TETRA TECH EM INC.

Donna Davies
START Back-up Point of Contact

April 13, 2010

Mr. Dominic Ventura (3HS32)
On-Scene Coordinator
U.S. Environmental Protection Agency Region 3
1650 Arch Street
Philadelphia, PA 19103

Subject: **Final After Action Letter Report for the Chesapeake Products Site**
December 2009 – February 2010 Removal Action
EPA Contract No. EP-S3-05-02
Technical Direction Document No. E43-026-09-11-002
Document Tracking No. 0973

Dear Mr. Ventura:

Tetra Tech EM Inc. (Tetra Tech) is submitting the final after action letter report for the Chesapeake Products site summarizing removal action activities conducted from December 2009 to February 2010. .

If you have any questions regarding this report, please contact me at (215) 669-0069.

Sincerely,

Donna Davies
START Back-up Point of Contact

Enclosure

cc: TDD File

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FINAL AFTER ACTION LETTER REPORT
CHESAPEAKE PRODUCTS
NOVEMBER 2009 – FEBRUARY 2010
REMOVAL ACTION
CHESAPEAKE, VIRGINIA

Prepared for

U.S. Environmental Protection Agency Region 3
1650 Arch Street
Philadelphia, PA 19103

Submitted by

Tetra Tech EM Inc.
7 Creek Parkway
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Boothwyn, PA 19061

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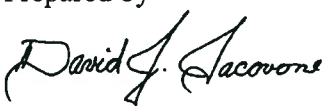

David J. Iacovone
Chemist

Approved by

Donna Davies
START Backup Point of Contact

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FIGURES

1.0 INTRODUCTION

Under Eastern Area Superfund Technical Assessment and Response Team (START) Contract EP-S3-05-02, Technical Direction Document (TDD) No. E43-26-09-11-002, U.S. Environmental Protection Agency (EPA) Region 3 tasked Tetra Tech EM Inc. (Tetra Tech) with conducting removal support at the Chesapeake Products site in Chesapeake, VA. As part of removal support activities, Tetra Tech conducted air monitoring, soil screening, documentation of site activities, monitoring of site safety, and providing photographic documentation of site activities.

This after action letter report provides site background information in Section 2.0, describes site activities in Section 3.0, and provides a report summary in Section 4.0. All references cited in this report are listed after the text. In addition, Appendix A contains a copy of Tetra Tech's field logbook notes, Appendix B contains the photographic log, Appendix C contains the Sampling, Screening, and Analysis Plan and Appendix D contains the analysis of remediation options.

2.0 BACKGROUND

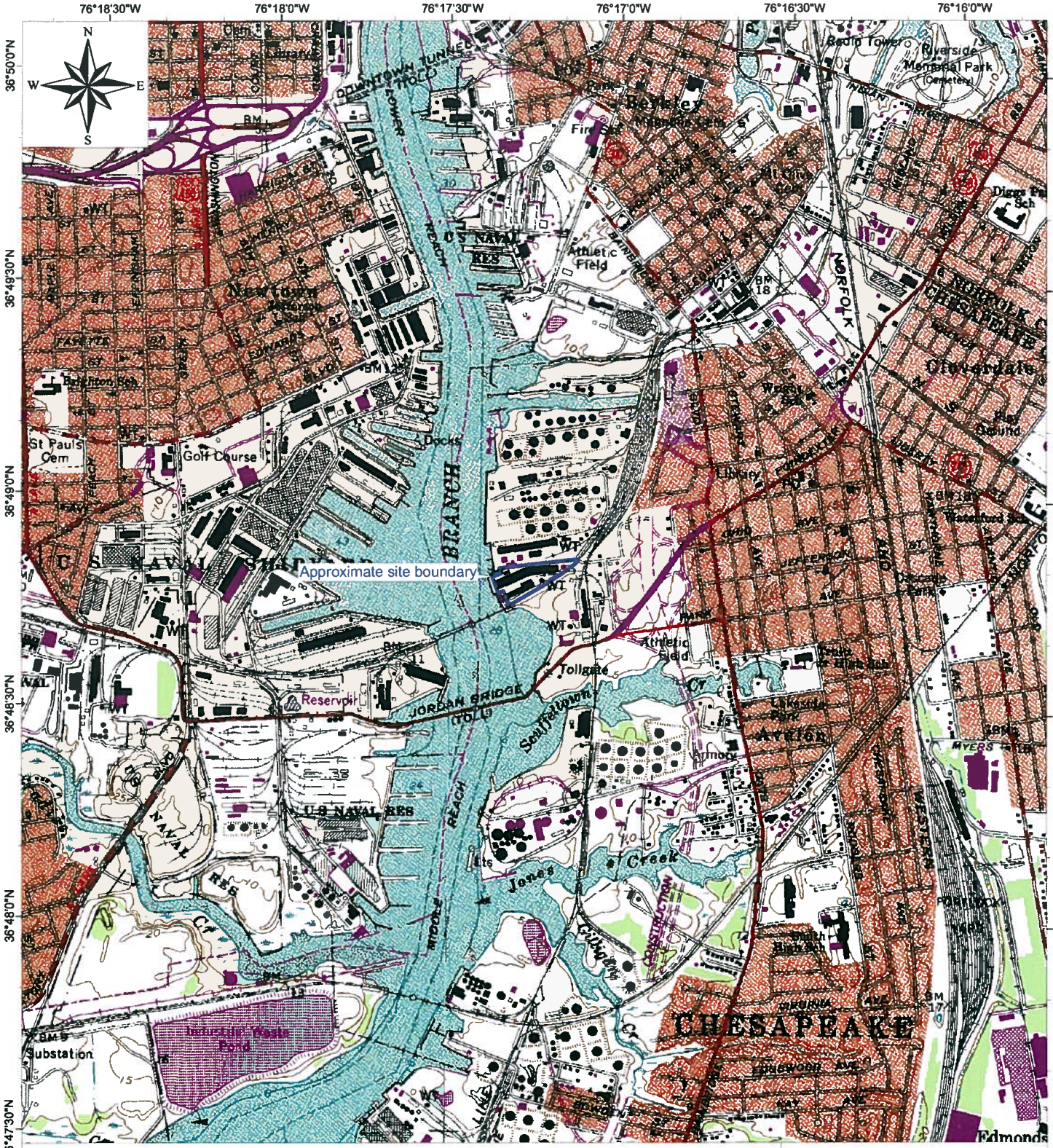
This section describes the site location, presents a description of the site, and summarizes the site's history.

2.1 SITE LOCATION

The Chesapeake Products site is located at 1331 Priority Lane in Chesapeake, Virginia, as shown in Figure 1, Site Location Map. The geographic coordinates for the approximate center of the site are 36.81354444 degrees north latitude and 76.28838333 degrees west longitude. The site is geographically triangular and is bordered to the north by Titan America Concrete, to the east and south by railroad lines, and to the west by the Elizabeth River.

2.2 SITE DESCRIPTION

The Chesapeake Products site is a former micronutrient production and storage facility. All buildings at the facility were razed in 2008. The only structures that remained at the site, prior to the commencement of cleanup operations, were the concrete foundations. The front entrance of

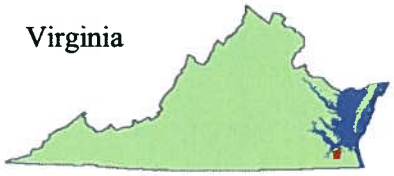


Source: Modified from USGS 7.5-Minute Series Topographic Quadrangle; Norfolk South, Virginia, 1965, Photorevised 1986

0 0.25 0.5 Miles

Quadrangle Location =

Virginia



Chesapeake Products Site
Chesapeake, Virginia

Figure 1
Site Location Map

TDD No. E43-026-09-11-002
EPA Contract No. EP-S3-05-02

Map created on July 12, 2009
by D. Call, Tetra Tech EM Inc.

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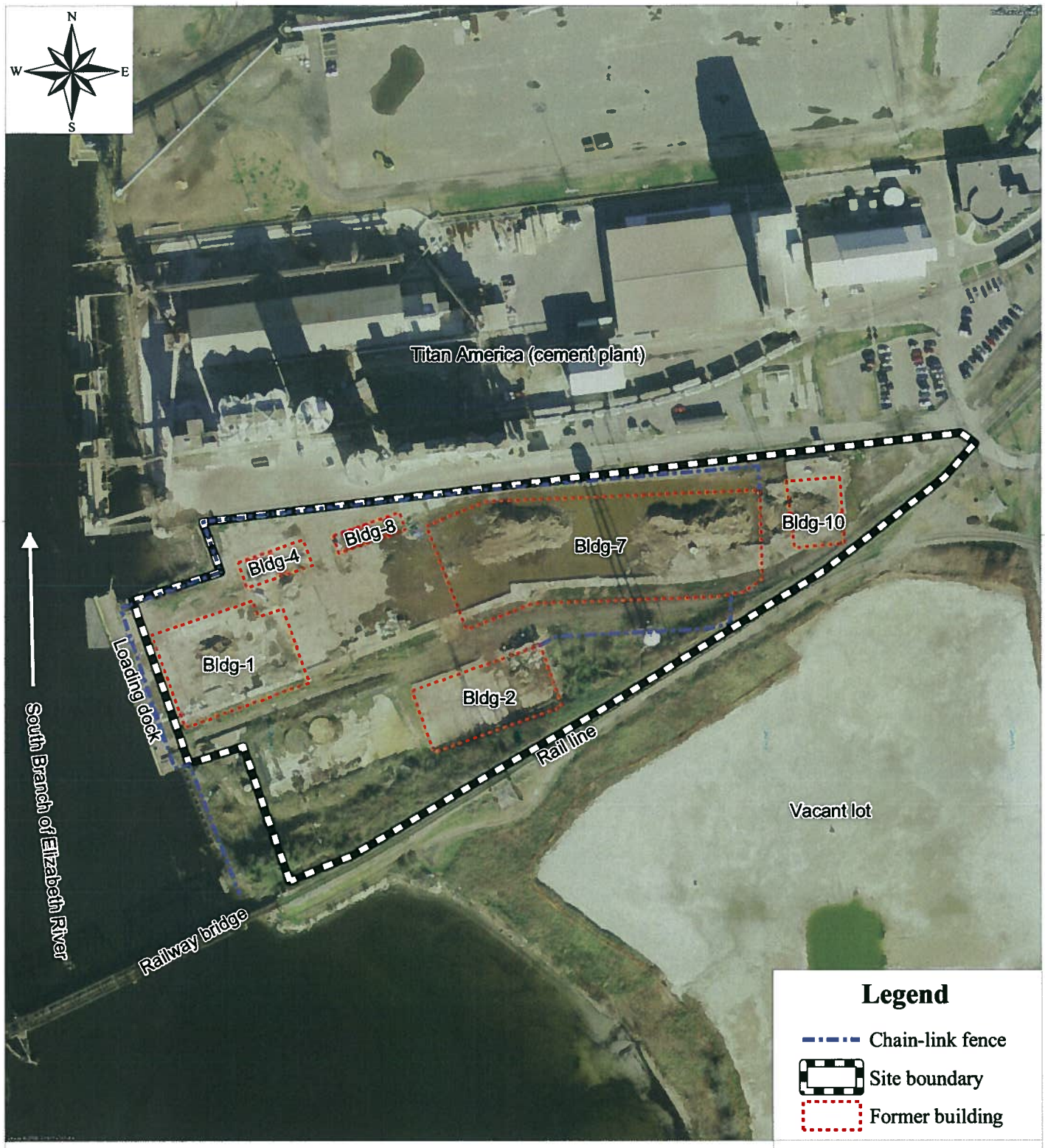
the facility is located on Priority Lane. The facility consists of several concrete pads, a central access road, and two rail lines (Figure 2, Site Layout Map).

2.3 PREVIOUS INVESTIGATIONS

In January 2003, Bay Environmental performed a combined Phase I and Phase II investigation of the Chesapeake Products facility on behalf of the Titan America Corporation. Upon completion of the investigation, Bay Environmental prepared an Environmental Site Assessment (ESA) report with their findings from the investigation activities in February 2003. The results indicated environmental contamination of soil and groundwater at the site. The pH levels of the groundwater were determined to be acidic and below the Virginia Department of Environmental Quality (VADEQ) groundwater pH standards of 6.5 to 9.0. The lowest reported pH was 3.5, recorded near a former sulfuric acid storage tank area. In addition to the acidic groundwater, the ESA also indicated the presence of nitrates, phosphorus, diesel range organic (DRO) compounds, arsenic, and lead in subsurface soils at levels exceeding VADEQ reporting limits. The conclusion of the ESA was that the presence of lead in soil and groundwater was the greatest concern at the site.

In April 2005, EPA and Tetra Tech performed a removal site assessment at Chesapeake Products. Ten surface soil samples and 20 waste pile samples were collected from various areas throughout the site and analyzed for RCRA metals, pesticides, and polychlorinated biphenyls (PCBs). The assessment identified contaminants of concern, including heavy metals, PCBs, and various pesticides.

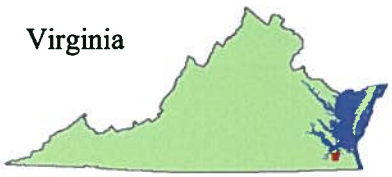
EPA conducted a multi-media removal assessment of the Chesapeake Products facility from July 20-22, 2009, for the purpose of determining the lateral extent of heavy metal contamination, primarily lead, in the surface soils at the site and to determine whether hazardous substances were present in the groundwater beneath the site. Tetra Tech collected 41 surface soil samples and screened 35 of those samples for lead contamination using a portable x-ray fluorescence (XRF) analyzer. In 19 of the samples, lead was measured at a concentration greater than 800 milligrams per kilogram (mg/kg), EPA's regional screening level (RSL) for industrial soils. Additionally, Tetra Tech collected four subsurface soil samples from three soil borings and screened those samples for lead using the XRF analyzer. In two of the four samples screened



Source: Modified from DigitalGlobe aerial photography, January 1, 2009.

Approximate Site Location = ■

Virginia



Chesapeake Products Site
Chesapeake, Virginia

Figure 2
Site Layout Map

TDD No. E43-026-09-11-002
EPA Contract No. EP-S3-05-02

Map created on July 12, 2009
by D. Call, Tetra Tech EM Inc.

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lead was measured at concentrations greater than the EPA's industrial soil RSL. One sample, collected at a depth of 2-4 feet below ground surface (bgs), had a lead concentration of 10,681 mg/kg. Tetra Tech submitted confirmation soil samples to a laboratory to determine the accuracy of the XRF results. Of the 18 soils samples submitted to the lab, eight samples had higher lead concentrations in the laboratory analyzed samples than compared to the XRF screening results.

Based on the results of the removal assessment an EPA removal action was initiated. The purpose of the removal action was to reduce the threat to human health from direct contact with contaminated surface soil and to reduce the potential for surface contamination to migrate into the Elizabeth River and on to adjacent properties. To meet the objectives of the removal action, EPA determined that surface soil at the site containing lead at concentrations greater than 800 parts per million (ppm) should be removed and replaced with clean fill. EPA used 800 ppm as the cleanup level as it is EPA's regional screening level (RSL) for lead in industrial soil as well as Virginia's Voluntary Remediation Program's (VRP) screening level. The depth of excavation on site was limited to 2 feet. This depth was determined based on the shallow depth of groundwater at the site and in order to limit the quantity of soil requiring off site disposal.

3.0 SITE ACTIVITIES

This section presents a chronological discussion of removal action activities conducted during the period of December 2009 through February 2010. On-site activities were documented in a site logbook (field logbook notes are included in Appendix A) and through photographic documentation (Photographic Documentation Log, Appendix B).

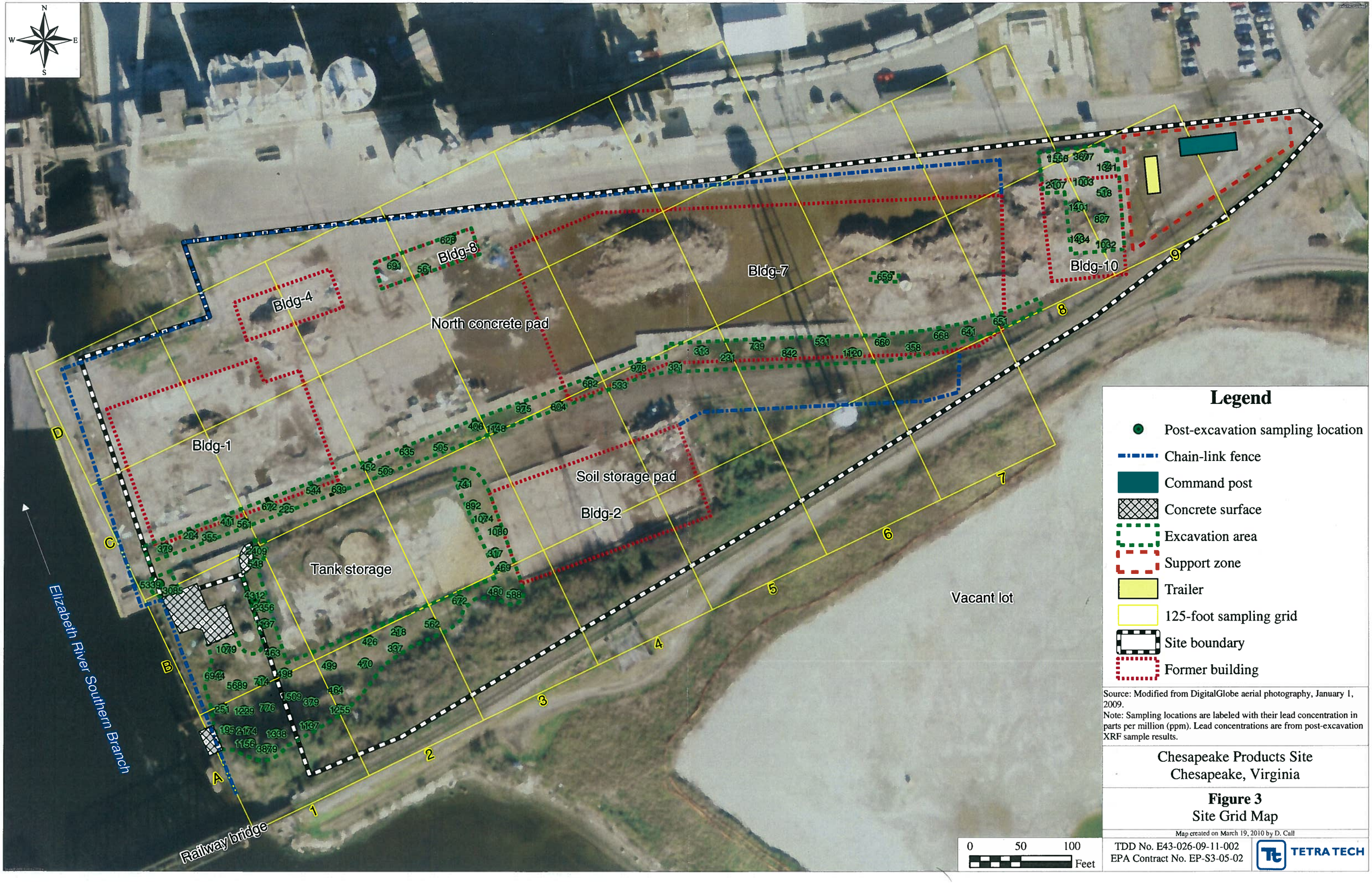
3.1 DECEMBER 2009

On Monday, December 7, 2009, the Emergency Rapid Response Services (ERRS) contractor, START, and EPA Region 3 mobilized to the site. A support zone had been set up by ERRS personnel, prior to mobilization, at the east end of the facility on Priority Lane. The support zone consisted of an ERRS equipment trailer and a Command Post trailer. From December 7 to December 11, 2009, ERRS completed site activities in preparation for the commencement of excavation operations at the site. These activities included organization of the support zone (staging area, command post, etc.), extension of previous site fencing to encompass the support

zone, installation of gates to limit site access, installation of utilities, and preparation of the soil staging pad for the eventual stockpiling of excavated site soils. Sanitation facilities were also delivered prior to mobilization to the site. During this time period, ERRS personnel worked on improving site drainage due to the amount of standing water as a result of heavy precipitation in the area. Silt fence was installed in areas along the central access road to limit the migration of soil/sediment in the water. During this time, START personnel began developing a draft Screening, Sampling, and Analysis Plan (SSAP) (Appendix C) in preparation for the upcoming excavation activities. The SSAP was finalized on December 29, 2010.

On December 10-11, START began screening the area along the central access road with an XRF analyzer in order to determine lead and arsenic concentrations in the soil. Initially, the eastern end of the central access road was evaluated as it was planned to begin excavation of soils with the area between the north concrete pad and the central access road. However, this plan was changed per the EPA On Scene Coordinator (OSC) due to the presence of standing water which would make screening, as well as excavation, difficult. Screening of surface soils was moved to the southwest corner of the site along the Elizabeth River. By the afternoon of December 11th, START had accumulated enough data to identify which areas should be excavated. The criterion used to determine which areas would be excavated was the EPA industrial soil RSL and VRP screening level for lead of 800 ppm.

On December 11th, ERRS began excavating soil from the southwest corner of the site, just south of the central access road. In order to make identification of work areas easier, a gridded map (Figure 3) was developed and posted in the command post. This map was also utilized to track progress. Excavation began in grid square C-1. Soil was excavated to a depth of approximately two feet and then screened with the XRF to identify lead concentrations. XRF readings post excavation were still in excess of 800 ppm in some areas. Figure 3 shows areas that were excavated as well as post excavation XRF results.



Legend

- Post-excavation sampling location
- Chain-link fence
- Command post
- Concrete surface
- Excavation area
- Support zone
- Trailer
- 125-foot sampling grid
- Site boundary
- Former building

Source: Modified from DigitalGlobe aerial photography, January 1, 2009.

Note: Sampling locations are labeled with their lead concentration in parts per million (ppm). Lead concentrations are from post-excavation XRF sample results.

0 50 100 Feet

Chesapeake Products Site
Chesapeake, Virginia

Figure 3
Site Grid Map

Map created on March 19, 2010 by D. Call

TDD No. E43-026-09-11-002
EPA Contract No. EP-S3-05-02

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During excavation operations, a DataRAM 4 and two PDR 1500 aerosol monitors were utilized to measure dust emissions as a result of excavation operations. When possible, one monitor was placed upwind of excavation operations, one was placed downwind, and the other would be placed in the cab of the excavator or front-end loader. Data would be collected during operations, downloaded at the end of the day, and then evaluated to determine whether emissions exceeded the action limit. The action limit for the site was set at 0.025 mg/m^3, which is half of the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) of 0.05 mg/m^3. Utilizing the highest known concentration of lead detected in the soils, it was possible to determine the approximate lead concentration in the airborne dust at any given time. At no time during the excavation of the southwest area, or any other area of the site, did the concentration of airborne lead exceed the established action limit.

The excavation of the contaminated soils was performed with a tracked excavator, or backhoe if necessary, and the soils were then transferred to a front-end load for transport to the soil storage pad, located at the foundation of former Building 2 where it was stockpiled. In preparation for the staging of the excavated soil, straw bales were placed around the pad to limit the migration of contamination as a result of runoff.

Excavation operations in the southwest area progressed in the following order: grids C-1, B-1, A-1, A-2, A-3, and finally B-3. These areas were completed by December 21, 2009. All of the lead contaminated soils excavated from these areas were transported to the soil storage pad and consolidated as Stockpile #1. Stockpile #1 was covered with polyethylene sheeting which was anchored by hay bales or other available heavy items. Composite samples of the stockpile were collected and sent off for analysis and disposal profiling.

On December 21, 2010, ERRS began excavating the soil in the area between the central access road and the north concrete pad at grid C-1. Upon moving further east (towards grid C-2), ERRS came into contact with the two rail lines that ran alongside the north concrete pad. This area proved to be more difficult to excavate because of the presence of two rail lines. In many cases, the extent of lead contamination went below the rails and railroad ties. In order to facilitate the removal of the contaminated soil, the rails and railroad ties were removed. The rails were pulled up and staged on the north concrete pad. The railroad ties were staged in a pile on the soil storage pad. The soils excavated from the area between the north concrete pad and central

access road were staged separately (Stockpile #2) from the soils excavated from the southwest portion of the site (Stockpile #1)

Another issue encountered in this area was the lower elevation of the surface as compared to the rest of the site, especially the north concrete pad. Water would accumulate if appropriate drainage conditions were not maintained. This created a problem with the possibility of sediment-laden waters migrating off-site from an outlet, at the west end of the north concrete pad, to the Elizabeth River. A filter of hay bales and silt fence was installed just in front of the outlet to alleviate this problem. Also, accumulated site waters were often pumped through a geotextile filter bag, known as a "Dirtbag". The bag works by pumping sediment laden water into the bag which allows water to filter out through the fabric (like a sieve), thus trapping the sediment.

On December 21, 2009, a START engineer was mobilized to the site to assess the exposed bank on the Elizabeth River. After assessing the condition of the bank, the START engineer developed options and methods for stabilizing the bank which, would be conducted by ERRS personnel. The EPA OSC would evaluate the options to determine which would be placed into effect. START submitted a letter report for the analysis of the remediation options (Appendix D) on January 11, 2010.

On December 23, 2009, site personnel began preparations to secure the site for the holidays. Those preparations were completed by the end of the day. On December 24th, EPA, ERRS, and START demobilized from the site

3.2 JANUARY 2010

On January 5th, 2010, EPA, ERRS, and START re-mobilized to the site. Upon return to the site, ERRS immediately resumed removal of the rail lines south of the north concrete pad. By January 7, 2010, the removal of the rail lines and railroad ties was complete and ERRS resumed excavating the soil. Excavation of the soil south of the north concrete pad started at grid C-1, moving easterly to grids C-2, C-3, C-4, and then B-4. ERRS personnel then moved to the east end of the site and resumed the excavation of soil between the central access road and north concrete pad starting at grid B-7, and moving west to grids B-6, B-5, B-4, and finally C-4. The excavated soil was transferred to the soil storage pad for inclusion in Stockpile #2. During this

operation, it was necessary to dig a trench adjacent to the wall of the north concrete pad to promote drainage of water from the area. Once again, poor weather conditions contributed to the accumulation of standing water making excavation operations difficult.

On January 11, 2010 the first load of backfill material arrived at the site. Initially, the backfill was utilized to build a vehicle ramp to the top of the north concrete pad. The ramp would provide vehicle access to the top of the pad for the eventual excavation of lead contaminated soils/solids identified in various areas around the pad. The backfilling of excavated areas in the southwest area of the site began on January 12, 2010, while the excavation of the soil between the central access road and north concrete pad were ongoing. The excavation of the area between the north concrete pad and central access road were completed on January 13, 2010. On that same day, ERRS excavated contaminated soil out of the former location of Building 8. This was the only area at the north boundary of the north concrete pad that was identified by the XRF as having lead concentrations above the RSL of 800 ppm.

On January 13, 2010, an investigation of the material lying underneath the east concrete pad (former location of Building 10) began. During the previously conducted site assessment and prior to the investigation, a black granular material was noted in a gap in the concrete wall. XRF screening of the black granular material indicated the presence of high concentrations of heavy metals, including lead at a concentration ranging from 4,000-9,000 ppm. An excavator was utilized to peel back the concrete surface of the concrete pad so that it could be determined if the material was beneath the remaining portions of the east concrete pad. Screening of the solids underneath indicated that high concentrations of lead were present throughout these materials. The black granular material was consistent throughout all areas of the east concrete pad and would have to be removed (excavated) and transferred to the soil storage pad. This material was staged separately from the other two soil stockpiles and would be Stockpile #3. On January 18, 2010 the removal and transfer of this material to the soil storage pad was complete. The walls of the foundation of the east concrete pad were pressure washed to remove residual contamination.

In addition, a small area of lead contaminated solid protruding from a side wall of the north concrete pad was also removed on January 18, 2010. An investigation of this area indicated that the material did not extend under the adjacent concrete surfaces.

Starting on January 20, 2010, the concrete from the surface of the east concrete pad was loaded and shipped Meeks Disposal Corporation, in Chesapeake, VA. Thirteen truckloads (a total of 190.52 tons) of broken up concrete was sent for recycling. This operation was completed on January 28, 2010.

Site personnel were scheduled for demobilization for January 22, 2010, however, poor weather in the area and the accumulation of large amounts of standing water resulted in the demobilization being advanced to January 21, 2010. Remobilization to the site was scheduled for January 25, 2010, however, conditions at the site resulted in postponement to January 26, 2010. EPA, ERRS, and START returned to the site on that day.

On January 27, 2010, ERRS began the exposed river bank stabilization operation. Backfill was placed against the bank to create and even surface. Following the smoothing of the bank, ERRS then excavated a trench at the base of the bank during low tide. Geotextile fabric was then placed in the trench and along the bank and stapled into place. Riprap was then placed in the trench and up the bank. These operations were scheduled to coincide with low tide conditions for the Elizabeth River. This operation was completed on January 27, 2010.

Backfilling operations continued at the site for the remainder of January 2010. On January 30-31, 2010 the site received heavy snowfall (approximately one foot) and resulted in a temporary suspension of operations until the snow could be removed and conditions at the site improved.

3.3 FEBRUARY 2010

On February 1, 2010, ERRS personnel began scraping the concrete surfaces of the north concrete pad to remove as much solid/sediment as possible. These scrapings were consolidated and staged atop the north concrete pad. The piles contained a large amount of slush, so they were allowed to remain uncovered in order to allow the water to evaporate off, reducing the size of the pile.

On February 2, 2010, ERRS personnel began to reinforce the central access road in order to facilitate the upcoming loadout of the contaminated site soils. This road would be heavily used by dump trucks arriving on site to pick up the contaminated soils and transport them to an authorized landfill. ERRS personnel placed geotextile fabric on the road and then covered it

with several truckloads of stone to build a firm surface. The reinforcement of the road was completed on February 3, 2010, at which time the dump trucks for the soil loadout operation began arriving on site. Starting with Stockpile #2, the soil was loaded into the dump trucks by the tracked excavator. The soil was moved to the excavator from the pile by front-end loader, in order to minimize traffic on the soil storage pad and increase the efficiency of the loading of the trucks. The last load of contaminated soil left the site on February 25, 2010. In all, a total of 201 loads of lead contaminated soil (4,412.27 tons) were sent to the Waste Management Bethel located in Hampton, VA.

During the loadout operation, other activities were conducted on site for personnel not immediately needed for the loadout. On February 11, 2010, repairs were begun on the chain link fence on the west side of the site that had become damaged. Several of the vertical poles had either broken off at their base or had stripped the bolts of the base from the concrete that they were set in and one pole had been damaged when it was backed into by an excavator. New poles were installed and cemented into place and the old poles were secured to them. The damaged pole was adjusted and re-anchored with fresh concrete. These repairs were completed by February 13, 2010.

On February 13, 2010, ERRS personnel began de-watering the north concrete pad and scraping the surface to remove residual solids/sediments. This operation was completed on February 18, 2010. Low lying areas on the concrete pad were backfilled to a surface level even with the rest of the pad. XRF screening was conducted to ensure that no areas exceeded EPA's industrial soil RSL established for lead of 800 ppm.

On February 24, 2010, the contaminated railroad ties were loaded onto trucks for shipment to the King & Queen Landfill, in Little Plymouth, VA. A total of six truckloads (83.54 tons) of railroad ties were shipped as Weathered Railroad Ties. This task was competed on February 25, 2010. On February 25, 2010, ERRS personnel began securing equipment for demobilization and START personnel packed up equipment, including instruments to be returned to the EPA Continuity of Operations (COOP) facility, for final demobilization on February 26, 2010.

4.0 SUMMARY

Tetra Tech conducted air monitoring, soil screening, and written documentation in support of ERRS contractor removal activities at the Chesapeake Products site during the period of December 6, 2009, through February 26, 2010. Daily activities were recorded in the site logbook (Appendix A). Photographic documentation of site activities is presented in the Photographic Documentation Log (Appendix B).

Air monitoring for dusts was conducted during any operation involving the excavation, loading or scraping of solids, soils and sediments. The Data RAM 4 and the two PDR-1500 aerosol monitors were zeroed prior to use and the collected data was downloaded at the end of each day. The data was summarized and posted on the wall of the command past for the benefit of the on-site personnel.

XRF screening was performed by Tetra Tech to identify areas for excavation and to document concentrations following excavation. The XRF underwent a daily calibration check and standards were also analyzed on a daily basis to ensure that the XRF was in proper working order.

Attached to this letter report is a compact diskette that contains the following information:

- Raw photographs
- Disposal logs
- XRF calibration and standards analysis records
- Data RAM 4 and PDR-1500 dust monitoring data
- Electronic file of map containing XRF data of excavated areas

REFERENCES

Tetra Tech. 2006b. "Quality Assurance and Project Plan (QAPP) for START." November.

U.S. Geological Survey (USGS). 1981. 7.5-Minute Series Topographic Map of Frankford, Pennsylvania, Quadrangle. Revised 1984