of chlorinated solvents and hexavalent chromium (from historical plating operations that occurred in the southern portion of Building A) in the southern branch of the storm drain network in Building A basement. This report is organized into the following sections: (1) Introduction, (2) Site Description and Background, (3) Investigation Approach and Methodology, (4) MH-D18 Sampling Results, and (5) References. Figures are at the end of the report body following Section 5.

SECTION 2
SITE DESCRIPTION AND BACKGROUND

This section presents a brief description of the infrastructure in Building A basement, along with a summary of previous investigations.

2.1 BACKGROUND

An initial site reconnaissance was conducted on March 8, 2019 to investigate the storm drain network and its connection with the sumps in Building A basement (Figure 1-1). This reconnaissance sought to determine storm drain network-to-sump construction, depth, operational condition, and flow observations, and was based on visual inspection only. The storm drain system in Building A basement (that primarily historically serviced floor drains and heater room sumps) includes a southern piping run and a northern piping run that converge at manhole D18 (MH-D18). At MH-D18 the storm drainage flows generally to the west out of the basement area, ultimately discharging to Outfall 002 on Cow Pen Creek. The most notable observations made at MH-D18 during site reconnaissance were that the southern branch of the storm drain line was plugged, and the orientation of sump SP-1 appeared to directly intercept the location where an older storm drain line should have been found (based on historical drawings showing the original building construction). Sump SP-1 was constructed later than the remainder of the Building A basement, and its purpose for installation or construction details are not available in historical records.

Interviews with workers familiar with facility infrastructure did not identify the date or reason why the plug at MH-D18 was placed. This plug is not completely watertight, and physical observation of SP-1 did not definitively indicate an interaction of that sump with the storm drain line. These conditions made it difficult to sample the southern drain line of the storm drain system, and also made it difficult to determine whether the drain line may be transmitting contaminated water from the area around former plating operations farther south in the basement. Therefore, direct sampling at MH-D18 was proposed (Tetra Tech, 2020), and that subsequent sampling is the subject of this report.

SECTION 3
INVESTIGATION APPROACH AND METHODOLOGY

The technical approach used for water sampling is described in this section, as is the field methodology used for these activities. The scope of work associated with the sampling activities included the collection of water seeping from the plug in manhole D18 (MH-D18) to determine the possible presence of chlorinated solvents and hexavalent chromium.

3.1 MOBILIZATION/DEMOBILIZATION

On November 18, 2020, Tetra Tech mobilized the required equipment and supplies to the site for water sample collection. Tetra Tech provided notification to and coordinated access arrangements through Lockheed Martin Security, EMCOR (site maintenance), and MRA Systems, Inc. (MRAS) to gain access to Building A basement. Middle River Complex (MRC) tenants were informed and updated about the field investigation at LMC Properties, Inc. (LMCPI) bi-weekly meetings. The work for this investigation was not intrusive, so did not require executing the standard digging authorization form and risk handling checklist through EMCOR.

3.2 FIELD METHODOLOGY

3.2.1 MH-D18 Visual Inspection

Before water sampling activities began, Tetra Tech visually inspected MH-D18 to assess whether conditions of the manhole had changed since the initial site reconnaissance in 2019. Upon visual inspection, the manhole appeared to be in the same condition as previously observed; with the six-inch plug intact but with water seeping around it; minimal water observed at the base of the manhole. Field work continued as planned based on these observations.

3.2.2 MH-D18 Sampling

On November 18, 2020, Tetra Tech collected one water sample from the base of MH-D18. The water sample was analyzed for volatile organic compounds (VOCs) using SW846 Method 8260C and hexavalent chromium using Method 218.6. The sample was sent to offsite laboratories

(Eurofins TestAmerica, North Canton, Ohio [for VOCs] and Eurofins TestAmerica, Chicago, Illinois [for hexavalent chromium]) for these analyses.

The water sample was collected from the base of the manhole utilizing a peristaltic pump fitted with low-density polyethylene (LDPE) tubing, as initial attempts to collect a grab sample from the base of the seeping plug proved unsuccessful due to the very low volume of seepage. The first attempt to collect a grab sample used a sample container affixed to a pole; the container was lowered into MH-D18 to the base of the structure. However, a sample could not be collected using this method as the level of water in the manhole was too low. The water was therefore collected using a peristaltic pump fitted with low-density polyethylene (LDPE) tubing, which was lowered into the manhole and placed into the water that had seeped from the plug and was at the base of the structure. The sample was collected in this manner from the side of the manhole where the six-inch plug was present. A peristaltic pump was used to pump the water directly into three 40 milliliter vials preserved with hydrochloric acid for VOC analysis. Additional water from MH-D18 was collected for hexavalent chromium, and was passed through an in-line 0.45-micron filter prior to being placed into its plastic sample container, which was pre-preserved with a buffer solution (as required by United States Environmental Protection Agency [USEPA] Method 218.6). The water samples were immediately placed on ice in two separate coolers and prepared for shipment to the laboratories.

No investigation-derived waste (IDW) was generated during this sampling event. Gloves and tubing utilized during the sampling event were placed in a trash bag and disposed as general refuse.

3.3 SAMPLE NOMENCLATURE

The water sample collected during this investigation was identified with a unique sample identification tag consisting of the site location (i.e., MRC for Middle River Complex), followed by the building designation (i.e., "A" for Building A), followed by the sampling location (i.e., MHD18 for manhole D-18) and followed by the date of the sample. The water sample collected from MH-D18 on November 18, 2020 was identified as "MRC-A-MHD18-111820." A trip blank, provided by the laboratory, was labeled as "TB-111820" using the sample date.

3.5 DOCUMENTATION

Sample documentation consisted of chain of custody reports and a matrix-specific sampling log sheet. Information about the manhole water sampling was recorded on a field sheet, and included sample identification, depth of sample, date and time of sampling, and the laboratory analyses to be performed. The field sheet completed for the November 2020 MH-D18 sampling, as well as the signed chain of custodies for transport to the laboratories, are included in Appendix A. The chain-of-custody report is a standardized form summarizing and documenting pertinent sample information, such as sample identification and type, matrix, date and time of collection, preservation, and requested analysis. Sample custody procedures to document sample acquisition and integrity were properly followed. Tetra Tech also generated a Daily Activities Report to summarize the work completed for this sampling event, which is included in Appendix A.

3.6 SAMPLE HANDLING

As stated above, proper custody procedures were followed throughout all phases of sample collection and handling. Chain-of-custody protocols were used throughout sample handling to establish the evidentiary integrity of the water samples. These protocols demonstrate that the water samples were handled and transferred in a manner that would eliminate (or detect) possible tampering. Water sampling containers were released under signature from the laboratories and were accepted under signature by the sampler or individual responsible for maintaining custody until the sample containers were transferred to the sampling team.

Sample containers were released under signature from the sampling team and were accepted under signature by the laboratories. Transport containers returning to the laboratories were sealed with strapping tape and a tamper-resistant custody seal. The custody seal included the signature of the individual releasing the transport container, along with the date and time.

3.7 LABORATORY ANALYSIS AND DATA VALIDATION

Tetra Tech collected water samples from one location (MH-D18) in the northern portion of Building A basement. In addition, one quality control sample (a trip blank only for VOCs) was provided by the laboratory and sent along with the VOC sample for laboratory analysis. Tetra Tech used two laboratories accredited in the State of Maryland (Eurofins TestAmerica, North Canton,

Ohio and Eurofins TestAmerica, Chicago, Illinois) for the sample analyses. Water samples collected from the manhole were analyzed for the following parameters:

- VOCs by SW846 Method 8260C (Eurofins TestAmerica, Canton)
- hexavalent chromium by USEPA Method 218.6 (Eurofins TestAmerica, Chicago)

Samples for each analytical parameter were placed in a cooler containing ice immediately upon collection. One aqueous trip blank was placed in the cooler used to store and ship the VOC samples before samples were collected; the trip blank accompanied the VOC samples throughout the day and was sent along with the samples to the laboratory. The trip blank was also analyzed for VOCs by SW846 Method 8260C. No other quality assurance/quality control (QA/QC) samples were collected. Samples were analyzed on a standard turnaround of 21 calendar days.

Following receipt of the water analytical data, data were validated by an independent chemist in accordance with USEPA Region 3 protocols. Chemical data were supplied by the laboratories as hard-copy reports and electronic databases. All data were validated for all QA/QC parameters, including laboratory QA/QC and accuracy, precision, completeness, and comparability, in accordance with USEPA guidance. This review is based on the *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA, 2017b) and the *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA, 2017a), and the specifics of the analytical method used. The data validation report, including complete chain of custody documentation, are in Appendix B.

Collectively, these data are acceptable for their intended use. For this validation, the following data qualifiers (i.e., flags) were applied to the chemical results presented in this report, and appear on the chemical results tables in Section 4 and Appendix B:

U The analyte is considered not detected at the reported value.

J The analyte is considered present in the sample, but the concentration value is estimated and might not be accurate or precise.

UJ The analyte was not detected; however, the quantitation or detection limit may be inaccurate or imprecise.

SECTION 4
MH-D18 SAMPLING RESULTS

This section presents the results of the water sampling activities at manhole D18 (MH-D18) in the Block I Building A basement at the Middle River Complex (MRC) located in Middle River, Maryland. Validated data reports, as well as full analytical laboratory reports, are included as Appendix B.

Trichloroethene (TCE) was the only volatile organic compound detected in the MH-D18 water sample, at an estimated trace concentration of 0.13*J* micrograms per liter (µg/L). In addition, hexavalent chromium was detected in the MH-D18 sample, also at a low concentration (1.7 µg/L). These concentrations are below applicable screening criteria including ambient water quality criteria, maximum contaminant levels, and swimming criteria developed for use in Dark Head Cove.

SECTION 5
REFERENCES

Lockheed Martin Corporation, 2016. *Remediation Contractor's ESH Handbook, Revision 2*, effective May 1.

Tetra Tech, Inc. (Tetra Tech), 2018. *Groundwater Leachate Management Block I Flow Testing and Additional Sump Sampling Work Plan*, Middle River Complex, Lockheed Martin Middle River Complex, 2323 Eastern Boulevard Middle River, Maryland. Prepared by Tetra Tech, Inc., Germantown, Maryland for Lockheed Martin Corporation, Bethesda, Maryland. March.

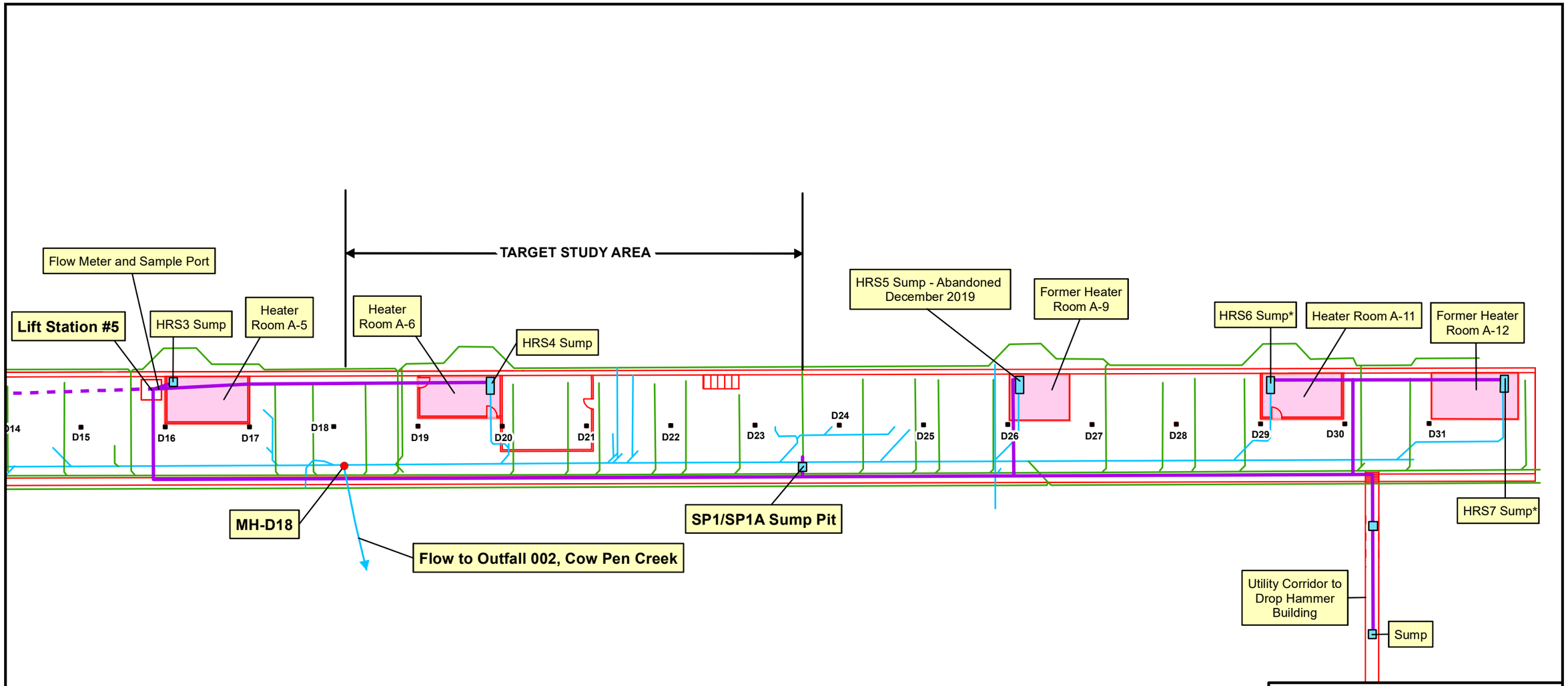
Tetra Tech, Inc. (Tetra Tech), 2020. *Building A Basement MH-D18 Sampling Letter Work Plan*, Middle River Complex, Lockheed Martin Middle River Complex, 2323 Eastern Boulevard Middle River, Maryland. Prepared by Tetra Tech, Inc., Germantown, Maryland for Lockheed Martin Corporation, Bethesda, Maryland. October.

United States Environmental Protection Agency (USEPA), 2017a. *National Functional Guidelines for Inorganic Superfund Methods Data Review.* January.

United States Environmental Protection Agency (USEPA), 2017b. *National Functional Guidelines for Organic Superfund Methods Data Review*. January.

FIGURES

Figure 1-1 Building A Basement MH-D18 Target Study Area



LEGEND

- BASEMENT INTERIOR LAYOUT
- SUMP
- STORM DRAIN LID
- BASEMENT COLUMN
- DRAIN TILE
- STORM SEWER
- SUMP DISCHARGE PIPING
- SUMP DISCHARGE PIPING, ESTIMATED (UNDERGROUND)
- HEATER ROOM FOOTPRINTS

*HRS6 and HRS7 Sumps were abandoned in November 2020

FIGURE 1-1

BUILDING A BASEMENT
MH-D18 TARGET STUDY AREA

Lockheed Martin Middle River Complex
Middle River, Maryland

0 15 30 Feet

DATE MODIFIED: 2/9/21

CREATED BY: JAM

TETRA TECH

Map Document: (P:\GIS\Middle_River\MapDocs\MXD\bldg_a_basement_mh-d18_study_area_dec2019.mxd)
03/30/20 -- PFO

APPENDICES

Appendix A—MH-D18 Water Sample Log Sheets and Daily Activities Report

Appendix B—Full Analytical and Data Validation Reports

APPENDIX A—MH-D18 WATER SAMPLE LOG SHEETS AND DAILY ACTIVITIES REPORT

APPENDIX B—FULL ANALYTICAL AND DATA VALIDATION REPORTS