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July 21, 2017

Scott Hooton
Port of Tacoma
One Sitcum Plaza
Tacoma, WA 98421

Kim Seely
Coastline Law Group
4015 Ruston Way, Suite 200
Tacoma, WA 98402

Subject: Privileged and Confidential Attorney Work Product
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Dear Mr. Hooton and Ms. Seely:

PIONEER Technologies Corporation is submitting an electronic final copy of the aforementioned report for your use. The March 2017 version of the report was revised based on comments provided by the Port of Tacoma and Coastline Law Group. This report allocates remedial action costs for the arsenic and lead impacts in the North Boundary Area (NBA) based on a lines-of-evidence evaluation. A comprehensive and detailed evaluation was necessary in large part because of CDM Smith's frequent re-interpretations about the nature of arsenic and lead impacts within the NBA and on the former United States Gypsum Corporation (USG) Property near the NBA. For example, after seven years of contentious revisions to the Supplemental Remedial Investigation (RI) Report for the USG Property, the Washington State Department of Ecology (Ecology) recently re-wrote a significant portion of the Supplemental RI Report text, including text related to CDM Smith's latest NBA-related interpretations. When providing the revised Supplemental RI Report text in a September 6, 2016 email, the Ecology project manager explained that Ecology's edits "were not meant to be negotiable or further edited, because Ecology doesn't think it is productive to spend more time with further back and forth over language for this report. Therefore, I did not approve of any of the changes to the text that I provided on 7/14." If you have questions about the Cost Allocation Report that you would like to discuss, please do not hesitate to contact me at (360) 570-1700.

Respectfully,

Troy Bussey, Jr., P.E. (WA, CA, NC, SC), L.G. (WA, CA, NC, SC), L.HG. (WA)
Principal Engineer

Enclosures:
Cost Allocation Report

cc: Rob Healy, Port of Tacoma (electronic copy only)
Terri Bowers, Gradient Corporation (electronic copy only)

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Cost Allocation Report

North Boundary Area of the Former Arkema Manufacturing Site

USG Property: Agreed Order No. DE 3405

Arkema Site: Agreed Order No. DE 5668

Prepared for:

Port of Tacoma

One Sitcum Plaza
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Phone: 253.383.5841

Prepared by:

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July 2017

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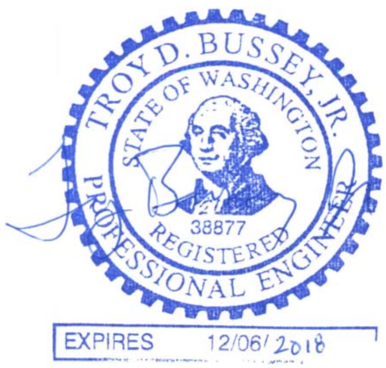
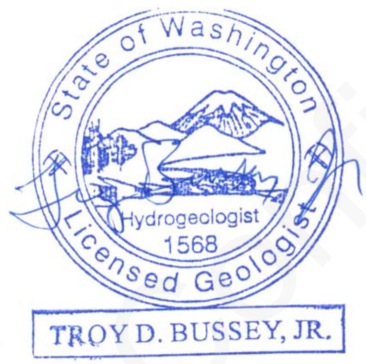
Professional Certification

This document was prepared under my direction. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that I was in responsible charge of the work performed for this document.





July 21, 2017

Date

Troy D. Bussey Jr.
Principal Engineer
PIONEER Technologies Corporation
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Executive Summary

It has not been determined to what extent the liable parties for the former United States Gypsum Corporation (USG) Property (USG Property) and the former Arkema Manufacturing Site (Arkema Site) are responsible for arsenic and lead concentrations exceeding cleanup levels in the North Boundary Area (NBA) of the Arkema Site. Arsenic and lead are the primary constituents of potential concern in the NBA and will be the constituent drivers for the NBA remedy. The arsenic and lead exceedances are concentrated in the northwest portion of the NBA adjacent to the USG Property. USG predecessors, USG, and a USG successor operated a rock wool mineral fiber (fiber) manufacturing facility on the USG Property from the early 1940s through 2002. Arkema predecessors operated a chloro-alkali chemical manufacturing facility on the Arkema Site from circa 1927 to 1997.

The purpose of this Cost Allocation Report (Report) is to (1) present the results of a lines-of-evidence evaluation that was conducted to determine the extent to which the liable parties for the USG Property and the Arkema Site are responsible for the arsenic and lead impacts in the NBA, and (2) allocate the NBA remedial action costs between the liable parties for the USG Property and the Arkema Site accordingly. The lines of evidence evaluated in this Report include:

- Manufacturing Operations
- Waste Management
- Potential Sources
- Potential Transport
- Forensics

As shown in the following table, each individual line of evidence concludes that the arsenic and lead impacts in the NBA are most likely attributable to the USG Property.

Line of Evidence	Evaluated	Rationale	Summary of Results	Liable Party
Manufacturing Operations	The nature and location of USG and Arkema historical manufacturing operations and features within and adjacent to the NBA	Historical manufacturing operations and features indicate the nature of wastes that could have been released to the NBA	USG manufacturing produced large quantities of wastes containing significantly elevated concentrations of both arsenic and lead adjacent to the primary impacted portions of the NBA. It is unlikely that Arkema manufacturing (inside or outside the NBA) produced arsenic- and lead-impacted wastes that were released to the NBA.	USG
Waste Management	The nature and location of USG and Arkema historical waste management activities within and adjacent to the NBA	Waste management activities indicate how wastes containing arsenic and lead could have been released to the NBA	USG stockpiled waste, used waste as fill, and emitted airborne wastes containing elevated arsenic and lead concentrations adjacent to the primary impacted portion of the NBA. It is unlikely that Arkema waste management activities (inside or outside of the NBA) caused a release of arsenic or lead in the NBA.	USG

Line of Evidence	Evaluated	Rationale	Summary of Results	Liable Party
Potential Sources	Arsenic and lead concentrations in potential USG and Arkema sources within and adjacent to the NBA	Arsenic and lead concentrations associated with the potential sources indicate where arsenic and lead were released to the NBA	A plume of arsenic and lead contamination appears to be emanating from the USG Property onto the NBA. A close correlation exists between elevated arsenic concentrations, elevated lead concentrations, and evidence of USG waste. Potential Arkema sources that could have affected the NBA do not have enough arsenic or lead to be a source for the arsenic and lead impacts in the NBA.	USG
Potential Transport	Potential transport mechanisms for potential sources within and adjacent to the NBA	Transport mechanism(s) indicate how arsenic and lead were transported from one or more suspected sources to the NBA	USG wastes were transported onto the NBA via (1) material rolling off waste stockpiles, (2) fugitive dust blowing off waste stockpiles, (3) filling/grading activities, (4) airborne deposition, and/or (5) direct disposal. Potential Arkema transport mechanisms are insignificant given the low arsenic and lead concentrations in potential Arkema sources that could have affected the NBA.	USG
Forensics	Metals ratios for the potential sources of arsenic and lead	Metals ratios provide an indication of whether or not NBA impacts share a forensics signature with one of more suspected sources	NBA samples with arsenic and lead exceedances are associated with USG wastes and are consistent with metals ratios for USG wastes. The signatures for Arkema potential sources are inconsistent with the signature of other NBA samples.	USG
	Overall		The lines of evidence indicate that USG wastes are responsible for all exceedances of arsenic and lead cleanup levels in the NBA.	USG

The results of the lines-of-evidence evaluation indicate that arsenic- and lead-laden wastes (e.g., fibers, shot, slag, baghouse dust) produced by USG manufacturing are responsible for all of the arsenic and lead concentrations exceeding cleanup levels in the NBA. A conceptual illustration of how wastes were released from historical manufacturing operations and waste management practices and transported onto the NBA is presented in Figure ES-1. In summary, arsenic and lead cleanup level exceedances in the NBA were caused by transport of wastes from USG stockpiles, transport of wastes from USG emissions, and/or direct disposal of wastes by USG. The USG waste deposits in the NBA were subsequently covered by fill material (e.g., construction debris, bark sludge) that did not have arsenic and lead concentrations exceeding cleanup levels. In addition, no compelling evidence exists that Arkema caused any arsenic or lead cleanup level exceedances in the NBA. Therefore, the conclusion of this Report is that USG is 100% responsible for the estimated $15,063,772 of NBA remedial action costs.

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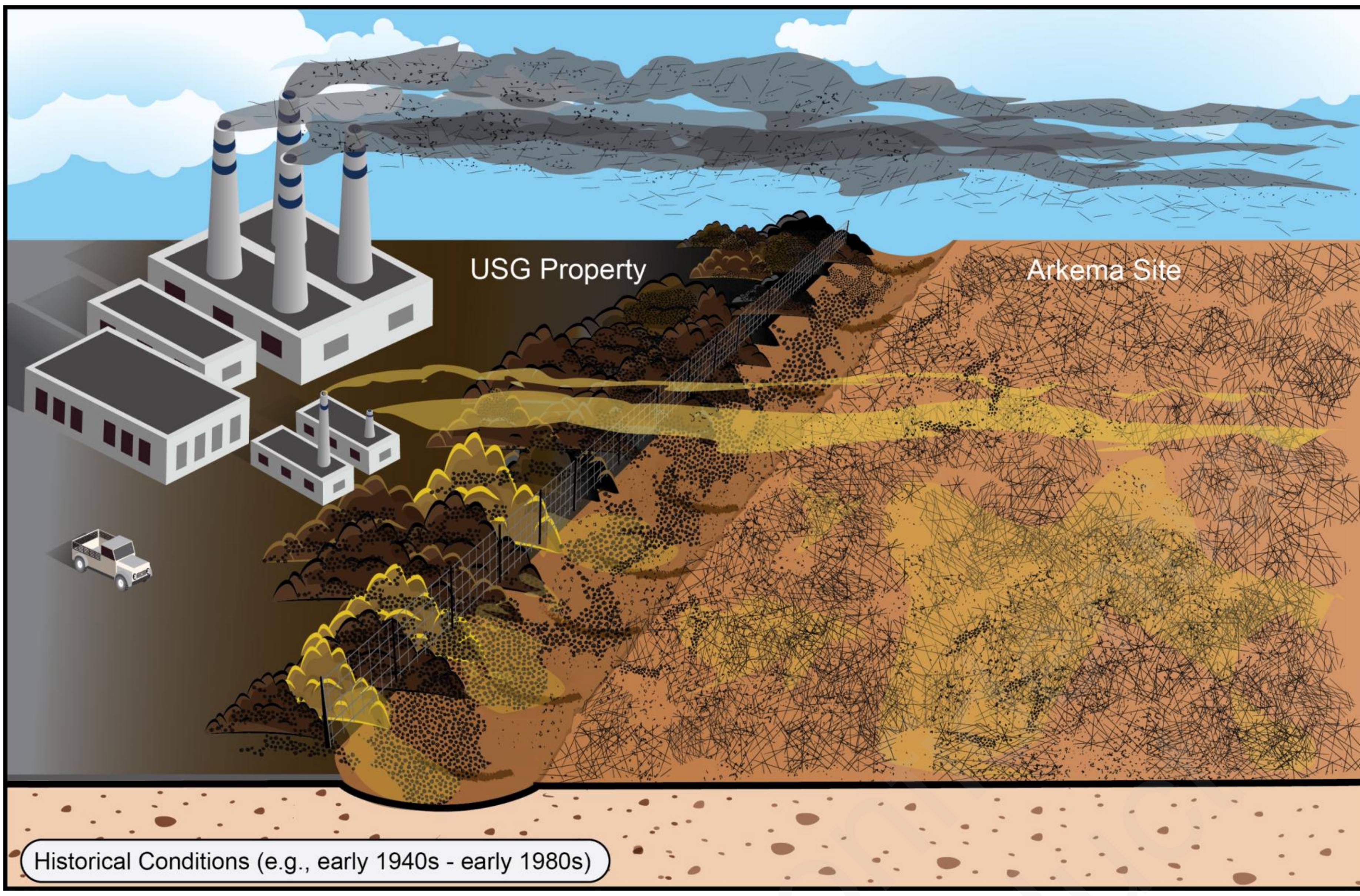
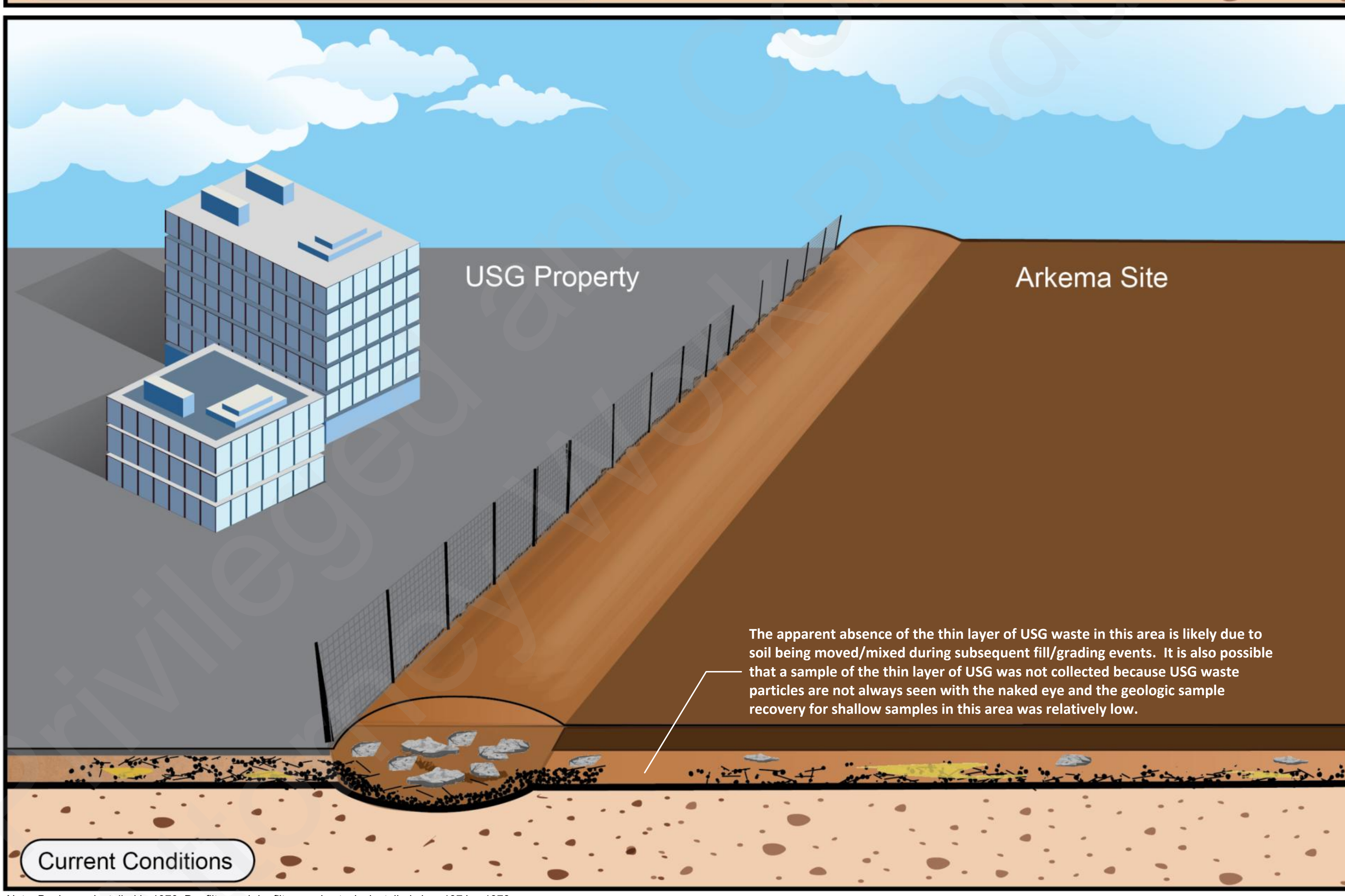


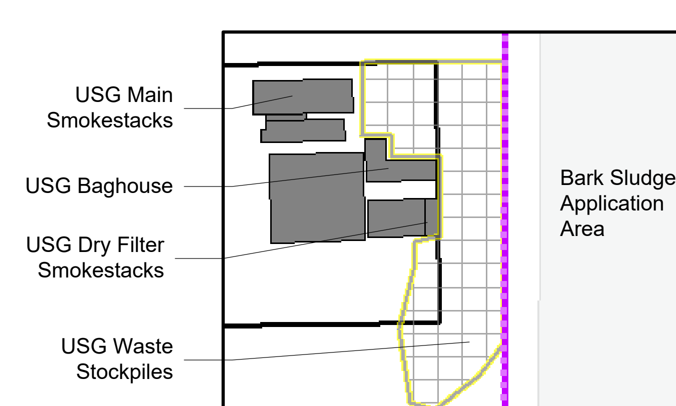


Note: Baghouse installed in 1970. Dry filter and dry filter smokestacks installed circa 1974 – 1978.

This figure is a conceptual summary of the evaluation conclusion. Arsenic and lead cleanup level exceedances in the NBA were caused by transport of wastes from USG stockpiles, transport of wastes from USG emissions, and/or direct disposal of wastes by USG. The USG waste deposits in the NBA were subsequently covered by fill material (e.g., construction debris, bark sludge) which did not have arsenic and lead concentrations exceeding cleanup levels.

Legend

- Assumed Early 1940s to Early 1980s Ground Surface
- Current Ground Surface
- Fibers
- Shot/Slag
- Baghouse Dust
- Other Subsurface Soil
- Construction Debris
- Other Fill
- Bark Sludge



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Conclusion of Lines-Of-Evidence Evaluation
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure ES-1

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List of Acronyms

Acronym	Explanation
Arkema Site	Former Arkema Manufacturing Site
bgs	Below Ground Surface
DOF	Dalton, Olmsted, & Fuglevand, Inc.
Ecology	Washington State Department of Ecology
EMP	Electron Microprobe
Fibers	Rock Wool Mineral Fibers
FS	Feasibility Study
IA	Interim Action
MTCA	Model Toxics Control Act
NBA	North Boundary Area
Penite	Sodium Arsenite
PIONEER	PIONEER Technologies Corporation
Port	Port of Tacoma
PSAPCA	Puget Sound Air Pollution Control Agency
Report	Cost Allocation Report
RI	Remedial Investigation
Site ID	Site Identification Number (Sample Location)
USG	United States Gypsum Corporation
USG Property	Former USG Property
XRF	X-ray Fluorescence

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SECTION 1: INTRODUCTION

1.1 Purpose

The purpose of this Cost Allocation Report (Report) is to (1) present the results of a lines-of-evidence evaluation that was conducted to determine the extent to which the liable parties for the former United States Gypsum Corporation (USG) Property (USG Property)[1] and the former Arkema Manufacturing Site (Arkema Site)[2] are responsible for the arsenic and lead impacts in the North Boundary Area (NBA), and (2) allocate the NBA remedial action costs between the liable parties for the USG Property and the Arkema Site accordingly. The lines of evidence evaluated in this Report include:

- Manufacturing Operations
- Waste Management
- Potential Sources
- Potential Transport
- Forensics

This comprehensive, systematic, and detailed lines-of-evidence evaluation was necessary to address questionable assertions that CDM Smith has made on behalf of USG about NBA impacts. As presented in Appendix A, the historical record and existing data do not support CDM Smith's previous assertions about the NBA. In addition, CDM Smith has repeatedly modified its interpretations of impacts within the NBA and on USG Property near the NBA in an attempt to minimize USG's cost allocation for NBA impacts.

1.2 Locations and Boundaries

The USG Property and Arkema Site are located on Port of Tacoma (Port)-owned property in the Tacoma Tideflats along the Hylebos Waterway in Tacoma, Washington (see Figure 1). The approximately 9.4-acre USG Property and approximately 48-acre Arkema Site are located adjacent to each other, bounded to the east by the Hylebos Waterway and to the west by Taylor Way (see Figure 1). The street address for the USG Property is 2301 Taylor Way. The street addresses for the Arkema Site are 2901 and 2920 Taylor Way.

Although the NBA is located completely within the Arkema Site, the impacts within the NBA have not been attributed to the Arkema Site.[3] The Port and USG have agreed to use the boundary between the USG Property and Arkema Site as a functional boundary until the cause of NBA impacts is determined

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[1] USG is used in this Report to represent all companies that operated the former manufacturing facility, including Pacific Carbide Corporation, Mineral Fiber Producing Company, Feltrock Insulation Manufacturing Company), USG (including subsidiaries USG Acoustical Products Company and USG Interiors), and Thermafiber LLC (CDM Smith 2016).

[2] Arkema is used in this Report to represent all companies that operated the former manufacturing facility, including Tacoma Electrochemical Company, Pennsylvania Salt Manufacturing Company of Washington, Pennwalt Corporation, Atochem Inc., Elf Atochem North America, and Atofina Inc. (Malcolm Pirnie 2006).

[3] The Arkema Site boundary was defined in the Remedial Investigation (RI) Report (Dalton, Olmstead, & Fuglevand, Inc. [DOF] 2013).

(Seely and Hall 2013). The USG site boundary has not been formally defined since it includes the USG Property and adjacent properties such as the Arkema Site where "contaminants originating from the Taylor Way property may have impacted adjacent properties" (CDM Smith 2016).

Consistent with past practices at the Arkema Site, all references to direction (i.e., north, south, east, and west) in this Report are in relation to "site north," which is parallel to the Site shoreline. "Site north" is approximately 45 degrees west (counter clockwise) from true north. Both "site north" and true north are shown on the figures for this Report.

1.3 Report Scope

Consistent with the purpose of this Report, the scope and content of this Report focus on information pertinent to the allocation of remedial action costs for the arsenic and lead impacts in the NBA. As a result, this Report does not present a comprehensive summary of the extensive investigation and remediation chronology of the USG Property and Arkema Site since much of that information is not relevant to the NBA impacts. In addition, although there are some NBA groundwater impacts, the focus of this Report is on soil impacts. Soil data are a direct indicator of impacts, and are more representative than groundwater data for determining cost allocation. Likewise, this Report does not address potential impacts in Hylebos Waterway sediment and surface water downgradient of the NBA.

1.4 Report Organization

This Report is organized as follows:

- Section 2: Background Information
- Section 3: Lines-of-Evidence Evaluation
- Section 4: Allocation of Remedial Action Costs
- Section 5: References

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SECTION 2: BACKGROUND INFORMATION

A brief overview of background information is presented in this section to provide context for the lines-of-evidence evaluation (Section 3) and the allocation of remedial action costs (Section 4). The information presented in this section is based on the RI Report for the Arkema Site (DOF 2013) or the Supplemental RI for the USG Property (CDM Smith 2016), unless otherwise noted.

2.1 Overview of Environmental Setting

The USG Property and Arkema Site are located within the tideflats of the Puyallup River delta. In general, the pre-development tideflats consisted of alternating layers of lower permeability silt/clay deposits and sandy deposits. Sediment dredged from Commencement Bay and its tributaries as well as other fill material were used to create developable land during the industrial development of the tideflats. This anthropogenic fill unit, which consists primarily of dredge sand and imported fill, was placed on the USG Property and Arkema Site prior to 1927. The post-fill topography of both the USG Property and Arkema Site are relatively flat, with the exception of the shorelines sloping to the Hylebos Waterway. The post-fill land use at the USG Property and Arkema Site has been industrial and is expected to remain industrial.

The USG Property and Arkema Site are located in Western Washington, which is typified by relatively mild temperatures and a marine-influenced climate (Western Regional Climate Center 2016). The average annual precipitation for Tacoma is approximately 40 inches, with most precipitation falling between October and April (Western Regional Climate Center 2016).

2.2 Overview of Operational History

2.2.1 USG Property

Rock wool mineral fiber (fiber) was manufactured on the USG Property from the early 1940s through 2002. The approximate boundary of the former USG manufacturing area is shown in Figure 2. Waste products from USG fiber manufacturing that contained elevated arsenic and lead concentrations included fibers, shot, slag, and baghouse dust. The historical manufacturing operations for the USG Property are discussed in more detail in Section 3.1.1.

2.2.2 Arkema Site

Chlorine, sodium hydroxide, sodium chlorate, hydrochloric acid, and sodium arsenite (Penite) were manufactured at the Arkema Site (a chloro-alkali chemical manufacturing facility) from circa 1927 to 1997. All manufacturing operations were conducted in the Central Manufacturing Area (the northern portion of this manufacturing area is shown in Figure 2); no manufacturing was performed in the NBA. In general, historical use of the NBA was limited. The only historical features within the NBA were the salt pads, the former surface impoundment known as Waggoner's Wallow, and the bark sludge

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application area (see Figure 2). The historical manufacturing operations and historical features for the Arkema Site are discussed in more detail in Section 3.1.2.

2.3 Overview of Regulatory Setting

2.3.1 USG Property

Investigation and cleanup of the USG Property is being conducted under the Model Toxics Control Act (MTCA) in accordance with a 2006 agreed order (amended in 2015) between Ecology, USG, and the Port. The supplemental RI phase was completed in 2016, and the USG Property is currently in the feasibility study (FS) phase. Previously, investigation and cleanup activities at the USG Property were completed under MTCA in accordance with a 1994 agreed order (as amended) between Ecology and USG.

2.3.2 Arkema Site

Investigation and cleanup of the Arkema Site is being conducted under MTCA in accordance with a 2011 agreed order between Ecology and the Port. The RI phase was completed in 2013, and the Arkema Site is currently in the FS phase. Previously, investigation and cleanup activities at the Arkema Site were completed under the Clean Water Act in accordance with a 1987 consent decree between Ecology and Arkema.

2.4 Overview of Relevant Chronology

2.4.1 USG Property

A significant number of investigation and cleanup activities have been performed at the USG Property. Relevant USG Property investigation and cleanup activities (see Figure 2 for excavation locations and Appendix B for sample locations and associated analytical data) included:

- Collection of soil samples representative of pre-remediation conditions from borings proximate to the NBA (i.e., S-series, MW-9-1, MW-13, HA-series, and B-DS4-series)[4] between 1994 and 1998 (AGI Technologies 1995, 1996, 1998).
- Excavation and off-site disposal of 4,144 tons of arsenic- and lead-impacted waste and soil from the MW-9 area during a 1999 interim action (IA). The 1999 MW-9 area excavation started adjacent to the NBA and eventually extended approximately five feet onto the Arkema Site. The excavation depth was approximately 2 to 3 feet below ground surface (bgs) with a maximum depth of approximately 5 feet bgs. Sidewall samples (SW-series) and bottom samples (B-DS5-series) were collected from the excavation, including five sidewall samples on the Arkema Site (AGI Technologies 2000).
- Collection of soil samples representative of pre-remediation conditions from borings and test pits proximate to the NBA (i.e., B-DS6-series, B13-series, B23-series, B13W40, B13W41, and B13F42) between 2002 and 2005 (Kennedy/Jenks Consultants 2002; CDM 2005).

[4] Suffixes were added to site identification numbers (Site IDs) as necessary to facilitate data management. For instance, the "-DS4," "-DS5," and "-DS6" suffixes were added to differentiate between borings with the same Site ID.

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- Excavation and off-site disposal of 8,176 tons of arsenic- and lead-impacted waste and soil from the B13 and B23 areas during a 2005 IA. The B13 area and B23 area excavations adjoined the footprint of the 1999 MW-9 area excavation. The excavation depths for the B13 area and B23 area were approximately 4 – 8 feet bgs and 1.5 – 5 feet bgs, respectively (CDM 2005).[5]
- Collection of soil samples representative of pre-remediation conditions from borings proximate to the NBA (i.e., MW-13R-2, MW-1R-1, DPT-series, NB-series, and SUPFS-1)[6] between 2006 and 2013 (CDM Smith 2016; DOF 2013; Pacific Environmental & Redevelopment Corporation and PIONEER Technologies Corporation [PIONEER] 2013).
- Completion of the Supplemental RI Report in 2016 in accordance with the 2006 agreed order (CDM Smith 2016).

2.4.2 Arkema Site

A significant number of investigation and cleanup activities have been performed at the Arkema Site. Relevant Arkema Site investigation and cleanup activities within the NBA (see Appendix B for sample locations and associated analytical data) included:

- Collection of Waggoner's Wallow sludge samples in 1989 (WWS-series) prior to the placement of a soil cap/cover over Waggoner's Wallow (Kennedy/Jenks/Chilton 1990).
- Installation of a soil cap/cover on Waggoner's Wallow in 1990 with an estimated thickness of 0.4 to 2.4 feet (AWARE Corporation 1981; DOF 2013).
- Collection of bark sludge samples in 1990 from locations where bark sludge was applied to the NBA (BSL-series) between 1986 and 1990 (Boateng 1990).
- Collection of soil samples from within the NBA (AT-series, PT-series, SPA-series, and NB-series) between 2003 and 2012 (Boateng 2003; Malcolm Pirnie 2007; DOF 2013).
- Electron microprobe (EMP) analysis of nine soil samples collected in 2012 from eight NB-series borings within and adjacent to the NBA (CDM Smith 2013). The magnification of the EMP enabled "particles as small as 1 micron" to be seen during the EMP analyses (CDM Smith 2013). The EMP analyses are important for this Report because the EMP was able to identify USG wastes that could not be seen with the naked eye (see Section 3.3.1.1 for more detail).
- Completion of the RI Report in 2013 in accordance with the 2011 agreed order (DOF 2013).

Boring logs associated with the investigation activities referenced in this section (if available) are included in Appendix C.

2.5 Soil Cleanup Standards Used in This Report

Final cleanup levels have not been established for the USG Property or the Arkema Site since the FS reports have not been prepared or approved yet. For the purposes of this Report, MTCA Method A/Standard Method C industrial soil cleanup levels for the soil direct contact pathway of 88 mg/kg and 1,000 mg/kg were assumed to be the soil cleanup levels for arsenic and lead in the NBA, respectively.

[5] Excavation sidewall and bottom samples were collected; however, these data are not relevant to this Report because the samples are not representative of pre-remediation conditions and the B13 area and B23 area excavations did not extend onto the Arkema Site like the 1999 MW9 area excavation.

[6] Borings NB-2 and NB-12 were collected from previously excavated areas (see Appendix B); therefore, samples collected from these borings are not representative of pre-remediation conditions.

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These assumed cleanup levels are consistent with cleanup levels used for the Wypenn IA on the Arkema Site (DOF 2015b) and other recent cleanups at nearby sites such as Arkema Mound (DOF 2015a), Superlon (Pacific Environmental & Redevelopment Corporation and PIONEER 2014) and Reichhold (Floyd Snider 2008). A soil point of compliance from ground surface to 15 feet bgs was also assumed in accordance with Washington Administrative Code 173-340-740(6)(f).

2.6 Overview of the Nature and Extent of NBA Soil Impacts

Arsenic and lead are the primary constituents of potential concern in the NBA and will be the constituent drivers for the NBA remedy. Arsenic and lead concentrations in the NBA exceed the soil cleanup levels within the point of compliance defined in Section 2.5. While arsenic concentrations exceed soil cleanup levels in several portions of the Arkema Site, all but two of the lead cleanup level exceedance locations for the Arkema Site are within the NBA. Elevated lead concentrations are an important indicator of USG wastes (see Section 3 for more detail).

The exceedances of the arsenic and lead soil cleanup levels are concentrated in the northwest portion of the NBA (see Figure 2). To assist in the lines-of-evidence evaluation, a primary impacted portion of the NBA was defined for the purposes of this Report (see Figure 2). The primary impacted portion of the NBA includes 28 of the 31 sample locations with cleanup level exceedances and all 11 sample locations with arsenic concentrations exceeding 400 mg/kg and lead concentrations exceeding 1,000 mg/kg.[7]

2.7 Overview of the Presumed NBA Remedy

For the purposes of this Report, it was assumed that the selected final NBA remedy would include the following components:

- A pre-design investigation to determine the soil excavation design
- Excavation and off-site disposal of all soil between ground surface and 15 feet bgs with arsenic or lead concentrations exceeding the soil cleanup levels defined in Section 2.5
- Field oversight and sampling and analysis activities
- Engineering controls during excavation and off-site disposal activities
- Institutional controls (i.e., restrictive covenant) to prevent future non-commercial/industrial land use and prevent installation of drinking water wells
- Monitored natural attenuation for arsenic and lead impacts in NBA groundwater

2.8 Estimated Remedial Action Costs

Based on personal correspondence between Scott Hooton of the Port and Troy Bussey of PIONEER, past remedial action costs relevant to the NBA are $463,772 as outlined in the following table:

[7] The maximum arsenic concentration for the three sample locations outside of the primary impacted portion of the NBA was 150 mg/kg (1.7 times the 88 mg/kg cleanup level). There were no lead cleanup level exceedances in the three sample locations outside of the primary impacted portion of the NBA.

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Past Remedial Action Item	Cost
DOF NBA investigation-related costs between November 2011 and October 2014 (e.g., drilling, sampling, laboratory analyses, data evaluation, reporting, NBA-related meetings)	$118,752
Port NBA oversight costs between May 2009 and January 2017 (e.g., reviewing USG RI documents with respect to NBA impacts, NBA-related meetings, NBA cost allocation)	$129,464
DOF NBA cost allocation costs between August 2010 and December 2013 (e.g., reviewing and evaluating historical documents, reviewing and evaluating historical analytical results, preparing cost allocation documentation)	$39,990
Kennedy Jenks review of storm sewer construction issues between May 2015 and July 2015	$8,216
PIONEER NBA cost allocation costs between September 2015 and current (e.g., reviewing and evaluating historical documents, compiling and evaluating historical analytical results, compiling and evaluating boring logs, compiling and evaluating aerial photographs, evaluating forensics data, preparing cost allocation documentation)	$167,350
Total of Past Remedial Action Costs	$463,772

Based on the presumed NBA remedy outlined in Section 2.7, the cost for anticipated future remedial actions is currently estimated to be $14,600,000 (see Table 1). The basis for the excavation volumes used in this cost estimate is presented in Figure 3. It should be noted that there are uncertainties associated with the anticipated future costs. For instance, the cost estimate could decrease as more site-specific information is obtained. On the other hand, the cost estimate could increase for a variety of reasons, including the potential for (1) more stringent cleanup levels, (2) more stringent Ecology requirements for the selected remedy, (3) larger excavation volumes, and (4) higher unit costs at the time the work is performed.

Thus, the total of past remedial action costs ($463,772) and anticipated future remedial action costs ($14,600,000) is $15,063,772.

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SECTION 3: LINES-OF-EVIDENCE EVALUATION

The following five lines of evidence were evaluated in this Report:

- Manufacturing Operations
- Waste Management
- Potential Sources
- Potential Transport
- Forensics

These lines of evidence are appropriate for supporting the allocation determination because they provide information about the nature of wastes that could have been released to the NBA, how wastes containing arsenic and lead could have been released to the NBA, where arsenic and lead were released to the NBA, how arsenic and lead were transported from one or more of the suspected sources to the NBA, and whether or not NBA impacts share a forensics signature with one of more suspected sources. The supporting data and information used during the lines-of-evidence evaluation include previous USG Property documents included in the references section, previous Arkema Site documents included in the references section, and the following appendices:

- Appendix B: Analytical Data[8]
- Appendix C: Relevant Boring Logs
- Appendix D: Historical Photographs
- Appendix E: Key Puget Sound Air Pollution Control Agency (PSAPCA) Files for the USG Property

3.1 Manufacturing Operations

For this line of evidence, the nature and location of USG and Arkema historical manufacturing operations and features within and adjacent to the NBA were evaluated to help determine the extent to which the liable parties for the USG Property and Arkema Site are responsible for the arsenic and lead impacts in the NBA. This line of evidence is appropriate for supporting the allocation determination because historical manufacturing operations and features indicate the nature of wastes that could have been released to the NBA.

3.1.1 USG Property

Fibers used for insulation were manufactured in the former manufacturing area of USG Property from the early 1940s through 2002. The former USG manufacturing area is located adjacent to the primary impacted portion of the NBA (see Figure 4). Key historical manufacturing features within the former manufacturing area included the cupola room, production building, main smokestacks, baghouse, dry filter, pump room, and dry filter smokestacks (see Figure 4). In general, fiber manufacturing consisted of

[8] Field x-ray fluorescence (XRF) and laboratory analytical data were both utilized in this evaluation since the results typically represented different sample intervals.

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heating feedstocks such as slag and basalt rock to a molten state in a cupola furnace and then cooling and fiberizing the molten material with air in the production building (TLI Systems 1996). Cupola emissions were emitted from the main smokestacks without any controls prior to 1970 (TLI Systems 1996). The baghouse was installed in 1970 and the dry filter was installed circa 1974 to 1978 to control particulate emissions associated with fibers manufacturing; emission continued after circa 1974 to 1978 from the dry filter smokestacks (TLI Systems 1996; Appendix D). The baghouse generated a large quantity of waste that previously had been emitted from the main smokestacks. For instance, the baghouse generated an estimated 30,000 pounds per week of baghouse dust waste (TLI Systems 1996; CDM Smith 2016).

Slag obtained from ASARCO's smelter in Ruston, Washington was used by USG as a raw material for fiber manufacturing from at least 1946 until 1973 (TLI Systems 1996; Appendix D). ASARCO slag-related wastes that were generated included fibers, shot, slag fines, and baghouse dust (TLI Systems 1996; CDM Smith 2016). These wastes contained elevated arsenic and lead concentrations from the ASARCO slag. As noted by CDM Smith, "arsenic and lead are typically the metals that drive cleanups at sites contaminated by ASARCO slag" (CDM Smith 2016). For instance, the baghouse dust generated when ASARCO slag was being used as a feedstock contained arsenic and lead concentrations of approximately 230,000 mg/kg and 85,000 mg/kg, respectively (TLI Systems 1996; CDM Smith 2016). Post-1973 USG wastes contained less arsenic and lead, but still had significantly elevated concentrations. For instance, arsenic and lead concentrations in a 1992 sample of USG baghouse dust collected by Ecology were 15,200 mg/kg and 18,400 mg/kg, respectively (personal communication between Marv Coleman of Ecology and Brad Grimsted of PIONEER).

3.1.2 Arkema Site

3.1.2.1 Inside the NBA

In general, historical use of the NBA was limited. The only historical features within the NBA were the salt pads, the former surface impoundment known as Waggoner's Wallow, and the bark sludge application area (see Figure 4). The salt pads were used for temporary storage of sea salt, which was the primary feedstock for the production of chlorine, sodium hydroxide, sodium chlorate, and hydrochloric acid within the former Central Manufacturing Area (Malcolm Pirnie 2006). The salt pads are not located within the primary impacted portion of the NBA. Waggoner's Wallow was used for treatment and temporary storage of chlorine manufacturing wastes (i.e., sodium hypochlorite). Since chlorine manufacturing essentially consisted of adding electrical power to salt water in a reactor cell to produce chlorine gas, neither arsenic nor lead were associated with chlorine manufacturing wastes (AWARE Corporation 1981; Malcolm Pirnie 2006). Waggoner's Wallow was used from the 1940s through 1986, and its size expanded over time as the size of the manufacturing operations and salt pads expanded (see Appendix D). Bark sludge was spread across a large portion of the NBA in several phases between 1986 and 1990 to establish a vegetative cover (Boateng 1990; Appendix D). Bark sludge was a mixture of wood from a wood processing operation and sludge excavated from the former Taylor Lake Area Surface

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Impoundments located south of the former Central Manufacturing Area (Boateng 1990; DOF 2013). The sludge in the former Taylor Lake Area Surface Impoundments and the resulting bark sludge contained negligible arsenic and lead concentrations (Boateng 1990; DOF 2013). The footprints of Waggoner's Wallow and the bark sludge application area are not consistent with the primary impacted portion of the NBA (see Figure 4). Significant portions of Waggoner's Wallow and bark sludge application area footprints are outside of the primary impacted portion of the NBA. In other words, if Waggoner's Wallow or bark sludge was the source of arsenic and lead impacts within the NBA, one would expect the footprint of arsenic and lead impacts to resemble the footprint of Waggoner's Wallow and/or the bark sludge application area.

3.1.2.2 Outside the NBA

Chlorine, sodium hydroxide, sodium chlorate, hydrochloric acid, and Penite were manufactured in the former Central Manufacturing Area of the Arkema Site (see Figure 4). The historical manufacturing operations and historical features on the Arkema Site pertinent to this evaluation are associated with the former Penite Manufacturing Area and the former Sandblasting Shed since both used products from ASARCO's smelter in Ruston, Washington as raw materials. Arsenic trioxide was combined with sodium hydroxide to produce Penite in the former Penite Manufacturing Area between circa 1940 and 1972 (ICF Technology Incorporated 1990, Intera 1995, TLI Systems 2000). Arsenic-impacted Penite manufacturing wastes (e.g., sludge, washdown water, and filter cake) were disposed of in the former Penite Pits (Malcolm Pirnie 2006; DOF 2013). Stormwater and some arsenic-impacted wastewater associated with the Penite Manufacturing Area were discharged directly to the Hylebos Waterway (Kennedy/Jenks/Chilton 1990; Malcolm Pirnie 2006). ASARCO sand that "is easily recognizable by its green color" was used for sandblasting within or near the former Sandblasting Shed located southeast of the former Central Manufacturing Area (AWARE Corporation 1981). Green-colored sand was observed in surface soil surrounding the former Sandblasting Shed in 1981 (AWARE Corporation 1981). The former Penite Manufacturing Area and the Penite Pits are located approximately 1,000 feet south of the primary impacted portion of the NBA, while the former Sandblasting Shed and green-colored sand observed in 1981 are located approximately 1,300 feet southeast of the primary impacted portion of the NBA. In addition, the historical operations and features related to Penite manufacturing and the former Sandblasting Shed were completely separated from the NBA by other non-arsenic-related manufacturing operations. In addition, Penite manufacturing and the former Sandblasting Shed did not involve airborne emissions of wastes.

An important diagnostic characteristic of the wastes produced by historical manufacturing operations and features on the Arkema Site (i.e., former Penite Manufacturing Area and the former Sandblasting Shed) was the general lack of elevated lead concentrations. Lead concentrations within the former Penite Manufacturing Area, the area surrounding the former Penite Pits, and in the vicinity of the former Sandblasting Shed are relatively low (DOF 2013). In fact, only two soil borings within the entire former Central Manufacturing area and the area south of the former Central Manufacturing area had a lead concentration exceeding the soil cleanup level of 1,000 mg/kg, with a maximum concentration of

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1,900 mg/kg (see Appendix B). More remarkably, only one sample proximate to the former Penite Pits (which received all Penite waste except for water discharged to the Hylebos Waterway) had a lead concentration exceeding the cleanup level (1,800 mg/kg in the PT-33 sample at 6 feet bgs). By contrast, the arsenic concentration in the same PT-33 sample was an order of magnitude higher (25,000 mg/kg). The reason that the Penite-related solid wastes contained a relatively low percentage of lead is because Arkema used a purified arsenic trioxide product formulated by ASARCO as the Penite feedstock (Intera 1995, TLI Systems 2000, personal communication between Kim Seely of Coastline Law Group and Troy Bussey of PIONEER). The relatively low percentage of lead in Penite-related solid wastes is a critical distinction between Arkema and USG wastes (see Section 3.5 for more detail).

3.1.3 Conclusion for this Line of Evidence

In summary, the evaluation of the nature and locations of the historical manufacturing operations and features on the USG Property and Arkema Site indicated that the NBA impacts are most likely attributable to the USG Property for several reasons discussed in this section, including:

- USG Property: Historical manufacturing operations and features on the USG Property (e.g., production building, main smokestacks, baghouse, dry filter smokestacks) produced large quantities of wastes containing significantly elevated concentrations of both arsenic and lead adjacent to the primary impacted portions of the NBA (see Figure 4).
- Arkema Site (Inside the NBA): The three Arkema historical features within the NBA (i.e., salt pads, Waggoner's Wallow, bark sludge application area) were not associated with manufacturing processes that involved arsenic or lead. In addition, the salt pads are not located within the primary impacted portion of the NBA, and the footprints of Waggoner's Wallow and the bark sludge application area are not consistent with the primary impacted portion of the NBA (see Figure 4).
- Arkema Site (Outside the NBA): Lead concentrations associated with historical Arkema manufacturing operations and features pertinent to this evaluation (i.e., the former Penite Manufacturing Area and the former Sandblasting Shed) are relatively low. Lead concentrations exceeding the soil cleanup level of 1,000 mg/kg are only present in two sample locations within the entire former Central Manufacturing area due to the low ratio of lead/arsenic concentrations in Penite-related wastes. The relatively low concentrations of lead in Penite-related wastes are due to the relative purity of the arsenic trioxide feedstock used by Arkema. In addition, the former Penite Manufacturing Area and the former Sandblasting Shed were located a considerable distance from the primary impacted portion of the NBA (see Figure 4).

3.2 Waste Management

For this line of evidence, the nature and location of USG and Arkema historical waste management activities within and adjacent to the NBA were evaluated to help determine the extent to which the liable parties for the USG Property and Arkema Site are responsible for the arsenic and lead impacts in the NBA. This line of evidence is appropriate for supporting the allocation determination because waste management activities indicate how wastes containing arsenic and lead could have been released to the NBA.

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3.2.1 USG Property

The USG waste management practices pertinent to this evaluation were:

- The stockpiling of wastes adjacent to the primary impacted portion of the NBA;
- The use of wastes as fill adjacent to the primary impacted portion of the NBA;
- The potential for direct disposal of wastes in the NBA; and
- The emissions of wastes.

3.2.1.1 Stockpiling of Wastes

USG generated and stockpiled slag-related solid wastes (e.g., fibers, shot, slag, and baghouse dust) on its property adjacent to the primary impacted portion of the NBA. "Temporary stockpiles of … waste material (mixture of shot, slag fines, baghouse dust, off-spec product, cupola bottoms) were located on mostly unpaved surfaces at the … southeastern side of the production building" (CDM Smith 2016). Based on a review of historical photographs (see Appendix D), the specific area where wastes were stockpiled closely aligned with the northern boundary of the primary impacted portion of the NBA (see Figure 5). The quantities of wastes stockpiled between the production building and primary impacted portion of the NBA were large (see Appendix D and Figure 5). For example, USG generated approximately 6,000 tons of shot waste per year and typically stockpiled approximately 13,000 tons at any given time (TLI Systems 1996). The USG wastes in these stockpiles contained significantly elevated arsenic and lead concentrations (see Section 3.1.1 for more detail).

3.2.1.2 Use of Wastes as Fill

USG used the stockpiled waste described in the previous subsection as fill when it paved the area between the production building and the primary impacted portion of the NBA in circa 1981 (Appendix D; CDM Smith 2016).[9] "Shot and other waste products, some of which were derived from the ASARCO slag, had been used as fill throughout the material stockpile area and southeastern truck passageway to raise the grade" (CDM Smith 2016). A total of 12,320 tons of USG waste and soil impacted with both arsenic and lead were removed from the area between the production building and the primary impacted portion of the NBA during the MW9 area, B13 area, and B23 area excavations described in Section 2.4.1. The locations of the MW9 area, B13 area, and B23 area excavations are shown on Figure 5. The maximum pre-remediation arsenic and lead concentrations in these excavation areas were in borings HA1 and HA15. The maximum arsenic concentrations in HA1 and HA15 were 14,000 mg/kg and 15,000 mg/kg, respectively. The maximum lead concentrations in HA1 and HA15 were 10,000 mg/kg and 8,400 mg/kg, respectively. HA1 was located less than five feet north of the fence near the USG/Arkema property boundary, while HA15 was located less than 20 feet from the fence (AGI Technologies 1998).

[9] This area of stockpiled waste is referred to as the southeastern truck passageway in the CDM Smith Supplemental RI Report (CDM Smith 2016).

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3.2.1.3 Potential for Direct Disposal of Wastes in the NBA

The MW9 area excavation provides irrefutable evidence that USG wastes were present in the northern portion of NBA since the excavation extended approximately five feet into the NBA in order to remove USG fibers and hazardous waste that were present on the Arkema Site (AGI Technologies 2000). The USG wastes within the portion of the MW9 area excavation on the Arkema Site were most likely transported onto the NBA via (1) material rolling off waste stockpiles, (2) fugitive dust blowing off waste stockpiles, and/or (3) material being pushed into the NBA when the waste was used as fill (see Section 3.4.1.1 for more detail). However, it is also possible that USG directly disposed of some of its wastes in the NBA. First of all, the historical boundary between the USG Property and the Arkema was not well defined. For instance, a professional surveyor was required in order to determine the property boundary during the MW9 area remedial excavation (AGI Technologies 2000). More importantly, USG has admitted that “waste management activities are not well documented” and some “disposal sites are not known" (CDM Smith 2016). Some of these unknown disposal sites have turned out to be neighboring properties. USG wastes were disposed of on the nearby Superlon property (Pacific Environmental & Redevelopment Corporation and PIONEER 2014), and Ecology suspects that USG wastes may have been disposed of on the nearby Gardner Fields property based on existing boring logs (Ecology 2016; GeoEngineers 2009). The NBA may have been another USG disposal site.

3.2.1.4 Emissions of Wastes

USG emitted wastes from (1) the main smokestacks prior to 1970 (without any emission controls), (2) the main smokestacks subsequent to 1970 (with emission controls), and (3) the dry filter smokestacks subsequent to circa 1974 to 1978. Existing evidence documents that these airborne wastes were deposited in the NBA (see Section 3.4.1.3 for more detail).

3.2.2 Arkema Site

3.2.2.1 Inside the NBA

Waggoner’s Wallow was the only historical Arkema waste management activity within the NBA. Waggoner's Wallow was a former surface impoundment that provided treatment and temporary storage of chlorine manufacturing wastes (i.e., sodium hypochlorite) as described in Section 3.1.2.1. This chlorine manufacturing waste management activity did not involve arsenic or lead. In addition, the footprint of Waggoner's Wallow is not consistent with the primary impacted portion of the NBA (see Figure 4). In other words, if Waggoner's Wallow was the source of arsenic and lead impacts within the NBA, one would expect the footprint of arsenic and lead impacts to resemble the Waggoner's Wallow footprint.

3.2.2.2 Outside the NBA

Historical waste management activities outside of the NBA pertinent to this Report are associated with the former Penite Manufacturing Area and the former Sandblasting Shed (see Section 3.1.2.2 for more detail). Arsenic-impacted Penite manufacturing wastes were disposed of in the former Penite Pits and

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the Hylebos Waterway. Green-colored sand, which was presumably sandblasting waste, was located around the former Sandblasting Shed. These waste management activities were conducted a considerable distance from the NBA. It does not make sense that Arkema would expend the considerable effort to haul Penite manufacturing waste and/or sandblasting waste all the way to the NBA when it was already using disposal locations immediately adjacent to where the waste was being generated (i.e., in the former Penite Pits and on the ground around the former Sandblasting Shed). More importantly, these wastes did not contain significantly elevated lead concentrations (see Section 3.1.2.2 for more detail). As a result, these waste management activities were unlikely to have caused the arsenic and lead impacts in the NBA.

Since a historical report indicates that the green-colored sand associated with the former Sandblasting Shed was also used for "fill material and dike material", CDM Smith has previously speculated that the green-colored sand might have been used as fill material or dike material in the NBA (AWARE Corporation 1981). However, it was highly unlikely for this green-colored sand to have been used as fill material or dike material in the NBA for the following reasons:

- The spent sandblasting waste was "primarily found on Pennwalt's site around the sandblasting shed located between the Taylor Lake area and the Hylebos Waterway" (AWARE Corporation 1981). The location of the Sandblasting Shed was not near the NBA (see Figure 4). It does not make sense that Arkema would expend the considerable effort to haul the spent sandblasting waste all the way to the NBA when it was already placing this waste immediately adjacent to where it was being generated (i.e., at the Sandblasting Shed).
- Green-colored sand (or spent sandblasting waste) could not have been used for dike material in the NBA because Waggoner's Wallow did not have a dike (AWARE Corporation 1981). Rather, the green-colored sand would have been used in the dikes around the former Taylor Lake Area Surface Impoundments located south of the former Central Manufacturing Area. Not coincidentally, the former Taylor Lake Area Surface Impoundments were located adjacent to the former Sandblasting Shed where the green-colored sand was generated (see Figure 4).
- Green-colored soil (let alone green-colored sand) is generally absent from the NBA. Soil with a greenish color was only observed in two sample intervals within the entire NBA: NB-8 at 1.8 feet bgs and NB-22 at 5 – 6 feet bgs (see Appendix C). NB-22 is located on the southern boundary of the primary impacted portion of the NBA, and NB-8 is located outside of the primary impacted portion of the NBA. Neither of these sample intervals had a color description that matched the description of the green-colored sand around the former Sandblasting Shed, which "is easily recognizable by its green color" (AWARE Corporation 1981). The NB-8 interval had a "greenish-colored zone @ 1.8'" and the color in the NB-22 interval was "green-gray." The greenish colors observed in these localized NB-8 and NB-22 intervals are most likely from natural mineralization since green and greenish colors occur naturally in minerals, rocks, and soil.
- The arsenic and lead concentrations in the aforementioned greenish NB-8 and NB-22 intervals do not exceed the cleanup levels. The arsenic and lead concentrations associated with the greenish NB-8 sample interval were 88 mg/kg and 96 mg/kg, respectively. The arsenic and lead concentrations associated with the greenish NB-22 sample interval were 62 mg/kg and 19 mg/kg, respectively. By contrast, NBA samples with arsenic and lead concentrations exceeding

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cleanup levels are closely correlated with black-colored soil and USG wastes that had a black color (e.g., fibers, shot, and slag) as discussed further in Section 3.3.1.

- The 1981 AWARE Corporation document that was CDM Smith's information source regarding spent sandblasting waste concluded the spent sandblasting waste was "not considered to be a significant source of arsenic" on the Arkema property (AWARE Corporation 1981).

3.2.3 Conclusion for this Line of Evidence

In summary, the evaluation of the nature and locations of the historical waste management activities for the USG Property and Arkema Site indicated that the NBA impacts are most likely attributable to the USG Property for several reasons discussed in this section, including:

- USG Property: USG stockpiled waste, used waste as fill, and emitted airborne wastes adjacent to the primary impacted portion of the NBA (see Figure 5). Large quantities of these wastes were generated and the wastes contained significantly elevated concentrations of both arsenic and lead. It is also possible that USG directly disposed of wastes in the NBA.
- Arkema Site (Inside the NBA): Waggoner's Wallow was the only historical Arkema waste management activity within the NBA. Waggoner's Wallow was associated with chlorine manufacturing waste, which did not involve arsenic or lead. In addition, the footprint of Waggoner's Wallow is not consistent with the primary impacted portion of the NBA (see Figure 4).
- Arkema Site (Outside the NBA): There are relatively low lead concentrations associated with the pertinent waste disposal locations outside the NBA (i.e., the former Penite Pits and the ground around the former Sandblasting Shed). In addition, the former Penite Pits and the green-colored sand observed on the ground around the former Sandblasting Shed were located a considerable distance from the primary impacted portion of the NBA (see Figure 4). Furthermore, it is highly unlikely that the green-colored sand associated with the former Sandblasting Shed was used to construct a dike or used as fill material in the NBA since (1) spent sandblasting waste was primarily located near the former Sandblasting Shed, (2) Waggoner's Wallow did not have a dike, (3) a greenish color was only observed in two sample intervals within the NBA, (4) the greenish color in these two sample intervals is more representative of natural mineralization than a sand that "is easily recognizable by its green color", (5) the arsenic and lead concentrations in the two greenish samples did not exceed arsenic or lead cleanup levels, and (6) the spent sandblasting waste was not a significant source of arsenic.

3.3 Potential Sources

For this line of evidence, arsenic and lead concentrations in potential USG and Arkema sources within and adjacent to the NBA were evaluated to help determine the extent to which the liable parties for the USG Property and Arkema Site are responsible for the arsenic and lead impacts in the NBA. This line of evidence is appropriate for supporting the allocation determination because arsenic and lead concentrations associated with the potential sources indicate where arsenic and lead were released to the NBA.

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Before evaluating each individual potential source, all arsenic and lead soil concentrations on the USG Property and Arkema Site potentially pertinent to this evaluation were plotted on figures (see Figures 6 and 7).[10] In general, there is a spatially bifurcated distribution of locations with arsenic concentrations exceeding 1,000 mg/kg on the USG Property and Arkema Site (see Figure 6). One cluster of arsenic concentrations exceeding 1,000 mg/kg is located near where USG stockpiled waste and adjacent sample locations in the NBA. The other cluster of arsenic concentrations exceeding 1,000 mg/kg is associated with Penite manufacturing (i.e., the former Penite Manufacturing Area, the former Penite Pits, and east of the Penite Pits due to groundwater transport of arsenic from the Penite Pits towards the Hylebos Waterway). By contrast, the only cluster of lead concentrations exceeding 1,000 mg/kg is located near where USG stockpiled waste and adjacent sample locations in the NBA (see Figure 7). The data presented in Figures 6 and 7 demonstrate (1) arsenic-impacted soil associated with Penite manufacturing is not spatially correlated with the arsenic-impacted soil in the NBA, and (2) lead concentrations are relatively low in samples within the entire former Central Manufacturing Area (e.g., only two locations with lead cleanup level exceedances) and the area south of the former Central Manufacturing Area. As a result, the former Penite Manufacturing Area, the former Penite Pits, the former Sandblasting Shed, and green-colored sand around the former Sandblasting Shed were not evaluated further as potential sources.

3.3.1 USG Property

The two key potential sources associated with the USG Property are:

- Fibers, shot, and slag in waste stockpiles, fill material, and/or airborne emissions; and
- Baghouse dust in waste stockpiles, fill material, and/or airborne emissions.

3.3.1.1 Fibers, Shot, and Slag in Waste Stockpiles, Fill Material, and/or Airborne Emissions

A plume of arsenic and lead contamination appears to be emanating onto the NBA from source locations on the USG Property with similar arsenic and lead concentrations. The locations of arsenic and lead cleanup level exceedances in the NBA are closely aligned with source locations on the USG Property where releases of fibers, shots, and slag from waste stockpiles, fill material, and/or airborne emissions caused arsenic and lead cleanup level exceedances. As shown in Figure 8, the majority of pre-bark sludge sampling locations with arsenic concentrations exceeding 400 mg/kg in the NBA are contiguous with pre-remediation sample locations on the USG Property also containing arsenic concentrations exceeding 400 mg/kg.[11] Likewise, as shown in Figure 9, the majority of pre-bark sludge sampling locations with lead concentrations exceeding 1,000 mg/kg in the NBA are contiguous with pre-remediation sample locations on the USG Property containing lead concentrations exceeding 1,000 mg/kg.

[10] All sample locations and analytical data presented in Appendix B are included in these figures, including samples on the USG Property that are not representative of pre-remediation conditions (e.g., post-excavation confirmation samples).

[11] Excluding post-excavation confirmation samples and post-remediation samples.

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The presence of fibers, shot, and slag that were released from waste stockpiles, fill material, and/or airborne emissions is closely correlated with elevated arsenic and lead concentrations on the USG Property and the NBA. Evidence of fibers, shot, and slag were observed in borings advanced on the USG Property and on the Arkema Site, as well as samples analyzed by EMP (see Table 2). In addition, materials that were likely associated with fibers, shot, and slag (e.g., "fine SAND with black stringers" "Black sand matrix with slight sparkle") were identified in borings advanced on the USG Property and on the Arkema Site (categorized as "likely USG waste" in Table 2). As shown on Figure 10, a close correlation exists between elevated arsenic concentrations and evidence of fibers, shot, slag, and likely USG waste. Likewise, as shown on Figure 11, a close correlation also exists between elevated lead concentrations and evidence of fibers, shot, slag, and likely USG waste. In summary, fibers, shot, slag, and/or likely USG waste are present at locations where arsenic and lead concentrations in the NBA exceed cleanup levels.

The presence of fibers, shot, and slag that were released from waste stockpiles, fill material, and/or airborne emissions is also closely correlated with the NBA samples that had the highest arsenic and lead concentrations. A total of 16 NBA soil samples in 11 borings had arsenic concentrations exceeding 400 mg/kg **AND** lead concentrations exceeding 1,000 mg/kg. As shown in Table 3, evidence of USG waste was observed in all 16 of these NBA soil samples. Evidence of fibers, shot, and/or slag were observed within 13 of the 16 samples, evidence of fibers was observed a few inches above another sample, and likely USG waste was observed in the other two samples (see Figure 12). The fact that USG waste is present in all NBA sample locations with significantly elevated arsenic concentrations and lead concentrations is an important diagnostic characteristic for this Report.

EMP analyses demonstrated that fibers, shot, and slag can be present in soil even when these wastes cannot be seen with the naked eye in a soil boring. In the 8 EMP analyses in which USG wastes were identified, the EMP magnification facilitated a different and more robust understanding of the specific USG wastes present in the sample compared to what was visually observed in the boring log. Of particular importance is the fact that the EMP analyses demonstrated the presence of shot and/or slag in two samples in which there was no prior evidence of potential USG waste, not even the presence of black soil (see Table 3).[12] Thus, small shot, slag, and mineral fiber particles are present in NBA soil even when they are not observed in a boring log.

Finally, it should be noted that some residual fibers, shot, and/or slag remain in the southwestern corner of the USG Property (the southwestern corner is based on "site north" defined in Section 1.2; this area is referred to as the Southern Corner in CDM Smith reports). Since the southwestern corner was apparently not within the area where USG wastes were stockpiled, these wastes could have been deposited by aerial deposition and/or as fill when the grade was raised prior to the paving of this area.

[12] The two samples were the NB-8 sample at 1.8 feet bgs and the NB-35 sample at 2 feet bgs.

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3.3.1.2 Baghouse Dust in Waste Stockpiles, Fill Material, and/or Airborne Emissions

Baghouse dust that was released via waste stockpiles, fill material, and/or airborne emissions is a significant potential source for arsenic and lead in the NBA. Large quantities (an estimated 30,000 pounds per week) of baghouse dust containing significantly elevated arsenic and lead concentrations (arsenic concentrations of 230,000 mg/kg and lead concentrations of 85,000 mg/kg when ASARCO slag was used as feedstock) were produced on the USG Property (see Section 3.1.1 for more detail). Unfortunately, it is extremely difficult to identify baghouse dust in the subsurface once it interacts with the environment. Baghouse dust is highly leachable and "has the consistency of dry, loose silt" similar to other subsurface soils, which makes it difficult to identify baghouse dust in boring logs (TLI Systems 1996). Unfortunately, EMP magnification is also unable to identify baghouse dust (CDM Smith 2013). Consequently, CDM Smith has been unable to identify the presence of baghouse dust on the USG Property even though baghouse dust is considered a primary source material on the USG Property. "Elevated arsenic concentrations in soils exist because of: a) the presence of residual source material (i.e., slag, shot), and b) leaching of arsenic from the original source materials, most particularly baghouse dust" (CDM Smith 2016). As a result, the logical presumption is that baghouse dust in waste stockpiles, fill material, and/or airborne emissions were likely a significant source for NBA impacts given the amount of baghouse dust generated and the arsenic and lead concentrations in the baghouse dust.

3.3.2 Arkema Site

The three key potential sources associated with the Arkema Site are:

- Waggoner's Wallow;
- Bark Sludge; and
- Fill Material.

3.3.2.1 Waggoner's Wallow

Waggoner's Wallow is unlikely to be a potential source for the arsenic and lead impacts in the NBA based on the arsenic and lead concentrations in Waggoner's Wallow sludge samples. In other words, Waggoner's Wallow did not contain enough arsenic or lead to be a source. As shown in Figure 13, the arsenic and lead concentrations in the seven 1989 sludge samples collected from Waggoner's Wallow ranged from 9.2 mg/kg to 150 mg/kg and 56 mg/kg to 290 mg/kg, respectively. These concentrations are less than the cleanup levels, with the exception of the arsenic concentrations in three samples. The maximum concentration in these three samples is 150 mg/kg, which is 1.7 times the cleanup level of 88 mg/kg. These low arsenic and lead concentrations in Waggoner's Wallow sludge are consistent with the nature of Waggoner's Wallow (i.e., it was used for treatment and temporary storage of chlorine manufacturing wastes rather than wastes related to arsenic or lead).

It should be noted here that there is a correlation between arsenic and lead concentrations in the Waggoner's Wallow sludge samples and the distance of the samples from USG's main smokestacks (see Figure 13). Documented evidence of aerial deposition of wastes from USG's main smokestacks onto the NBA exists (see Section 3.4.1.3 for more detail). Airborne deposition from USG's main smokestacks

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would have settled on the sludge in Waggoner's Wallow, which was open to the atmosphere, since the 1940s. Waggoner's Wallow sludge samples WWS-4 and WWS-5 are located closest to the main smokestacks and have the highest arsenic and lead concentrations (arsenic concentrations of 150 mg/kg in both WWS-4 and WWS-5; lead concentrations of 280 mg/kg and 290 mg/kg in WWS-4 and WWS-5, respectively). WWS-3 is slightly farther away from the main smokestacks than WWS-4 and WWS-5, and there is a corresponding slight decrease in arsenic (130 mg/kg) and lead concentrations (260 mg/kg) in WWS-3. WWS-1 and WWS-2 are slightly farther away from the main smokestacks than WWS-3, and again there is a corresponding slight decrease in arsenic (67 mg/kg to 82 mg/kg) and lead concentrations (120 mg/kg to 220 mg/kg) in WWS-1 and WWS-2. Likewise, the lowest arsenic (9.2 mg/kg to 13 mg/kg) and lead concentrations (56 mg/kg to 69 mg/kg) are in the WWS-6 and WWS-7 samples, which were located farthest away from the main smokestacks. Thus, airborne deposition from USG's main smokestacks is the most plausible cause for the minor arsenic exceedances in WWS-3 through WWS-5, especially since Waggoner's Wallow was used for chlorine manufacturing wastes that did not involve arsenic or lead.

3.3.2.2 Bark Sludge

Bark sludge is unlikely to be a potential source for the arsenic and lead impacts in the NBA based on the arsenic and lead concentrations in samples of bark sludge and likely bark sludge. In other words, bark sludge did not contain enough arsenic or lead to be a source. A 1990 Boateng report documented an extensive sampling effort to characterize the bark sludge after it was applied to the NBA (Boateng 1990). The results of this 1990 characterization demonstrated that the arsenic and lead concentrations in bark sludge were low (i.e., arsenic concentrations ranged from 4 mg/kg to 42 mg/kg, and lead concentrations ranged from 13 mg/kg to 36 mg/kg). In addition, NBA boring logs were also evaluated for observations of likely bark sludge (see Table 4). The arsenic and lead concentrations in the sample intervals where bark sludge was likely present were also low. In summary, the arsenic and lead concentrations were less than the cleanup levels in 53 of the 54 borings where bark sludge or likely bark sludge was sampled (see Figure 14). The only cleanup level exceedances was an arsenic concentration of 90 mg/kg (1.02 times the 88 mg/kg cleanup level) in one sample that contained likely bark sludge (as well as other soil). These low arsenic and lead concentrations in bark sludge and likely bark sludge are consistent with the nature of bark sludge (i.e., a mixture of wood debris and sludge excavated from the former Taylor Lake Area Surface Impoundments). The sludge in the former Taylor Lake Area Surface Impoundments and the resulting bark sludge contained negligible arsenic and lead concentrations (Boateng 1990; DOF 2013).

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3.3.2.3 Fill Material

Based on PIONEER's interpretation of the historical photographs, the only Arkema fill event within the primary impacted portion of the NBA was a phased event between 1986 and 1990 (see Appendix D).[13] That fill event included (1) adding fill to Waggoner's Wallow and the "historical low spot" (CDM Smith 2016) between Waggoner's Wallow and the USG Property in the primary impacted portion of the NBA, and (2) the bark sludge application (which was already discussed as a potential source in Section 3.3.2.2). Construction debris and potential fill material (besides bark sludge) were identified in NBA boring logs to evaluate arsenic and lead concentrations associated with this fill event (see Table 5). Construction debris and/or potential fill material were identified in 18 NBA borings in the eastern portion of the primary impacted portion of the NBA, consistent with the location of the "historical low spot" (see Figure 15).[14] Where present, this construction debris and potential fill material is located beneath bark sludge (e.g., NB-6, NB-9, NB-10, NB-11, NB-13, NB-16, NB-18, NB-20, and NB-24). The arsenic and lead concentrations in the samples collected from this construction debris and potential fill material were low. The arsenic and lead concentrations in 24 of the 28 construction debris and potential fill material samples were less than the cleanup levels (see Figure 15), and the cleanup level exceedances in the other four samples (NB-13 samples at 6 feet bgs and 6.5 feet bgs and NB-18 samples at 5 feet bgs and 5 – 5.5 feet bgs) were likely due to USG wastes as explained below. While some asphalt and crushed rock were associated with the two NB-13 depth intervals, fibers were also present within or immediately adjacent to the same NB-13 depth intervals (see Tables 2 and 5). Based on other NBA sampling results (i.e., elevated arsenic and lead concentrations in samples that contained fibers compared with the lack of arsenic or lead exceedances in samples that just contained construction debris and potential fill), the elevated concentrations in these two NB-13 samples were most likely caused by the USG fibers present within or immediately adjacent to the sample intervals. The boring log description associated with the two NB-18 sample intervals was "Gray-black, silty, fine SAND, with black charred wood." The minor arsenic exceedances in these two NB-18 samples (maximum arsenic concentration of 170 mg/kg) were likely caused by USG wastes given (1) the presence of a "gray-black, silty, fine SAND", (2) the NB-18 location and sample interval depth relative to USG wastes in nearby borings, and (3) the lack of arsenic and lead exceedances in other construction debris and potential fill samples. In summary, fill material is unlikely to be a potential source for the arsenic and lead impacts in the NBA based on the arsenic and lead concentrations in construction debris and potential fill samples. In other words, the construction debris and potential fill did not contain enough arsenic or lead to be a source.

[13] The historical color photographs are particularly helpful for identifying the vegetation that was present in the northwestern portion of the primary impacted portion of the NBA prior to 1986. This vegetation could potentially be mistaken for potential filling/gradient activities in some black and white photos.

[14] Potential fill was also identified in a 19th boring (SPA-05) as shown on Table 5. However, SPA-05 is not shown on Figure 15 because a sample of the potential fill was not collected from SPA-05. SPA-05 is located between NB-32 and NB-33 (both of which contained construction debris and/or potential fill).

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In addition, it is highly unlikely that Arkema used ASARCO slag as fill in the NBA for the following reasons:

- The Arkema fill event occurred between 1986 and 1990. Operations at the ASARCO smelter in Tacoma ended in 1985 (United States Environmental Protection Agency 1994).
- Slag was not encountered within the fill material that Arkema did use (i.e., bark sludge, construction debris and potential fill material). As shown in Tables 4 and 5, slag was not encountered in any locations in which likely bark sludge or construction debris and potential fill were identified, with the exception of slag in one NB-18 sample interval.
- In locations where construction debris and potential fill material are present in the NBA, the highest arsenic and lead concentrations are associated with a relatively thin layer of fibers, shot, and/or slag underneath the construction debris and potential fill material (see Section 3.4.1.1 for more detail). In addition, fibers are present more frequently than slag within this relatively thin layer of USG waste (see Table 2). Thus, the boring log observations do not indicate the presence of a large slag fill event.
- There is no documentation that Arkema used ASARCO slag as fill in the NBA.

3.3.3 Conclusion for this Line of Evidence

In summary, the evaluation of potential USG and Arkema sources indicated that the NBA impacts are most likely attributable to the USG Property for several reasons discussed in this section, including:

- A plume of arsenic and lead contamination appears to be emanating onto the NBA from source locations on the USG Property with similar arsenic and lead concentrations (see Figure 8 and 9).
- A close correlation exists between elevated arsenic concentrations, elevated lead concentrations, and evidence of USG fibers, shot, and slag (see Figures 10 and 11).
- Evidence of USG waste was observed in all NBA soil samples with arsenic concentrations exceeding 400 mg/kg **AND** lead concentrations exceeding 1,000 mg/kg (see Table 3 and Figure 12).
- EMP analyses demonstrated the USG wastes can be present in soil even when these wastes cannot be seen with the naked eye (see Table 2). Thus, small USG waste particles may be causing arsenic and lead cleanup level exceedances even when a visual indicator of this USG waste cannot be seen with the naked eye.
- USG baghouse dust that was released via waste stockpiles, fill material, and/or airborne emissions is likely a significant source for NBA impacts given the amount of baghouse dust generated and the arsenic and lead concentrations in the baghouse dust.
- Waggoner's Wallow and bark sludge did not contain enough arsenic or lead to be a source for the arsenic and lead impacts in the NBA (see Figures 13 and 14).
- The construction debris and potential fill material Arkema placed in the NBA between 1986 and 1990 did not contain enough arsenic or lead to be a source for the arsenic and lead impacts in the NBA (see Figure 15).

3.4 Potential Transport

For this line of evidence, the potential transport mechanisms for potential sources within and adjacent to the NBA were evaluated to help determine the extent to which the liable parties for the USG Property

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and Arkema Site are responsible for the arsenic and lead impacts in the NBA. This line of evidence is appropriate for supporting the allocation determination because transport mechanism(s) indicate how arsenic and lead were transported from one or more suspected sources to the NBA.

3.4.1 USG Property

The key USG transport mechanisms of interest for this Report included:

- Transport from stockpiles and/or filling/grading activities;
- Transport from direct disposal of USG wastes; and
- Transport from waste emissions.

3.4.1.1 Transport from Stockpiles and/or Filling/Grading Activities

Large quantities of USG wastes with significantly elevated concentrations of arsenic and lead were stockpiled immediately adjacent to the primary impacted portion of the NBA (see Section 3.2.1.1 for more detail). Existing data indicate that some of these stockpiled wastes were most likely transported to the abutting low lying areas of the NBA via (1) material rolling off waste stockpiles, (2) fugitive dust blowing off waste stockpiles, and/or (3) material being pushed into the NBA when the waste material was "spread across the area in an effort to raise the grade" in circa 1981 (CDM Smith 2016). The historical wire fence located on or near the property boundary was unable to prevent the transport of USG wastes onto the NBA (see Figure 16). A cross-section (A-A') that was developed based on analytical data, EMP results, and boring logs illustrates how USG wastes stockpiled along the property boundary were most likely transported onto the NBA to form a contiguous layer of USG waste (see Figure 17). Key evaluation findings presented in Figure 17 include:

- The historical ground surface was different from the current ground surface.
- The slightly lower historical ground surface on the Arkema Site side of the property boundary ("historical low spot") enabled gravity transport of USG waste onto the NBA.
- USG wastes on the USG Property were covered by fill material when the grade was raised prior to paving this portion of the USG Property.
- USG wastes on the NBA were covered by fill material (e.g., construction debris, bark sludge) that had low arsenic and lead concentrations.
- Prior to excavation activities, USG wastes were in a relatively thin layer on top of the historical ground surface on both the USG Property and Arkema Site.
- Arsenic in the relatively thin layer of USG waste leached to deeper soil, but the lead remained relatively immobile within the USG waste layer. "Because it does not have the same propensity to leach as arsenic, elevated lead concentrations are associated with the presence of ASARCO-related source material" (CDM Smith 2016).
- The MW9 area IA excavation did not extend deep enough or far enough laterally onto the Arkema Site to capture additional USG waste in the NBA because (1) the excavation depth near the property boundary was too shallow to encounter the USG wastes that had been deposited in this former low lying area, (2) the sidewall samples near the property boundary were too shallow, and (3) the visual inspection method used by AGI Technologies was an ineffective method for detecting USG wastes (see Appendix A).

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3.4.1.2 Transport from Direct Disposal of USG Wastes

It is possible that USG directly disposed of some of its wastes in the NBA (see Section 3.2.1.3 for more detail).

3.4.1.3 Transport from Waste Emissions

Large quantities of USG wastes containing significantly elevated concentrations of arsenic and lead were emitted from USG manufacturing operations adjacent to the primary impacted portion of the NBA (see Section 3.1.1 for more detail). Historical photographs demonstrate that the emissions contained a significant amount of particulates and that the emissions traveled over the primary impacted portion of the NBA (see Figure 18). These USG emissions and the lack of compliance with PSAPCA air emission rules resulted in 35 unique notices of violation and seven civil penalties in the time between when PSACPA was formed in 1967 and 1975 (see Appendix E). Three of the seven PSAPCA civil penalties were specifically related to "causing or allowing the discharge of particulate matter to become deposited upon the real property of others." PSAPCA documentation and complaints provide details about the nature of the deposition of particulate matter from USG emissions (see Appendix E). For instance, "Husband works at [redacted] graveyard shift. They blow out insulation pollution in wee hours around 4 or 5 o'clock. He has to wash his car every morning." A cross-section (B-B') based on analytical data, EMP results, and boring logs illustrates how USG wastes were most likely transported onto the NBA via airborne deposition (see Figure 19). Key evaluation findings presented in Figure 19 include:

- USG wastes comprise a relatively thin layer located on top of the historical ground surface in both the USG Property and the NBA.
- USG wastes in the USG Property were subsequently covered by fill material when the grade was raised prior to paving this portion of the USG Property.
- USG wastes in the NBA were subsequently covered by fill material (e.g., bark sludge) that had low arsenic and lead concentrations.
- This relatively thin layer of USG wastes is often difficult to visually identify in the NBA. Fibers, shot, and slag can be present in soil even when these wastes cannot be seen with the naked eye (see Section 3.3.1 for more detail). For instance, there was no visual evidence of USG waste in the NB-35 interval from 1.5 – 4 feet bgs and yet shot and slag were identified at 2 feet bgs in the EMP analysis. In addition, it is extremely difficult to identify baghouse dust in the subsurface.
- The apparent absence of the thin layer of USG waste in the vicinity of NB-38 and NB-43 was likely due to soil being moved/mixed during subsequent fill/grading events. It is also possible that (1) small fiber, shot, slag, and/or baghouse dust particles were present in the vicinity of NB-38 and NB-43 but were not sampled because they could not be seen with the naked eye, and (2) the thin layer of USG waste was not included in the geologic sample obtained from these borings because of poor sample recovery.

3.4.2 Arkema Site

The Arkema transport mechanisms of potential interest for this Report were:

- Arkema fill material in the NBA; and
- Water overflowing from Waggoner's Wallow.

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Potential transport from the former Penite Manufacturing Area, the former Penite Pits, the former Sandblasting Shed, and the green-colored sand on the ground around the former Sandblasting Shed to the NBA is highly unlikely as discussed in Sections 3.1.2.2 and 3.2.2.2. In addition, Penite manufacturing and the former Sandblasting Shed did not involve airborne emissions of wastes.

3.4.2.1 Arkema Fill Material in the NBA

Construction debris and potential fill material identified in boring logs are indicators that Arkema placed fill material in the NBA. However, the construction debris and potential fill did not contain enough arsenic or lead to be a source of arsenic and lead cleanup level exceedances in the NBA (see Section 3.3.2.3 for more detail). Thus, this transport mechanism is insignificant with respect to the NBA impacts.

3.4.2.2 Water Overflowing from Waggoner's Wallow

Historical photographs suggest that standing water was sometimes present within the primary impacted portion of the NBA. It is possible that water could have overflowed from Waggoner's Wallow during heavy rainfall events (especially since Waggoner's Wallow did not have an associated dike) and contributed to this standing water (AWARE Corporation 1981). As a result, constituents within Waggoner's Wallow could have been transported beyond the confines of Waggoner's Wallow. However, the arsenic and lead concentrations in Waggoner's Wallow were not high enough for Waggoner's Wallow to be a source of arsenic and lead cleanup level exceedances in the NBA (see Section 3.3.2.1 for more detail). Thus, this transport mechanism is insignificant with respect to the NBA impacts.

3.4.3 Conclusion for this Line of Evidence

In summary, the evaluation of potential transport mechanisms for potential USG and Arkema sources indicated that the NBA impacts are most likely attributable to the USG Property for several reasons discussed in this section, including:

- Existing evidence indicated that USG wastes stockpiled next to the property boundary were most likely transported to the abutting low lying areas of the NBA via (1) material rolling off waste stockpiles, (2) fugitive dust blowing off waste stockpiles, and/or (3) filling/gradient activities (see Figure 17).
- Existing evidence indicated that USG wastes were transported onto the NBA via airborne deposition of USG emissions (see Figures 18 and 19).
- Although fill material (e.g., construction debris) was placed in the primary impacted portion of the NBA (presumably by Arkema), this transport mechanism is insignificant since the Arkema fill material does not have sufficient arsenic and lead concentrations to be a source for the arsenic and lead impacts in the NBA.
- Although constituents within Waggoner's Wallow could have been transported beyond the confines of Waggoner's Wallow due to water overflowing from Waggoner's Wallow, this transport mechanism is insignificant since Waggoner's Wallow does not have sufficient arsenic and lead concentrations to be a source for the arsenic and lead impacts in the NBA.

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3.5 Forensics

For this line of evidence, metals ratios for the potential sources of arsenic and lead were evaluated to help determine the extent to which the liable parties for the USG Property and Arkema Site are responsible for the arsenic and lead impacts in the NBA. Gradient Corporation supported PIONEER with this evaluation. This line of evidence is appropriate for supporting the allocation determination because metals ratios provide an indication of whether or not NBA impacts share a forensics signature with one of more suspected sources.

3.5.1 Approach

To conduct this evaluation, metals ratios for the samples representative of each potential source were plotted to identify unique signatures and determine whether or not one or more of these potential source signatures were consistent with NBA signatures (see Charts 1 and 2).[15,16] Although the EMP is an important investigation tool, EMP analysis is not an appropriate forensics technique for this cost allocation scenario. In addition, CDM Smith's interpretations of the EMP results for cost allocation purposes are inappropriate (see line of evidence #4 in Appendix A for more detail). By contrast, metals ratios is a standard forensic technique used to determine contaminant origin that is more appropriate for this cost allocation scenario (Morrison and Murphy 2006). The metals ratios technique is based on the premise that each potential source contains a relatively unique percentage of metals based on the origin of the source material. For example, wastes from a specific metal smelter will have a different distribution of certain metals than a metal-based pesticide. For the USG Property and the NBA, elevated lead concentrations are an important diagnostic characteristic since "soils containing high lead concentrations occur [on the USG Property] where residual source material is present or is in the immediate vicinity" (CDM Smith 2016). Thus, the slope of a regression line for plotted concentrations from two metals (or the ratio of two metals in a single sample) can provide an indication if NBA impacts are characteristic of a particular source.

3.5.2 Results and Discussion

The key results from the metals ratios evaluation were:

- NBA samples with arsenic and lead cleanup level exceedances are associated with USG wastes (i.e., fibers, shot, and/or slag), with the exception of three Waggoner's Wallow samples, two NB-

[15] Samples representative of fibers, shot, and slag were identified in Table 2. Samples representative of Waggoner's Wallow, bark sludge, and USG baghouse dust were the samples collected directly from the potential source in 1989, 1990, and 1992, respectively (see Appendix B). Samples representative of likely bark sludge were identified in Table 4. Samples representative of construction debris and potential fill were identified in Table 5. Samples representative of the Penite Pits Area were determined based on proximity to the former Penite Pits.

[16] The results of lab and XRF analyses were used in this evaluation. Even though there is the potential for double counting results when lab and XRF analyses were performed on the same sample interval, it was appropriate to use both analyses because the lab and XRF analyses represented different sample intervals in the overwhelming majority of cases. If a particular sample contained multiple potential sources (e.g., fibers as well as construction debris and potential fill), the sample was included in the data set for each potential source, unless otherwise noted. For the purpose of this evaluation, non-detect values were assumed to equal the reporting limit.

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13 sample intervals, and two NB-18 sample intervals (see Charts 1 and 2). However, the minor arsenic exceedances in three Waggoner's Wallow samples, the two NB-13 sample intervals, and the two NB-18 sample intervals were likely caused by USG wastes (see Section 3.3.2 for more detail).

- The slopes of the lead/arsenic and lead/zinc regression lines for each potential source are unique, with the exception of the lead/arsenic ratios for shot and slag (see Charts 1 and 2).[17,18] In other words, the potential sources have unique forensic signatures. The similar lead/arsenic slopes for shot and slag are consistent with shot and slag sharing a common source.
- The lead/arsenic and lead/zinc ratios for NBA samples with cleanup level exceedances are consistent with the slopes of the regression lines for fibers, shot, and/or slag that are present in USG Property and the NBA (see Charts 1 and 2). Furthermore, the data in Charts 1 and 2 demonstrate that USG wastes have characteristically elevated lead and zinc concentrations (e.g., lead and zinc concentrations in the 1,000 mg/kg to 10,000 mg/kg range). By contrast, the maximum lead and zinc concentrations in NBA samples associated with potential Arkema sources were 290 mg/kg and 202 mg/kg, respectively.[19]
- The slope of the lead/arsenic regression line for NBA samples containing fibers is consistent with the slope of the regression line for the rest of the NBA samples not associated with leached arsenic (see Chart 3).[20] In other words, NBA samples carry the same fibers signature regardless of whether or not fibers were observed in the samples. Thus, fibers appear to be the primary cause for most of the arsenic and lead cleanup level exceedances within the NBA. This result is consistent with the close correlation between evidence of fibers and elevated arsenic and lead concentrations in NBA samples (see Table 3). In addition, it is reasonable that fibers would be responsible for most of the NBA impacts since the smaller and lighter fibers would have been transported and deposited over a wider area compared to the heavier shot and slag particles.
- The lead/arsenic ratio for the 1992 baghouse dust sample is similar to the slopes of the two Chart 3 regression lines for the NBA samples not associated with leached arsenic. This result indicates that baghouse dust could have contributed to NBA impacts. It should be noted that the lead/arsenic ratio for baghouse dust likely varied over time (i.e., the pre-1973 signature was likely different than that of the 1992 sample).
- The slope of the lead/arsenic regression line for Waggoner's Wallow samples is inconsistent with the slope of the lead/arsenic regression line for the other NBA samples (see Chart 4). This result indicates that Waggoner's Wallow was not the source of arsenic and lead cleanup level exceedances in the NBA.
- The slope of the nickel/arsenic regression line for bark sludge and likely bark sludge is inconsistent with the slope of the nickel/arsenic regression line for the other NBA samples (see

[17] Waggoner's Wallow samples are not included on Chart 2 since these samples were not analyzed for zinc.

[18] There is only one 1992 baghouse dust sample and one Sandblasting Area sample. Therefore, a single ratio for each of these individual samples is included for potential comparison with the slopes of the regression lines.

[19] NB-13 samples at 6 feet bgs and 6.5 feet bgs were excluded because the elevated lead and zinc concentrations in these samples were most likely caused by USG fibers (see Section 3.3.2.3 for more detail).

[20] Samples that are likely associated with leached arsenic located underneath USG waste were excluded from Chart 3 since these samples are not representative of the USG waste source. For the purposes of this Report, samples with leached arsenic were defined as samples with arsenic concentrations greater than 100 mg/kg, lead concentrations less than or equal to 100 mg/kg, and the sample top depth greater than or equal to 5 feet bgs.

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Chart 5). This result indicates that bark sludge was not the source of arsenic and lead cleanup level exceedances in the NBA.

- The slope of the lead/arsenic regression line for construction debris and potential fill samples is inconsistent with the slope of the lead/arsenic regression line for other NBA samples (see Chart 6). This result indicates that construction debris and potential fill was not the source of arsenic and lead cleanup level exceedances in the NBA.
- The metals ratios for the Penite Pit area were included on Charts 1 and 2 for comparison purposes since the former Penite Pits are the only Arkema features with high enough arsenic concentrations to be a potential source for the arsenic impacts in the NBA. The lead/arsenic and lead/zinc ratios for NBA samples with cleanup level exceedances are inconsistent with the slopes of the regression lines for the Penite Pits Area. This result indicates that the arsenic exceedances and single lead exceedance in the Penite Pits Area samples are not relevant to the NBA.

3.5.3 Conclusion for this Line of Evidence

In summary, the evaluation of metals ratios for the potential sources indicated that the NBA impacts are most likely attributable to the USG Property for several reasons discussed in this section, including:

- NBA samples with arsenic and lead cleanup level exceedances are associated with USG wastes (i.e., fibers, shot, and/or slag).
- USG wastes have characteristically elevated lead and zinc concentrations. NBA samples with arsenic and lead cleanup levels are consistent with the lead/arsenic and lead/zinc ratios for USG wastes.
- NBA samples carry the same USG fibers signature regardless of whether or not fibers were observed in the samples.
- The signatures for (1) Waggoner's Wallow, (2) bark sludge and likely bark sludge, (3) construction debris and potential fill, and (4) the Penite Pits area are inconsistent with the signature of NBA samples.

3.6 Overall Conclusion

As shown in the following table, each individual line of evidence concludes that the arsenic and lead impacts in the NBA are most likely attributable to the USG Property.

Line of Evidence	Evaluated	Rationale	Summary of Results	Liable Party
Manufacturing Operations	The nature and location of USG and Arkema historical manufacturing operations and features within and adjacent to the NBA	Historical manufacturing operations and features indicate the nature of wastes that could have been released to the NBA	USG manufacturing produced large quantities of wastes containing significantly elevated concentrations of both arsenic and lead adjacent to the primary impacted portions of the NBA. It is unlikely that Arkema manufacturing (inside or outside the NBA) produced arsenic- and lead-impacted wastes that were released to the NBA.	USG

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Line of Evidence	Evaluated	Rationale	Summary of Results	Liable Party
Waste Management	The nature and location of USG and Arkema historical waste management activities within and adjacent to the NBA	Waste management activities indicate how wastes containing arsenic and lead could have been released to the NBA	USG stockpiled waste, used waste as fill, and emitted airborne wastes containing elevated arsenic and lead concentrations adjacent to the primary impacted portion of the NBA. It is unlikely that Arkema waste management activities (inside or outside of the NBA) caused a release of arsenic or lead in the NBA.	USG
Potential Sources	Arsenic and lead concentrations in potential USG and Arkema sources within and adjacent to the NBA	Arsenic and lead concentrations associated with the potential sources indicate where arsenic and lead were released to the NBA	A plume of arsenic and lead contamination appears to be emanating from the USG Property onto the NBA. A close correlation exists between elevated arsenic concentrations, elevated lead concentrations, and evidence of USG waste. Potential Arkema sources that could have affected the NBA do not have enough arsenic or lead to be a source for the arsenic and lead impacts in the NBA.	USG
Potential Transport	Potential transport mechanisms for potential sources within and adjacent to the NBA	Transport mechanism(s) indicate how arsenic and lead were transported from one or more suspected sources to the NBA	USG wastes were transported onto the NBA via (1) material rolling off waste stockpiles, (2) fugitive dust blowing off waste stockpiles, (3) filling/grading activities, (4) airborne deposition, and/or (5) direct disposal. Potential Arkema transport mechanisms are insignificant given the low arsenic and lead concentrations in potential Arkema sources that could have affected the NBA.	USG
Forensics	Metals ratios for the potential sources of arsenic and lead	Metals ratios provide an indication of whether or not NBA impacts share a forensics signature with one of more suspected sources	NBA samples with arsenic and lead exceedances are associated with USG wastes and are consistent with metals ratios for USG wastes. The signatures for Arkema potential sources are inconsistent with the signature of other NBA samples.	USG
	Overall		The lines of evidence indicate that USG wastes are responsible for all exceedances of arsenic and lead cleanup levels in the NBA.	USG

The results of the lines-of-evidence evaluation indicate that arsenic- and lead-laden wastes (e.g., fibers, shot, slag, baghouse dust) produced by USG manufacturing are responsible for all of the arsenic and lead concentrations exceeding cleanup levels in the NBA. A conceptual illustration of how wastes were released from historical manufacturing operations and waste management practices and transported onto the NBA is presented in Figure 20. In summary, arsenic and lead cleanup level exceedances in the NBA were caused by transport of wastes from USG stockpiles, transport of wastes from USG emissions, and/or direct disposal of wastes by USG. The USG waste deposits in the NBA were subsequently covered by fill material (e.g., construction debris, bark sludge) that did not have arsenic and lead concentrations exceeding cleanup levels. In addition, no compelling evidence exists that Arkema caused any arsenic or lead cleanup level exceedances in the NBA.

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SECTION 4: ALLOCATION OF REMEDIAL ACTION COSTS

An allocation of the NBA remedial action costs between the liable parties for the USG Property and the Arkema Site based on the conclusions of the lines-of-evidence evaluation is presented in this section. Individually, each line of evidence indicated that the arsenic and lead impacts in the NBA are most likely attributable to the USG Property. Collectively, the five lines of evidence provide a compelling explanation of how arsenic- and lead-laden wastes (e.g., fibers, shot, slag, baghouse dust) produced by USG manufacturing are responsible for all of the arsenic and lead concentrations exceeding cleanup levels in the NBA. In addition, no compelling evidence exists that Arkema caused any arsenic or lead cleanup level exceedances in the NBA. Therefore, the conclusion of this Report is that USG is 100% responsible for the $15,063,772 of NBA remedial action costs estimated in Section 2.8.

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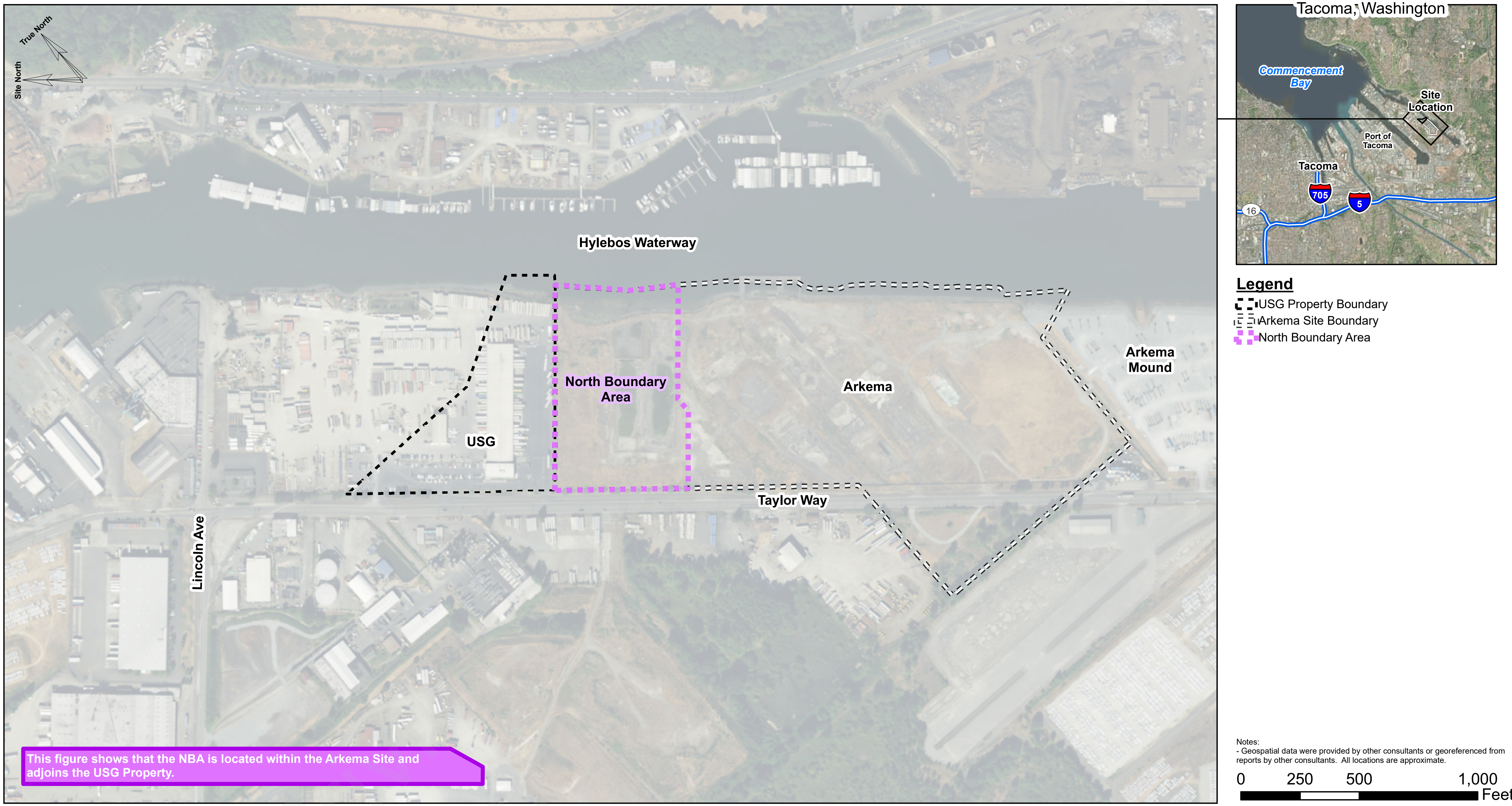

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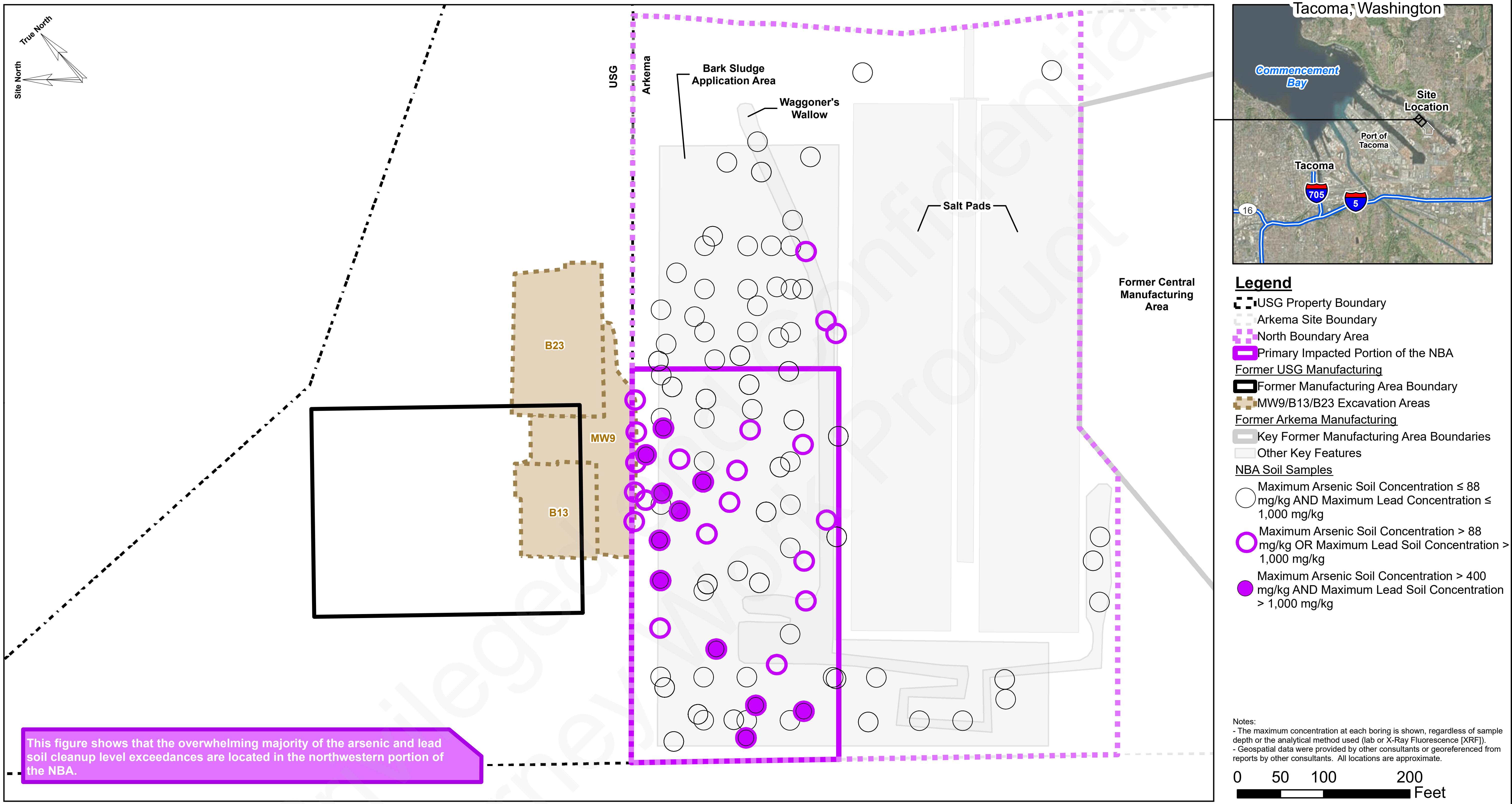
Vicinity Map
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 1



Notes:
- The maximum concentration at each boring is shown, regardless of sample depth or the analytical method used (lab or X-Ray Fluorescence [XRF]).
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-2_Identification of the Primary Impacted Portion of the NBA.mxd; Author: SM; Date Saved: 3/17/2017

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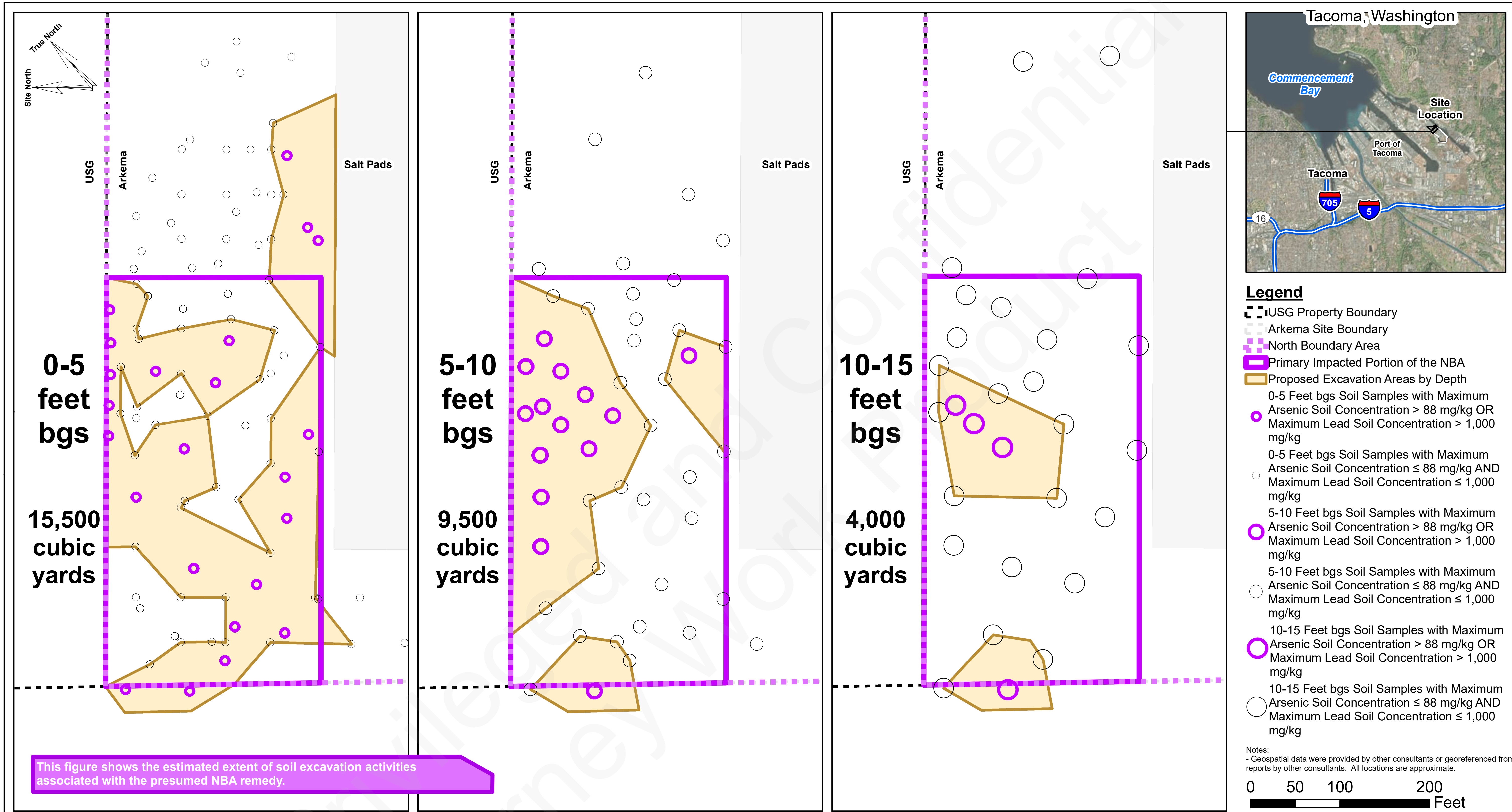
Identification of the Primary Impacted Portion of the NBA
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 2



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Anticipated Soil Excavation Areas
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 3

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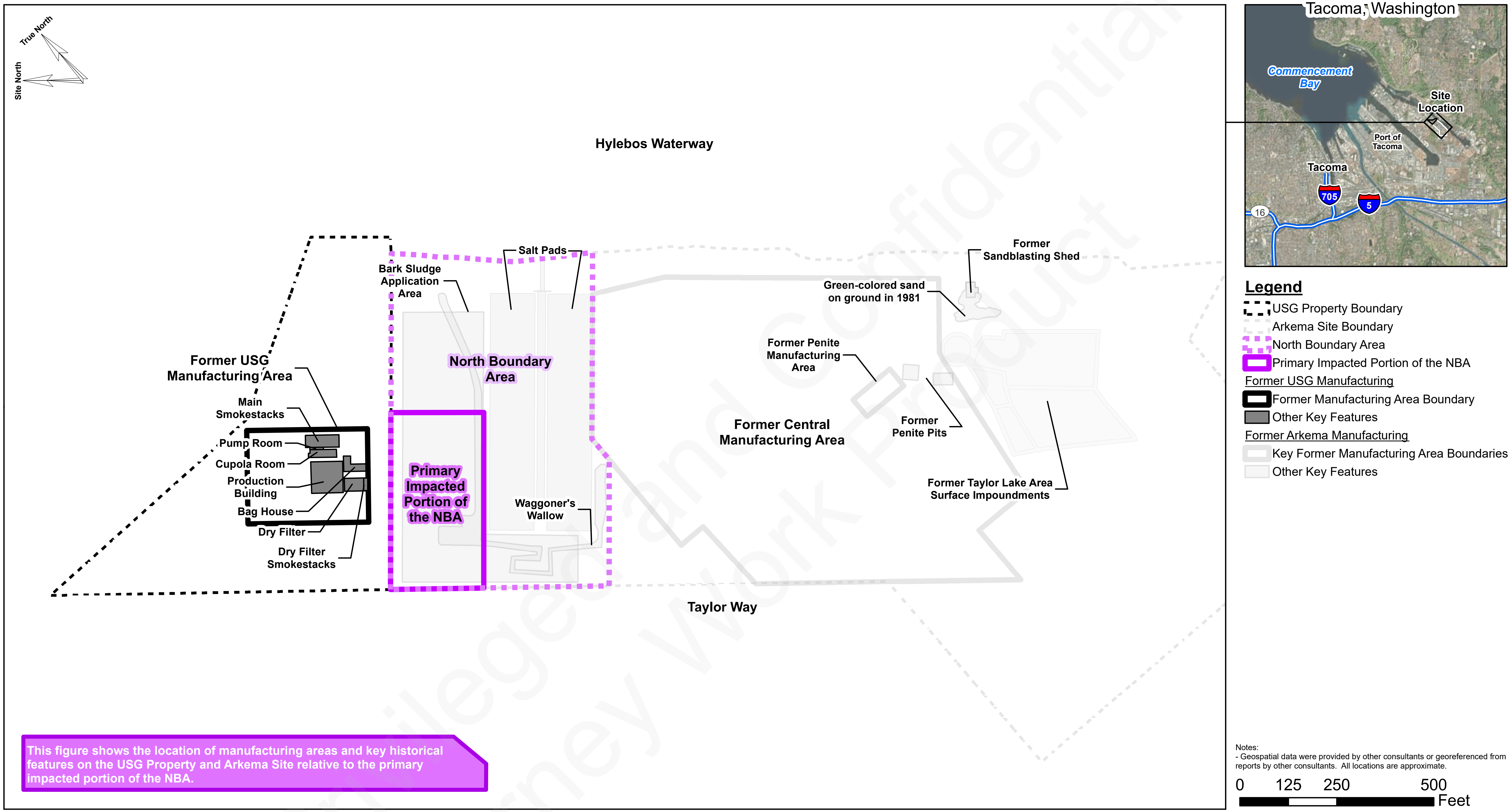
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-3_Remediation Location Explanation.mxd; Author: SM; Date Saved: 3/16/2017



PIONEER TECHNOLOGIES CORPORATION

Key Historical Manufacturing Features
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 4

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-4_Key Historical Manufacturing Features.mxd; Author: SM; Date Saved: 3/17/2017

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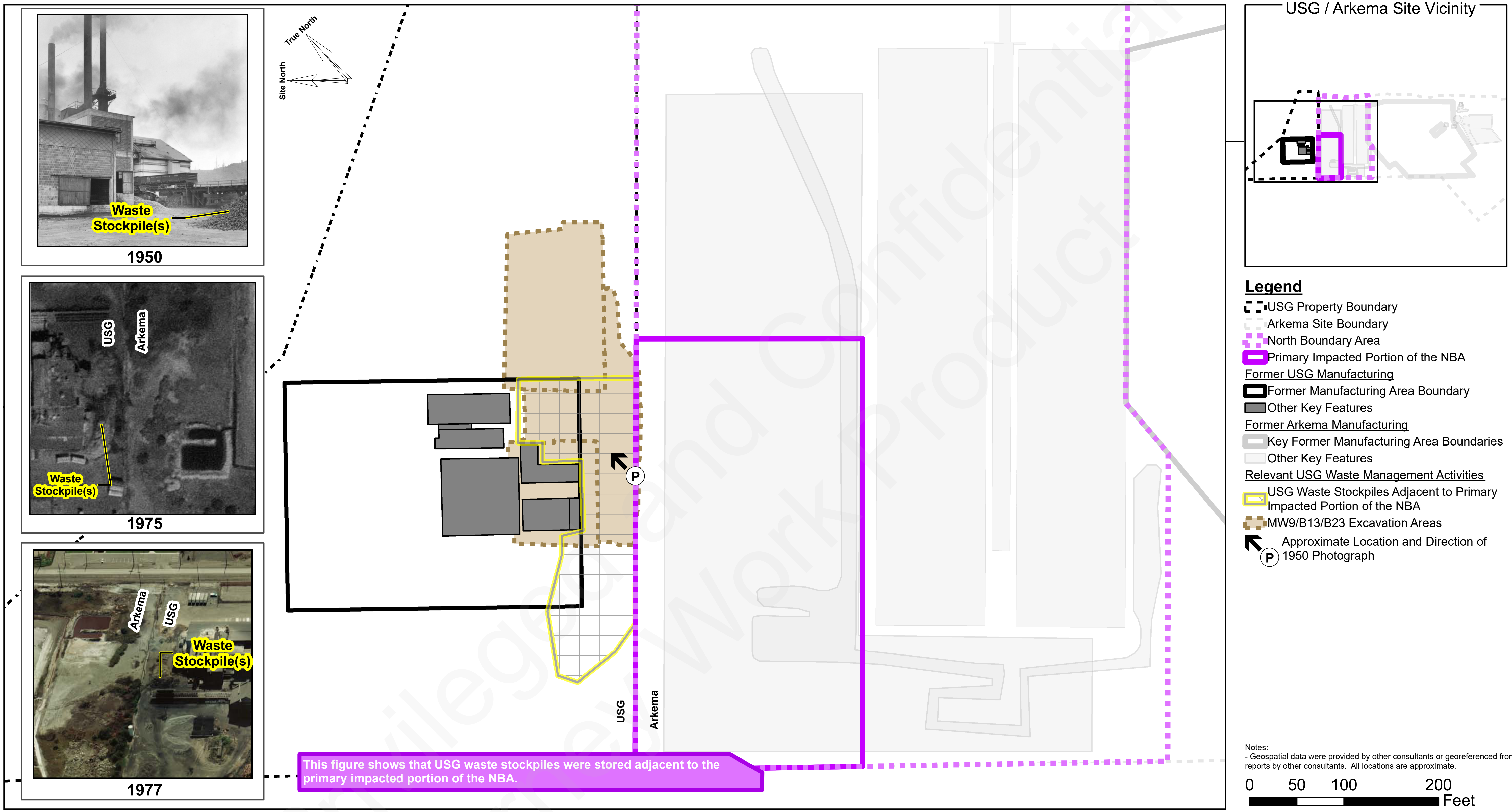

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USG Waste Management Adjacent to the Primary Impacted Portion of the NBA
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 5

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-5_USG Waste Management Practices.mxd; Author: SM; Date Saved: 3/17/2017

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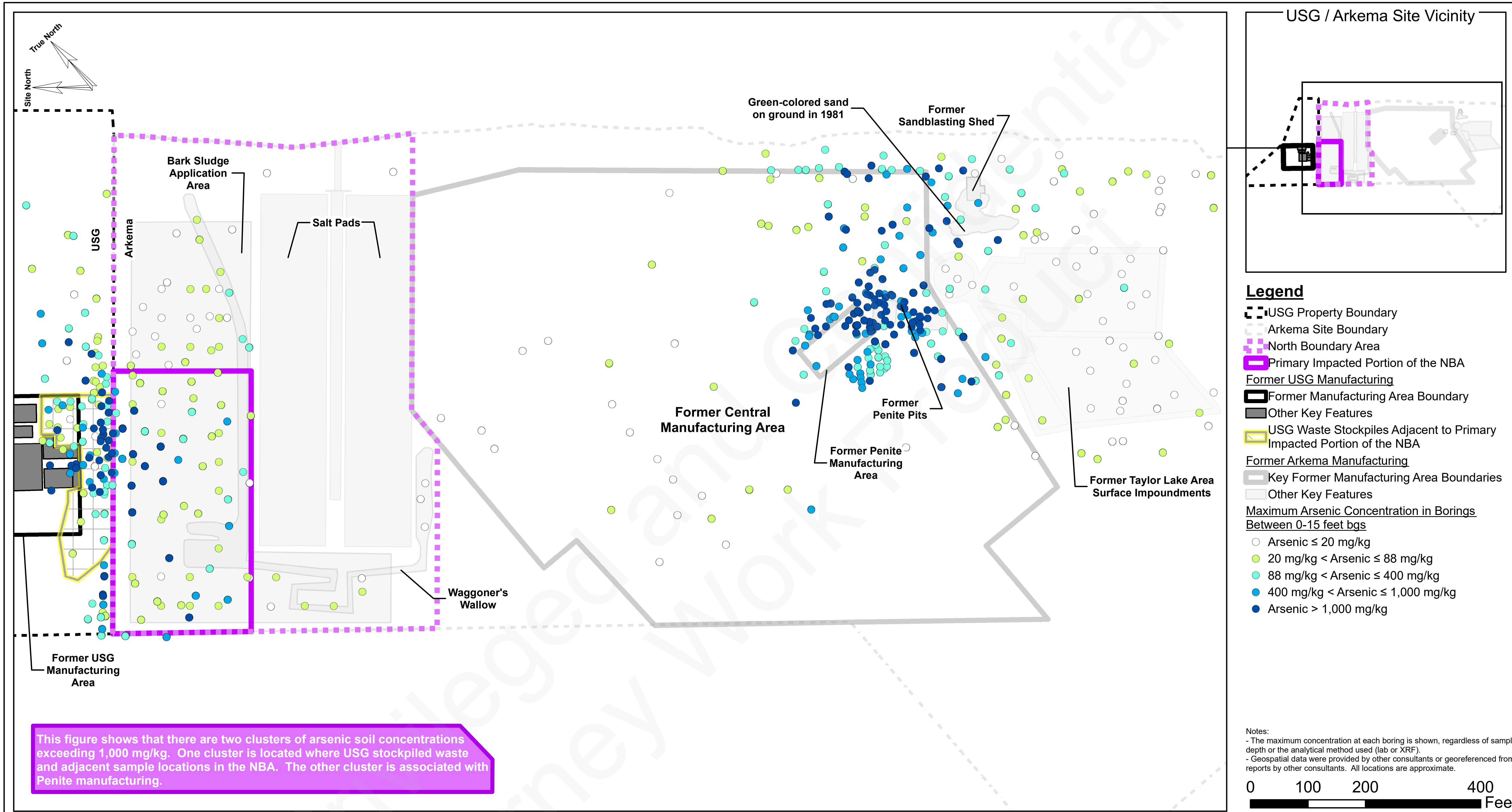
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-6_Arsenic Soil Concentrations.mxd; Author: SM; Date Saved: 3/17/2017



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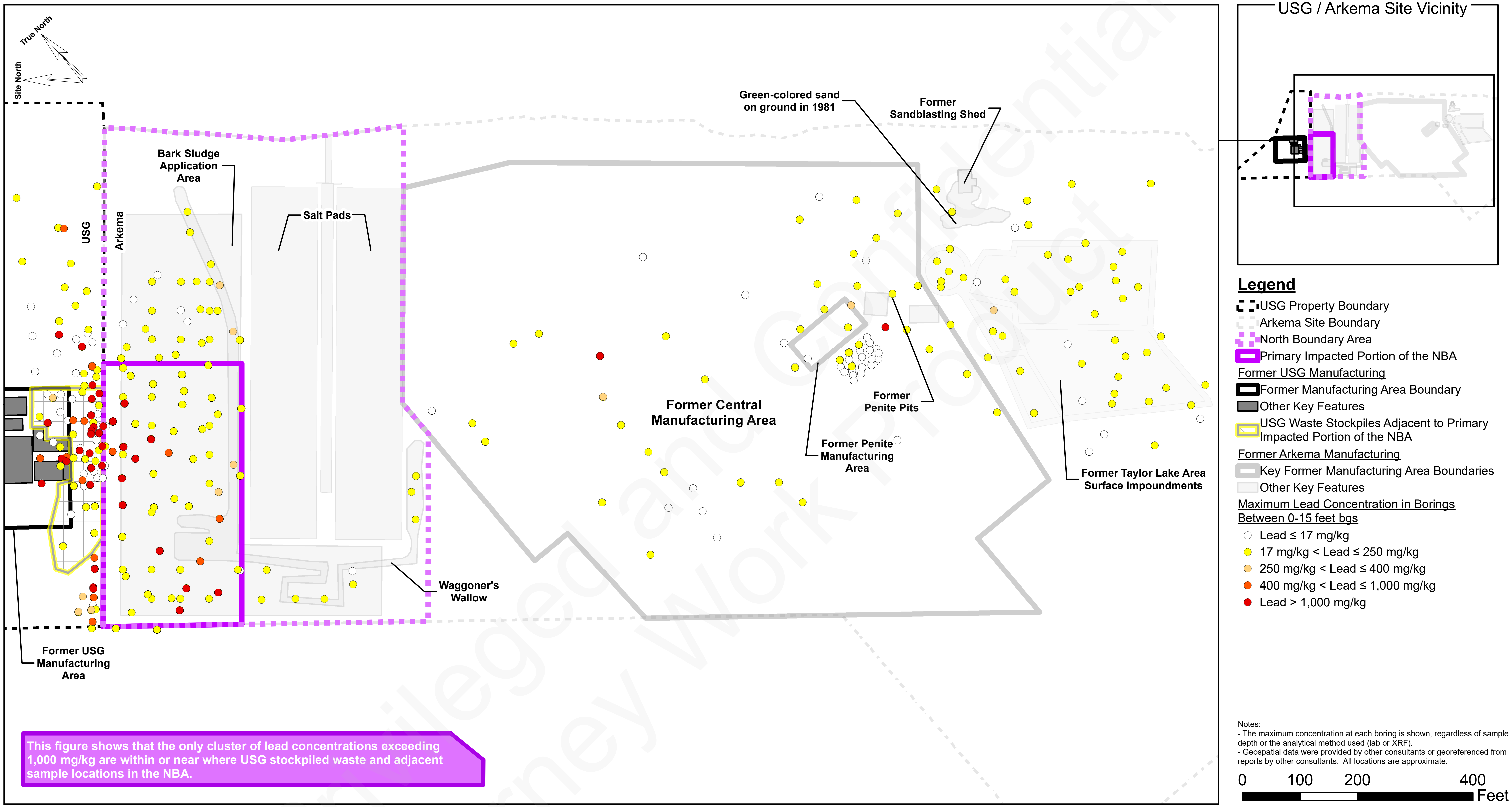
PIONEER TECHNOLOGIES CORPORATION

Arsenic Soil Concentrations
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 6



PIONEER TECHNOLOGIES CORPORATION

Lead Soil Concentrations
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 7

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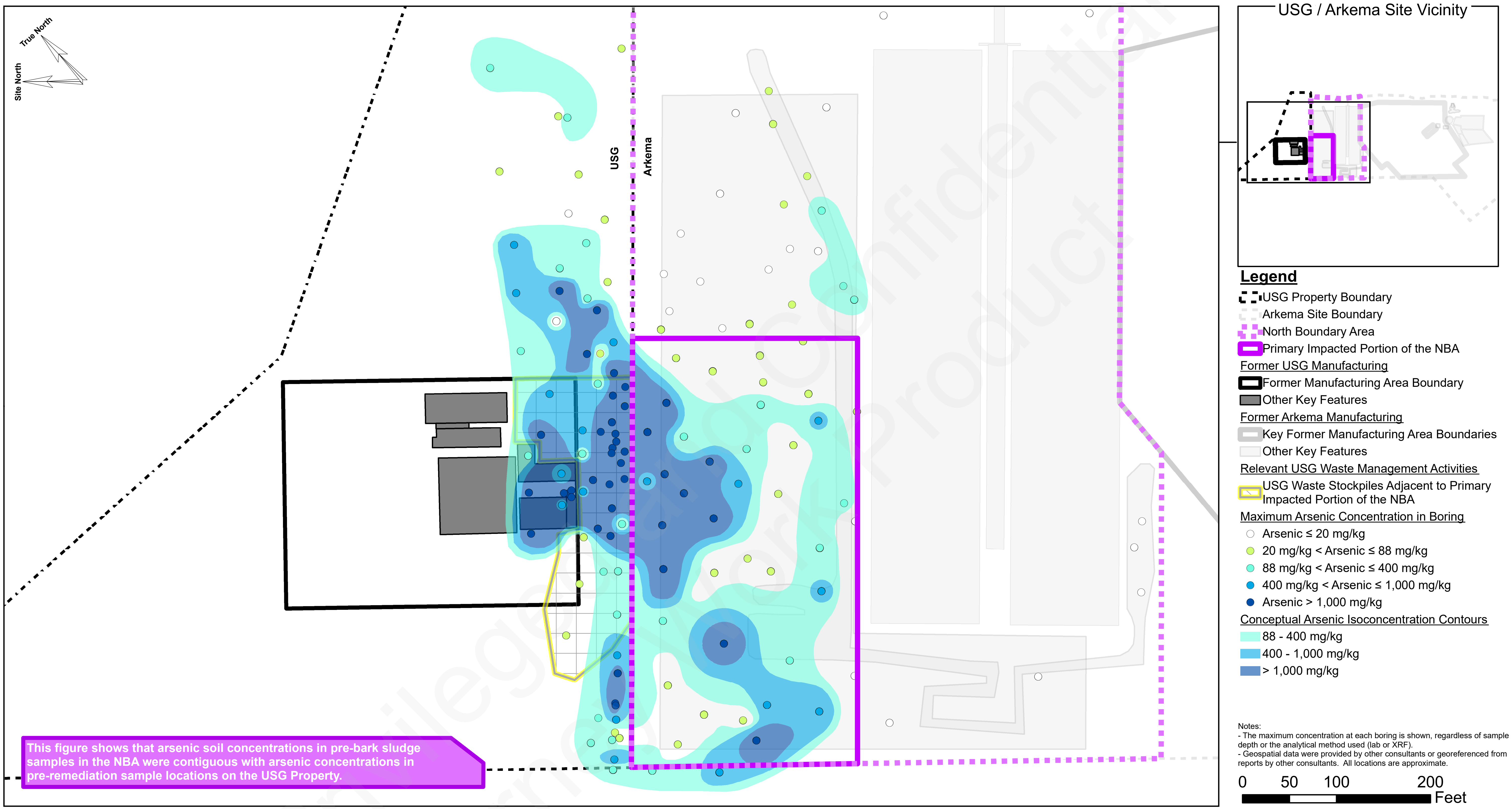
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-7_Lead Soil Concentrations.mxd; Author: SM; Date Saved: 3/17/2017



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TECHNOLOGIES CORPORATION

Pre-Remediation and Pre-Bark Sludge Arsenic Soil Isoconcentration Contours
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 8

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-8_Arsenic Isocontours.mxd; Author: SM; Date Saved: 3/17/2017

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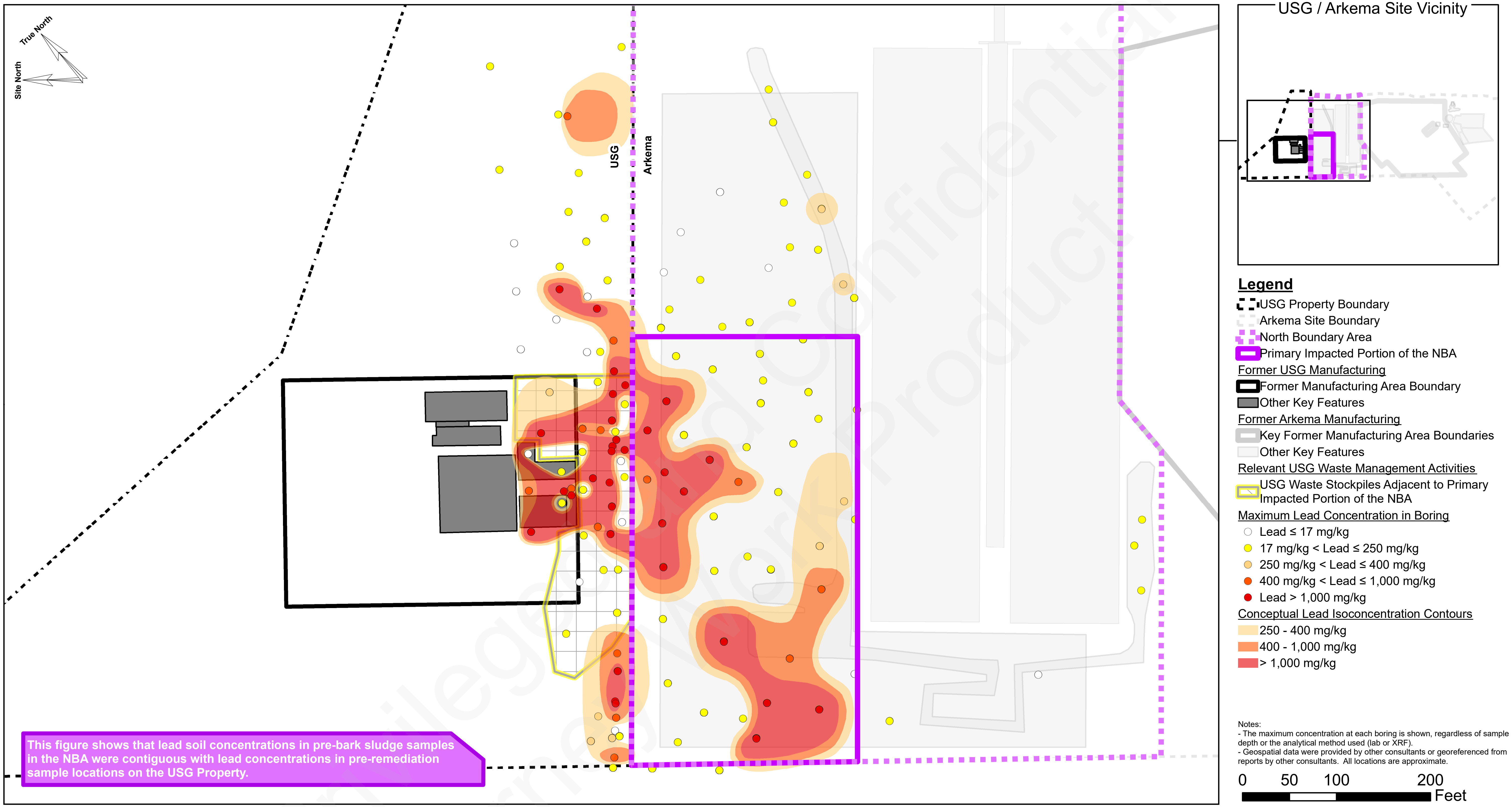


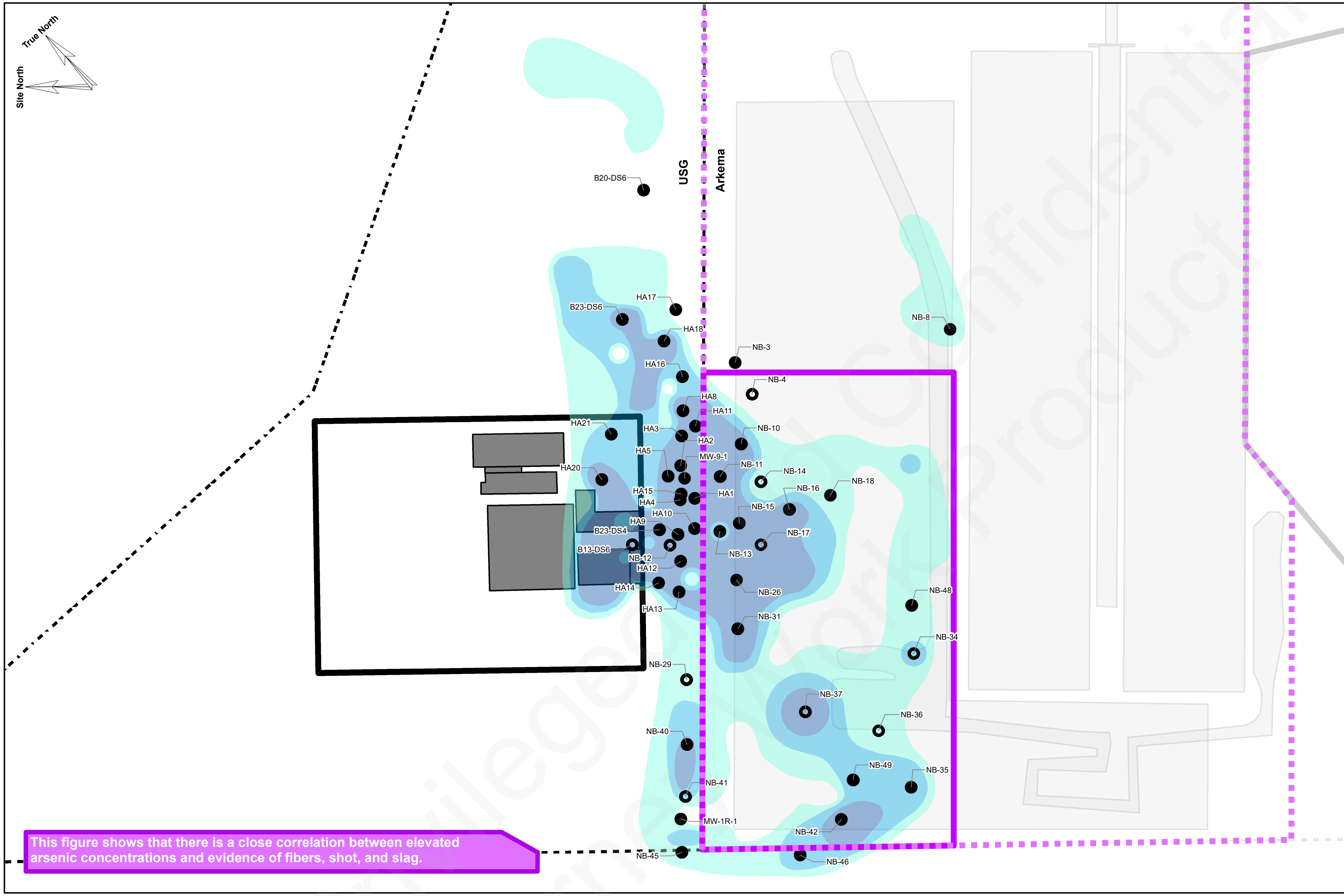
PIONEER TECHNOLOGIES CORPORATION

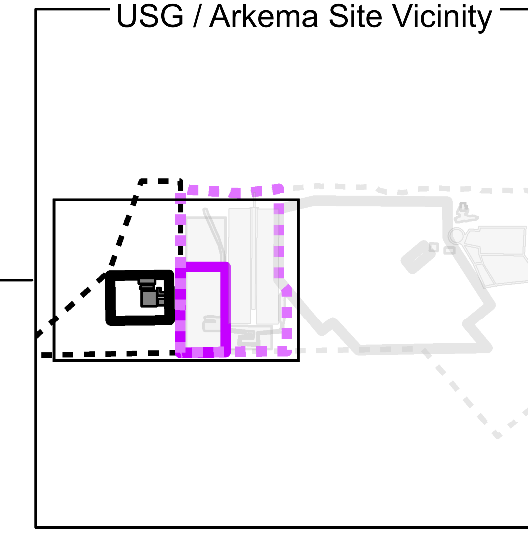
Pre-Remediation and Pre-Bark Sludge Lead Soil Isoconcentration Contours
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 9

Privileged and Confidential Attorney Work Product

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-9_Lead Isocontours.mxd; Author: SM; Date Saved: 3/17/2017





Legend

USG Property Boundary
Arkema Site Boundary
North Boundary Area
Primary Impacted Portion of the NBA

Former USG Manufacturing
Former Manufacturing Area Boundary
Other Key Features

Former Arkema Manufacturing
Key Former Manufacturing Area Boundaries
Other Key Features

Key Boring Log Observations
Visual Evidence of Fibers, Shot, and/or Slag in Boring Log and/or EMP Results [1]
Visual Evidence of Likely USG Waste in Boring Log [1]

Conceptual Arsenic Isoconcentration Contours
88 - 400 mg/kg
400 - 1,000 mg/kg
> 1,000 mg/kg

Notes:
[1] If both categories were identified in a boring, the fibers, shot, and/or slag symbol is shown.
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.

0 50 100 200 Feet

PIONEER TECHNOLOGIES CORPORATION

Comparison of Arsenic Isoconcentration Contours and USG Waste Locations
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 10

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-10_Key Boring Logs with USG Waste and Arsenic Isocontours.mxd; Author: SM; Date Saved: 3/17/2017

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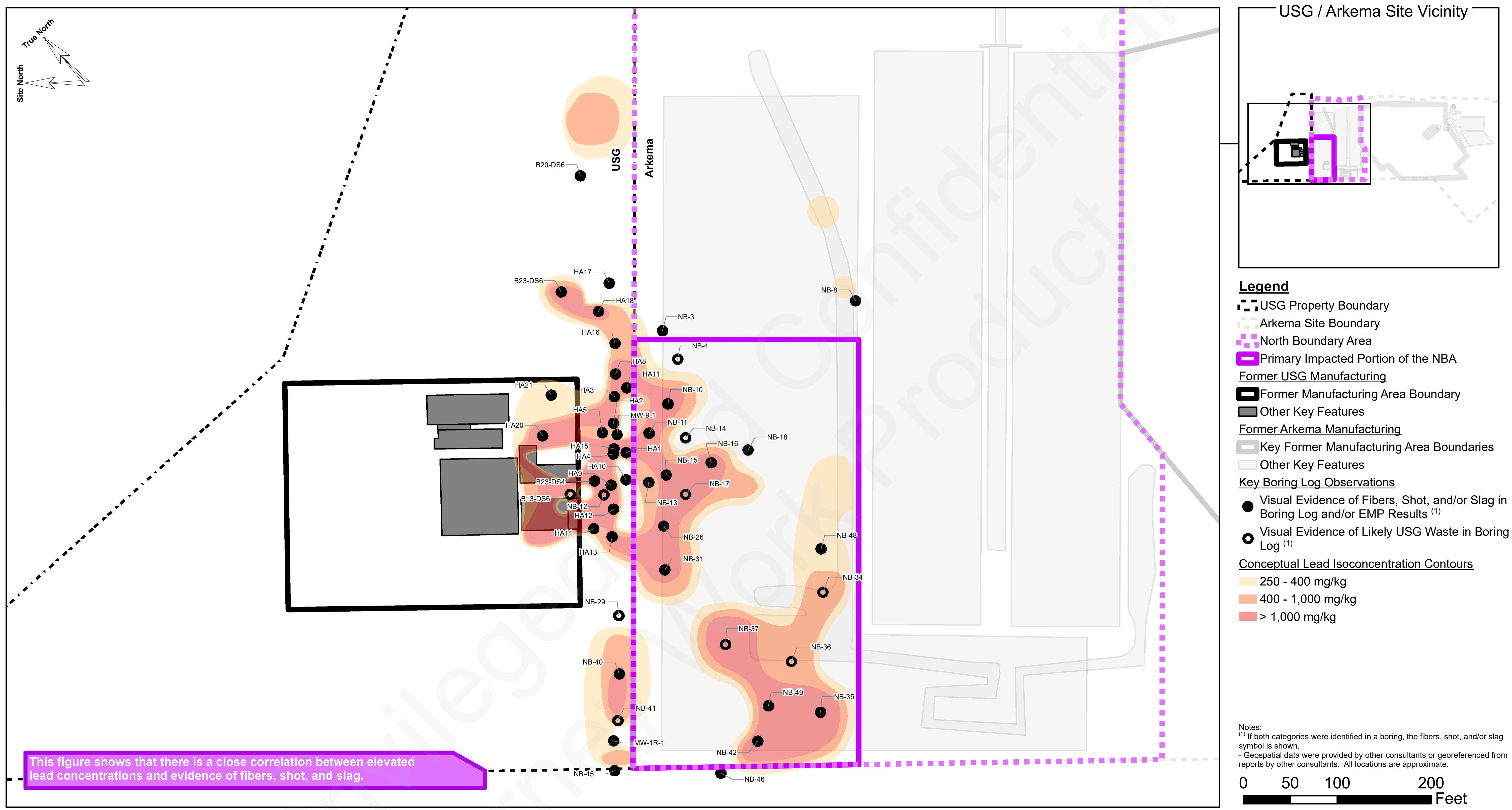

PIONEER TECHNOLOGIES CORPORATION

Comparison of Lead Isoconcentration Contours and USG Waste Locations
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 11

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-11_Key Boring Logs with USG Waste and Lead Isocontours.mxd; Author: SM; Date Saved: 3/17/2017

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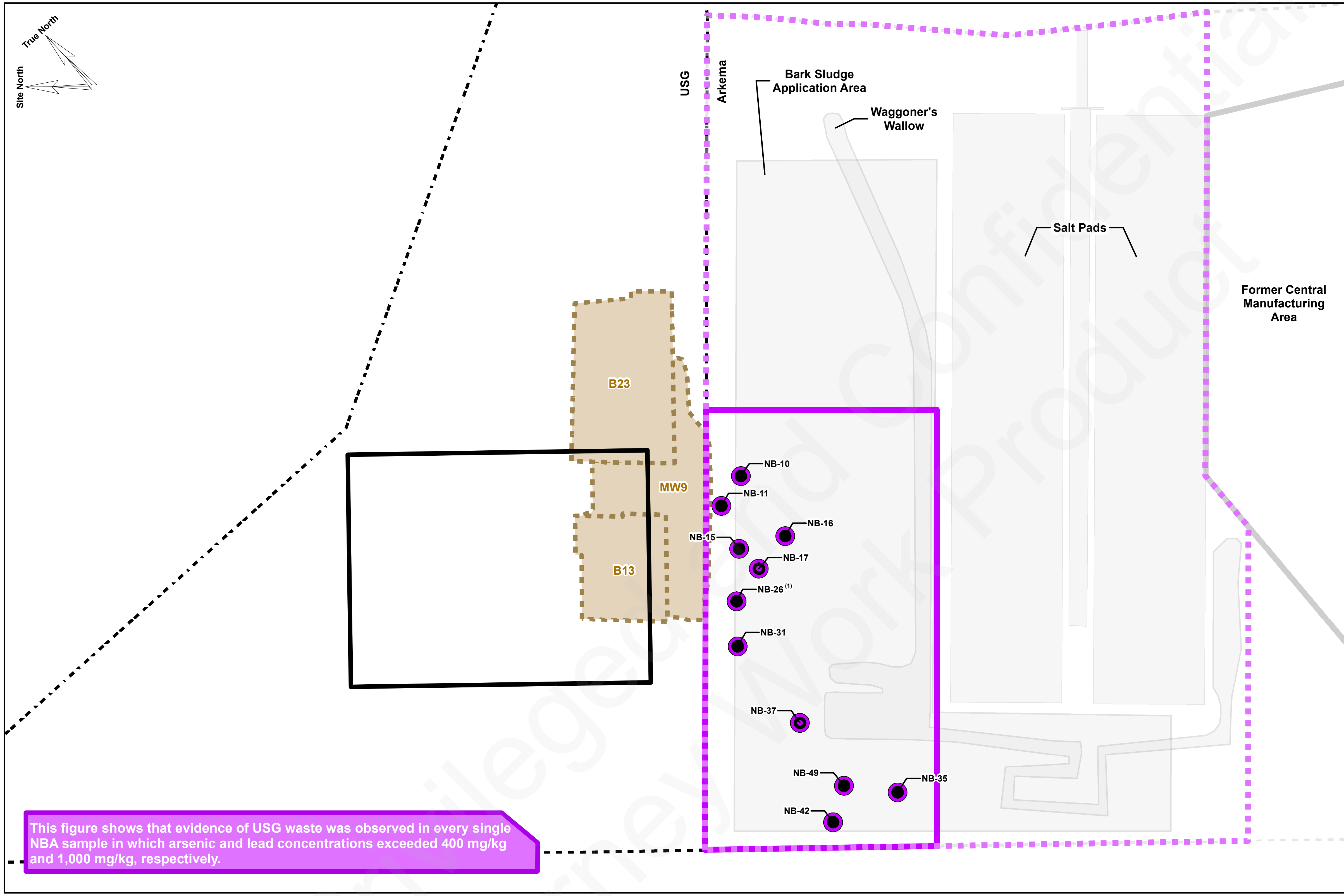

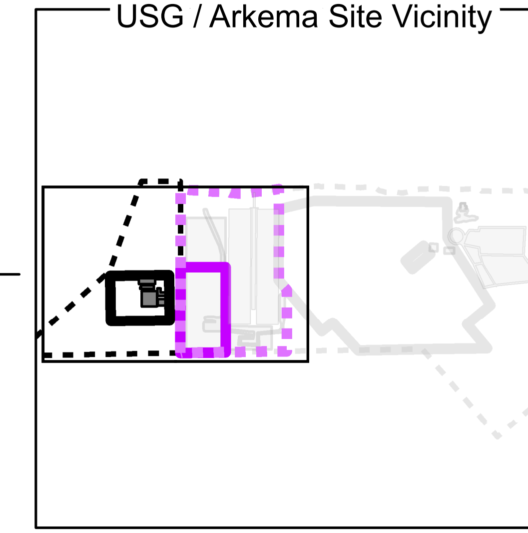

Legend

- USG Property Boundary
- Arkema Site Boundary
- North Boundary Area
- Primary Impacted Portion of the NBA

Former USG Manufacturing

- Former Manufacturing Area Boundary
- MW9/B13/B23 Excavation Areas

Former Arkema Manufacturing

- Key Former Manufacturing Area Boundaries
- Other Key Features

Elevated Arsenic and Lead Samples

- Sample with Arsenic Concentration > 400 mg/kg AND Lead Concentration > 1,000 mg/kg
- Sample with Arsenic Concentration > 400 mg/kg AND Lead Concentration > 1,000 mg/kg Has Visual Evidence of Fibers, Shot, and/or Slag
- Sample with Arsenic Concentration > 400 mg/kg AND Lead Concentration > 1,000 mg/kg Has Visual Evidence of Likely USG Waste

Notes:
(1) Even though this sample interval of 6.5 - 6.5 feet bgs was not categorized as a USG waste or likely USG waste, evidence of fibers was observed in the 6.0 - 6.2 feet bgs interval of this boring.
- See Table 3 for specific sample intervals associated with samples shown on this figure.
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.

0 50 100 200 Feet

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USG Wastes Within Samples Containing Arsenic Concentrations Exceeding 400 mg/kg and Lead Concentrations Exceeding 1,000 mg/kg
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 12

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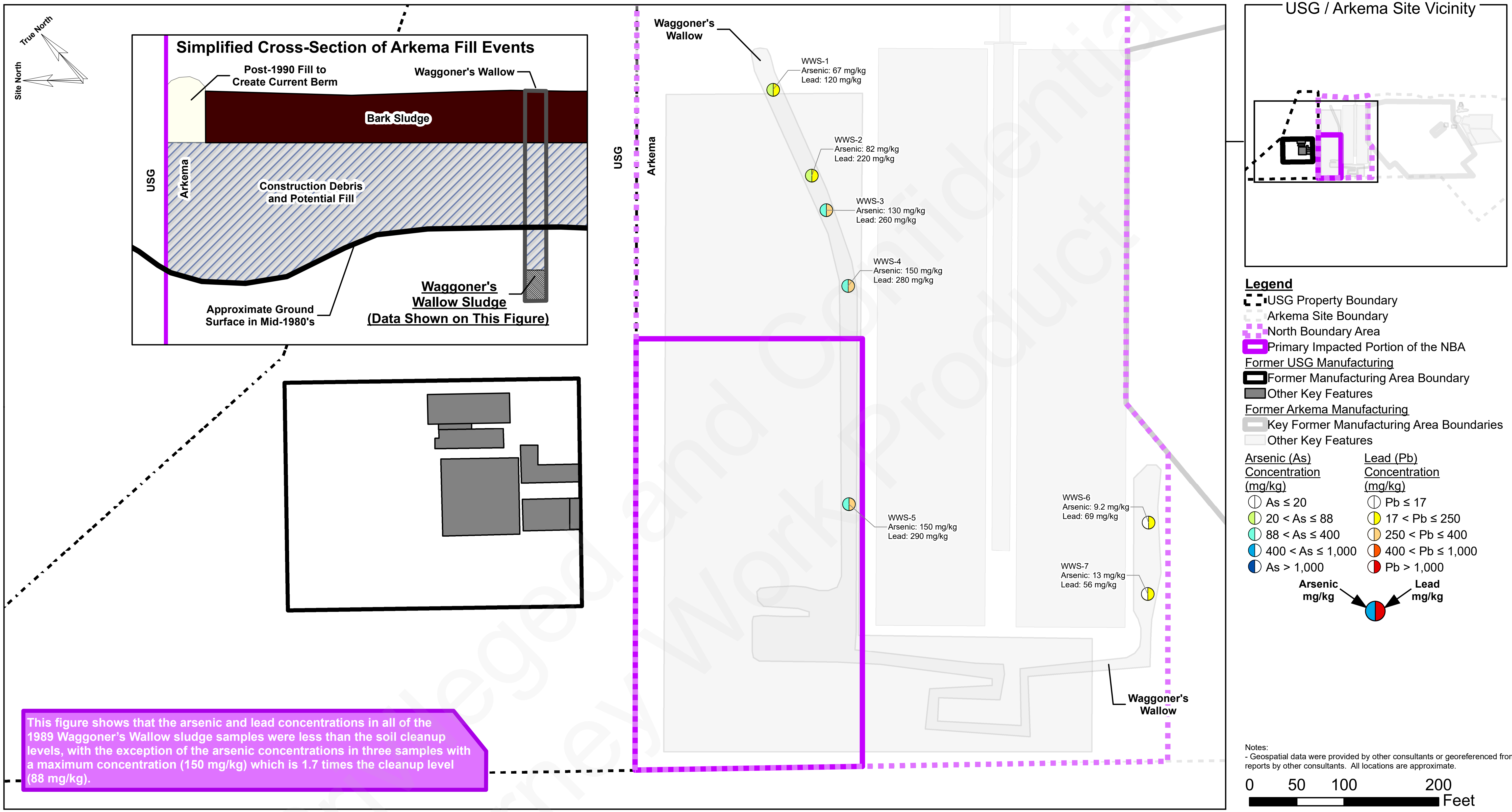
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-12_Samples with Elevated As AND Pb.mxd; Author: SM; Date Saved: 3/17/2017



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Arsenic and Lead Concentrations in Waggoner's Wallow Sludge
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 13

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-13_Waggoners Wallow Samples.mxd; Author: SM; Date Saved: 3/17/2017

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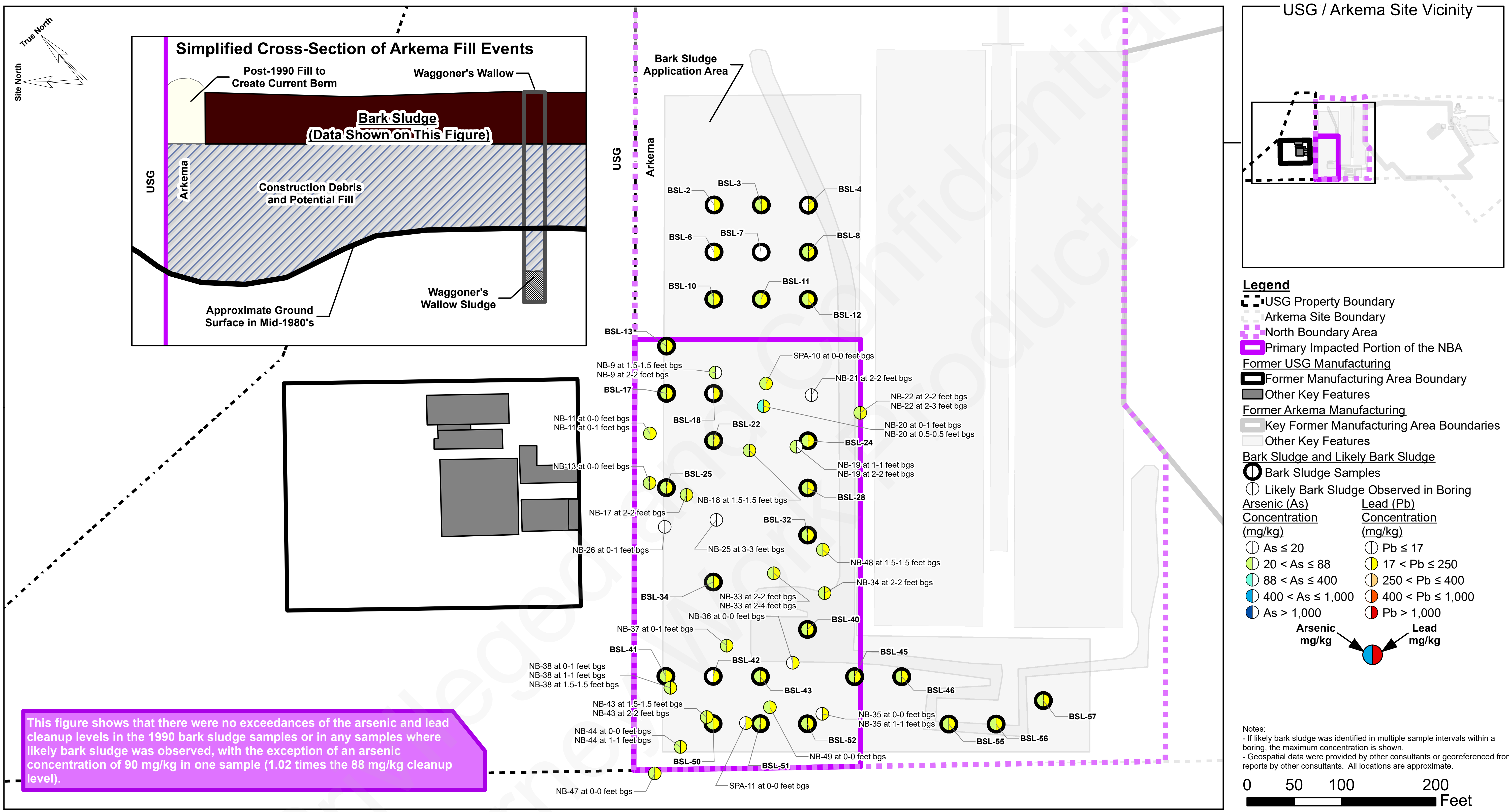
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-14_Bark Sludge Samples.mxd; Author: SM; Date Saved: 3/17/2017



PIONEER TECHNOLOGIES CORPORATION

Arsenic and Lead Concentrations in Bark Sludge Samples
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 14

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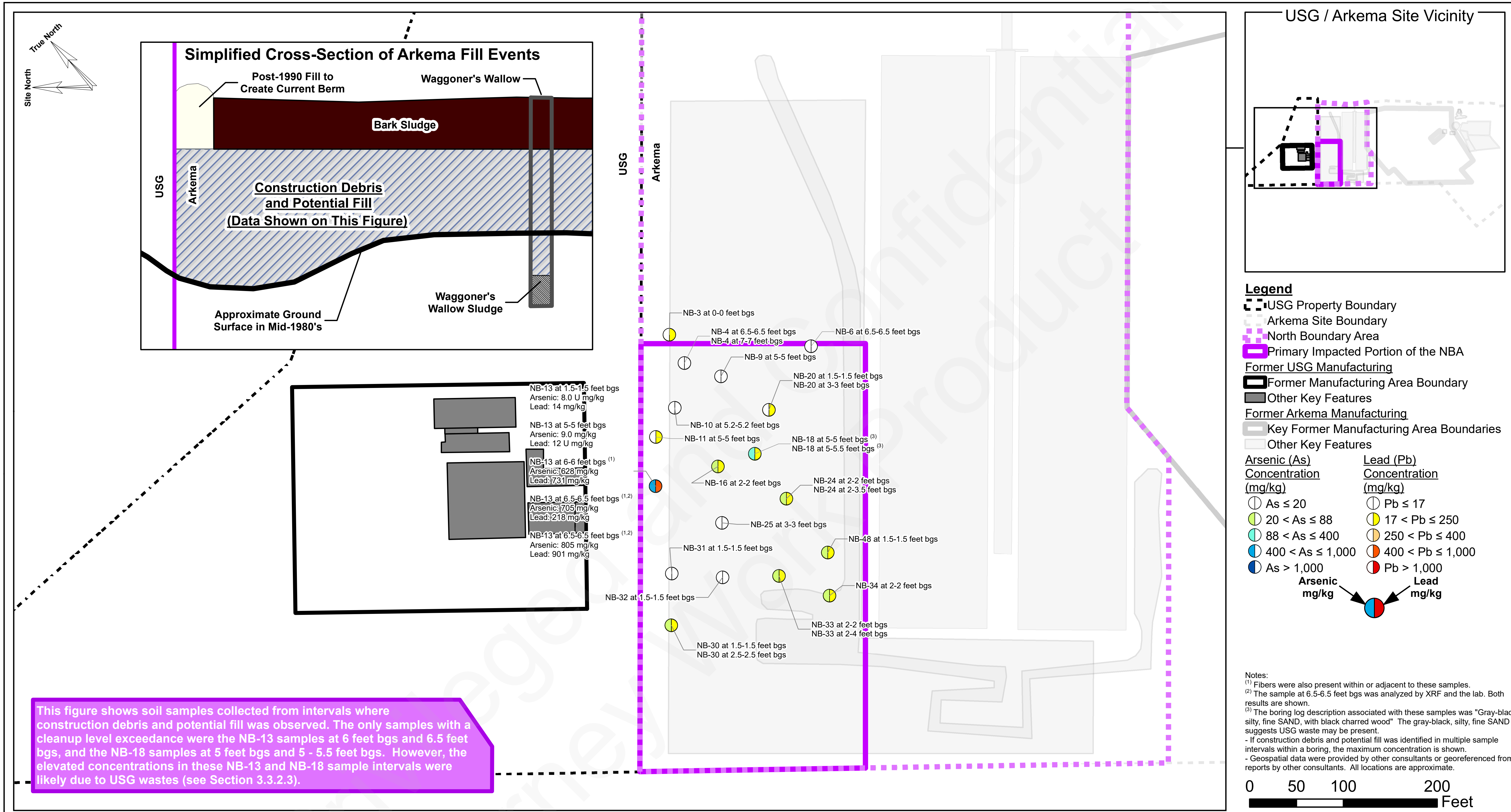

PIONEER TECHNOLOGIES CORPORATION

Arsenic and Lead Concentrations in NBA Soil Samples with Construction Debris and Potential Fill (Excluding Bark Sludge)
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 15

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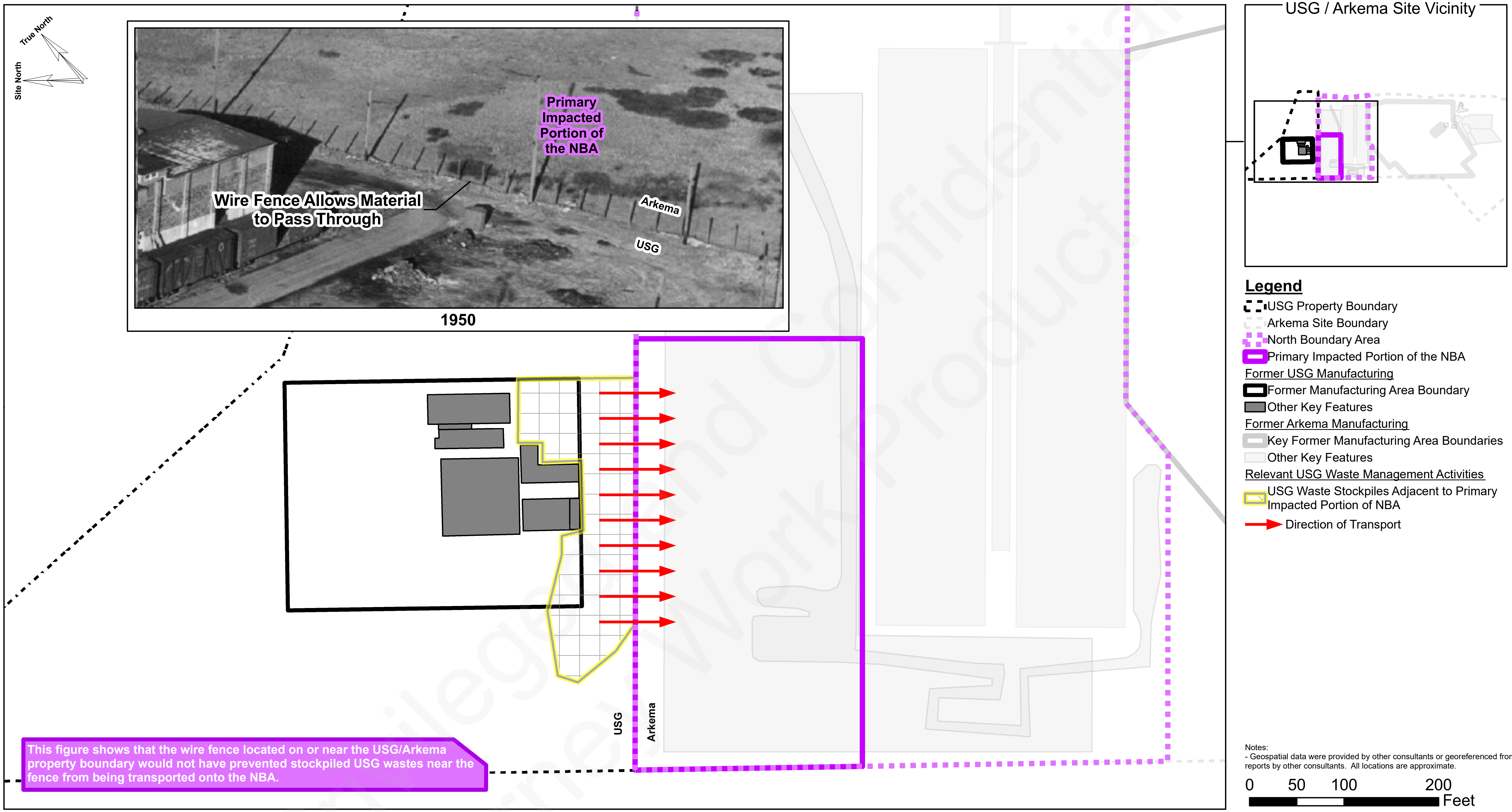
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-15_Potential Fill Samples.mxd; Author: SM; Date Saved: 3/17/2017

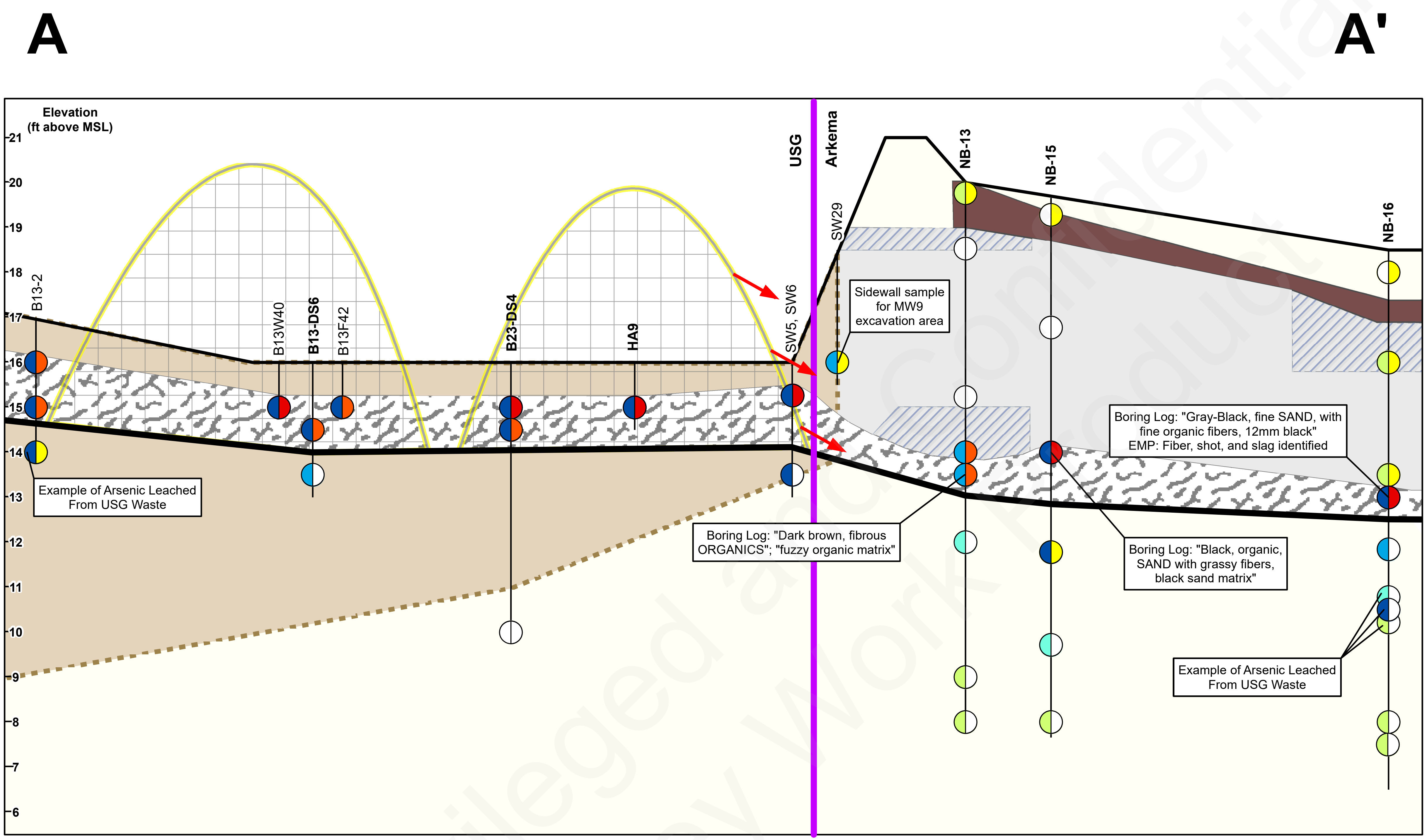


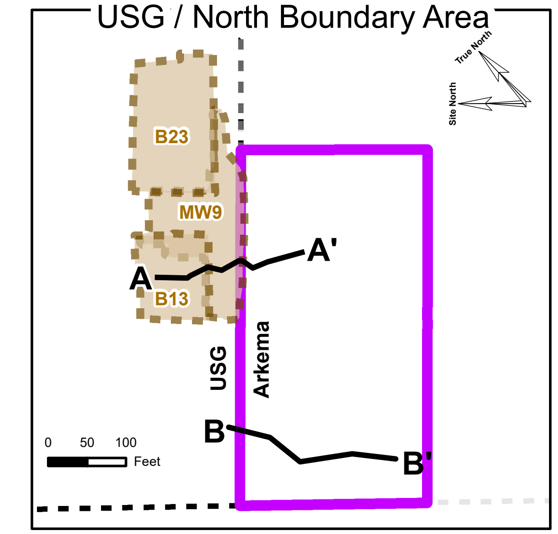
PIONEER TECHNOLOGIES CORPORATION

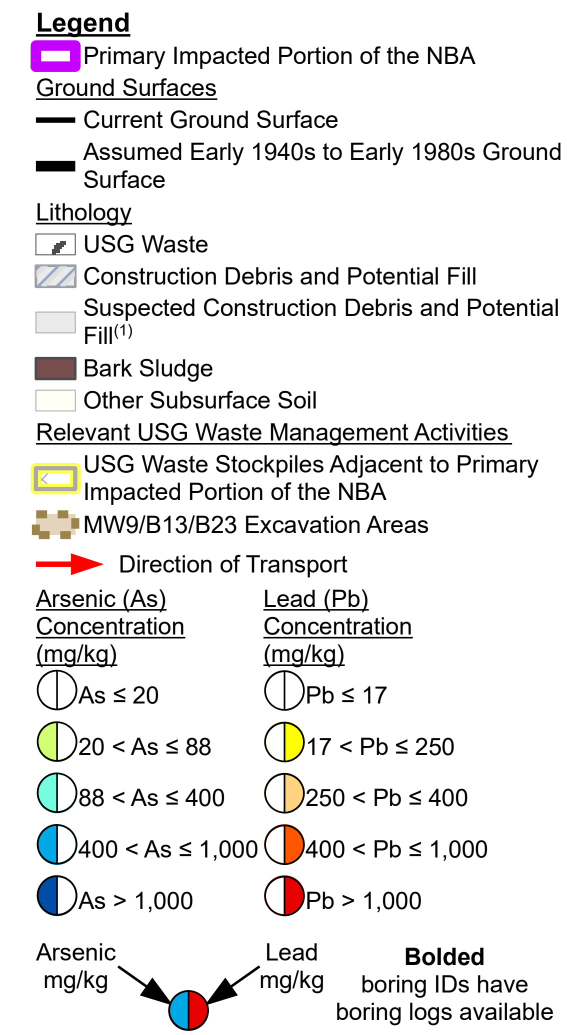
Transport Mechanisms from USG Stockpiles onto the NBA
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 16

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-16_Potential Transport from USG Stockpiles.mxd; Author: SM; Date Saved: 3/17/2017







This figure shows how stockpiled USG wastes located near the property boundary were transported and deposited onto the NBA prior to the subsequent filling of the NBA up to the current ground surface.

Notes:
(1) Large pieces of construction debris may be present in this area but were not included in the geologic sample given 1) the small size of the soil sampler (2 inch diameter) relative to the size of construction debris, and 2) the 40%-80% recovery in NB-13, NB-15, and NB-16 between 0 to 5 feet bgs.
- The maximum concentration for each sample interval is shown, regardless of the analytical method used (lab or XRF).
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.
- Topography of the current ground surface is based on 2007 ground surface elevation contours.
- The excavation bottom was depicted based on the depth of excavation bottom samples proximate to the cross-section.

PIONEER TECHNOLOGIES CORPORATION

Cross-Section A-A'
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 17

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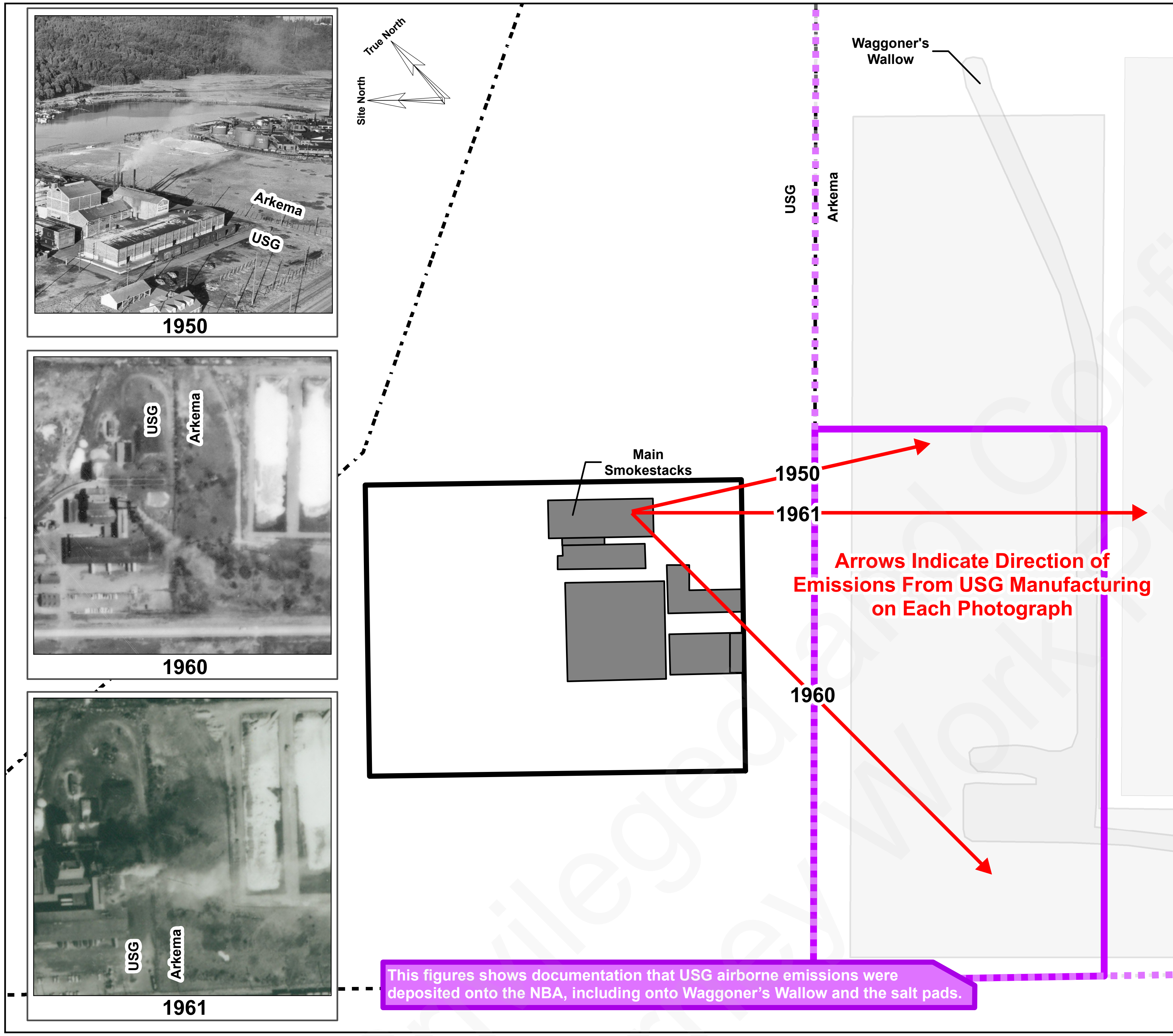
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-17_A-A'_CrossSection.mxd; Author: SM; Date Saved: 3/17/2017

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-18_USG Aerial Deposition onto Arkema.mxd; Author: SM; Date Saved: 3/17/2017



Notices of violations, civil penalties, and direct quotes related to USG's air emissions according to PSAPCA's files (see Appendix E):

35 Unique notices of violation between 1967 and 1975

7 Unique civil penalties between 1967 and 1975, including 3 civil penalties related to *"causing or allowing the discharge of particulate matter to become deposited upon the real property of others"*

"The six-inches deep accumulations of the wool and slag beads on the plant roof and grounds is a positive evidence of its release and of poor industry housekeeping."
June 5, 1969 memorandum documenting May 26, 1969 plant visit

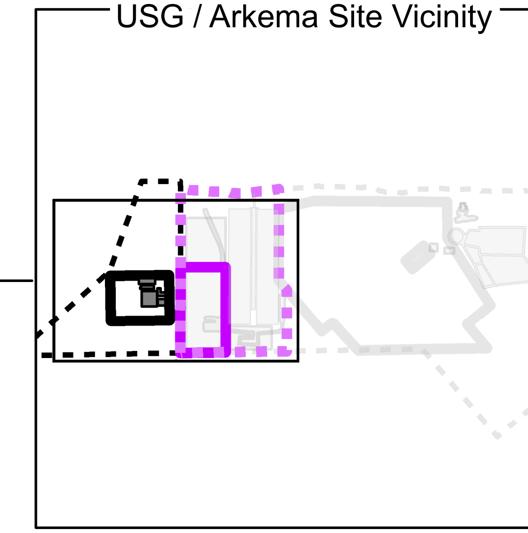
"Husband works at [redacted] graveyard shift. They blow out insulation pollution in wee hours around 4 or 5 o'clock. He has to wash his car every morning."
August 22, 1972 complaint

"Was called to the parking lot of Pennwalt, by Dennis Roths, to see fly wool falling on the lot and adjacent property. I took a picture of it, examined it, and took a sample of it. I then went back to the parking lot of U.S. Gypsum where the same conditions prevailed."
August 2, 1973 inspector's report

Observation noted in Kennedy/Jenks/Chilton 1990 report

"Atmospheric deposition of arsenic onto the salt piles is known to have occurred from the production of mineral insulation and other products from ASARCO slag at U.S. Gypsum Plant"

USG / Arkema Site Vicinity



Legend

USG Property Boundary
Arkema Site Boundary
North Boundary Area
Primary Impacted Portion of the NBA

Former USG Manufacturing
Former Manufacturing Area Boundary
Other Key Features

Former Arkema Manufacturing
Key Former Manufacturing Area Boundaries
Other Key Features

USG Emissions
Direction of Transport Shown in Historical Photos

Notes:
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.

0 50 100 200 Feet

PIONEER TECHNOLOGIES CORPORATION

USG Aerial Deposition onto the NBA
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 18

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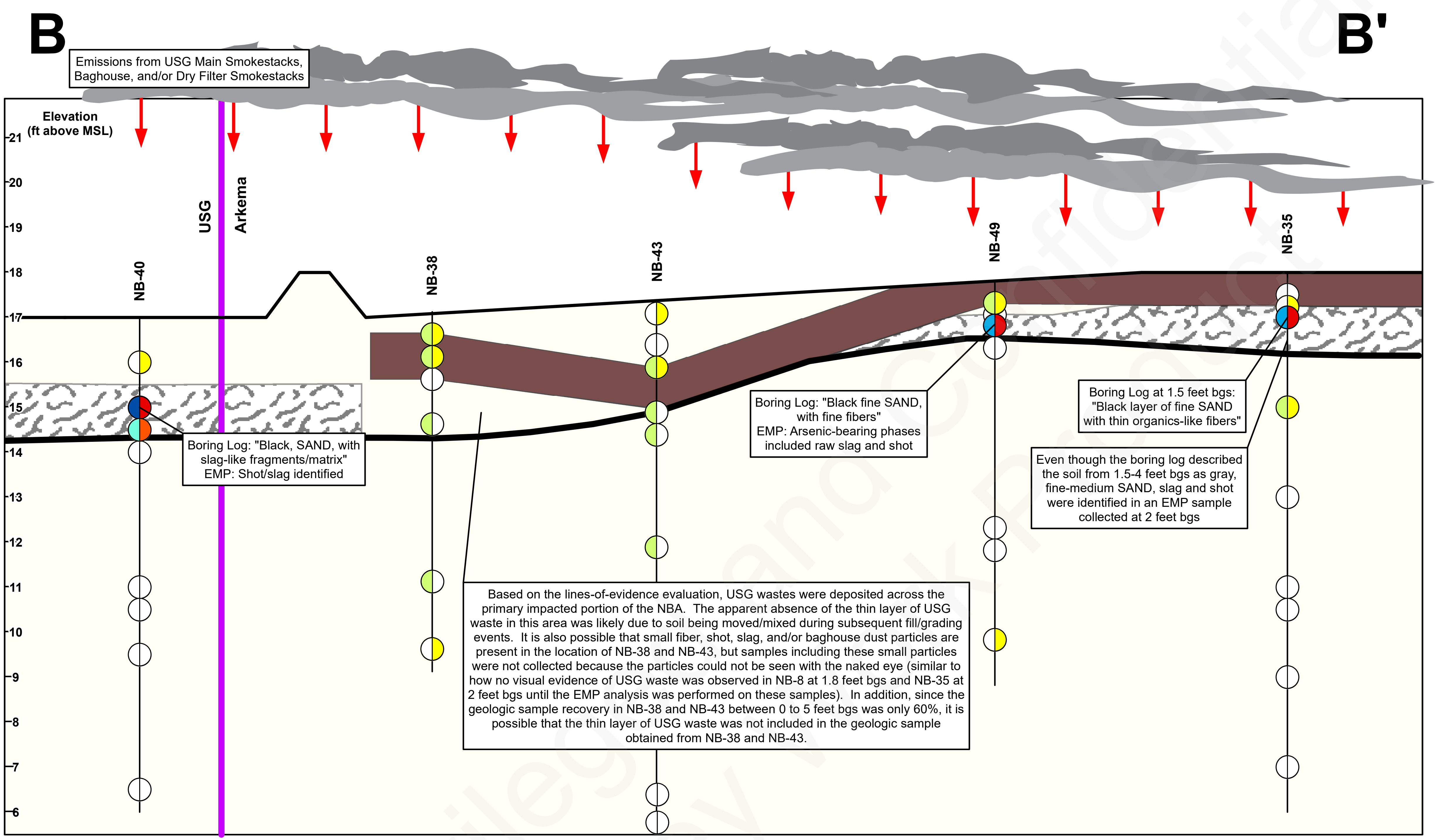

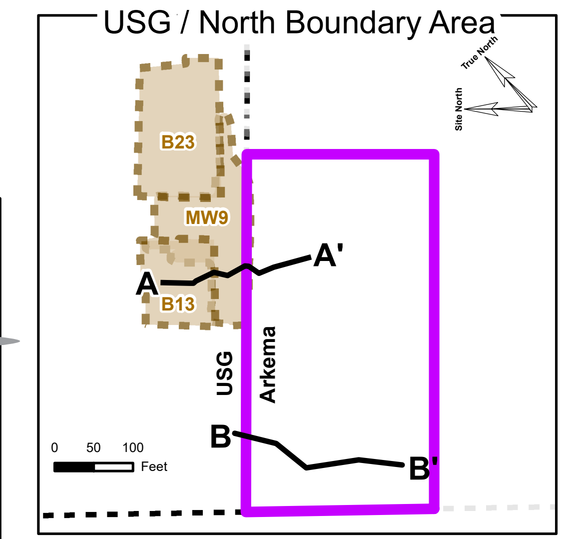

Legend

Primary Impacted Portion of the NBA

Ground Surfaces
- Current Ground Surface
- Assumed Early 1940s to Early 1980s Ground Surface

Lithology
- USG Waste
- Bark Sludge
- Other Subsurface Soil

Relevant USG Waste Management Activities
- MW9/B13/B23 Excavation Areas

USG Emissions
- USG Emissions Onto Arkema Site
- Direction of Transport

Arsenic (As) Concentration (mg/kg)	Lead (Pb) Concentration (mg/kg)
As ≤ 20	Pb ≤ 17
20 < As ≤ 88	17 < Pb ≤ 250
88 < As ≤ 400	250 < Pb ≤ 400
400 < As ≤ 1,000	400 < Pb ≤ 1,000
As > 1,000	Pb > 1,000

Arsenic mg/kg — Lead mg/kg

Bolded boring IDs have boring logs available

This figure shows how USG airborne emissions were deposited onto the NBA prior to the subsequent filling of the NBA up to the current ground surface.

Notes:
- The maximum concentration for each sample interval is shown, regardless of the analytical method used (lab or XRF).
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.
- Topography of the current ground surface is based on 2007 ground surface elevation contours.

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Cross-Section B-B'
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 19

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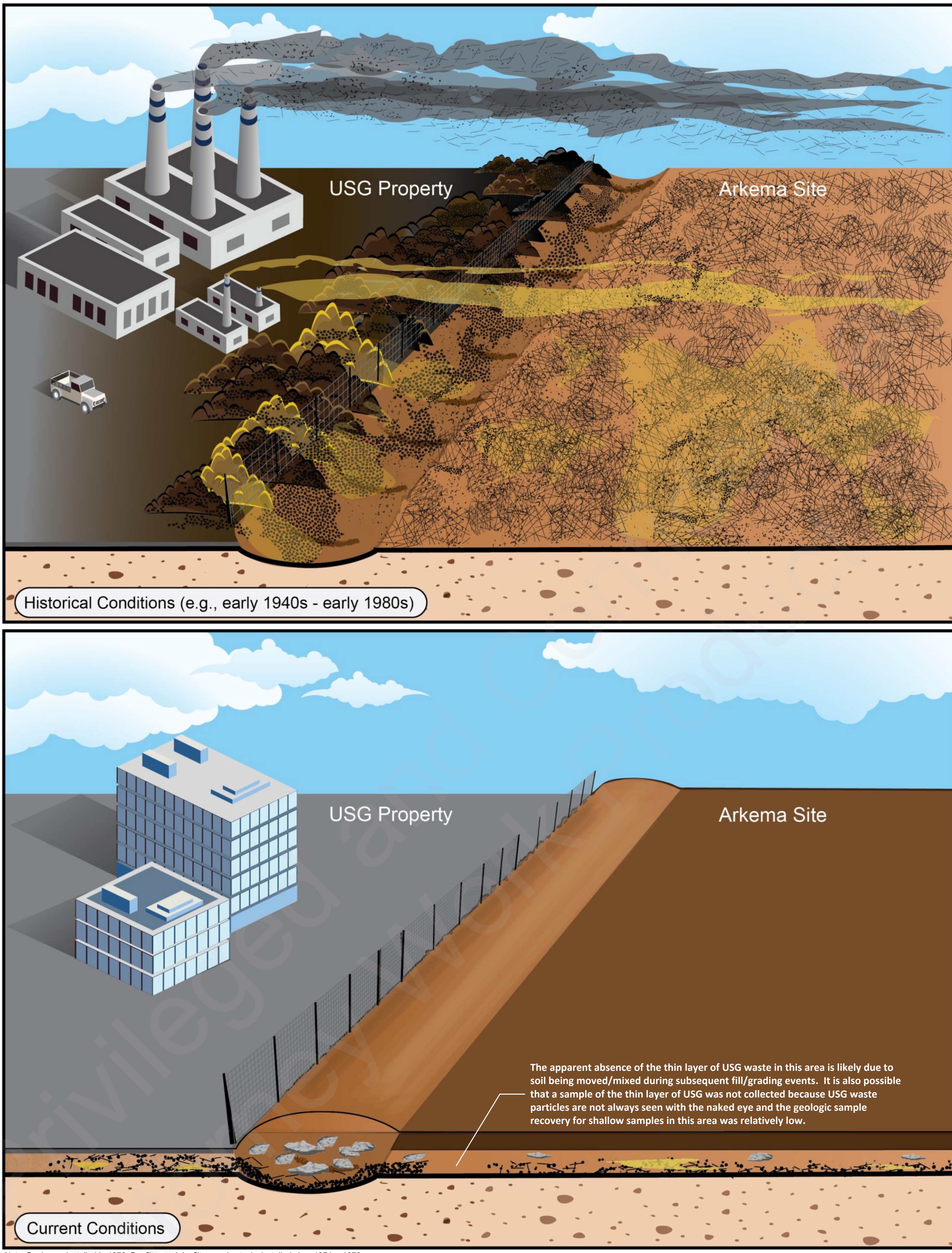
Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-19_B-B'_CrossSection.mxd; Author: SM; Date Saved: 3/17/2017

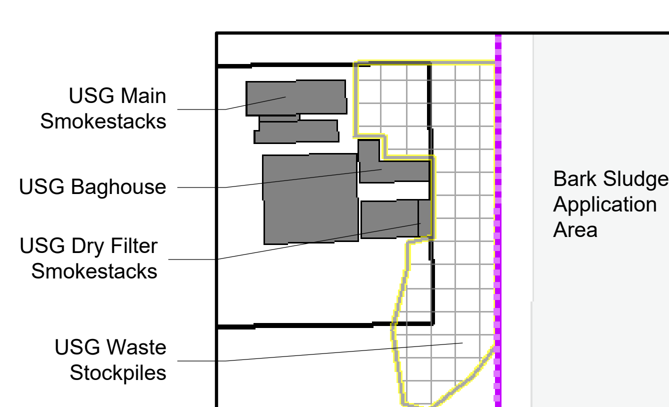


Note: Baghouse installed in 1970. Dry filter and dry filter smokestacks installed circa 1974 – 1978.

This figure is a conceptual summary of the evaluation conclusion. Arsenic and lead cleanup level exceedances in the NBA were caused by transport of wastes from USG stockpiles, transport of wastes from USG emissions, and/or direct disposal of wastes by USG. The USG waste deposits in the NBA were subsequently covered by fill material (e.g., construction debris, bark sludge) which did not have arsenic and lead concentrations exceeding cleanup levels.

Legend

- Assumed Early 1940s to Early 1980s Ground Surface
- Current Ground Surface
- Fibers
- Shot/Slag
- Baghouse Dust
- Other Subsurface Soil
- Construction Debris
- Other Fill
- Bark Sludge



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Conclusion of Lines-Of-Evidence Evaluation
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure 20

Charts

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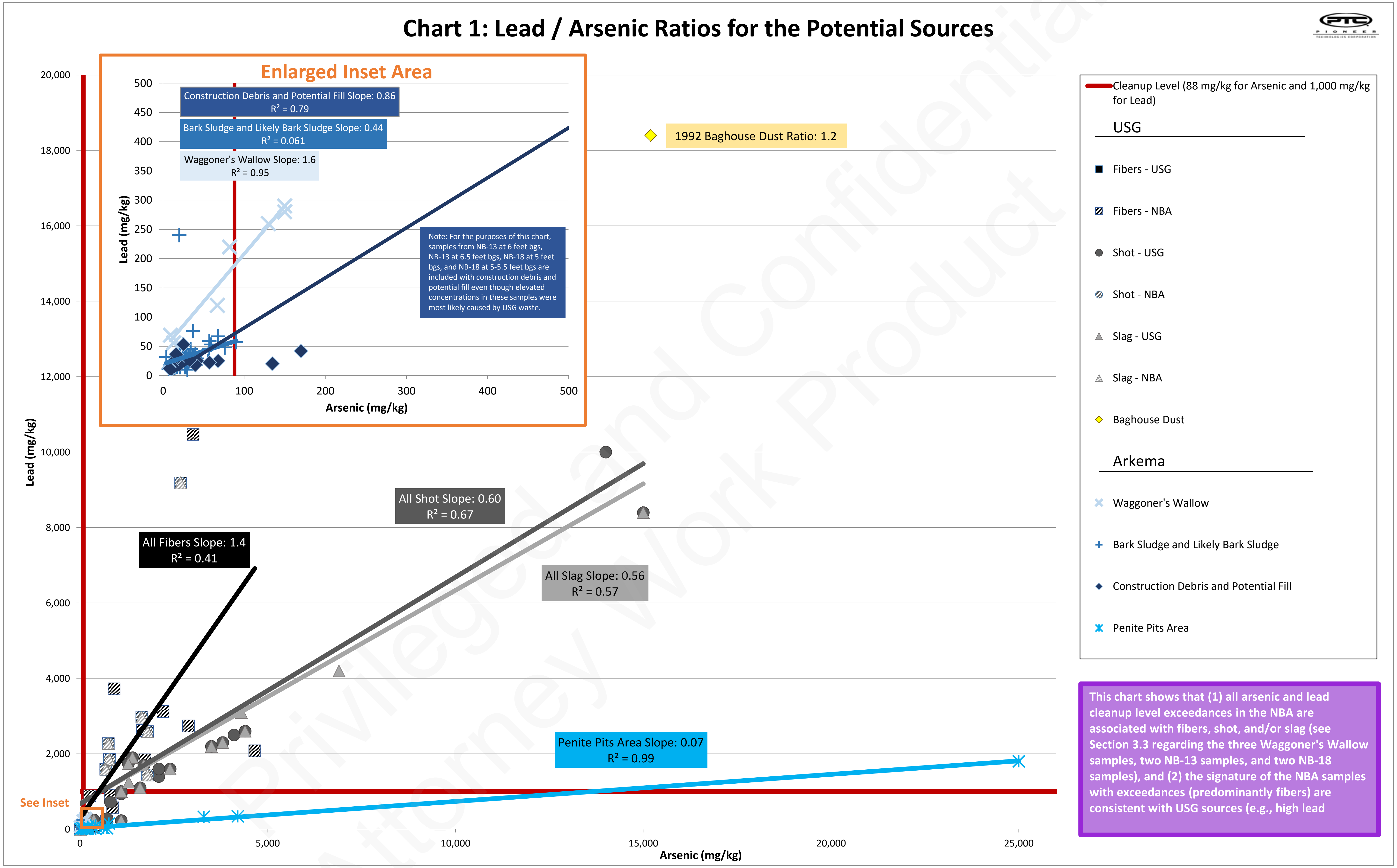

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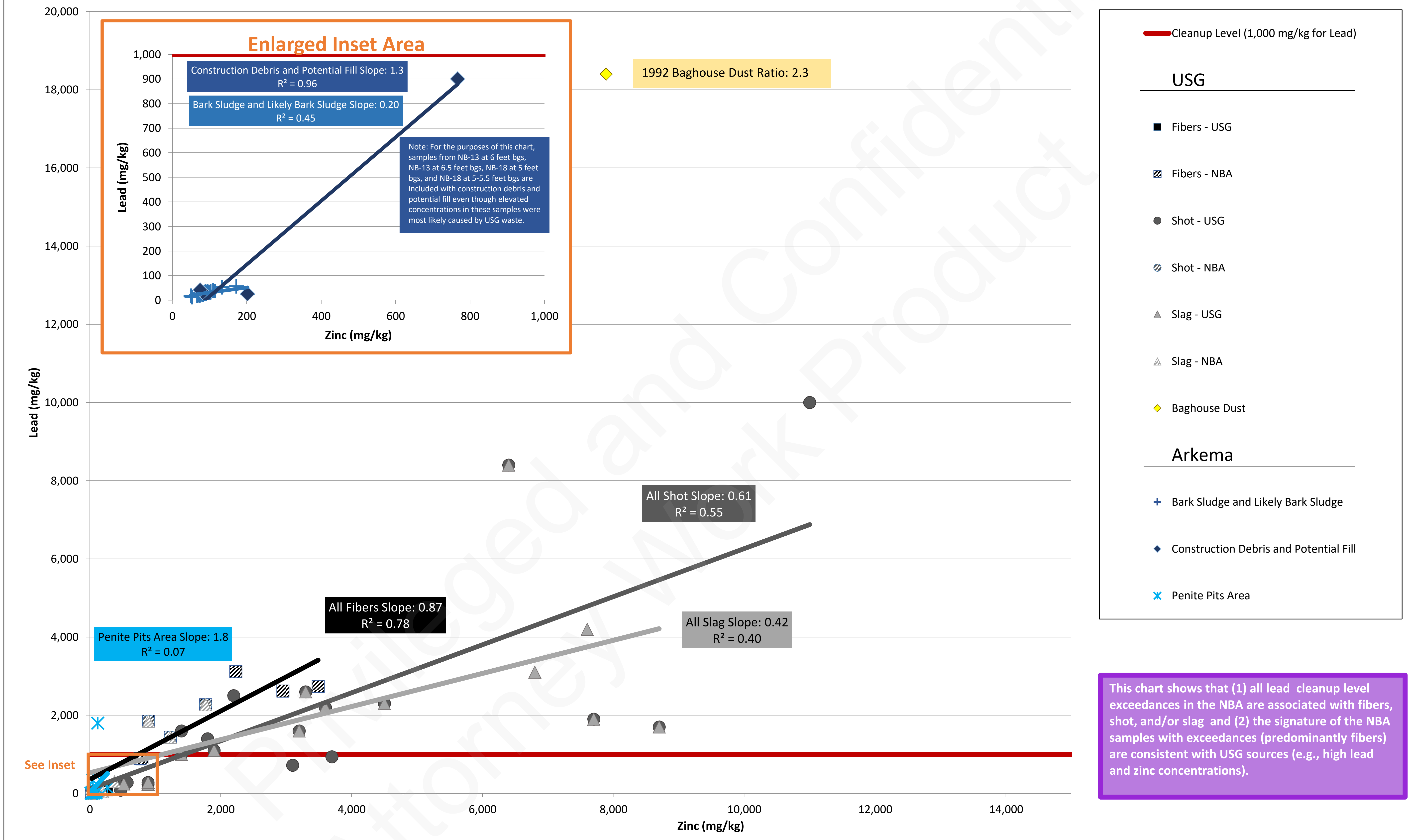
Chart 2: Lead / Zinc Ratios for the Potential Sources



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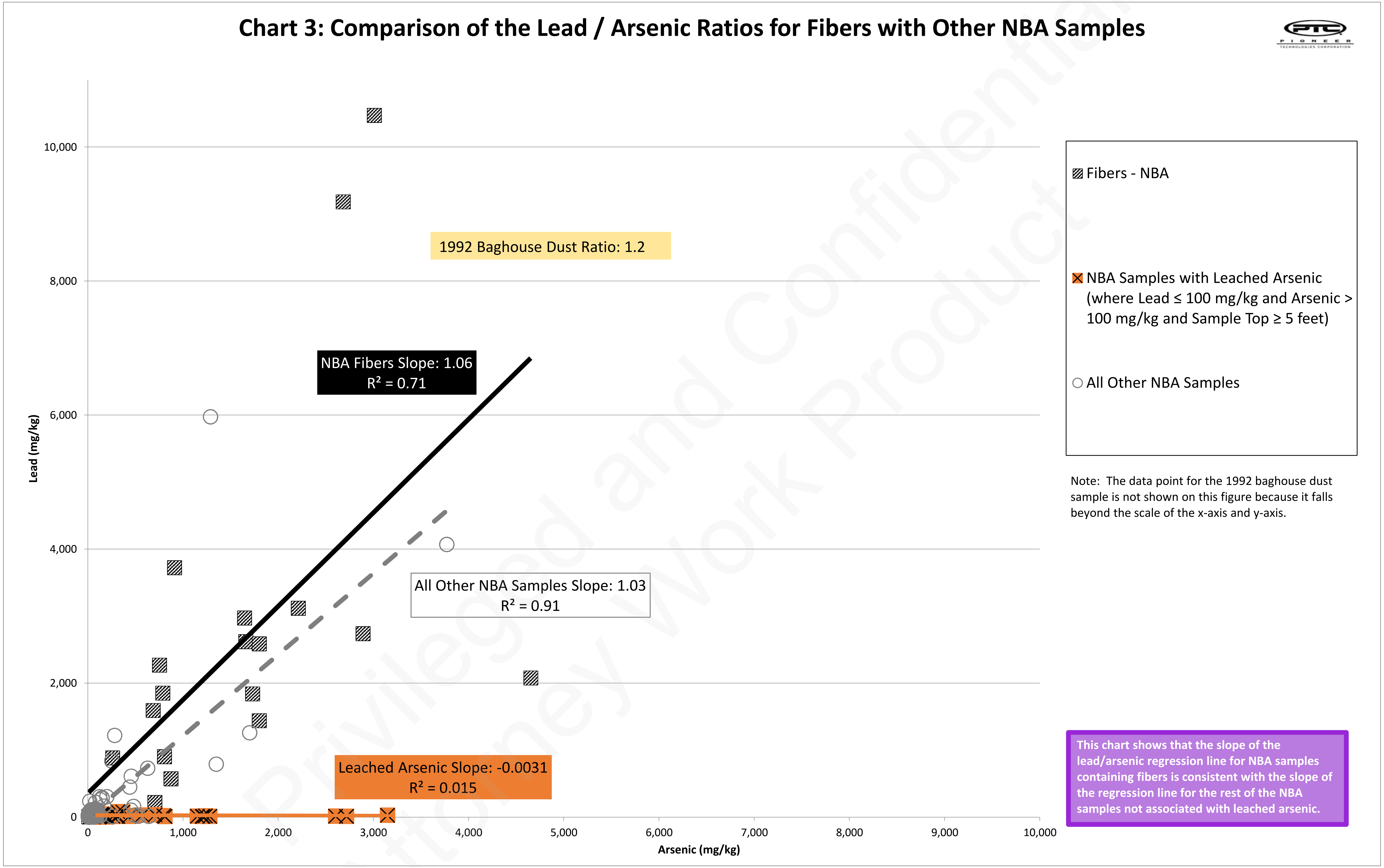

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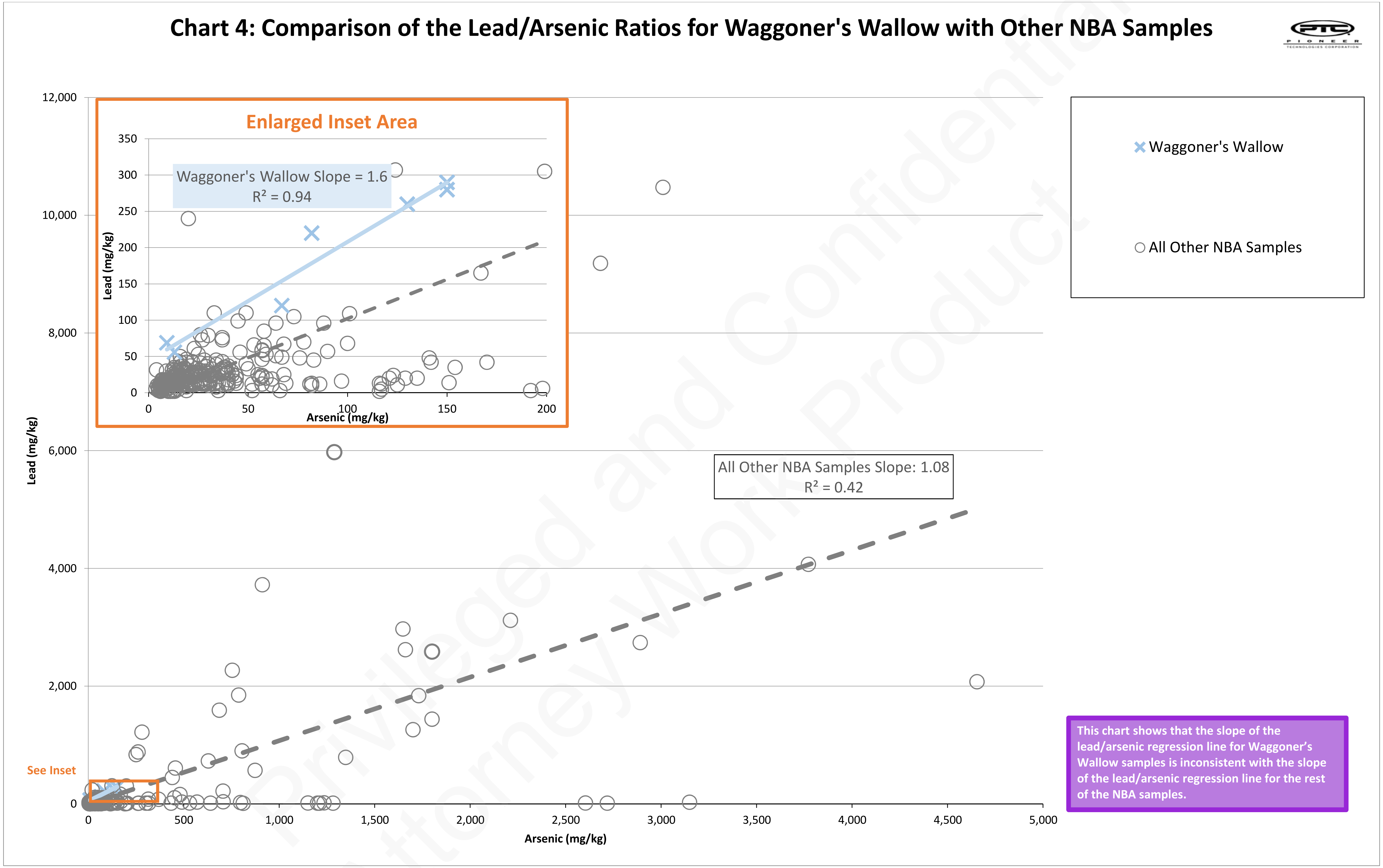

Chart 4: Comparison of the Lead/Arsenic Ratios for Waggoner's Wallow with Other NBA Samples
Enlarged Inset Area
Waggoner's Wallow Slope = 1.6
R² = 0.94
Lead (mg/kg)
Arsenic (mg/kg)
Waggoner's Wallow
All Other NBA Samples
All Other NBA Samples Slope: 1.08
R² = 0.42
See Inset
This chart shows that the slope of the lead/arsenic regression line for Waggoner's Wallow samples is inconsistent with the slope of the lead/arsenic regression line for the rest of the NBA samples.
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Chart 5: Comparison of the Nickel / Arsenic Ratios for Bark Sludge and Likely Bark Sludge with Other NBA Samples

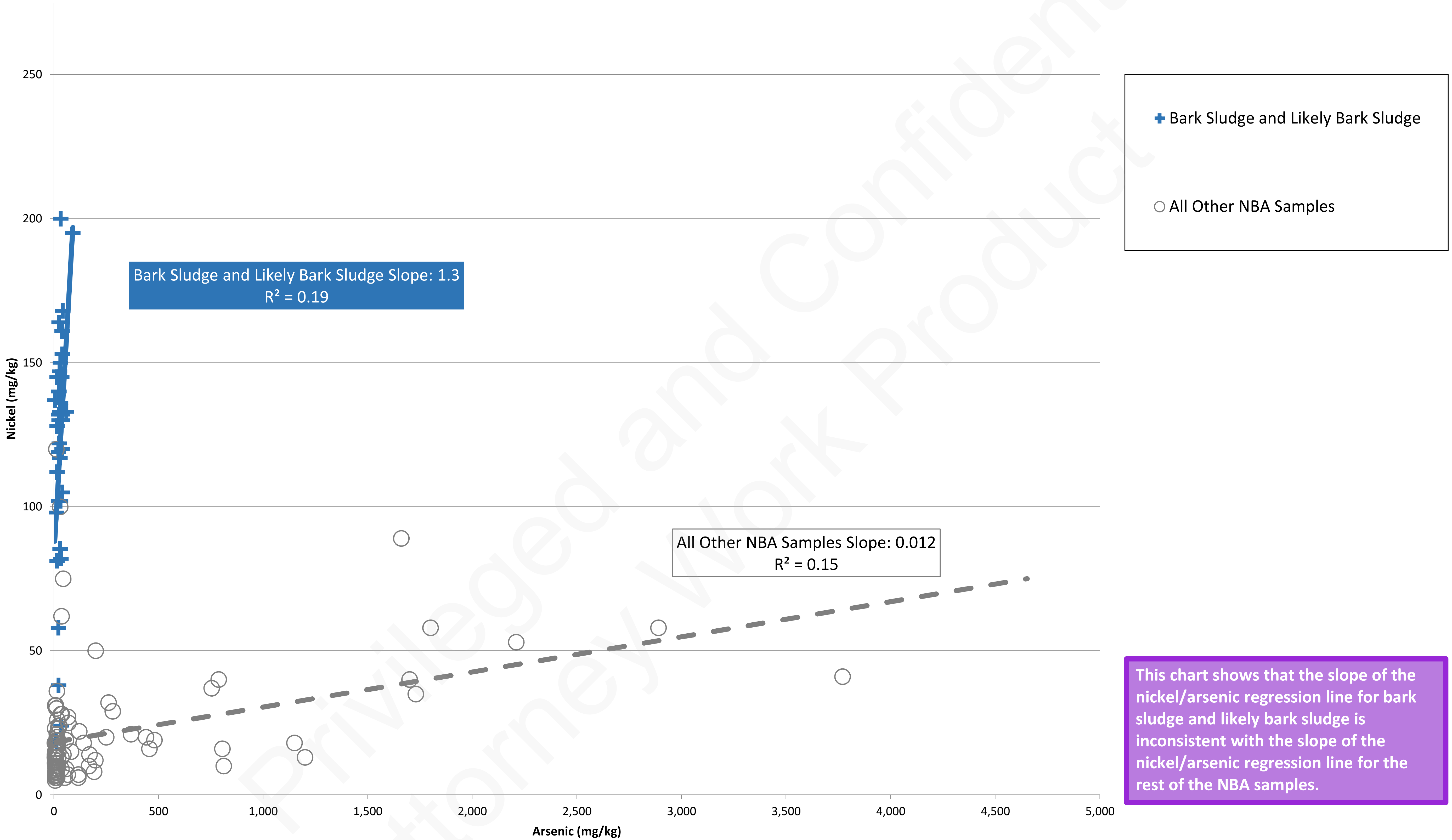

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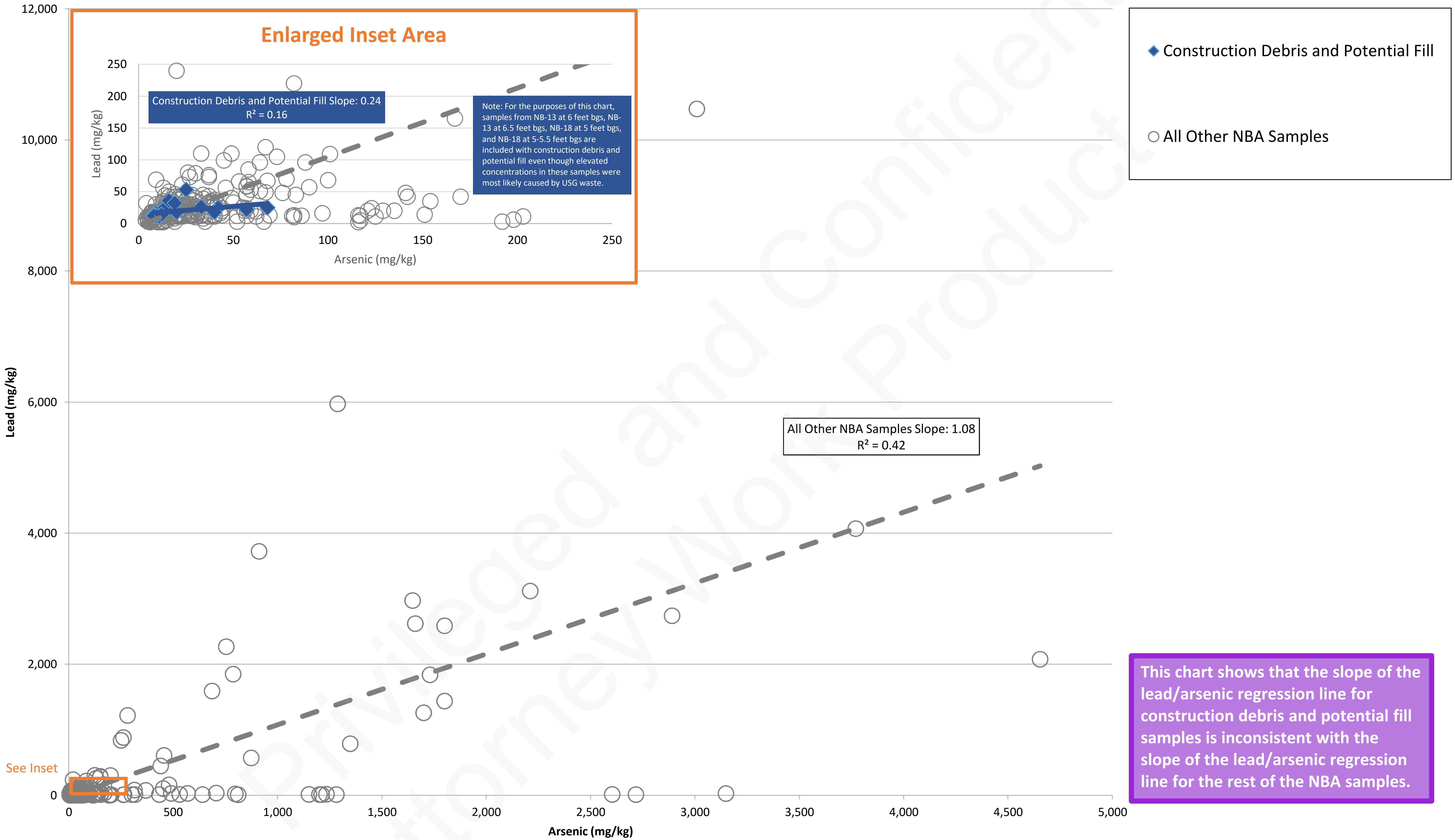
Chart 6: Comparison of the Lead/Arsenic Ratios for Construction Debris and Potential Fill with Other NBA Samples



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Tables

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Table 1: Anticipated Future Remedial Action Costs

Cost Type	Item Description	Qty	Unit	Basis for Quantity Assumption	Unit Cost	Basis for Unit Price Assumptions	Cost
Direct Capital Costs	Contractor mobilization	5	%	Assumed % of direct capital costs.	N/A	N/A	$429,117
	Miscellaneous Contractor-prepared plans/permits	1	LS	Qty assumed to simplify estimate.	$50,000	Assumed based on similar items at other sites.	$50,000
	Decommission monitoring wells within excavation boundaries	2	Day	Assumed 2 days will be necessary to decommission 6 wells based on the location of current NBA wells and the assumed excavation boundaries (DOF 2013; Figure 3).	$3,000	Assumed based on similar items at other sites.	$6,000
	Excavate arsenic and lead cleanup level exceedances	43,500	Ton	See Figure 3 for the assumed excavation volume. Assumed a soil density of 1.5 tons per cubic yard.	$30	Assumed based on similar items at other sites.	$1,305,000
	Dewatering-related costs	1	LS	Qty assumed to simplify estimate.	$200,000	Assumed based on excavation depth, excavation size, and, typical depths to groundwater (e.g., less than 5 feet bgs) near the assumed excavation boundaries (DOF 2013).	$200,000
	Load, haul, treat, and dispose of excavated material that is hazardous waste at the Waste Management facility in Arlington, Oregon	14,355	Ton	Assumed 33% of the excavated waste would be hazardous waste consistent with the waste percentages in the MW9 area excavation (AGI Technologies 2000).	$317	Assumed $10/ton for loading unit cost. $307/ton unit cost for haul, treat, and disposal from 2015 Waste Management correspondence (assuming waste has an average arsenic concentration less than or equal to approximately 1,000 mg/kg).	$4,550,535
	Load, haul, and dispose of excavated material that is non-hazardous waste at the LRI Landfill in Graham, Washington	29,145	Ton	Assumed 67% of the excavated waste would be non-hazardous waste consistent with the waste percentages in the MW9 area excavation (AGI Technologies 2000).	$40	Assumed $10/ton for loading unit cost. $30/ton haul and disposal unit cost from 2015 Superlon actual costs.	$1,165,800
	Gravel borrow, haul, and backfill soil excavations	43,500	Ton	Assumed Qty would equal the excavation Qty.	$30	Assumed based on similar items at other sites.	$1,305,000
	Other miscellaneous cleanup requirements during excavation and disposal activities (e.g., health and safety, site control, dust control, stormwater control, engineer controls, hydroseeding)	2	%	Assumed % of direct capital costs.	N/A	N/A	$171,647
	Sales tax	9.6	%	Assumed all direct capital costs taxed at current Tacoma rate.	N/A	N/A	$881,577
						Subtotal [1]	$10,100,000
	Pre-design investigation, design, and reporting (prior to excavation and disposal activities)	1	LS	Qty assumed to simplify estimate.	$200,000	Assumed based on anticipated level of effort.	$200,000
	Consultant field oversight during excavation and disposal activities	3	%	Assumed % of direct capital costs.	N/A	N/A	$303,000
	Sampling and analysis costs for excavation and disposal activities	3	%	Assumed % of direct capital costs.	N/A	N/A	$303,000
	Completion report for excavation and disposal activities	2	%	Assumed % of direct capital costs.	N/A	N/A	$202,000
	Consultant project management for excavation and disposal activities	2	%	Assumed % of direct capital costs.	N/A	N/A	$202,000
	Port oversight for excavation and disposal activities	1	%	Assumed % of direct capital costs.	N/A	N/A	$101,000
	Ecology oversight and permit fees for excavation and disposal activities	1	%	Assumed % of direct capital costs.	N/A	N/A	$101,000
	Institutional control inspections and reporting	30	Year	Assumed duration of institutional controls.	$1,000	Assumed based on anticipated level of effort.	$30,000
	Groundwater sampling and reporting for monitored natural attenuation	30	Year	Assumed duration of groundwater sampling.	$20,000	Assumed based on anticipated level of effort.	$600,000
	Periodic installation of groundwater monitoring wells	6	Day	Assumed a total of 6 days will be necessary to replace decommissioned wells and periodically replace wells.	$3,000	Assumed based on similar items at other sites.	$18,000
						Subtotal [1]	$2,100,000
						Total without contingency [1]	**$12,200,000**
						20% Contingency (e.g., for larger excavation volumes, different waste percentages, and/or higher unit costs) [1]	$2,400,000
						Total with contingency [1]	**$14,600,000**

Notes:
LS: lump sum, N/A: not applicable, Qty: quantity
This cost estimate is intended to be +/- 50%. Since this estimate is based on a variety of simplifying assumptions, actual implementation costs will likely vary as the remedial design is refined. Furthermore, since PIONEER has no control over the cost of labor, materials, and equipment or the nature of a particular competitive bidding process at the time the work would be performed, this estimate represents PIONEER's professional judgment based on experience with similar work.
[1] Rounded to the nearest $100,000.

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Table 2: USG Wastes Identified In Boring Logs and EMP Results

Property	Boring Name (Site ID)	Date	Depth on Boring Log (feet bgs)[1]	Description in Boring Log[2,3]	Excerpt of EMP Results [2]	Evidence of Fibers[4]	Evidence of Shot[5]	Evidence of Slag[6]	Evidence of Likely USG Waste[7]	XRF/Lab Analysis?
USG	MW-9-1[8]	10/31/1994	0.5-2.2	**BLACK SANDY GRAVEL** (GP) loose, wet; fine to coarse grained, with some silt, and a **black, medium grained, spherical, vitreous material (Fill)**.	N/A		X			
USG	HA1	6/6/1998	0.3-1.0	BROWN **SILTY SAND (SM)**…becomes gray brown, loose to medium dense, moist; with organics (rootlets) and **black medium grain vitreous material** and occasional **black angular vitreous fragments.**	N/A		X	X		X
USG	HA1	6/6/1998	1.0-1.25	**BLACK ROUND VITREOUS MATERIAL**, medium dense, moist.	N/A		X			X
USG	HA2	6/6/1998	0.5-1.5	**BLACK GRAVELLY SAND** (SP) loose, moist; with occasional **black angular vitreous fragments**.	N/A			X		X
USG	HA3	6/6/1998	0.5-1.0	**BLACK ROUND VITREOUS MATERIAL**, loose, moist; with some **black angular vitreous fragments.**	N/A		X	X		X
USG	HA4	6/6/1998	0.6-1.85	**BLACK**/GRAY **SILTY SAND** (SM) loose to medium dense, moist; with gravel, some **black angular vitreous fragments.**	N/A			X		X
USG	HA5	6/6/1998	0.5-1.25	**DARK** BROWN **GRAVELLY SAND** (SP) dense, moist; **with black round vitreous material**, cobble and **black angular vitreous fragments.**	N/A		X	X		X
USG	HA5	6/6/1998	1.25-1.5	**DARK** BROWN **SANDY GRAVEL** (GP) dense, moist; **with black round vitreous material.**	N/A		X			X
USG	HA8	6/6/1998	0.75-1.0	**DARK** BROWN/GRAY **SANDY GRAVEL** (GP) dense, moist; **with black round vitreous material and black angular vitreous fragments**.	N/A		X	X		X
USG	HA9	6/6/1998	0.5-1.3	**Black round vitreous material and black angular vitreous fragments.**	N/A		X	X		X
USG	HA10	6/6/1998	0.1-1.5	**DARK** BROWN **SILTY SAND** (SM) loose, moist; **with black round vitreous material**, organics (rootlets), trace **black angular vitreous fragments**.	N/A		X	X		X
USG	HA11	6/6/1998	0.5-1.9	REDDISH BROWN **SILT** (ML) soft to medium stiff, with brown sand interlayers. Brown sand **contains black round vitreous material and occasional black angular vitreous fragments.**	N/A		X	X		X
USG	HA12	7/21/1998	0.5-1.5	**BLACK ROUND VITREOUS MATERIAL**, medium dense, moist **with black angular vitreous fragments** and gravel.	N/A		X	X		X
USG	HA13	7/21/1998	0.5-0.65	GRAY **ANGULAR VITREOUS MATERIAL**, very dense, dry; with gravel.	N/A			X		
USG	HA13	7/21/1998	0.65-1.0	**BLACK ROUND VITREOUS MATERIAL**, dense, moist **with black angular vitreous fragments**, some sand and gravel.	N/A		X	X		X
USG	HA13	7/21/1998	1.0-1.5	GRAY GREEN **SILTY SAND** (SM) dense, moist to wet with gravel and some **black round vitreous material.**	N/A		X			X
USG	HA14	7/21/1998	0.3-0.5	GRAY **ANGULAR VITREOUS MATERIAL**, very dense, dry; with gravel.	N/A			X		
USG	HA15	7/21/1998	0.5-1.75	**BLACK ROUND VITREOUS MATERIAL**, medium dense, moist; **with black angular vitreous fragments**, sand, gravel, and occasional cobbles.	N/A		X	X		X
USG	HA16	7/21/1998	0.5-1.0	**BLACK GRAVELLY SAND** (SP) dense, moist; **with some black round vitreous material**.	N/A		X			X
USG	HA17	7/21/1998	0.17-0.6	**DARK** BROWN **SILTY SAND** (SP) medium dense, moist; with gravel, some **black round vitreous material**.	N/A		X			X
USG	HA18	7/21/1998	0.5-1.1	**BLACK ROUND VITREOUS MATERIAL**, medium dense, moist; **with black angular vitreous fragments.**	N/A		X	X		X
USG	HA20	7/21/1998	0.75-2.4	**BLACK SANDY GRAVEL** (GP) dense, moist; with silt and some **black round vitreous material**.	N/A		X			X
USG	HA21	7/21/1998	0.75-1.0	**BLACK ROUND VITREOUS MATERIAL**, medium dense, moist.	N/A		X			X
USG	B23-DS4[8]	10/5/1998	0.8-3.0	**BLACK GRAVELLY SAND** (SW) medium dense, wet **(shot)**.	N/A		X			X
USG	B13-DS6[8]	10/30/2002	0.5-2.0	Well-graded SAND with gravel. Gray/dark brown/dark gray, gravel and sand mixture with up to 5% silt, **contains dark material with a metallic appearance** primarily at 1-2 feet, slightly moist.	N/A				X	X
USG	B20-DS6[8]	10/30/2002	0.5-3.0	Well-graded **GRAVEL with silt and sand**. **Dark** gray**,** angular gravel with sand and 5-10% silt, moist, **contains fine metallic particles (shot?) and fragments with metallic surface appearance (slag?)**.	N/A		X	X		X
USG	B23-DS6[8]	10/30/2002	0.8-2.0	Well-graded **GRAVEL with sand**. **Dark** gray to **black**, angular gravel (60%) with sand and minor silt, **metallic appearance on some fragments (slag?)**.	N/A			X		X
USG	MW-1R-1[8]	12/12/2006	3.0-4.5	**Sandy Gravel** (GP) layer...becomes brown, piece of **slag**, piece of brick.	N/A			X		X
USG	NB-12	7/20/2012	5.0-7.5	Wet, gray, **SILT with black organic layer** @ 6.5', grading fine sandy at base	N/A				X	X
USG	NB-29	7/20/2012	2.5-3.5	Wet, gray-**black, SILT**, with trace **black organics**	N/A				X	X
USG	NB-40	7/20/2012	1.8-2.1	Damp, **black, SAND, with slag-like fragments/matrix**	**Sample NB40-2 was collected from a deposit of black sandy material with a slag-like appearance near the base of the layer. The appearance of the material is consistent with "shot", a waste by-product of the mineral fiber production.**		X	X		X
USG	NB-41	7/20/2012	2.3-2.5	Moist, **black, gravelly, SAND**, with **no obvious slag but similar to NB40**	N/A				X	X
USG	NB-45	7/20/2012	2.0-2.3	Moist, **black, silty, fine SAND**, **with fine organic fibers**	N/A	X				X

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Table 2: USG Wastes Identified In Boring Logs and EMP Results

Property	Boring Name (Site ID)	Date	Depth on Boring Log (feet bgs)[1]	Description in Boring Log[2,3]	Excerpt of EMP Results [2]	Evidence of Fibers[4]	Evidence of Shot[5]	Evidence of Slag[6]	Evidence of Likely USG Waste[7]	XRF/Lab Analysis?
Arkema	NB-3	7/18/2012	7.0-7.5	Wet, **black, fibrous organics**, grading to silt	N/A	X				X
	NB-4	7/18/2012	6.0-8.0	Wet, gray, SILT with silty fine sand interbeds, **black organics**, wood	N/A				X	X
	NB-8	7/19/2012	1.8	Moist, mottled brown/gray, gravelly, SAND, with some silt; greenish-colored zone @ 1.8'	**Sample NB8-1.8 contained only raw slag**			X		X
	NB-10	7/18/2012	5.5-5.6	**Black fine SAND with thin small organic fibers**	**Shot was present in the sample; the arsenic present in the sample was mostly in the form of a fine sand-sized (~100 um) angular material with a composition consistent with slag**	X	X	X		X
		7/18/2012	5.6-9.0	Wet, saturated, gray, silty, fine, SAND, interbedded with silt, **black organics**	N/A				X	X
	NB-11	7/17/2012	6.5-7.0	Wet, **dark** brown, **fibrous ORGANICS**, grass-like **fibers** with yellow trace inside	N/A	X				X
		7/17/2012	7.0-8.0	Wet, gray, **fine SAND with black stringers. Black sand matrix with slight sparkle.**	N/A				X	X
		7/17/2012	10.0-11.0	Wet, gray-**black, SILT with trace organics**	N/A				X	X
	NB-13	7/17/2012	6.2-6.8	Wet, **dark** brown, **fibrous ORGANICS**, 2mm root-like, **fuzzy organic matrix**. Decomposed asphalt atop organics.	N/A	X				X
		7/17/2012	12.0-14.0	Wet, **black, ORGANICS**, interbedded with fine-medium sand, silt clasts	N/A				X	X
	NB-14	7/18/2012	5.0	Reduced-**black stained, 6mm black, fine sand** layer @ 5'	N/A				X	X
		7/18/2012	5.0-8.0	Wet, gray-**black, SILT** with **scattered organics**, thin fine sand interbeds	N/A				X	X
	NB-15	7/17/2012	6.0-6.5	Wet, **black, organic, SAND, with grassy fibers, black sand matrix**, yellow trace	N/A	X				X
	NB-16	7/18/2012	1.0-1.5	Moist, **black**-brown**, organic**, **silty, SAND** with trace gravel, bark, wood chip	N/A				X	
		7/18/2012	5.3-5.5	Wet, gray-**black, fine SAND, with fine organic fibers, 12mm black,** 12 mm gray layers	**Phases with slag composition included one grain of spherical material and a grain with a blade-like or planer habit, which may be indicative of mineral wool fiber or a sliver of material detached from a larger grain of shot or raw slag**	X	X	X		X
		7/18/2012	7.0-8.5	Wet, gray-**black, SILT, with black organics**	N/A				X	X
	NB-17	7/18/2012	6.0	**12mm layer of black, silty fine SAND**	N/A				X	X
	NB-18	7/18/2012	0.5-1.5	Wet, mottled brown, **organic, silty, SAND** with wood chip, **slag**	N/A			X		X
	NB-26	7/17/2012	6.0-6.2	Wet, **dark** brown, **fibrous, ORGANICS**	N/A	X				
	NB-31	7/17/2012	5.0-5.3	Wet, brown, **fibrous ORGANICS interbedded with fine sand**	**The arsenic was present mostly in the form of raw slag; shot grains were also found**	X	X	X		X
		7/17/2012	5.3-5.4	Wet, gray, **silty, fine SAND, with silver metallic flakes**, yellow trace on organics	N/A				X	X
	NB-34	7/16/2012	2.0-2.5	Wet, gray-**black, fine SAND, with organics**	N/A				X	X
	NB-35	7/16/2012	1.5	Thin, **black layer of fine SAND with thin organics-like fibers**	N/A	X				X
		7/16/2012	1.5-4.0	Wet, gray, fine-medium SAND	**The vast majority of the arsenic-bearing grains found were raw slag; a single grain of spherical slag (shot) was found**		X	X		X
	NB-36	7/16/2012	2.0	**1/2' layer of black fine SAND**	N/A				X	X
	NB-37	7/16/2012	2.5	**2" layer of black organics / fine SAND**	N/A				X	X
	NB-42	7/16/2012	2.0-2.2	Red-**black**, **fine SAND**, oxidized, **with thin fibers**	N/A	X				X
	NB-46	7/19/2012	5.0-7.5	Wet, brown, **organic, SILT, fibrous organics throughout**	N/A	X				X
	NB-48	7/19/2012	1.5-2.5	Wet, gray-**black, fine sandy, SILT**	**The main phases identified were raw slag**			X		X
	NB-49	7/19/2012	1.0	**1" thick layer of black fine SAND, with fine fibers**	**The arsenic-bearing phases included raw slag and shot**	X	X	X		X
		7/19/2012	7.0-9.0	Wet, gray, SILT, soft, **black organics** 8-9'	N/A				X	X

Notes:

N/A: Not applicable since sample not analyzed for EMP

(1) If the sample depth was not specified in the boring log, then the sample depth was approximated based on the visual depiction of the sample depth in the boring log. Each EMP sample was collected at a discrete depth within the sample interval (e.g., the NB35 EMP sample was collected at 2 feet bgs).

(2) Emphasis was added (using a bold font) to highlight key descriptors. In addition, some acronyms used in the boring logs (e.g., color, sand-size) were spelled out.

(3) The Unified Soil Classification System acronyms used in some descriptions are GP: Poorly graded gravel, SP: Poorly graded sand, SW: Well graded sand, SM: Silty sand, and ML: Silt

(4) Samples were placed in this category if fibers were explicitly mentioned in the boring log or EMP results, or if the description in the boring log was indicative of fibers (e.g., fibrous black organic materials).

(5) Samples were placed in this category if shot was explicitly mentioned in the boring log or EMP results, or if the description in the boring log was indicative of shot (e.g., black round vitreous materials).

(6) Samples were placed in this category if slag was explicitly mentioned in the boring log or EMP results, or if the description in the boring log was indicative of slag (e.g., black angular vitreous materials).

(7) Samples were placed in this category if the description in the boring log suggested that fibers, shot, and/or slag were likely present (e.g., black fine sand with organics) and other information (e.g., sample depth, layer thickness, proximity to other samples/layers with USG waste) supported the determination. It should be noted that many layers encountered in the NBA that may be associated with USG waste (e.g., black sand, black silt, black organics) were not included in this "likely" category for conservatism.

(8) Suffixes were added to these Site IDs to facilitate data management in the analytical results database. For instance, the "-DS4" and "-DS6" suffixes were added to differentiate between borings with the same Site ID.

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Table 3: Boring Log Descriptions and EMP Results for NBA Samples with Arsenic Concentrations Exceeding 400 mg/kg and Lead Concentrations Exceeding 1,000 mg/kg

Sample Location (Site ID)	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)				Boring Log Description Associated with Sample Interval(s)[1]	Excerpt of EMP Results Associated with Sample Interval(s)	Evidence of Fibers[2]	Evidence of Shot[2]	Evidence of Slag[2]	Evidence of Likely USG Waste[2]
			Arsenic (Lab)	Arsenic (XRF)	Lead (Lab)	Lead (XRF)						
NB-10	5.5	5.5		2,682		9,184	**Black fine SAND with thin small organic fibers**	**Shot was present in the sample; the arsenic present in the sample was mostly in the form of a fine sand-sized (~100 um) angular material with a composition consistent with slag**	X	X	X	
	5.5	5.6	754		2,270							
NB-11	6.5	6.5		3,009		10,474	Wet, **dark** brown, **fibrous ORGANICS**, grass-like **fibers** with yellow trace inside	N/A	X			
	6.5	7.0	1,660		2,620							
NB-15	6.0	6.5	2,890		2,740		Wet, **black, organic, SAND, with grassy fibers, black sand matrix**, yellow trace	N/A	X			
	6.5	6.5		4,653		2,077						
NB-16	5.4	5.4		1,800		2,588	Wet, gray-**black, fine SAND, with fine organic fibers, 12mm black,** 12 mm gray layers	**Phases with slag composition included one grain of spherical material and a grain with a blade-like or planer habit, which may be indicative of mineral wool fiber or a sliver of material detached from a larger grain of shot or raw slag**	X	X	X	
	5.3	5.5	1,800		1,440							
NB-17	6.0	6.0	3,770	1,348	4,070	790	**12mm layer of black, silty fine SAND**	N/A				X
NB-26	6.5	6.5	1,700	2,717	1,260	13	Wet, gray, sandy, GRAVEL, bottom 3" **mixed with organics**, yellow trace	N/A	[3]			
NB-31	5.0	5.0		1,647		2,973	Wet, brown, **fibrous ORGANICS interbedded with fine sand**	**The arsenic was present mostly in the form of raw slag; shot grains were also found**	X	X	X	
	5.3	5.3	2,210		3,120							
NB-35	1.5	1.5	261	911	884	3,724	Thin, **black layer of fine SAND with thin organics-like fibers**	N/A	X			
NB-37	2.5	2.5	281	1,288	1,220	5,975	2" layer of **black organics / fine SAND**	N/A				X
NB-42	2.0	2.0	1,730	873	1,840	571	Red-**black**, **fine SAND**, oxidized, **with thin fibers**	N/A	X			
NB-49	1.0	1.0	787	686	1,850	1,592	1" thick layer of **black fine SAND, with fine fibers**	**The arsenic-bearing phases included raw slag and shot**	X	X	X	

Notes:

N/A: Not applicable since sample not analyzed for EMP

This table displays the samples in which the arsenic concentration exceeded 400 mg/kg AND the lead concentration exceeded 1,000 mg/kg. For a given sample interval, the maximum of the lab and XRF concentrations was used to determine if the arsenic concentration exceeded 400 mg/kg and the lead concentration exceeded 1,000 mg/kg.

Concentrations are shown as two significant figures in standard notation unless that number is greater than 100. If greater than 100, the number is rounded to a whole number.

If the cell is blank for a given constituent, that means the sample was not analyzed for that constituent.

(1) Emphasis was added (using a bold font) to highlight key descriptors. In addition, some acronyms used in the boring logs (e.g., color, sand-size) were spelled out.

(2) See Table 2 for determination of waste categories.

(3) Even though this sample interval of 6.5 - 6.5 feet bgs was not categorized as a USG waste or likely USG waste, evidence of fibers was observed in the 6.0 - 6.2 feet bgs interval of this boring.

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Table 4: Likely Bark Sludge Identified In NBA Boring Logs

Boring Name (Site ID)	Date	Depth on Boring Log (feet bgs)(1)	Description in Boring Log(2)	XRF/Lab Analysis?
NB-5	7/18/2012	0.8-1.5	Wet, dark brown, organic, silty SAND **with bark, wood chip**	
NB-6	7/19/2012	0.5-1.0	Wet, dark brown, organic, silty SAND with some gravel, **bark, wood chip**	
NB-7	7/18/2012	0.0-1.0	Damp, brown, silty, SAND with thin roots, **bark @ 1'**	
	7/18/2012	1.0-2.0	Moist, mottled gray-brown, gravelly, silty, SAND **with scattered wood**	
NB-9	7/18/2012	1.0-2.0	Wet, mottled brown, organic, silty, SAND with some gravel, **bark, woodchip**	X
NB-10	7/18/2012	0.5-1.0	Damp, brown, silty, SAND with trace gravel, thin roots, **bark, woodchips**	
NB-11	7/17/2012	0.0-2.0	Moist, mottled, gray-brown, gravelly, silty, SAND **with scattered bark**	X
NB-13	7/17/2012	0.0-1.0	Damp, brown, silty, SAND with some gravel, **scattered bark**	X
NB-14	7/18/2012	0.5-1.0	Damp, dark brown, **WOOD CHIP, BARK** in silty sand matrix	
NB-15	7/17/2012	0.5-1.0	Moist, mottled gray-brown, gravelly, silty, SAND **with bark @ 0.5-1'**	
NB-16	7/18/2012	1.0-1.5	Moist, black-brown, organic, silty, SAND with trace gravel, **bark, wood chip**	
NB-17	7/18/2012	1.0-4.0	Moist, mottled gray, gravelly, silty, SAND **with scattered wood chip**	X
NB-18	7/18/2012	0.5-1.5	Wet, mottled brown, organic, silty, SAND **with wood chip**, slag	X
NB-19	7/19/2012	0.5-1.0	Wet, mottled brown, mix of gravelly SAND and **wood chip / bark**	X
	7/19/2012	1.0-2.0	Moist, brown, gravelly, SAND with some silt, **scattered bark**	X
NB-20	7/18/2012	0.5-1.0	Wet, mottled brown, organic, silty, SAND, **with wood chip, bark,** some sand	X
NB-21	7/19/2012	0.0-0.5	Damp, brown, silty, SAND, with trace gravel, **2' layer of bark at base**	
	7/19/2012	1.0-2.5	Moist, brown, gravelly, SAND with some silt, **scattered wood**	X
NB-22	7/19/2012	2.0-3.0	Wet, mottled brown, fine sandy, SILT, with scattered gravel, **wood chip**	X
NB-24	7/17/2012	0.5-1.0	**Wood chip / Bark**	
NB-25	7/17/2012	1.0-3.5	Wet, mottled brown, gravelly, silty, SAND, with crushed rock, **wood**, asphalt	X
NB-26	7/17/2012	0.8-2.0	Moist, mottled brown, silty, SAND, with some gravel, **wood chip, bark**	X
NB-33	7/17/2012	0.5-2.5	Moist, mottled brown, silty, SAND with some gravel, crushed rock, **wood chip**	X
NB-34	7/16/2012	0.5-2.0	Moist, mottled brown, silty, SAND, with some gravel, brick, **wood chip**	X
NB-35	7/16/2012	0.0-1.0	Damp, mottled brown, gravelly, silty, SAND, **with wood chip**	X
NB-36	7/16/2012	0.0-1.0	Damp, brown, silty, SAND, **with wood chip**	X
NB-37	7/16/2012	0.5-1.0	Moist, mottled brown, silty, SAND, **with wood chip**	X
NB-38	7/16/2012	0.5-1.5	Moist, mottled brown, **wood chip**	X
NB-43	7/16/2012	1.5-2.5	Moist, mottled brown-black, silty, SAND, with some gravel, **wood**	X
NB-44	7/16/2012	0.0-1.0	Damp, mottled brown, silty, SAND, with some gravel, **wood chip**	X

Table 4: Likely Bark Sludge Identified In NBA Boring Logs

Boring Name (Site ID)	Date	Depth on Boring Log (feet bgs)[1]	Description in Boring Log[2]	XRF/Lab Analysis?
NB-47	7/19/2012	0.0-1.0	Damp, brown, silty, SAND, with some gravel, **scattered wood**	X
NB-48	7/19/2012	0.5-1.5	Moist, mottled black, brown, gravelly, SAND, **with bark**, asphalt, concrete	X
NB-49	7/19/2012	0.0-0.5	Damp, brown, silty, SAND, **with mixed wood chip**	X
SPA-03	4/23/2007	0.5	Clayey sand **with wood debris**	
SPA-04	4/23/2007	1.0-2.0	**Wood debris**	
SPA-06	4/23/2007	0.25-0.75	Silt **with wood debris**	
SPA-10	4/23/2007	0.0	Silty sand **with wood debris**	X
SPA-11	4/23/2007	0.0-2.5	Silt **with abundant wood debris**	X
SPA-12	4/23/2007	1.5-1.67	**Wood chips**	

Notes:

[1] If the sample depth was not specified in the boring log, then the sample depth was approximated based on the visual depiction of the sample depth in the boring log.

[2] Emphasis was added (using a bold font) to highlight key descriptors. In addition, some acronyms used in the boring logs (e.g., color, sand-size) were spelled out.

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Table 5: Construction Debris and Potential Fill (Excluding Bark Sludge) Identified In NBA Boring Logs

Boring Name (Site ID)	Date	Depth on Boring Log (feet bgs)[1]	Description in Boring Log[2]	XRF/Lab Analysis?
SPA-05	4/23/2007	0.5-1.5	Dredge material / **fill**	
NB-3	7/18/2012	0.0-1.0	Damp, mottled brown, silty, SAND, **with concrete**, gravel	X
NB-4	7/18/2012	6.0-8.0	Wet, gray, SILT with silty fine Sand interbeds, black organics, **wood**	X
NB-6	7/19/2012	6.5-7.0	Saturated, **wood**	X
NB-9	7/18/2012	5.0-6.0	Moist, black, **asphalt concrete, with crushed concrete**	X
NB-10	7/18/2012	5.0-5.5	Interlayered **asphalt concrete** and silty sand	X
NB-11	7/17/2012	5.0-6.5	Wet, gray, silty, SAND with minor gravel, **scattered wood**	X
NB-13	7/17/2012	1.0-1.5	Damp, black, **asphalt, concrete rubble**	X
	7/17/2012	5.0-6.2	Wet, mottled brown, SILT, scattered organics, **crushed rock**	X
	7/17/2012	6.2-6.8	Wet, dark brown, fibrous ORGANICS, 2mm root-like, fuzzy organic matrix. **Decomposed asphalt** atop organics.	X
NB-16	7/18/2012	1.5-2.0	Damp, black, **asphalt concrete debris**	X
NB-18	7/18/2012	5.0-5.3	Wet, gray-black, silty, fine SAND, with **black charred wood**	X
NB-20	7/18/2012	1.0-3.5	Moist, mottled gray, gravelly, SAND, with minor silt, **asphalt @ 1.5'**	X
NB-24	7/17/2012	1.0-3.0	Moist, mottled brown, gravelly, silty, SAND, **with scattered crushed rock**	X
NB-25	7/17/2012	1.0-3.5	Wet, mottled brown, gravelly, silty, SAND, **with crushed rock,** wood, **asphalt**	X
NB-30	7/16/2012	0.5-2.5	Moist, mottled brown, silty, SAND, with some gravel, **asphalt @ 2.5'**	X
NB-31	7/17/2012	0.5-1.5	Moist, mottled brown, gravelly, silty, SAND, **with asphalt**	X
NB-32	7/17/2012	0.5-1.5	Moist, mottled brown, silty, SAND, with some gravel, **crushed rock**	X
NB-33	7/17/2012	0.5-2.5	Moist, mottled brown, silty, SAND with some gravel, **crushed rock**, wood chip	X
NB-34	7/16/2012	0.5-2.0	Moist, mottled brown, silty, SAND, with some gravel, **brick**, wood chip	X
NB-48	7/19/2012	0.5-1.5	Moist, mottled black, brown, gravelly, SAND, with bark, **asphalt, concrete**	X

Notes:

(1) If the sample depth was not specified in the boring log, then the sample depth was approximated based on the visual depiction of the sample depth in the boring log.

(2) Emphasis was added (using a bold font) to highlight key descriptors. In addition, some acronyms used in the boring logs (e.g., color, sand-size) were spelled out.

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Appendix A

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Memo

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From: Troy Bussey Jr., P.E., L.G., L.HG. (PIONEER Technologies Corporation [PIONEER])

Cc: Kim Seely (Coastline Law Group), Terri Bowers (Gradient)

Date: June 17, 2016

Subject: Privileged and Confidential Attorney Work Product
Summary of Technical Arguments that Refute USG's NBA Assertions
Former Arkema Manufacturing Site, 2901 and 2920 Taylor Way, Tacoma, WA
Agreed Order No. DE 5668, Facility/Site ID No. 1220, Cleanup Site ID No. 3405

The purpose of this memorandum is to present a brief, high-level summary of technical arguments that refute assertions CDM Smith has made on behalf of the United States Gypsum Corporation (USG) regarding USG's contribution to the arsenic and lead impacts in the North Boundary Area (NBA) of the Port's Former Arkema Manufacturing Site (Site). The NBA is located immediately adjacent to historic USG operations and areas where USG wastes were generated and stored. Existing evidence clearly demonstrates that USG's historic operations and management of arsenic- and lead-laden wastes (e.g., shot, slag, baghouse dust, off-spec rock wool mineral fibers) were responsible for all or almost all of the impacts in the NBA. Rather than acknowledge USG's impacts to the NBA, it appears that CDM Smith is desperately trying to create assertions that Arkema[1] is somehow responsible for the NBA impacts in order to minimize USG's responsibility. CDM Smith claims that USG had a minimal contribution to the arsenic and lead impacts in the NBA based on the following assertions[2]:

1. Apparent lack of soil "plumes" emanating from USG sources
2. It was unnecessary to extend the MW9 soil remediation area excavation further onto Arkema property
3. Shot and slag were not observed in NBA soil borings except for NB18
4. Electron microprobe (EMP) results suggest most NBA impacts are not attributable to USG sources
5. Arkema discharged arsenic-impacted waste to land and water
6. Arsenic-impacted wastewater may have been discharged to Waggoner's Wallow prior to 1969
7. Waggoner's Wallow overflowed and caused ponded water in low lying areas of the NBA
8. The NBA received fill from unknown sources

USG Assertion #1: Apparent Lack of Soil "Plumes" Emanating from USG Sources

USG Assertion #1 was based on CDM Smith's interpretation of the spatial distribution of arsenic and lead impacts in NBA soil (e.g., CDM Smith's soil concentration contour figures). CDM Smith claims plumes of arsenic and lead soil contamination emanating from the USG site were not evident in their evaluation of soil concentrations. However, CDM

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[1] Arkema's predecessor companies (which include Tacoma Electrochemical Company, Pennsylvania Salt Manufacturing Company of Washington, Pennwalt Corporation, Atochem Inc., Elf Atochem North America, and Atofina Inc.) operated the former manufacturing facility. For simplicity, the term Arkema is used in this memorandum to represent Arkema's predecessor companies.

[2] Our understanding of CDM Smith's latest assertions is based on the April 8, 2016 Supplemental Remedial Investigation (RI) Report (CDM Smith 2016a), with support as necessary from other CDM Smith documents that discuss the NBA (i.e., CDM Smith 2013a, 2013b, 2015, 2016b).

Smith's evaluation did not consider pre-remediation soil concentrations from key USG areas where high concentrations of arsenic-impacted and lead-impacted soil were removed (e.g., MW9 soil remediation area, B13 soil remediation area) and ignored past USG waste management practices adjacent to the Arkema property. Plumes of arsenic and lead contamination emanating from the USG site are readily apparent once a comprehensive set of appropriate USG soil data and past USG waste management practices are considered in the evaluation of soil concentrations. Specifically:

- The northernmost NBA area with elevated arsenic and lead soil concentrations[3] directly abuts an area that contains (1) the MW9 soil remediation area, (2) the B13 soil remediation area, and (3) an adjoining area to the southwest of the MW9 and B13 soil remediation areas where USG stockpiled wastes on unpaved surfaces (see Figure 1). USG also used its arsenic- and lead-impacted wastes as fill material along the Arkema property boundary in this area (CDM Smith 2016a). The arsenic and lead soil concentrations of 14,000 mg/kg and 10,000 mg/kg, respectively, in a HA-1 soil sample located on the Arkema property boundary (see Figure 1) were indicative of the pre-remediation concentrations in soil abutting the Arkema property (AGI Technologies 1998).[4,5] The common sense conclusion is that the same USG releases that caused the arsenic and lead impacts at HA-1 also caused impacts to adjoining soil in the NBA. For instance, USG waste used as fill material along the Arkema property boundary likely rolled off into abutting low lying areas of the NBA when the waste was being placed. Similarly, wastes in stockpiles located along the Arkema property boundary likely rolled off from the stockpiles into abutting low lying area of the NBA. Given (1) typical pre-1980s unregulated waste management practices at industrial facilities, (2) USG's admission that "prior raw material and waste management activities are not well documented" (CDM Smith 2016a), (3) the historical property boundary was not well defined[6], and (4) clear evidence that USG wastes were present on Arkema property in the MW9 soil remediation area (see response to USG Assertion #2), it is likely that USG also directly disposed of waste material in the NBA.
- The southernmost NBA area with elevated arsenic and lead soil concentrations is across from USG's Southern Corner source area (see Figure 1) as well as the area to the southwest of the MW9 and B13 soil remediation areas where USG stockpiled wastes. The Southern Corner was identified as a key source area in the Supplemental RI Report due to the presence of significant USG wastes (e.g., slag, shot) and elevated arsenic and lead concentrations (CDM Smith 2013b, 2016a). Despite an area of relatively low arsenic and lead concentrations between the USG property and this southernmost NBA area with elevated arsenic and lead soil concentrations, USG is the logical source of these impacts in the NBA. USG wastes were likely transported to

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[3] For the purposes of this memorandum, locations with arsenic or lead soil concentrations greater than 400 mg/kg were used to define the areas with elevated arsenic and lead soil concentrations in the NBA.

[4] For context, the current Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted land uses for arsenic and lead are 20 mg/kg and 250 mg/kg, respectively. The current MTCA Method A soil cleanup levels for industrial properties for arsenic and lead are 88 mg/kg and 1,000 mg/kg, respectively.

[5] The arsenic and lead concentrations in this HA-1 soil sample (which was analyzed by a fixed lab) were an order of magnitude greater than the maximum concentrations detected in any NBA soil sample analyzed by a fixed lab. These HA-1 soil concentrations and other pre-remediation soil concentrations demonstrate that the USG wastes located near the Arkema property boundary contained sufficient source strength to cause the NBA soil impacts.

[6] As evidenced by the fact that surveyors were needed to determine the property boundary during the MW9 area remedial excavation (AGI Technologies 2000).

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this southernmost NBA area via airborne emissions and/or windblown fugitive dust of fines in stockpiles. Other plausible explanations include (1) USG wastes that were originally located closer to the property boundary were moved/mixed moved during subsequent fill/grading events, and (2) USG directly disposed of waste materials in the NBA.

- The presence of soil "plumes" containing elevated lead concentrations that are (1) co-located with elevated arsenic concentrations, and (2) adjacent to the USG property provides strong evidence that USG wastes are responsible for the NBA impacts. USG wastes had high lead concentrations (e.g., baghouse dust contained lead concentrations of approximately 60,000 mg/kg to 80,000 mg/kg [TLI Systems 1996]). By contrast, Arkema wastes contained little to no lead as demonstrated by the general lack of elevated lead concentrations in Arkema soil outside of the NBA.
- There is no compelling evidence underlying USG's assertions that historic Arkema operations caused the NBA impacts (see responses to USG Assertions #5 through #8).

USG Assertion #2: It Was Unnecessary to Extend the MW9 Soil Remediation Area Excavation Further Onto Arkema Property

Before responding to this assertion, it must be stated that the easternmost extent of the 1999 remedial excavation of the MW9 area extended approximately five feet into Arkema property in order to remove USG mineral fibers and hazardous waste that were present on Arkema property (AGI Technologies 2000). In addition, arsenic concentrations up to 640 mg/kg were left in place on the eastern sidewall. Thus, irrefutable evidence exists that USG caused impacts in the NBA that extend greater than five feet onto the Arkema property.

USG Assertion #2 was based primarily on visual observations of the apparent lack of mineral fibers in the eastern sidewall of the MW9 area remedial excavation. Specifically, the removal of arsenic- and lead-impacted soil on Arkema property in the MW9 area was halted after the "upper layer of material containing mineral wool fibers tapered out" (AGI Technologies 2000, emphasis added). The AGI Technologies decision to halt the excavation was also supported by the relatively low arsenic and lead concentrations in the five excavation sidewall samples collected on the Arkema property in 1999.[7] Recent discoveries have now revealed that (1) the MW9 area excavation did not extend deep enough or far enough onto the Arkema property to capture all of the arsenic and lead impacts from USG wastes, and (2) the visual inspection method used by AGI Technologies was not an effective means to detect the presence of USG wastes on the Arkema property. The MW9 area excavation was only about 3 to 5 feet deep and the five excavation sidewall samples on the Arkema property were only 2 to 3 feet deep (AGI Technologies 2000). 2012 sampling results from the six soil borings abutting the eastern sidewall of the MW9 area excavation demonstrated that the arsenic and lead impacts are not encountered until a depth of 5.5 to 6.5 feet, which is significantly deeper than where the excavation sidewall samples were collected and deeper than where the excavation stopped.[8] The reason why USG wastes are present at

[7] The maximum arsenic and lead concentrations in sidewall sample locations SW24 and SW27 through SW30 were 640 mg/kg and 32 mg/kg, respectively (AGI Technologies 2000).

[8] Significantly elevated arsenic and lead concentrations and visual evidence of USG waste were first encountered in NB10 at a depth of 5.5 feet below ground surface (bgs), NB11 at a depth of 6.5 feet bgs, NB13 at a depth of 6.5 feet bgs, NB15 at a depth of 6 feet bgs, NB17 at a depth of 6

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deeper depths in this portion of the NBA is most likely because it was formerly a low lying area. Even if the MW9 area excavation had continued deeper, the visual inspection method used by AGI Technologies would not have been capable of seeing the small USG waste particles (e.g., small slag, shot, mineral fiber, and baghouse dust particles) that are present in NBA soil as discussed in the response to USG Assertions #3 through #4.

USG Assertion #3: Shot and Slag Were Not Observed in NBA Soil Borings Except for NB18

USG Assertion #3 was based on CDM Smith's interpretation of visual observations noted in the boring logs for soil samples collected during the 2012 NBA investigation. CDM Smith's assertion distorts the actual observations noted in these boring logs and the EMP results. USG used black slag as a feedstock and produced a variety of wastes including off-spec mineral fibers, black shot, and black slag fines. Evidence of these USG materials and wastes were observed in the NBA boring logs. Fibers and/or black materials were visually observed in all 14 NBA soil samples in which arsenic and lead concentrations exceeded 400 mg/kg (CDM Smith 2015).[9] Four of these 14 soil samples were subsequently analyzed with the EMP (i.e., NB10-5.5, NB16-5.4, NB31-5, and NB49-1). The magnification of the EMP analyses demonstrated that the fibers and/or black materials present in all four samples contained USG waste shot, slag, and/or mineral fibers (CDM Smith 2013b). Moreover, slag and one small shot grain were also identified in the EMP analyses for two NBA samples in which fibers and/or black materials were not visually observed in the field (i.e., NB8-1.8 and NB35-2). Thus, small shot, slag, and mineral fiber particles are present in NBA soil even when they cannot be seen with the naked eye. Perhaps more importantly, visual observations and the EMP are not able to identify the significant quantities of baghouse dust generated by USG. As baghouse dust interacts with the environment, the baghouse dust particles become increasingly difficult to visually identify. Consequently, CDM Smith has been unable to identify the presence of baghouse dust on the USG property even though baghouse dust was unquestionably released to the USG property. In fact, Washington State Department of Ecology (Ecology) recognized that "there could have been baghouse dust present, based on the highly leachable materials in MW 9 area and the proximity to the baghouse, and that is not visually identifiable" (CDM Smith 2016b). Historic air emission information and photographic evidence of USG particulate emissions traveling onto the Arkema property demonstrate that a significant amount of baghouse dust was released to the Arkema property. USG generated an estimated 200 - 250 pounds per hour of baghouse dust in 1973 (TLI Systems 1996). USG had no emission controls prior to 1970, and was issued many Puget Sound Air Pollution Control Agency violations and civil penalties during initial operations of the emission controls between 1970 and 1973. The baghouse dust released by USG contained arsenic and lead concentrations of approximately 220,000 mg/kg to 230,000 mg/kg and 60,000 mg/kg to 80,000 mg/kg, respectively (TLI Systems 1996).

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feet bgs, and NB26 at a depth of 6.5 feet bgs (CDM Smith 2015). See response to USG Assertions #3 and #4 for why the material encountered at these depths includes USG waste.

[9] Samples collected from NB10 at 5.5 to 5.6 feet bgs, NB11 at 6.5 to 7 feet bgs, NB13 at 6.5 feet bgs, NB15 at 6 to 6.5 feet bgs, NB16 at 5.3 to 5.5 feet bgs, NB17 at 6 feet bgs, NB26 at 6.5 feet bgs, NB31 at 5 feet bgs, NB31 at 5.3 feet bgs, NB34 at 2 to 2.5 feet bgs, NB35 at 1.5 feet bgs, NB37 at 2.5 feet bgs, NB42 at 2 feet bgs, and NB49 at 1 foot bgs.

USG Assertion #4: EMP Results Suggest Most NBA Impacts Are Not Attributable to USG Sources

USG Assertion #4 was based on CDM Smith's interpretation of EMP results from nine soil samples collected during the 2012 NBA investigation (CDM Smith 2013b). CDM Smith determined that the vast majority of the arsenic present in the samples it chose for EMP analysis was present in secondary arsenic forms[10], with most of the remaining arsenic in a primary form CDM Smith interpreted as "angular slag." CDM Smith assumed that the "angular slag" was spent Arkema sandblasting grit simply because the particles were "sand-sized" (CDM Smith 2013b). Other primary arsenic forms identified by CDM Smith were "spherical slag" (assumed to be USG shot waste), "blady slag" (assumed to be USG rock wool mineral fiber waste), and arsenic oxide (which CDM Smith assumed without any basis to be from Arkema's use of arsenic trioxide in the production of Penite). CDM Smith's interpretation of the EMP analyses and its associated NBA cost allocation are inappropriate for a number of reasons, which include, but are not limited to, the following:

- CDM Smith's reliance on its interpretation of EMP results as the sole basis for cost allocation is inappropriate for many reasons, including that EMP is a questionable forensics tool for this situation. The EMP can be an effective tool for identifying unaltered shot and rock wool mineral fibers, but not for identifying USG baghouse dust. Metal ratios are a better forensics tool for evaluating the source of arsenic and lead impacts in the NBA. Existing metal ratios work has demonstrated that the metal ratios for NBA soil are similar to USG MW9 area soil and dissimilar to Penite Pit area soil and NBA bark sludge.
- CDM Smith's allocation of the secondary arsenic forms based on its EMP allocation percentage for the primary arsenic forms is absurd because the vast majority of the arsenic is present in secondary forms, and the secondary forms include altered USG baghouse dust. Moreover, there are significant issues associated with CDM Smith's interpretation of the primary arsenic forms (see subsequent bullets).
- CDM Smith's interpretation of what constitutes "angular slag" versus "spherical slag" versus "blady slag" is subjective. Based on CDM Smith's past record of distorting objective NBA data, it is likely that CDM Smith's subjective interpretation of slag shape was biased.
- CDM Smith's assumption that the "sand-sized", "angular slag" is spent Arkema sandblasting grit is wishful conjecture because USG produced sand-sized, slag-related wastes adjacent to the NBA, and existing documentation demonstrates it is highly unlikely that spent Arkema sandblasting grit was ever placed in the NBA (see response to USG Assertion #5). The more logical sources for the "sand-sized", "angular slag" in the NBA were the adjacent USG raw materials and wastes. USG used Asarco slag as a feedstock in the manufacture of rock wool between 1959 and 1973 and produced slag-related wastes during this time (TLI Systems 1996). In addition, USG used sand-sized shot waste to produce a sandblast grit product (TLI Systems 1996).
- CDM Smith's assumption that the minimal amount of arsenic oxide it identified in the NBA samples is arsenic trioxide from Penite wastes is unfounded because Penite wastes were not disposed of in the NBA (see response to USG Assertions #5 and #6), and USG wastes (e.g., baghouse dust) most likely contained arsenic oxides such as arsenic trioxide.

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[10] Secondary forms of arsenic occur when the primary arsenic forms (e.g., shot, rock wool mineral fibers, slag, arsenic trioxides) alter in the environment (e.g., via dissolution or oxidation). The sources of the secondary forms cannot be distinguished with the EMP.

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- CDM Smith's interpretation of the EMP results and its cost allocation ignores the source of the extensive lead impacts in the NBA. Lead is associated with USG wastes, but not Arkema wastes (see responses to USG Assertions #1 and #5).
- CDM Smith's determination of a cost allocation percentage based on seven EMP sample results is inappropriate because three of the seven samples are not representative of NBA locations with elevated arsenic and lead concentrations.[11] About five times more unaltered USG shot and mineral fiber waste was identified on average in the four samples containing elevated arsenic and lead concentrations compared to the three samples that did not contain elevated arsenic and lead concentrations (CDM Smith 2013b).

USG Assertion #5: Arkema Discharged Arsenic-Impacted Waste to Land and Water

USG Assertion #5 was based on information presented in historical reports that were prepared on behalf of Arkema. Although Arkema did discharge arsenic-impacted waste generated from Penite (sodium arsenite) manufacturing to land and water, these historical discharges were not associated with the NBA. The Penite manufacturing operations were in the central portion of the Arkema property, and were completely separated from the NBA by other non-arsenic-related manufacturing operations. Arsenic-impacted wastes from Penite manufacturing were discharged to land in the central portion of the Arkema property at the Penite Pits, which were not near the NBA (see Figure 1). Arsenic-impacted wastewater from Penite manufacturing was discharged via outfalls to the Hylebos Waterway, not to the NBA. CDM Smith has inappropriately insinuated that the black fine sand encountered in many of the NBA soil samples with elevated arsenic and lead concentrations may be spent Arkema sandblasting grit. While spent Arkema sandblasting grit was used for "fill material and dike material" (AWARE Corporation 1981), the following lines of evidence indicate it was highly unlikely for the spent Arkema sandblasting grit to have been used as fill material or dike material in the NBA:

- The spent Arkema sandblasting grit was "primarily found on Pennwalt's site around the sandblasting shed located between the Taylor Lake area and the Hylebos Waterway" (AWARE Corporation 1981). The location of the Sandblasting Shed was not near the NBA (see Figure 1). It does not make sense that Arkema would expend the considerable effort to haul the spent Arkema sandblasting grit all the way to the NBA when it was already placing the spent sandblasting grit immediately adjacent to where it was being generated (i.e., at the Sandblasting Shed).
- Although the spent Arkema sandblasting grit could have been used for dike material around former surface impoundments located southeast of the Sandblasting Shed, it could not have been used for Waggoner's Wallow since Waggoner's Wallow did not have a dike (AWARE Corporation 1981).
- The spent Arkema sandblasting grit "is easily recognizable by its green color" (AWARE Corporation 1981). The elevated arsenic and lead concentrations in the NBA are associated with a black fine sand, not a green sand. A green color was only used in the description of three soil samples collected during the 2012 NBA investigation,

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[11] Samples NB8-1.8, NB35-2, and NB48-2 did not contain arsenic or lead concentrations exceeding 400 mg/kg. Samples NB40-2 (which was located on USG property) and NB16-6 were not used by CDM Smith in its cost allocation (CDM Smith 2013b).

and the arsenic and lead concentrations in these green-colored samples were not elevated.[12] By contrast, USG generated a lot of waste that typically had a black color (e.g., shot, slag, mineral fiber particles, USG sandblast grit) and contained significantly elevated arsenic and lead concentrations.

- Elevated lead concentrations are not present in the vicinity of the Sandblasting Shed, which is where most of the spent Arkema sandblasting grit was placed (AWARE Corporation 1981). By contrast elevated lead concentrations are associated with black USG waste, which is present in the NBA.
- The 1981 AWARE Corporation document that was CDM Smith's information source regarding spent Arkema sandblasting grit concluded the spent sandblasting grit was "not considered to be a significant source of arsenic" on the Arkema property (AWARE Corporation 1981).

It should be noted that CDM Smith's assertion does not include discharge of lead-impacted wastes. Elevated lead concentrations are a critical diagnostic element for the impacts in NBA soil. Arkema manufacturing processes did not generate lead-impacted waste.

USG Assertion #6: Arsenic-Impacted Wastewater May Have Been Discharged to Waggoner's Wallow Prior to 1969

USG Assertion #6 is conjecture based on CDM Smith's perceived inconsistency regarding the construction date of Waggoner's Wallow. It is well documented that arsenic-impacted wastewater from the Penite manufacturing process was discharged to the Hylebos waterway, and other arsenic-impacted wastes were disposed of in the Penite Pits, which were not located near or connected to Waggoner's Wallow (see Figure 1). However, based on a perceived inconsistency about when Waggoner's Wallow was constructed, CDM Smith incorrectly speculated that arsenic-impacted wastewater may have been discharged to Waggoner's Wallow prior to 1969. The 1981 AWARE Corporation document estimated that Waggoner's Wallow was constructed circa 1969 to treat and discharge waste from chlorine manufacturing (AWARE Corporation 1981); however, historical aerial photos show construction of portions of the final Waggoner's Wallow system prior to 1969. PIONEER agrees that some of the Waggoner's Wallow ditches were constructed prior to 1969 as shown on historical aerial photos. Historical aerial photos also show that a pond feature, which provided additional treatment of chlorine manufacturing wastes, was added to the Waggoner's Wallow system circa 1969 near the westernmost corner of the ditches (see Figure 1). The estimated 1969 construction date mentioned in the 1981 AWARE Corporation document was likely referring to the addition of this pond feature. Regardless, the fact that some components of the Waggoner's Wallow system were constructed prior to 1969 does not mean that arsenic-impacted wastewater was discharged to Waggoner's Wallow prior to 1969 (or any time since 1969). There is no evidence that Waggoner's Wallow was ever associated with any manufacturing process other than chlorine manufacturing, which began in the 1920s and did not generate arsenic-impacted waste.

[12] The three samples were collected from NB8 at 1.8 feet bgs, NB22 at 5 to 6 feet bgs, and NB29 at 2.5 to 3.5 feet bgs. The arsenic concentrations in these three samples ranged from 62 mg/kg to 239 mg/kg. The lead concentrations in these three samples ranged from 7 mg/kg to 96 mg/kg.

USG Assertion #7: Waggoner's Wallow Overflowed and Caused Ponded Water in Low Lying Areas of the NBA

USG Assertion #7 was based on CDM Smith's interpretation of historical aerial photos. Regardless of whether or not Waggoner's Wallow periodically overflowed, any overflow of Waggoner's Wallow is moot with respect to a potential release of arsenic and lead from Waggoner's Wallow. The non-hazardous wastewater and sludge in Waggoner's Wallow was associated with sodium hypochlorite, not arsenic or lead. Furthermore, the arsenic and lead concentrations in seven 1989 sludge samples collected from Waggoner's Wallow ranged from only 9.2 mg/kg to 150 mg/kg and 56 mg/kg to 290 mg/kg, respectively (DOF 2013). These sludge concentrations were not high enough for Waggoner's Wallow to be considered a source of the significantly higher arsenic and lead concentrations present in NBA soil. Moreover, arsenic and lead concentrations were not uniform in the seven sludge samples collected from Waggoner's Wallow. Arsenic and lead concentrations were an order of magnitude higher in the three sludge samples located closest to USG compared to the four sludge samples located farthest away from USG, which provides further evidence that the impacts from USG's releases extended all the way to Waggoner's Wallow.

USG Assertion #8: The NBA Received Fill from Unknown Sources

USG Assertion #8 was based on CDM Smith's interpretation of historical aerial photos and wishful speculation about the potential source of historical fill material from the 1950s through the 1980s. PIONEER agrees that historical filling occurred in portions of the NBA during this period. However, based on our interpretation of historical aerial photos, the only filling event that overlaps the NBA areas with elevated arsenic and lead concentrations was the bark sludge application during the mid to late 1980s (see Figure 1). Bark sludge was spread across a large portion of the NBA to establish a vegetative cover. A 1990 Boateng report documented an extensive sampling effort to characterize the bark sludge (Boateng 1990). The results of the characterization demonstrated that bark sludge did not contain elevated arsenic or lead concentrations (i.e., arsenic concentrations ranged from 4 mg/kg to 42 mg/kg, and lead concentrations ranged from 13 mg/kg to 36 mg/kg). The only other obvious fill events shown in aerial photos between the 1950s and 1981 were significantly northeast of the two NBA areas with elevated arsenic and lead concentrations (see Figure 1). In addition, as discussed in the response to USG Assertion #5, it is highly unlikely that the spent Arkema sandblasting grit was used as fill in the NBA. Rather, the most plausible explanations for the arsenic and lead impacts in the NBA are direct disposal of USG wastes in the NBA and/or transport of USG wastes from the USG site to the NBA (see responses to USG Assertions #1 through #4).

Conclusion

The historical record, existing data, and common sense logic do not support any of the assertions CDM Smith has made on behalf of USG to conclude that USG operations had a minimal contribution to the arsenic and lead impacts in the NBA. Rather, CDM Smith is distorting the data and documentation record in order to invent far-fetched assertions and conclusions that don't pass the straight face test. As outlined in this memorandum, compelling evidence exists to demonstrate that USG caused all or almost all of the arsenic and lead impacts in the NBA.

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CDM Smith 2013a. Presentation titled "Source Evaluation", Arkema North Boundary Area, May 15.

CDM Smith 2013b. Report: Electron Microprobe Analysis, North Boundary Area Investigation, July 18.

CDM Smith 2015. Evaluation of Arsenic Source, North Boundary Area, April 27.

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DOF 2013. Remedial Investigation Report, Former Arkema Manufacturing Plant, September.

TLI Systems 1996. Hylebos Waterway Allocation, Parcel 24, 2301 Taylor Way, May 7.

Attachments

Figure 1: Key Features Discussed in Memo

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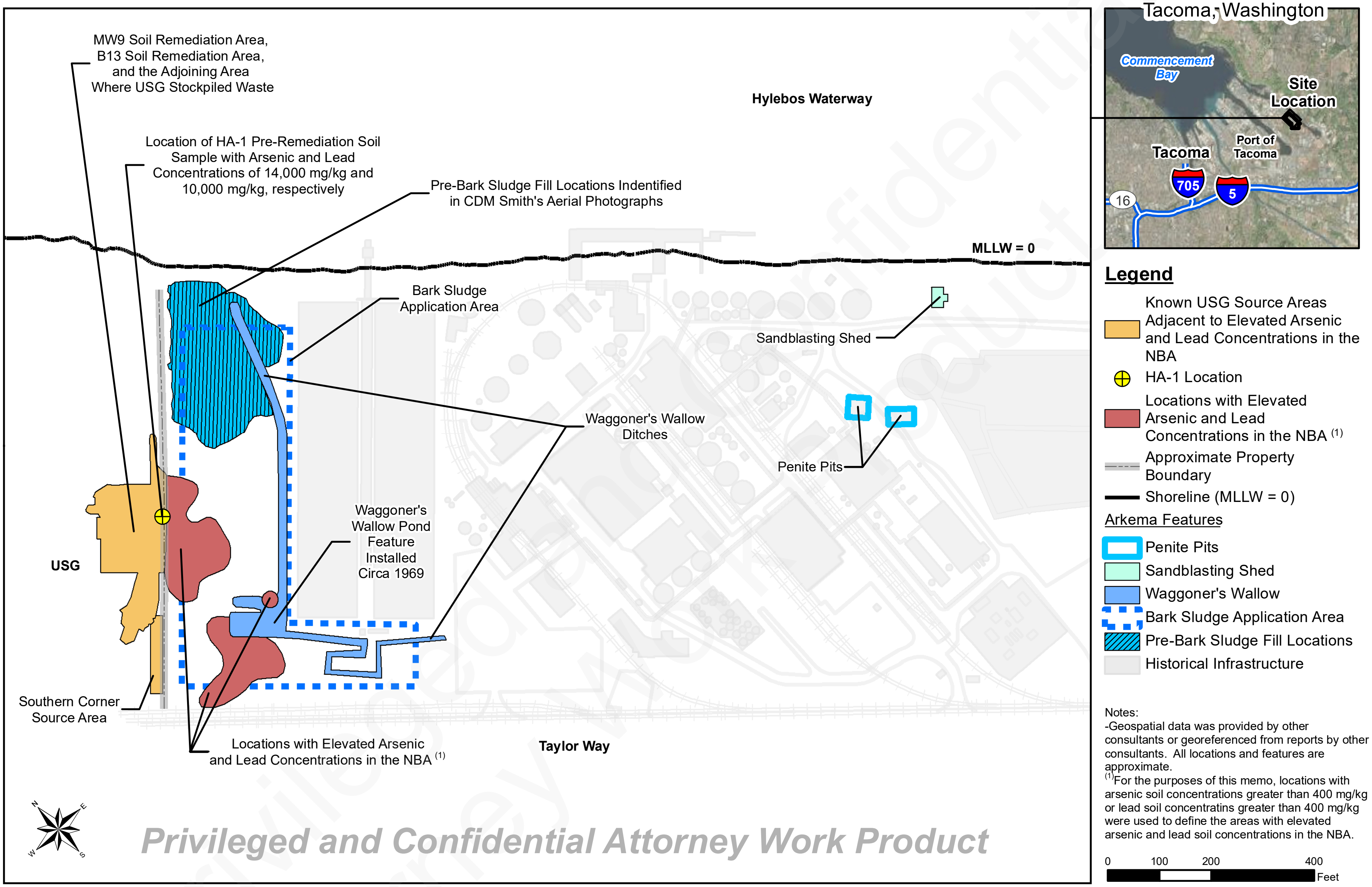

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Key Features Discussed in Memo
Summary of Technical Arguments that Refute USG's NBA Assertions
Port of Tacoma Former Arkema Manufacturing Site

Figure 1

Document Path: G:\Projects\Arkema\Maps\2016\June_2016\Arkema_Remedial_Locations_Key_Features_Update.mxd; Author: SM; Date Saved: 6/10/2016

Appendix B

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Figures

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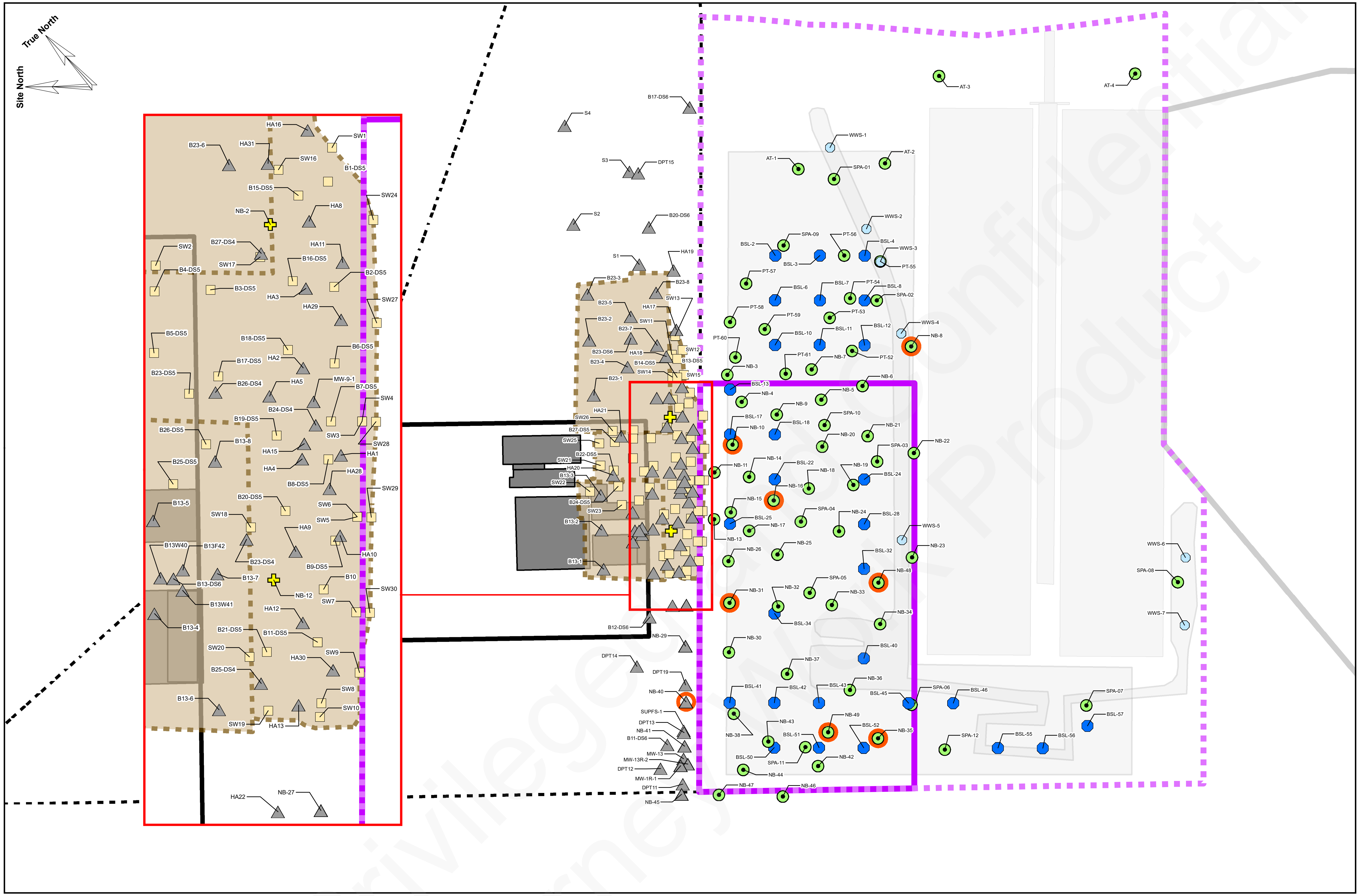

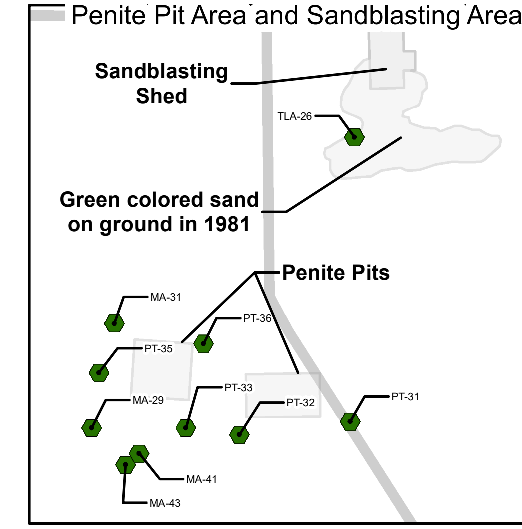

Legend

- MW9/B13/B23 Excavation Areas
- USG Property Boundary
- Arkema Site Boundary
- General North Boundary Area
- Primary Impacted Portion of the NBA

Former USG Manufacturing

- Former Manufacturing Area Boundary
- Other Key Features

Former Arkema Manufacturing

- Key Former Manufacturing Area Boundaries
- Other Key Features

Key Soil Sample Locations

- USG Sample Location Representative of Pre-Remediation Conditions
- USG Excavation Confirmation Sample Location
- USG Post-Remediation Sample Location Within Previously-Excavated Areas
- Arkema Waggoner's Wallow Sample Location
- Arkema Bark Sludge Sample Location
- Arkema NBA Sample Location – Other
- Arkema Penite Pit Area and Sandblasting Area Sample Location Used for Metals Ratios
- Sample Location with EMP Analysis

Notes:
- Suffixes were added to Site IDs as necessary to facilitate data management in the analytical results database. For instance, the "-DS4", "-DS5", and "-DS6" suffixes were added to differentiate between different borings that had the same Site ID.
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.

0 50 100 200 Feet

PIONEER TECHNOLOGIES CORPORATION

Key Soil Sample Locations for Lab/XRF Analyses
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure B-1

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-B-1_Key Soil Sample Locations.mxd; Author: SM; Date Saved: 3/17/2017

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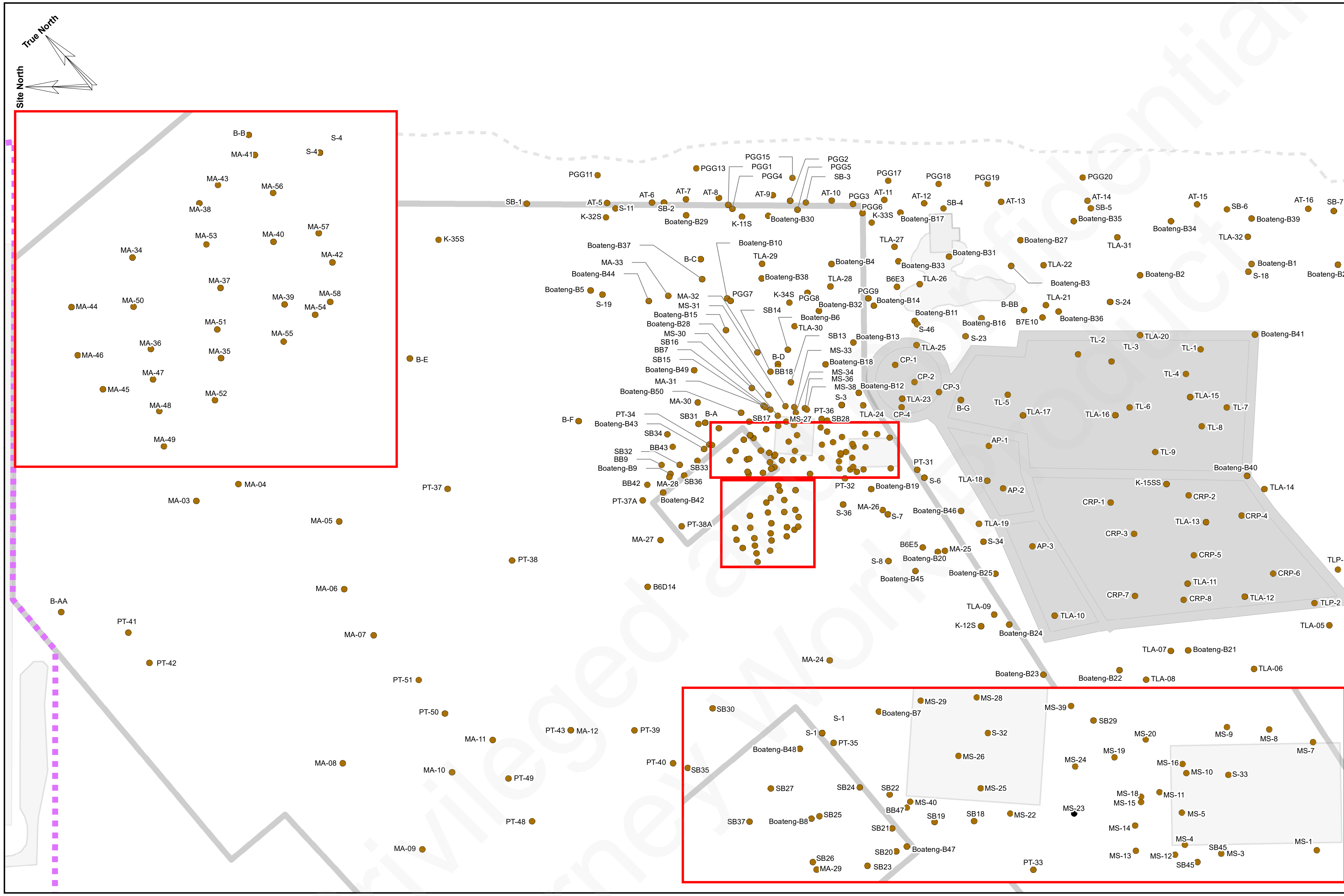

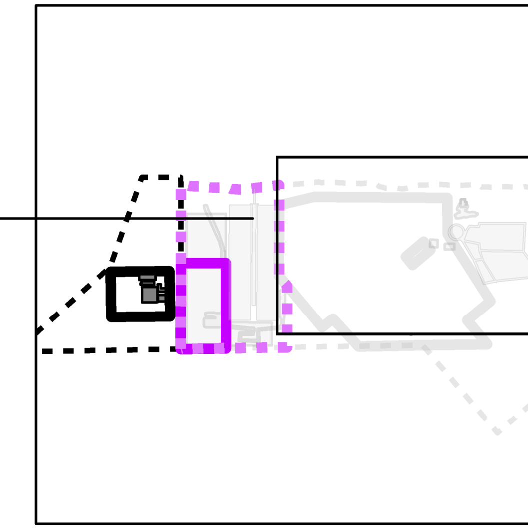

Legend

- USG Property Boundary
- Arkema Site Boundary
- General North Boundary Area
- Primary Impacted Portion of NBA

Former USG Manufacturing

- Former Manufacturing Area Boundary
- Other Key Features

Former Arkema Manufacturing

- Key Former Manufacturing Area Boundaries
- Other Key Features

Soil Sample Location

- Sample Location [(1)]

Notes:
[(1)] This figure presents miscellaneous Arkema sampling locations that are used in this report, but not presented on Figure B-1.
- Geospatial data were provided by other consultants or georeferenced from reports by other consultants. All locations are approximate.

0 50 100 200 Feet

PIONEER TECHNOLOGIES CORPORATION

Soil Sample Locations for Miscellaneous Arkema Lab/XRF Analyses
Cost Allocation Report
North Boundary Area of the Former Arkema Manufacturing Site

Figure B-2

Document Path: G:\Projects\Arkema\Maps\2017\Cost Allocation Report\Figure-B-2_Soil_Sample_Locations_Misc_Samples.mxd; Author: SM; Date Saved: 3/17/2017

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Tables

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Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Sample Locations Representative of Pre-Remediation Conditions	S1	5/1/1994	0.0	0.17	5.3				20				17		240	
	S1	5/1/1994	0.17	0.5	7.0				27				20		250	
	S2	5/1/1994	0.0	0.17	3.8				11				16		130	
	S2	5/1/1994	0.17	0.5	26				63				17		380	
	S3	5/1/1994	0.0	0.17	7.8				12				23		128	
	S3	5/1/1994	0.17	0.83	29				31				29		210	
	S4	5/1/1994	0.0	0.17	140				240				23		680	
	S4	5/1/1994	0.17	0.83	72				24				18		150	
	MW-9-1	11/2/1994	2.5	2.5	1,200				200				7.3		170	
	MW-9-1	11/2/1994	8.0	8.0	300				190				10		150	
	MW-13	11/2/1994	2.5	2.5	45				8.5				12		35	
	MW-13	11/2/1994	10	10	4.8				5.3				13		32	
	B23-DS4	10/5/1998	1.0	1.0	4,100				2,500						2,200	
	B23-DS4	10/5/1998	1.5	1.5	1,100				940						3,700	
	B23-DS4	10/5/1998	6.0	6.0	14	U			10						34	
	B24-DS4	10/5/1998	3.0	3.0	7,700				3,200						3,300	
	B24-DS4	10/5/1998	4.5	4.5	16	U			9.1						47	
	B24-DS4	10/5/1998	7.0	7.0	220				6.8						9.8	
	B24-DS4	10/5/1998	9.0	9.0	16				6.8	U					12	
	B25-DS4	10/5/1998	1.0	1.0	1,700				620						740	
	B25-DS4	10/5/1998	2.0	2.0	410				40						88	
	B25-DS4	10/5/1998	4.0	4.0	16	U			8.9						42	
	B26-DS4	10/5/1998	1.0	1.0	330				300						550	
	B26-DS4	10/5/1998	1.5	1.5	830				630						4,400	
	B26-DS4	10/5/1998	4.5	4.5	14	U			7.1	U					34	
	B27-DS4	10/5/1998	1.5	1.5	160				49						78	
	B27-DS4	10/5/1998	5.0	5.0	220				6.9	U					21	
	HA1	6/6/1998	0.4	0.4	240				280						890	
	HA1	6/6/1998	1.0	1.0	14,000				10,000						11,000	
	HA10	6/6/1998	0.5	1.5	1,100				230						890	
	HA11	6/6/1998	0.5	1.5	1,600				1,100						1,900	
	HA12	7/21/1998	0.75	1.0	3,800				2,300						4,500	
	HA12	7/21/1998	1.5	1.75	280				37						120	
	HA12	7/21/1998	2.5	2.5	740				300						550	
	HA13	7/21/1998	0.75	0.75	3,500				2,200						3,600	
	HA13	7/21/1998	1.25	1.5	230				34						99	
	HA13	7/21/1998	2.0	2.25	290				130						240	
	HA15	7/21/1998	1.25	1.25	15,000				8,400						6,400	
	HA15	7/21/1998	2.25	2.25	2,300				620						1,000	
	HA16	7/21/1998	0.75	0.75	810				720						3,100	

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Sample Locations Representative of Pre-Remediation Conditions	HA16	7/21/1998	1.0	1.25	130				4.6						27	
	HA16	7/21/1998	2.0	2.0	130				55						210	
	HA17	7/21/1998	0.5	0.5	64				86						470	
	HA17	7/21/1998	1.5	1.75	45				41						230	
	HA18	7/21/1998	0.75	1.0	1,400				1,900						7,700	
	HA18	7/21/1998	1.5	1.5	190				120						370	
	HA18	7/21/1998	2.0	2.25	280				31						80	
	HA19	7/21/1998	1.0	1.0	81				100						410	
	HA19	7/21/1998	2.5	2.5	6.6	U			2.1						21	
	HA19	7/21/1998	5.0	5.0	6.6	U			2	U					30	
	HA2	6/6/1998	0.5	0.5	4,300				3,100						6,800	
	HA2	6/6/1998	1.65	1.65	1,100				220						530	
	HA2	6/6/1998	2.5	2.5	330				8.6						43	
	HA20	7/21/1998	1.0	1.0	2,100				1,600						1,400	
	HA20	7/21/1998	1.5	1.5	2,100				1,400						1,800	
	HA20	7/21/1998	2.5	2.75	99				34						72	
	HA21	7/21/1998	0.75	1.0	720				280						570	
	HA21	7/21/1998	1.25	1.25	420				6.7						32	
	HA21	7/21/1998	2.0	2.0	130				22						130	
	HA22	7/21/1998	1.5	1.5	190				61						170	
	HA22	7/21/1998	2.0	2.0	160				17						61	
	HA28	10/6/1998	3.0	3.0	2,900				10						26	
	HA28	10/6/1998	5.0	5.0	42				15						52	
	HA29	10/6/1998	3.0	3.0	1,900				100						210	
	HA29	10/6/1998	4.0	4.0	83				12						46	
	HA3	6/6/1998	0.75	0.75	1,700				1,700						8,700	
	HA3	6/6/1998	2.2	2.2	180				150						700	
	HA30	10/6/1998	2.5	2.5	180				6	U					26	
	HA30	10/6/1998	4.0	4.0	230				9.9						39	
	HA31	10/6/1998	0.5	0.5	49				39						66	
	HA4	6/6/1998	1.3	1.3	6,900				4,200						7,600	
	HA5	6/6/1998	0.5	1.5	1,100				1,000						1,400	
	HA8	6/6/1998	0.75	1.0	2,400				1,600						3,200	
	HA8	6/6/1998	1.3	1.5	130				44						130	
	HA9	6/6/1998	0.5	1.3	4,400				2,600						3,300	
	B11-DS6	10/29/2002	0.5	2.5	233				268							
	B13-DS6	10/29/2002	1.0	2.0	1,310				894							
	B13-DS6	10/29/2002	2.0	3.0	708				6.1							
	B12-DS6	11/1/2002	1.2	2.8	37				5.2							
	B17-DS6	11/1/2002	0.5	2.7	65				65						317	

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Sample Locations Representative of Pre-Remediation Conditions	B17-DS6	11/1/2002	3.0	7.0	1.8				1.3						17.5	
	B20-DS6	11/1/2002	1.0	3.0	60				101							
	B20-DS6	11/1/2002	3.0	5.0	17											
	B23-DS6	11/1/2002	0.8	2.0	1,300				1,250							
	B23-DS6	11/1/2002	2.5	5.0	26				12							
	B13-1	6/1/2005	1.0	1.0	2,100				1,200							
	B13-1	6/1/2005	2.0	2.0	300				3.8	U						
	B13-1	6/1/2005	3.0	3.0	270				4.3	U						
	B13-2	6/1/2005	1.0	1.0	2,200				780							
	B13-2	6/1/2005	2.0	2.0	2,800				950							
	B13-2	6/1/2005	3.0	3.0	2,500				46							
	B13-3	6/1/2005	1.0	1.0	56				10.0							
	B13-3	6/1/2005	2.0	2.0	150				4.3	U						
	B13-3	6/1/2005	3.0	3.0	97				4.6							
	B13-4	6/1/2005	1.0	1.0	1,000				83							
	B13-4	6/1/2005	2.0	2.0	510				3.7	U						
	B13-4	6/1/2005	3.0	3.0	580				4.0							
	B13-5	6/1/2005	1.0	1.0	28				7.5							
	B13-5	6/1/2005	2.0	2.0	46				30							
	B13-5	6/1/2005	3.0	3.0	560				21							
	B13-6	6/1/2005	1.0	1.0	53				26							
	B13-6	6/1/2005	2.0	2.0	69				6.5							
	B13-6	6/1/2005	3.0	3.0	26				3.6	U						
	B13-7	6/1/2005	1.0	1.0	21				4.2	U						
	B13-7	6/1/2005	2.0	2.0	6.6				3.9	U						
	B13-7	6/1/2005	3.0	3.0	570				45							
	B13-8	6/1/2005	1.0	1.0	96				78							
	B13-8	6/1/2005	2.0	2.0	74				4.2	U						
	B13-8	6/1/2005	3.0	3.0	14				4.8	U						
	B13F42	6/14/2005	1.0	1.0	1,010		878		570		486					
	B13W40	6/14/2005	1.0	1.0	3,200		5,868		2,030		2,910					
	B13W41	6/14/2005	1.0	1.0	2,580		3,015		1,570		1,699					
	B23-1	6/1/2005	1.0	1.0	16				4.4	U						
	B23-1	6/1/2005	2.0	2.0	250				4.9	U						
	B23-1	6/1/2005	3.0	3.0	280				11							
	B23-2	6/1/2005	1.0	1.0	690				7.2							
	B23-2	6/1/2005	2.0	2.0	270				6.4							
	B23-2	6/1/2005	3.0	3.0	430				4	U						
	B23-3	6/1/2005	1.0	1.0	210				4.1	U						
	B23-3	6/1/2005	2.0	2.0	510				4.7							

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Sample Locations Representative of Pre-Remediation Conditions	B23-3	6/1/2005	3.0	3.0	190				3.7	U						
	B23-4	6/1/2005	1.0	1.0	16				3.6	U						
	B23-4	6/1/2005	2.0	2.0	11				3	U						
	B23-4	6/1/2005	3.0	3.0	15				3	U						
	B23-5	6/1/2005	1.0	1.0	90				63							
	B23-5	6/1/2005	2.0	2.0	320				31							
	B23-5	6/1/2005	3.0	3.0	41				3.8	U						
	B23-6	6/1/2005	1.0	1.0	1,900				5.8							
	B23-6	6/1/2005	2.0	2.0	81				4.6							
	B23-6	6/1/2005	3.0	3.0	43				3.6	U						
	B23-7	6/1/2005	1.0	1.0	67				3.6							
	B23-7	6/1/2005	2.0	2.0	10.0				3.7	U						
	B23-7	6/1/2005	3.0	3.0	330				6.5							
	B23-8	6/1/2005	1.0	1.0	10.0				3.2	U						
	B23-8	6/1/2005	2.0	2.0	97				91							
	B23-8	6/1/2005	3.0	3.0	13				4.8	U						
	MW-13R-2	12/12/2006	2.0	2.0			72				93					
	MW-13R-2	12/12/2006	3.5	3.5			20				15					
	MW-13R-2	12/12/2006	5.0	5.0	29		20		9.0		15					
	MW-13R-2	12/12/2006	8.0	8.0			24				9					
	MW-13R-2	12/12/2006	11	11			21				5	U				
	MW-13R-2	12/12/2006	13	13			5	U			8					
	MW-13R-2	12/12/2006	16	16			16				6	U				
	MW-13R-2	12/12/2006	21	21			5	U			6	U				
	MW-1R-1	12/12/2006	2.0	2.0			14				9					
	MW-1R-1	12/12/2006	2.5	2.5			150				60					
	MW-1R-1	12/12/2006	3.0	3.0	276	J	282		258		184					
	MW-1R-1	12/12/2006	5.5	5.5			17				13					
	MW-1R-1	12/12/2006	8.5	8.5			53				6	U				
	DPT11	8/21/2008	1.5	1.5			40				24					
	DPT11	8/21/2008	3.5	3.5			531				928					
	DPT11	8/21/2008	5.5	5.5	320		177				114					
	DPT11	8/21/2008	7.0	7.0			141				11					
	DPT12	8/21/2008	1.0	1.0			79				37					
	DPT12	8/21/2008	4.0	4.0	173		243				305					
	DPT12	8/21/2008	5.0	5.0			72				59					
	DPT12	8/21/2008	6.5	6.5			8	U			10					
	DPT13	8/21/2008	3.5	3.5	1,130		3,335				2,389					
	DPT13	8/21/2008	5.5	5.5			30				11					
	DPT13	8/21/2008	8.0	8.0			155				11	U				
	DPT14	8/21/2008	1.5	1.5			58				35					
	DPT14	8/21/2008	3.5	3.5	10.0	U	12				11	U				
	DPT15	8/21/2008	2.0	2.0	270		325				465					

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Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Sample Locations Representative of Pre-Remediation Conditions	DPT15	8/21/2008	6.0	6.0			11	U			12	U				
	DPT19	8/21/2008	3.0	3.0	580		976				903					
	NB-27	7/19/2012	1.0	1.0			67				100					
	NB-27	7/19/2012	0.5	1.5	43				39				30		112	
	NB-27	7/19/2012	2.0	2.0			27				16					
	NB-27	7/19/2012	5.0	5.0			197				12	U				
	NB-27	7/19/2012	5.0	6.0	276				11				27		54	
	NB-27	7/19/2012	6.5	6.5			17				11	U				
	NB-27	7/19/2012	8.0	8.0			7	U			12					
	NB-27	7/19/2012	9.0	9.0			6	U			10	U				
	NB-29	7/19/2012	1.0	1.0			10				13	U				
	NB-29	7/19/2012	2.0	2.0			17				22					
	NB-29	7/19/2012	2.5	2.5			49				13	U				
	NB-29	7/19/2012	3.0	3.0			88				12	U				
	NB-29	7/19/2012	2.5	3.5	239				7				14		37	
	NB-29	7/19/2012	5.0	5.0			30				12	U				
	NB-29	7/19/2012	6.5	6.5			7	U			12					
	NB-29	7/19/2012	8.5	8.5			7				11	U				
	NB-29	7/19/2012	11	11			7	U			12	U				
	NB-40	7/19/2012	1.0	1.0			14				18					
	NB-40	7/19/2012	0.5	1.5	28				23				26		120	
	NB-40	7/19/2012	2.0	2.0			1,286				1,737					
	NB-40	7/19/2012	1.8	2.1	370				245				20		518	
	NB-40	7/19/2012	2.5	2.5			110				160					
	NB-40	7/19/2012	3.0	3.0			8	U			14	U				
	NB-40	7/19/2012	2.1	3.0	260				444				17		3,250	
	NB-40	7/19/2012	5.0	5.0			14				12	U				
	NB-40	7/19/2012	6.5	6.5			7	U			13					
	NB-40	7/19/2012	8.5	8.5			6	U			10	U				
	NB-40	7/19/2012	10.5	10.5			7	U			12	U				
	NB-41	7/19/2012	1.0	1.0			9	U			15					
	NB-41	7/19/2012	2.0	2.0			193				126					
	NB-41	7/19/2012	2.3	2.5	600				605				48		2,720	
	NB-41	7/19/2012	2.5	2.5			152				48					
	NB-41	7/19/2012	5.0	5.0			6	U			10	U				
	NB-41	7/19/2012	6.5	6.5			7	U			14					
	NB-41	7/19/2012	8.0	8.0			34				13	U				
	NB-45	7/19/2012	0.0	0.0			10				13	U				

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Sample Locations Representative of Pre-Remediation Conditions	NB-45	7/19/2012	1.0	1.0			13				16					
	NB-45	7/19/2012	1.0	2.0	9.0				10				25		51	
	NB-45	7/19/2012	2.0	2.0			61				40					
	NB-45	7/19/2012	2.0	2.3	160				91				26		257	
	NB-45	7/19/2012	5.0	5.0			52				22					
	NB-45	7/19/2012	7.0	7.0			34				13	U				
	SUPFS-1	6/17/2013	0.0	0.0	1,920				3,070				47		15,950	
USG Excavation Confirmation Sample Locations	B10-DS5	8/16/1999	3.0	4.0	240	J			110						140	J
	B11-DS5	8/16/1999	2.0	3.0	450	J			ND						32	J
	B12-DS5	8/16/1999	3.5	4.0	170				9						50	
	B13-DS5	8/16/1999	2.0	2.0	290				ND						14	
	B14-DS5	8/16/1999	2.0	2.0	ND				ND						11	
	B15-DS5	8/16/1999	3.0	3.0	52				ND						ND	
	B16-DS5	8/16/1999	3.0	3.0	21				ND						27	
	B17-DS5	8/16/1999	3.0	3.0	170				ND						18	
	B18-DS5	8/16/1999	4.0	4.0	ND				ND						31	
	B19-DS5	8/16/1999	4.0	4.0	14				ND						23	
	B1-DS5	8/16/1999	3.0	3.0	90				45						150	J
	B20-DS5	8/16/1999	4.0	4.0	60				ND						27	
	B21-DS5	8/16/1999	5.0	5.0	ND				11						44	
	B22-DS5	8/16/1999	3.0	3.0	29	J			ND						30	
	B23-DS5	8/16/1999	2.0	2.0	54	J			9						54	
	B24-DS5	8/16/1999	4.0	4.0	71	J			ND						37	
	B25-DS5	8/16/1999	3.0	4.0	140	J			ND						38	
	B26-DS5	8/16/1999	3.0	3.0	ND				ND						41	
	B27-DS5	8/16/1999	2.0	2.0	40				ND						21	J
	B2-DS5	8/16/1999	2.0	3.0	140				ND						26	J
	B3-DS5	8/16/1999	1.0	2.0	140				6						53	
	B4-DS5	8/16/1999	2.0	2.0	66				ND						35	
	B5-DS5	8/16/1999	3.0	3.0	11				11						45	
	B6-DS5	8/16/1999	5.0	5.0	90				8						33	
	B7-DS5	8/16/1999	5.5	5.5	ND				9						41	
	B8-DS5	8/16/1999	5.0	5.0	ND				12						44	
	B9-DS5	8/16/1999	4.0	4.0	21				ND						40	
	SW1	8/16/1999	0.0	2.5	190				40						140	J
	SW10	8/16/1999	3.0	3.0	120				ND						29	
	SW11	8/16/1999	1.0	2.0	74				ND						56	
	SW12	8/16/1999	1.0	2.0	ND				13						63	
	SW13	8/16/1999	1.0	2.0	33				8						47	
	SW14	8/16/1999	1.0	2.0	34				ND						13	
	SW15	8/16/1999	1.0	2.0	43				ND						17	

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
USG Excavation Confirmation Sample Locations	SW16	8/16/1999	1.0	2.0	37				ND						ND	
	SW17	8/16/1999	2.0	3.0	81				16						71	
	SW18	8/16/1999	3.0	3.0	460				17						67	
	SW19	8/16/1999	3.0	4.0	170				9						41	
	SW2	8/16/1999	1.0	1.5	180				9						51	
	SW20	8/16/1999	3.0	4.0	440				ND						38	
	SW21	8/16/1999	2.0	3.0	28	J			27						120	
	SW22	8/16/1999	3.0	4.0	36	J			ND						25	
	SW23	8/16/1999	3.0	4.0	70	J			8						50	
	SW24	8/16/1999	2.0	3.0	420				ND						270	J
	SW25	8/16/1999	1.0	2.0	430				ND						37	J
	SW26	8/16/1999	1.0	2.0	380				13						51	J
	SW27	8/16/1999	2.0	3.0	250				ND						32	
	SW28	8/16/1999	2.0	3.0	530				15						67	
	SW29	8/16/1999	2.0	3.0	490				32						100	
	SW3	8/16/1999	1.5	1.5	1,900				2,100						1,800	
	SW30	8/16/1999	2.0	3.0	640				14						69	
	SW4	8/16/1999	2.0	3.0	2,900				ND						29	
	SW5	8/16/1999	0.0	1.5	2,800				2,000						3,700	
	SW6	8/16/1999	2.0	3.0	1,200				ND						46	
	SW7	8/16/1999	1.0	2.0	1,700	J			1,700						1,900	J
	SW8	8/16/1999	1.0	1.0	330	J			ND						100	J
	SW9	8/16/1999	3.0	3.0	120				10						69	
USG Post-Remediaiton Sample Locations Within Previously-Excavated Areas	NB-12	7/19/2012	0.0	0.0			10	U			16					
	NB-12	7/19/2012	1.0	1.0			18				17					
	NB-12	7/19/2012	2.0	2.0			10				13	U				
	NB-12	7/19/2012	5.5	5.5			7	U			12	U				
	NB-12	7/19/2012	6.5	6.5			13				27					
	NB-12	7/19/2012	7.5	7.5			8				10	U				
	NB-2	7/19/2012	0.0	0.0			12				13	U				
	NB-2	7/19/2012	1.5	1.5			7	U			12	U				
	NB-2	7/19/2012	2.0	2.0			9	U			12	U				
	NB-2	7/19/2012	5.0	5.0			34				12	U				
	NB-2	7/19/2012	6.5	6.5			13				11	U				
	NB-2	7/19/2012	8.0	8.0			8	U			22					
	NB-2	7/19/2012	9.0	9.0			7	U			11	U				
USG Bag house Dust Sample	BPA BAG 2	11/10/1992	0.0	0.0	15,200				18,400				42		7,890	

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema Waggoner's Wallow Sample Locations	WWS-1	6/8/1989	0.0	1.75	67				120							
	WWS-2	6/8/1989	0.0	1.08	82				220							
	WWS-3	6/8/1989	0.0	1.75	130				260							
	WWS-4	6/8/1989	0.0	1.58	150				280							
	WWS-5	6/8/1989	0.0	2.33	150				290							
	WWS-6	6/8/1989	0.0	0.75	9.2				69							
	WWS-7	6/8/1989	0.0	0.50	13				56							
Arkema Bark Sludge Sample Locations	BSL-10	9/11/1990	0.33	0.5	25				26				122		80	
	BSL-11	9/11/1990	0.33	0.5	28				30				133		86	
	BSL-12	9/11/1990	0.33	0.5	24				27				130		79	
	BSL-13	9/11/1990	0.33	0.5	29				36				85		103	
	BSL-17	9/11/1990	0.33	0.5	21				25				119		78	
	BSL-18	9/11/1990	0.33	0.5	15				27				128		87	
	BSL-2	9/11/1990	0.33	0.5	15				21				112		76	
	BSL-22	9/11/1990	0.33	0.5	31				23				102		75	
	BSL-24	9/11/1990	0.33	0.5	23				28				132		79	
	BSL-25	9/11/1990	0.33	0.5	26				31				145		86	
	BSL-28	9/11/1990	0.33	0.5	39				30				161		101	
	BSL-3	9/11/1990	0.33	0.5	23				28				140		82	
	BSL-32	9/11/1990	0.33	0.5	40				28				130		89	
	BSL-34	9/11/1990	0.33	0.5	28				20				117		74	
	BSL-4	9/11/1990	0.33	0.5	15				25				81		75	
	BSL-40	9/11/1990	0.33	0.5	24				33				164		96	
	BSL-41	9/11/1990	0.33	0.5	39				35				132		89	
	BSL-42	9/11/1990	0.33	0.5	4.0				32				137		92	
	BSL-43	9/11/1990	0.33	0.5	39				32				120		98	
	BSL-45	9/11/1990	0.33	0.5	27				28				147		80	
	BSL-46	9/11/1990	0.33	0.5	26				27				145		83	
	BSL-50	9/11/1990	0.33	0.5	39				27				153		91	
	BSL-51	9/11/1990	0.33	0.5	32				33				200		103	
	BSL-52	9/11/1990	0.33	0.5	37				26				145		83	
	BSL-55	9/11/1990	0.33	0.5	32				24				136		80	
	BSL-56	9/11/1990	0.33	0.5	42				29				168		94	
	BSL-57	9/11/1990	0.33	0.5	30				26				150		85	
	BSL-6	9/11/1990	0.33	0.5	12				20				98		72	
	BSL-7	9/11/1990	0.33	0.5	14				13				145		53	
	BSL-8	9/11/1990	0.33	0.5	22				28				102		75	

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Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	AT-1	4/11/2003	1.0	4.0	11	U							120		53	
	AT-1	4/11/2003	12	16	19	U							18		43	
	AT-1	4/11/2003	20	24	13	U							9.2		23	
	AT-2	4/11/2003	1.0	4.0	11	U							7.6		47	
	AT-2	4/11/2003	12	16	13	U							10		24	
	AT-2	4/11/2003	20	24	13	U							9.3		21	
	AT-3	4/11/2003	1.0	4.0	18								19		52	
	AT-3	4/11/2003	12	16	17								18		31	
	AT-3	4/11/2003	20	24	13	U							8.1		13	
	AT-4	4/11/2003	1.0	4.0	12	U							30		40	
	AT-4	4/11/2003	12	16	15	U							17		35	
	AT-4	4/11/2003	20	24	12	U							9.3		22	
	PT-52	5/4/2007	2.0	2.0	23				61				24		88	
	PT-53	5/8/2007	1.0	1.0	7.4				12				10		39	
	PT-54	5/8/2007	1.0	1.0	12	J			25	J			11		55	
	PT-55	5/8/2007	2.0	2.0	21				21				15		55	
	PT-56	5/8/2007	1.0	1.0	33				110				28		130	
	PT-57	5/8/2007	1.0	1.0	9.0				9.7				8.6		44	
	PT-58	5/8/2007	1.0	1.0	7.1				9.6				8		29	
	PT-59	5/8/2007	1.0	1.0	6.7				18				11		63	
	PT-60	5/8/2007	1.0	1.0	14				24				20		76	
	PT-61	5/8/2007	1.0	1.0	8.4				18				13		52	
	SPA-01	4/23/2007	0.0	0.0	3.7				5.6	U			18	J	41	
	SPA-01	4/23/2007	6.0	6.0	22				43				23	J	87	
	SPA-01	5/29/2007	10	10	7.8				6.3	U			9.1		30	
	SPA-02	4/23/2007	0.0	0.0	19				28				19	J	63	
	SPA-02	4/23/2007	6.0	6.0	13				23				11	J	52	
	SPA-03	4/23/2007	0.0	0.0	30				40				100	J	110	
	SPA-03	4/23/2007	6.0	6.0	480				160				19	J	300	
	SPA-04	4/23/2007	0.0	0.0	14				18				19	J	49	
	SPA-04	4/23/2007	6.0	6.0	440				450				20	J	210	
	SPA-05	4/23/2007	0.0	0.0	14				22				21	J	58	
	SPA-05	4/23/2007	6.0	6.0	38				35				28	J	880	
	SPA-06	4/23/2007	0.0	0.0	11				17				30	J	59	
	SPA-06	4/23/2007	6.0	6.0	9.5				16	J			6.7	J	34	
	SPA-07	4/23/2007	0.0	0.0	9.4				13				16	J	49	
	SPA-07	4/23/2007	6.0	6.0	5.5				11				15	J	41	
	SPA-08	4/23/2007	0.0	0.0	14				44				36	J	100	
	SPA-08	4/23/2007	6.0	6.0	19				8.1				10	J	32	
	SPA-09	4/23/2007	0.0	0.0	4.4				10				13	J	33	
	SPA-09	4/23/2007	6.0	6.0	12				17				11	J	72	

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	SPA-09	5/30/2007	10	10	6.1				2.9				6.6		30	
	SPA-10	4/23/2007	0.0	0.0	21				37				58	J	95	
	SPA-10	4/23/2007	6.0	6.0	57				24				19	J	50	
	SPA-11	4/23/2007	0.0	0.0	9.2				18				19	J	50	
	SPA-11	4/23/2007	6.0	6.0	45				99				14	J	62	
	SPA-12	4/23/2007	0.0	0.0	8.7				17				13	J	58	
	SPA-12	4/23/2007	6.0	6.0	19				42				13	J	65	
	NB-10	7/17/2012	0.0	0.0			31				24					
	NB-10	7/17/2012	3.0	3.0			9				13	U				
	NB-10	7/17/2012	5.2	5.2			9	U			16					
	NB-10	7/17/2012	5.5	5.5			2,682				9,184					
	NB-10	7/17/2012	5.5	5.6	754				2,270				37		1,770	
	NB-10	7/17/2012	5.7	5.7			52				12	U				
	NB-10	7/17/2012	6.0	6.0			19				12	U				
	NB-10	7/17/2012	5.6	6.0	66				3				7		66	
	NB-10	7/17/2012	7.0	7.0			7	U			5	U				
	NB-10	7/17/2012	8.5	8.5			7	U			11	U				
	NB-10	7/17/2012	11	11			17				11	U				
	NB-10	7/17/2012	10	12	10.0				2	U			6		25	
	NB-11	7/16/2012	0.0	0.0			57				59					
	NB-11	7/16/2012	0.0	1.0	22				23				38		83	
	NB-11	7/16/2012	5.0	5.0			16				36					
	NB-11	7/16/2012	6.5	6.5			3,009				10,474					
	NB-11	7/16/2012	7.0	7.0			33				12	U				
	NB-11	7/16/2012	6.5	7.0	1,660				2,620				89		2,950	
	NB-11	7/16/2012	7.0	8.0	52				3				6		27	
	NB-11	7/16/2012	10	10			9				11	U				
	NB-11	7/16/2012	13	13			82				10	U				
	NB-13	7/16/2012	0.0	0.0			68				67					
	NB-13	7/16/2012	1.5	1.5			8	U			14					
	NB-13	7/16/2012	5.0	5.0			9				12	U				
	NB-13	7/16/2012	6.0	6.0			628				731					
	NB-13	7/16/2012	6.5	6.5	805		705		901		218		16		767	
	NB-13	7/16/2012	8.0	8.0			62				11	U				
	NB-13	7/16/2012	7.0	8.0	198				6				12		45	
	NB-13	7/16/2012	11	11			57				12	U				
	NB-13	7/16/2012	12	12			86				12					
	NB-13	7/16/2012	14	14			15				12	U				
	NB-14	7/17/2012	0.0	0.0			58				65					
	NB-14	7/17/2012	2.0	2.0			14				14	U				

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-14	7/17/2012	2.0	4.0	5.0	U			6				14		30	
	NB-14	7/17/2012	5.0	5.0			314				82					
	NB-14	7/17/2012	6.0	6.0			9	U			18					
	NB-14	7/17/2012	5.0	6.0	167				165				10		164	
	NB-14	7/17/2012	6.5	6.5			151				14					
	NB-14	7/17/2012	7.0	8.0	35				13				13		42	
	NB-14	7/17/2012	10	10			14				13	U				
	NB-15	7/16/2012	0.0	0.0			17				37					
	NB-15	7/16/2012	2.5	2.5			12				11					
	NB-15	7/16/2012	6.0	6.5	2,890				2,740				58		3,490	
	NB-15	7/16/2012	6.5	6.5			4,653				2,077					
	NB-15	7/16/2012	8.0	8.0			3,148				29					
	NB-15	7/16/2012	7.0	9.0	811				10				10		72	
	NB-15	7/16/2012	10	10			117				12	U				
	NB-15	7/16/2012	12	12			81				12	U				
	NB-15	7/16/2012	11	12	117				5				7		30	
	NB-16	7/17/2012	0.0	0.0			13				24					
	NB-16	7/17/2012	2.0	2.0			68				25					
	NB-16	7/17/2012	5.0	5.0			30				79					
	NB-16	7/17/2012	5.4	5.4			1,800				2,588					
	NB-16	7/17/2012	5.3	5.5	1,800				1,440				58		1,230	
	NB-16	7/17/2012	6.0	6.0			433				12	U				
	NB-16	7/17/2012	7.0	7.0			97				16					
	NB-16	7/17/2012	8.0	8.0			1,211				12	U				
	NB-16	7/17/2012	8.2	8.2			31				13	U				
	NB-16	7/17/2012	7.0	8.5	82				13				15		40	
	NB-16	7/17/2012	10	10			40				13	U				
	NB-16	7/17/2012	11	11			23				11	U				
	NB-17	7/17/2012	0.0	0.0			17				29					
	NB-17	7/17/2012	2.0	2.0			24				27					
	NB-17	7/17/2012	5.0	5.0			22				13	U				
	NB-17	7/17/2012	6.0	6.0	3,770		1,348		4,070		790		41		2,650	
	NB-17	7/17/2012	7.0	7.0			706				37					
	NB-17	7/17/2012	9.0	9.0			264				14	U				
	NB-17	7/17/2012	12	12			316				12	U				
	NB-17	7/17/2012	10	12	192				3				8		43	
	NB-18	7/17/2012	0.0	0.0			129				20					
	NB-18	7/17/2012	1.5	1.5			57				46					
	NB-18	7/17/2012	2.0	2.0			28				25					
	NB-18	7/17/2012	5.0	5.0			135				20					

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-18	7/17/2012	5.0	5.5	170				42				14		75	
	NB-18	7/17/2012	6.5	6.5			13				11	U				
	NB-18	7/17/2012	5.5	7.0	11				2	U			6		35	
	NB-18	7/17/2012	10	10			8	U			13	U				
	NB-18	7/17/2012	11	11			17				12	U				
	NB-18	7/17/2012	10	12	11				2	U			7		36	
	NB-19	7/18/2012	0.0	0.0			26				41					
	NB-19	7/18/2012	1.0	1.0			27				14					
	NB-19	7/18/2012	2.0	2.0			9	U			14					
	NB-19	7/18/2012	5.0	5.0			20				11	U				
	NB-19	7/18/2012	6.0	6.0			12				11	U				
	NB-19	7/18/2012	10	10			64				51					
	NB-20	7/17/2012	0.0	0.0			43				16					
	NB-20	7/17/2012	0.5	0.5			34				45					
	NB-20	7/17/2012	0.0	1.0	90				57				195		172	
	NB-20	7/17/2012	1.5	1.5			8	U			13	U				
	NB-20	7/17/2012	3.0	3.0			20				18					
	NB-20	7/17/2012	5.0	5.0			39				13					
	NB-20	7/17/2012	5.0	6.0	69				13				25		89	
	NB-20	7/17/2012	7.0	7.0			8	U			12	U				
	NB-20	7/17/2012	10.5	10.5			11				12	U				
	NB-21	7/18/2012	0.0	0.0			46				56					
	NB-21	7/18/2012	2.0	2.0			8	U			13	U				
	NB-21	7/18/2012	3.0	3.0			23				13					
	NB-21	7/18/2012	5.0	5.0			30				27					
	NB-21	7/18/2012	5.0	6.0	16				15				26		78	
	NB-21	7/18/2012	7.0	7.0			8				10	U				
	NB-21	7/18/2012	10	10			7	U			12	U				
	NB-22	7/18/2012	0.0	0.0			12	U			32					
	NB-22	7/18/2012	2.0	2.0			76				48					
	NB-22	7/18/2012	2.0	3.0	34				39				24		110	
	NB-22	7/18/2012	5.0	5.0			62				19					
	NB-22	7/18/2012	6.5	6.5			8	U			13	U				
	NB-22	7/18/2012	10	10			7	U			12	U				
	NB-22	7/18/2012	11.5	11.5			7	U			11	U				
	NB-23	7/16/2012	0.0	0.0			17				32					
	NB-23	7/16/2012	0.0	1.0	17				18				19		53	
	NB-23	7/16/2012	2.5	2.5			11				13	U				
	NB-23	7/16/2012	5.0	5.0			8	U			17					
	NB-23	7/16/2012	5.0	6.0	7.0	U			7				12		33	

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Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-23	7/16/2012	6.5	6.5			6	U			10	U				
	NB-23	7/16/2012	10.5	10.5			6	U			10	U				
	NB-24	7/16/2012	0.0	0.0			20				22					
	NB-24	7/16/2012	2.0	2.0			57				22					
	NB-24	7/16/2012	2.0	3.5	19				32				23		82	
	NB-24	7/16/2012	5.0	5.0			7	U			12	U				
	NB-24	7/16/2012	7.0	7.0			8	U			12	U				
	NB-24	7/16/2012	12	12			6	U			10	U				
	NB-25	7/16/2012	0.0	0.0			18				20					
	NB-25	7/16/2012	3.0	3.0			8	U			13	U				
	NB-25	7/16/2012	5.0	5.0			1,281				13	U				
	NB-25	7/16/2012	5.0	6.0	1,200				12				13		63	
	NB-25	7/16/2012	7.5	7.5			125				11	U				
	NB-25	7/16/2012	10	10			57				58					
	NB-25	7/16/2012	12	12			116				13	U				
	NB-26	7/16/2012	0.0	0.0			13				31					
	NB-26	7/16/2012	0.0	1.0	12				17				18		67	
	NB-26	7/16/2012	3.0	3.0			7	U			12	U				
	NB-26	7/16/2012	6.5	6.5	1,700		2,717		1,260		13		40		1,350	
	NB-26	7/16/2012	8.0	8.0			797				23					
	NB-26	7/16/2012	10	10			2,603				16					
	NB-26	7/16/2012	10	10			1,234				19					
	NB-26	7/16/2012	10	11	1,150				16				18		85	
	NB-3	7/17/2012	0.0	0.0			14				25					
	NB-3	7/17/2012	1.5	1.5			8	U			14	U				
	NB-3	7/17/2012	2.0	2.0			8	U			13	U				
	NB-3	7/17/2012	5.0	5.0			8	U			13	U				
	NB-3	7/17/2012	6.0	6.0			21				12	U				
	NB-3	7/17/2012	7.0	7.0			9				9	U				
	NB-3	7/17/2012	6.0	8.0	13				4				10		27	
	NB-3	7/17/2012	11	11			8	U			12	U				
	NB-30	7/15/2012	0.0	0.0			14				30					
	NB-30	7/15/2012	1.5	1.5			42				25					
	NB-30	7/15/2012	2.5	2.5			8	U			13	U				
	NB-30	7/15/2012	6.5	6.5			302				13	U				
	NB-30	7/15/2012	6.0	8.0	116				2	U			6		27	
	NB-30	7/15/2012	9.0	9.0			29				12	U				
	NB-30	7/15/2012	12	12			7	U			11	U				
	NB-31	7/16/2012	0.0	0.0			16				32					
	NB-31	7/16/2012	1.5	1.5			11				11	U				

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-31	7/16/2012	4.9	4.9			452				105					
	NB-31	7/16/2012	5.0	5.0			1,647				2,973					
	NB-31	7/16/2012	5.3	5.3	2,210				3,120				53		2,230	
	NB-31	7/16/2012	6.0	6.0			203				11	U				
	NB-31	7/16/2012	7.0	7.0			17				12	U				
	NB-31	7/16/2012	11.5	11.5			7	U			12	U				
	NB-32	7/16/2012	0.0	0.0			26				16					
	NB-32	7/16/2012	1.5	1.5			8	U			12	U				
	NB-32	7/16/2012	1.5	2.5	6.0	U			4				23		36	
	NB-32	7/16/2012	5.0	5.0			15				13	U				
	NB-32	7/16/2012	5.0	6.0	58				85				9		94	
	NB-32	7/16/2012	7.0	7.0			7	U			14					
	NB-33	7/16/2012	0.0	0.0			19				20					
	NB-33	7/16/2012	2.0	2.0			12				14	U				
	NB-33	7/16/2012	3.5	3.5			12				13	U				
	NB-33	7/16/2012	2.0	4.0	33				26				82		202	
	NB-33	7/16/2012	6.0	6.0			27				12	U				
	NB-33	7/16/2012	9.0	9.0			7	U			12	U				
	NB-33	7/16/2012	12	12			7	U			12	U				
	NB-34	7/15/2012	0.0	0.0			13				35					
	NB-34	7/15/2012	2.0	2.0			25				53					
	NB-34	7/15/2012	2.0	2.5	456				610				16		248	
	NB-34	7/15/2012	2.5	2.5			73				105					
	NB-34	7/15/2012	7.0	7.0			8	U			12	U				
	NB-34	7/15/2012	9.0	9.0			8	U			12	U				
	NB-34	7/15/2012	12	12			7	U			12	U				
	NB-35	7/15/2012	0.0	0.0			7	U			11	U				
	NB-35	7/15/2012	1.0	1.0			20	U			240					
	NB-35	7/15/2012	1.5	1.5	261		911		884		3,724		32		797	
	NB-35	7/15/2012	2.5	2.5			56				20					
	NB-35	7/15/2012	2.0	4.0	13				2	U			6		23	
	NB-35	7/15/2012	4.0	4.0			10				14	U				
	NB-35	7/15/2012	6.0	6.0			8	U			12	U				
	NB-35	7/15/2012	7.5	7.5			12				15					
	NB-35	7/15/2012	8.0	8.0			7	U			12	U				
	NB-35	7/15/2012	10	10			7	U			11	U				
	NB-36	7/15/2012	0.0	0.0			18				34					
	NB-36	7/15/2012	2.0	2.0	250		124		839		307		20		316	
	NB-36	7/15/2012	2.5	2.5			78				70					
	NB-36	7/15/2012	6.0	6.0			8	U			13					

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-36	7/15/2012	11	11			8				12	U				
	NB-37	7/15/2012	0.0	0.0			15				21					
	NB-37	7/15/2012	0.0	1.0	59				53				133		134	
	NB-37	7/15/2012	2.5	2.5	281		1,288		1,220		5,975		29		882	
	NB-37	7/15/2012	3.0	3.0			44				13	U				
	NB-37	7/15/2012	6.0	6.0			7	U			13	U				
	NB-37	7/15/2012	9.0	9.0			11				11	U				
	NB-37	7/15/2012	10.5	10.5			8	U			17					
	NB-37	7/15/2012	12	12			7	U			13	U				
	NB-38	7/15/2012	0.0	0.0			24				24					
	NB-38	7/15/2012	0.0	1.0	40				37				105		115	
	NB-38	7/15/2012	1.0	1.0			37				33					
	NB-38	7/15/2012	1.5	1.5			17				15					
	NB-38	7/15/2012	3.0	3.0			40				11	U				
	NB-38	7/15/2012	6.5	6.5			10				17					
	NB-38	7/15/2012	5.0	7.0	35				3	U			9		43	
	NB-38	7/15/2012	8.0	8.0			7	U			18					
	NB-4	7/17/2012	0.0	0.0			49				40					
	NB-4	7/17/2012	0.0	1.0	36				31				62		91	
	NB-4	7/17/2012	2.0	2.0			9	U			14	U				
	NB-4	7/17/2012	1.0	3.0	5.0	U			4				11		24	
	NB-4	7/17/2012	5.0	5.0			8	U			14	U				
	NB-4	7/17/2012	6.5	6.5			9	U			12	U				
	NB-4	7/17/2012	7.0	7.0			8				12	U				
	NB-4	7/17/2012	11	11			44				20	U				
	NB-42	7/15/2012	0.0	0.0			37				43					
	NB-42	7/15/2012	1.5	1.5			57				12	U				
	NB-42	7/15/2012	2.0	2.0	1,730		873		1,840		571		35		900	
	NB-42	7/15/2012	3.0	3.0			8	U			13	U				
	NB-42	7/15/2012	7.0	7.0			7	U			11	U				
	NB-42	7/15/2012	9.0	9.0			9	U			30					
	NB-42	7/15/2012	10	10			9	U			14	U				
	NB-42	7/15/2012	12	12			7	U			17					
	NB-43	7/15/2012	0.0	0.0			11				18					
	NB-43	7/15/2012	1.0	1.0			9	U			15					
	NB-43	7/15/2012	0.5	1.5	9.0				6				31		48	
	NB-43	7/15/2012	1.5	1.5			55				25					
	NB-43	7/15/2012	2.0	2.0			21				14	U				
	NB-43	7/15/2012	3.0	3.0			28				12	U				
	NB-43	7/15/2012	6.0	6.0			24				12	U				

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Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-43	7/15/2012	9.5	9.5			6	U			9	U				
	NB-43	7/15/2012	12	12			8	U			15					
	NB-43	7/15/2012	10	12	11				11				18		53	
	NB-44	7/15/2012	0.0	0.0			29				14	U				
	NB-44	7/15/2012	1.0	1.0			28				45					
	NB-44	7/15/2012	1.0	2.0	6.0				3				31		44	
	NB-46	7/18/2012	0.0	0.0			12				21					
	NB-46	7/18/2012	1.0	1.0			37				73					
	NB-46	7/18/2012	5.0	5.0			100				68					
	NB-46	7/18/2012	6.0	6.0			141				48					
	NB-46	7/18/2012	5.0	7.0	368				78				21		156	
	NB-46	7/18/2012	7.0	7.0			154				35					
	NB-46	7/18/2012	10	10			569				31					
	NB-46	7/18/2012	10.5	10.5			33				13	U				
	NB-46	7/18/2012	10	11	19				3				13		34	
	NB-46	7/18/2012	11	11			50				33					
	NB-46	7/18/2012	12	12			7	U			12	U				
	NB-46	7/18/2012	11.5	12.5	142				42				18		86	
	NB-47	7/18/2012	0.0	0.0			37				76					
	NB-47	7/18/2012	1.8	1.8			16				42					
	NB-47	7/18/2012	4.0	4.0			123				24					
	NB-47	7/18/2012	4.5	4.5			261				11	U				
	NB-47	7/18/2012	4.0	5.0	121				20				22		137	
	NB-47	7/18/2012	5.0	5.0			31				16					
	NB-47	7/18/2012	6.0	6.0			28				14	U				
	NB-47	7/18/2012	8.0	8.0			5	U			8	U				
	NB-47	7/18/2012	10	10			7				10	U				
	NB-47	7/18/2012	12	12			8	U			13	U				
	NB-48	7/18/2012	0.0	0.0			64				96					
	NB-48	7/18/2012	1.5	1.5			40				18					
	NB-48	7/18/2012	2.0	2.0			83				45					
	NB-48	7/18/2012	1.5	2.5	199				305				50		378	
	NB-48	7/18/2012	5.0	5.0			53				66					
	NB-48	7/18/2012	6.0	6.0			37				11	U				
	NB-48	7/18/2012	7.0	7.0			8	U			13	U				
	NB-48	7/18/2012	6.0	7.5	6.0	U			2	U			5		16	
	NB-48	7/18/2012	10	10			7	U			13	U				

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Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-49	7/18/2012	0.0	0.0			23				22					
	NB-49	7/18/2012	0.8	0.8			12				12	U				
	NB-49	7/18/2012	1.0	1.0	787		686		1,850		1,592		40		896	
	NB-49	7/18/2012	1.5	1.5			8	U			13	U				
	NB-49	7/18/2012	1.0	2.0	15				5				6		43	
	NB-49	7/18/2012	5.0	5.0			10	U			6	U				
	NB-49	7/18/2012	5.0	6.0	12				2	U			7		22	
	NB-49	7/18/2012	7.0	7.0			7	U			12	U				
	NB-49	7/18/2012	8.0	8.0			13				21					
	NB-5	7/17/2012	0.0	0.0			59				20					
	NB-5	7/17/2012	0.0	0.8	44				24				75		85	
	NB-5	7/17/2012	1.5	2.5	5.0	U			3				14		28	
	NB-5	7/17/2012	2.5	2.5			9	U			15	U				
	NB-5	7/17/2012	5.0	5.0			17				10	U				
	NB-5	7/17/2012	5.5	5.5			17				22					
	NB-5	7/17/2012	8.0	8.0			17				12	U				
	NB-5	7/17/2012	10	10			14				14	U				
	NB-6	7/18/2012	0.0	0.0			19				46					
	NB-6	7/18/2012	2.5	2.5			8	U			12	U				
	NB-6	7/18/2012	1.0	3.0	6.0				6				12		26	
	NB-6	7/18/2012	5.0	5.0			31				18					
	NB-6	7/18/2012	6.0	6.0			34				8	U				
	NB-6	7/18/2012	6.5	6.5			8				12	U				
	NB-6	7/18/2012	10	10			16				42					
	NB-6	7/18/2012	11	11			9	U			14					
	NB-7	7/17/2012	0.0	0.0			16				50					
	NB-7	7/17/2012	2.5	2.5			49				110					
	NB-7	7/17/2012	2.0	3.5	26				80				24		71	
	NB-7	7/17/2012	5.0	5.0			34				15	U				
	NB-7	7/17/2012	6.5	6.5			8	U			14					
	NB-7	7/17/2012	10	10			20				14	U				
	NB-8	7/18/2012	0.0	0.0			22				27					
	NB-8	7/18/2012	1.8	1.8			88				96					
	NB-8	7/18/2012	1.0	2.0	67				49				27		196	
	NB-8	7/18/2012	2.0	2.0			101				109					
	NB-8	7/18/2012	5.0	5.0			11				12	U				

Table B-1: Soil Concentrations for Key Sample Locations

Category	Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)											
					Arsenic (Lab)	Qualifer	Arsenic (XRF)	Qualifer	Lead (Lab)	Qualifer	Lead (XRF)	Qualifer	Nickel (Lab)	Qualifer	Zinc (Lab)	Qualifer
Arkema NBA Sample Locations – Other	NB-8	7/18/2012	5.0	5.5	12				12				16		59	
	NB-8	7/18/2012	7.0	7.0			11				12	U				
	NB-8	7/18/2012	10	10			9	U			18	U				
	NB-8	7/18/2012	10	11	6.0	U			2	U			6		21	
	NB-9	7/17/2012	0.0	0.0			27				73					
	NB-9	7/17/2012	1.5	1.5			30				10	U				
	NB-9	7/17/2012	2.0	2.0			13				13	U				
	NB-9	7/17/2012	5.0	5.0			8	U			13	U				
	NB-9	7/17/2012	6.5	6.5			14				13	U				
	NB-9	7/17/2012	10.5	10.5			19				12	U				
Arkema Penite Pit Area and Sandblasting Area Sample Locations Used for Metals Ratios	MA-29	4/24/2007	0.0	0.0	15				8.8				11		38	
	MA-29	4/24/2007	6.0	6.0	420				100				6.8		120	
	MA-31	4/24/2007	0.0	0.0	62				28				21		93	
	MA-31	4/24/2007	6.0	6.0	770				150				100		270	
	MA-41	5/11/2007	0.0	0.0	100				12				11		58	
	MA-41	5/11/2007	6.0	6.0	170				6.3	U			7.2		29	
	MA-41	5/11/2007	9.5	9.5	190				6.3	U			6.4		19	
	MA-43	5/29/2007	7.0	7.0	160				15				13		95	
	PT-31	4/25/2007	0.0	0.0	17				13				16		68	
	PT-31	4/25/2007	6.0	6.0	210				25				8.1		40	
	PT-32	5/16/2007	0.0	0.0	720				28				14		41	
	PT-32	5/16/2007	6.0	6.0	420	J			6.1	U			8.4		22	
	PT-33	5/16/2007	0.0	0.0	4,200				340				11		49	
	PT-33	5/16/2007	6.0	6.0	25,000				1,800				30		120	
	PT-35	4/25/2007	0.0	0.0	210				70				19		97	
	PT-35	4/25/2007	6.0	6.0	3,300				330				9.8		170	
	PT-36	4/25/2007	0.0	0.0	220				25				21		76	
	PT-36	4/25/2007	6.0	6.0	630				27				7.8		53	
	TLA-26	5/1/2007	0.0	0.0	93				52				41		130	

Notes:

J: Estimated value

ND: Not detected and reporting limit was not avalable.

U: Not detected at shown reporting limit.

Concentrations are shown as two significant figures in standard notation unless that number is greater than 100. If greater than 100, the number is rounded to a whole number.

(1)If the cell is blank for a given constituent, that means the sample was not analyzed for that constituent.

Suffixes were added to Site IDs as necessary to facilitate data management in the analytical results database. For instance, the "-DS4", "-DS5", and "-DS6" suffixes were added to differentiate between different borings that had the same Site ID.

(2)See Figure B-1 for the locations of these samples (Site IDs), with the following exception. The 1992 sample with a Site ID of "BPA BAG 2", which was a sample of USG baghouse dust material collected by Ecology, is not shown on Figure B-1 because the specific sample location is not known.

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)(1,2)	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
S-1	7/31/1987	0.0	1.0	380			
S-1	7/31/1987	1.0	2.0	56			
S-1	7/31/1987	2.0	3.0	100			
S-1	7/31/1987	3.0	4.0	540			
S-1	7/31/1987	4.0	5.0	1,100			
S-1	7/31/1987	5.0	6.0	2,600			
S-1	7/31/1987	6.0	7.0	2,200			
S-1	7/31/1987	7.0	8.0	980			
S-1	7/31/1987	8.0	9.0	960			
S-1	7/31/1987	9.0	10	540			
S-1	7/31/1987	10	11	640			
S-1	7/31/1987	12	13	3,200			
S-1	7/31/1987	13	14	1,700			
S-3	7/31/1987	0.0	1.0	77			
S-3	7/31/1987	2.0	3.0	30			
S-3	7/31/1987	3.0	4.0	210			
S-3	7/31/1987	4.0	5.0	510			
S-3	7/31/1987	5.0	6.0	920			
S-3	7/31/1987	6.0	7.0	990			
S-3	7/31/1987	7.0	8.0	1,100			
S-3	7/31/1987	8.0	9.0	540			
S-3	7/31/1987	9.0	10	910			
S-3	7/31/1987	10	11	2,000			
S-3	7/31/1987	12	13	5,500			
S-3	7/31/1987	13	14	3,200			
S-4	7/31/1987	0.0	2.0	5,200			
S-4	7/31/1987	2.0	3.0	1,000			
S-4	7/31/1987	3.0	4.0	540			
S-4	7/31/1987	4.0	5.0	570			
S-4	7/31/1987	5.0	6.0	650			
S-4	7/31/1987	6.0	7.0	3,900			
S-4	7/31/1987	7.0	8.0	5,900			
S-4	7/31/1987	8.0	9.0	530			
S-4	7/31/1987	9.0	10	160			
S-4	7/31/1987	10	11	950			
S-4	7/31/1987	11	12	4,500			
S-4	7/31/1987	12	13	2,000			
S-4	7/31/1987	13	14	1,000			
S-6	7/31/1987	0.0	1.0	300			
S-6	7/31/1987	1.0	2.0	180			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
S-6	7/31/1987	2.0	3.0	72			
S-6	7/31/1987	3.0	4.0	180			
S-6	7/31/1987	4.0	5.0	100			
S-6	7/31/1987	5.0	6.0	150			
S-6	7/31/1987	6.0	7.0	160			
S-6	7/31/1987	7.0	8.0	1,200			
S-6	7/31/1987	8.0	9.0	620			
S-6	7/31/1987	9.0	10	2,500			
S-6	7/31/1987	10	11	4,500			
S-6	7/31/1987	11	12	3,100			
S-7	7/31/1987	0.0	1.0	440			
S-7	7/31/1987	1.0	2.0	370			
S-7	7/31/1987	2.0	3.0	970			
S-7	7/31/1987	3.0	4.0	2,000			
S-7	7/31/1987	4.0	5.0	370			
S-7	7/31/1987	5.0	6.0	120			
S-7	7/31/1987	6.0	7.0	150			
S-7	7/31/1987	7.0	8.0	730			
S-7	7/31/1987	8.0	10	610			
S-7	7/31/1987	10	11	3,600			
S-7	7/31/1987	11	12	1700			
S-7	7/31/1987	13	14	770			
S-8	7/31/1987	0.0	1.0	240			
S-8	7/31/1987	1.0	2.0	71			
S-8	7/31/1987	2.0	3.0	520			
S-8	7/31/1987	3.0	4.0	570			
S-8	7/31/1987	4.0	5.0	840			
S-8	7/31/1987	5.0	6.0	930			
S-8	7/31/1987	6.0	7.0	1,800			
S-8	7/31/1987	7.0	8.0	220			
S-8	7/31/1987	8.0	9.0	1,200			
S-8	7/31/1987	9.0	10	430			
S-8	7/31/1987	10	11	270			
S-8	7/31/1987	12	13	650			
S-8	7/31/1987	13	14	920			
CP-1	6/6/1989	0.0	2.0	4.6		42	
CP-2	6/6/1989	0.0	4.8	16		34	
CP-3	6/6/1989	0.0	3.8	6.7		43	
CP-4	6/6/1989	0.0	1.7	6.8		29	
TL-1	6/6/1989	0.0	3.6	6.6		42	

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
TL-2	6/6/1989	0.0	3.7	6.9		56	
TL-3	6/6/1989	0.0	3.75	6.5		43	
TL-4	6/6/1989	0.0	4.0	4.5		36	
TL-5	6/6/1989	0.0	5.0	4.2		48	
TL-7	6/6/1989	0.0	4.2	3.3		37	
TL-8	6/6/1989	0.0	4.2	5.0		47	
TL-9	6/6/1989	0.0	3.7	5.4		57	
AP-1	6/7/1989	0.0	2.7	75		280	
AP-2	6/7/1989	0.0	2.0	100		180	
AP-3	6/7/1989	0.0	1.5	77		88	
CRP-1	6/7/1989	0.0	4.5	1.1		11	
CRP-2	6/7/1989	0.0	5.0	1.7		30	
CRP-3	6/7/1989	0.0	5.0	1.1		48	
CRP-4	6/7/1989	0.0	3.0	4.3		31	
CRP-5	6/7/1989	0.0	6.3	2.0		44	
CRP-6	6/7/1989	0.0	5.5	2.3		39	
CRP-7	6/7/1989	0.0	4.3	2.9		17	
CRP-8	6/7/1989	0.0	5.3	3.5		43	
TLP-1	6/7/1989	0.0	1.5	9.5		24	
TLP-2	6/7/1989	0.0	0.0	29		84	
Boateng-B1	11/27/1989	3.0	3.0	5.0			
Boateng-B1	11/27/1989	6.0	6.0	10			
Boateng-B1	11/27/1989	9.0	9.0	7.0			
Boateng-B10	11/27/1989	3.0	3.0	13			
Boateng-B10	11/27/1989	6.0	6.0	766			
Boateng-B10	11/27/1989	9.0	9.0	826			
Boateng-B11	11/27/1989	3.0	3.0	18			
Boateng-B11	11/27/1989	6.0	6.0	2,340			
Boateng-B11	11/27/1989	9.0	9.0	295			
Boateng-B12	11/27/1989	3.0	3.0	405			
Boateng-B12	11/27/1989	6.0	6.0	2,120			
Boateng-B12	11/27/1989	9.0	9.0	897			
Boateng-B13	11/27/1989	3.0	3.0	144			
Boateng-B13	11/27/1989	6.0	6.0	770			
Boateng-B13	11/27/1989	9.0	9.0	719			
Boateng-B14	11/27/1989	3.0	3.0	156			
Boateng-B14	11/27/1989	9.0	9.0	534			
Boateng-B15	11/27/1989	3.0	3.0	25			
Boateng-B15	11/27/1989	6.0	6.0	716			
Boateng-B15	11/27/1989	9.0	9.0	58			

Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
Boateng-B16	11/27/1989	3.0	3.0	1,190			
Boateng-B16	11/27/1989	6.0	6.0	1,050			
Boateng-B16	11/27/1989	9.0	9.0	217			
Boateng-B17	11/27/1989	3.0	3.0	92			
Boateng-B17	11/27/1989	6.0	6.0	79			
Boateng-B17	11/27/1989	9.0	9.0	32			
Boateng-B18	11/27/1989	3.0	3.0	296			
Boateng-B18	11/27/1989	6.0	6.0	639			
Boateng-B18	11/27/1989	9.0	9.0	69			
Boateng-B19	11/27/1989	3.0	3.0	116			
Boateng-B19	11/27/1989	6.0	6.0	206			
Boateng-B19	11/27/1989	9.0	9.0	301			
Boateng-B2	11/27/1989	3.0	3.0	4.0			
Boateng-B2	11/27/1989	6.0	6.0	9.0			
Boateng-B2	11/27/1989	9.0	9.0	15			
Boateng-B20	11/27/1989	3.0	3.0	378			
Boateng-B20	11/27/1989	6.0	6.0	2,950			
Boateng-B20	11/27/1989	9.0	9.0	569			
Boateng-B3	11/27/1989	3.0	3.0	14			
Boateng-B3	11/27/1989	6.0	6.0	31			
Boateng-B3	11/27/1989	9.0	9.0	57			
Boateng-B4	11/27/1989	3.0	3.0	2.0			
Boateng-B4	11/27/1989	6.0	6.0	436			
Boateng-B4	11/27/1989	9.0	9.0	413			
Boateng-B5	11/27/1989	3.0	3.0	48			
Boateng-B5	11/27/1989	6.0	6.0	19			
Boateng-B5	11/27/1989	9.0	9.0	28			
Boateng-B6	11/27/1989	3.0	3.0	12			
Boateng-B6	11/27/1989	6.0	6.0	221			
Boateng-B6	11/27/1989	9.0	9.0	586			
Boateng-B7	11/27/1989	3.0	3.0	347			
Boateng-B7	11/27/1989	6.0	6.0	3,210			
Boateng-B7	11/27/1989	9.0	9.0	796			
Boateng-B8	11/27/1989	3.0	3.0	2,640			
Boateng-B8	11/27/1989	6.0	6.0	1,900			
Boateng-B8	11/27/1989	9.0	9.0	507			
Boateng-B9	11/27/1989	3.0	3.0	870			
Boateng-B9	11/27/1989	6.0	6.0	439			
Boateng-B9	11/27/1989	9.0	9.0	381			
K-11S	11/30/1989	11	11.7	8.6			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
K-11S	11/30/1989	14	14.7	2.1			
K-12S	11/30/1989	4.5	5.5	27			
K-12S	11/30/1989	6.5	7.5	5.6			
K-12S	11/30/1989	10.4	11	22			
K-12S	11/30/1989	12.5	12.9	1.8			
K-15SS	11/30/1989	4.5	6.0	0.5	U		
K-15SS	11/30/1989	9.0	10.5	3.2			
K-15SS	11/30/1989	12	13.5	4.8			
K-32S	11/30/1989	14.5	15	52			
K-33S	11/30/1989	9.5	10	820			
K-34S	11/30/1989	11.5	12	1,200			
K-35S	11/30/1989	9.0	9.5	6.6			
S-11	11/30/1989	5.0	5.5	9.8			
S-11	11/30/1989	10.5	11	10.0			
S-18	11/30/1989	5.0	5.5	0.9			
S-18	11/30/1989	6.0	7.0	0.5			
S-18	11/30/1989	7.5	8.5	1.2			
S-19	11/30/1989	3.0	4.5	18			
S-19	11/30/1989	6.0	7.5	18			
S-19	11/30/1989	11.5	12	42			
S-23	11/30/1989	2.5	3.0	24			
S-23	11/30/1989	5.5	6.0	220			
S-23	11/30/1989	9.0	9.5	130			
S-24	11/30/1989	4.0	5.0	3.2			
S-24	11/30/1989	6.0	7.0	2.1			
S-24	11/30/1989	9.0	10	1.8			
S-24	11/30/1989	11	11.5	3.4			
S-24	11/30/1989	13	13.5	4.0			
S-32	11/30/1989	12.5	13	5,000			
S-33	11/30/1989	11.2	11.7	6900			
S-34	11/30/1989	2.5	3.0	13			
S-34	11/30/1989	5.5	6.0	2.2			
S-34	11/30/1989	7.5	8.0	100			
S-36	11/30/1989	4.0	4.5	140			
S-36	11/30/1989	6.0	7.0	120			
S-36	11/30/1989	8.0	9.0	2,800			
S-46	11/30/1989	2.5	3.0	31			
S-46	11/30/1989	7.0	7.5	1,100			
S-46	11/30/1989	10	10.5	800			
S-46	11/30/1989	11.5	12	2,900			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
MS-1	1/16/1990	5.0	5.0	309			
MS-3	1/17/1990	4.0	4.0	203			
MS-4	1/17/1990	5.0	5.0	61,890			
MS-5	1/17/1990	5.0	5.0	1,146			
MS-7	1/18/1990	5.0	5.0	223			
MS-8	1/18/1990	5.0	5.0	1,197			
MS-10	1/19/1990	7.0	7.0	2,495			
MS-11	1/19/1990	5.0	5.0	96,925			
MS-9	1/19/1990	7.0	7.0	15,779			
MS-12	1/20/1990	6.0	6.0	676			
MS-13	1/20/1990	6.0	6.0	613			
MS-14	1/20/1990	4.0	4.0	1,059			
MS-15	1/20/1990	2.0	2.0	251,984			
MS-16	1/22/1990	3.0	3.0	194,742			
MS-18	1/22/1990	7.0	7.0	474			
MS-19	1/22/1990	6.0	6.0	623			
MS-20	1/22/1990	6.0	6.0	1,947			
MS-22	1/24/1990	6.0	6.0	4,130			
MS-23	1/24/1990	6.0	6.0	3,107			
MS-24	1/24/1990	5.0	5.0	410			
MS-25	1/24/1990	5.0	5.0	9,592			
MS-26	1/25/1990	4.0	4.0	40,769			
MS-27	1/25/1990	6.0	6.0	63,415			
MS-28	1/25/1990	6.0	6.0	152,280			
Boateng-B21	1/29/1990	3.0	3.0	15			
Boateng-B21	1/29/1990	6.0	6.0	9.0			
Boateng-B21	1/29/1990	9.0	9.0	7.0			
Boateng-B22	1/29/1990	3.0	3.0	27			
Boateng-B22	1/29/1990	6.0	6.0	6.0			
Boateng-B22	1/29/1990	9.0	9.0	9.0			
Boateng-B23	1/29/1990	3.0	3.0	10.0			
Boateng-B23	1/29/1990	6.0	6.0	6.0			
Boateng-B23	1/29/1990	9.0	9.0	8.0			
Boateng-B24	1/29/1990	3.0	3.0	9.0			
Boateng-B24	1/29/1990	6.0	6.0	8.0			
Boateng-B24	1/29/1990	9.0	9.0	8.0			
Boateng-B25	1/29/1990	3.0	3.0	23			
Boateng-B25	1/29/1990	6.0	6.0	13			
Boateng-B25	1/29/1990	9.0	9.0	53			
Boateng-B26	1/29/1990	3.0	3.0	27			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
Boateng-B26	1/29/1990	6.0	6.0	8.0			
Boateng-B26	1/29/1990	9.0	9.0	29			
Boateng-B27	1/29/1990	3.0	3.0	4.0			
Boateng-B27	1/29/1990	6.0	6.0	37			
Boateng-B27	1/29/1990	9.0	9.0	360			
Boateng-B28	1/29/1990	3.0	3.0	99			
Boateng-B28	1/29/1990	6.0	6.0	1,770			
Boateng-B28	1/29/1990	9.0	9.0	410			
Boateng-B29	1/29/1990	3.0	3.0	20			
Boateng-B29	1/29/1990	6.0	6.0	25			
Boateng-B29	1/29/1990	9.0	9.0	12			
Boateng-B30	1/29/1990	3.0	3.0	40			
Boateng-B30	1/29/1990	6.0	6.0	81			
Boateng-B30	1/29/1990	9.0	9.0	1,140			
Boateng-B31	1/29/1990	3.0	3.0	15			
Boateng-B31	1/29/1990	6.0	6.0	194			
Boateng-B31	1/29/1990	9.0	9.0	586			
Boateng-B32	1/29/1990	3.0	3.0	122			
Boateng-B32	1/29/1990	6.0	6.0	676			
Boateng-B32	1/29/1990	9.0	9.0	189			
Boateng-B33	1/29/1990	3.0	3.0	800			
Boateng-B33	1/29/1990	6.0	6.0	607			
Boateng-B33	1/29/1990	9.0	9.0	421			
Boateng-B34	1/29/1990	3.0	3.0	37			
Boateng-B34	1/29/1990	6.0	6.0	12			
Boateng-B34	1/29/1990	9.0	9.0	5.0			
Boateng-B35	1/29/1990	3.0	3.0	6.0			
Boateng-B35	1/29/1990	6.0	6.0	8.0			
Boateng-B35	1/29/1990	9.0	9.0	7.0			
Boateng-B36	1/29/1990	3.0	3.0	15			
Boateng-B36	1/29/1990	6.0	6.0	5.0			
Boateng-B36	1/29/1990	9.0	9.0	8.0			
Boateng-B37	1/29/1990	3.0	3.0	259			
Boateng-B37	1/29/1990	6.0	6.0	1,060			
Boateng-B37	1/29/1990	9.0	9.0	74			
Boateng-B38	1/29/1990	3.0	3.0	43			
Boateng-B38	1/29/1990	6.0	6.0	37			
Boateng-B38	1/29/1990	9.0	9.0	38			
Boateng-B39	1/29/1990	3.0	3.0	6.0			
Boateng-B39	1/29/1990	6.0	6.0	6.0			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
Boateng-B39	1/29/1990	9.0	9.0	5.0			
Boateng-B40	1/29/1990	3.0	3.0	6.0			
Boateng-B40	1/29/1990	6.0	6.0	6.0			
Boateng-B40	1/29/1990	9.0	9.0	8.0			
Boateng-B41	1/29/1990	3.0	3.0	18			
Boateng-B41	1/29/1990	6.0	6.0	5.0			
Boateng-B41	1/29/1990	9.0	9.0	6.0			
Boateng-B42	1/29/1990	3.0	3.0	824			
Boateng-B42	1/29/1990	6.0	6.0	222			
Boateng-B42	1/29/1990	9.0	9.0	826			
Boateng-B43	1/29/1990	3.0	3.0	603			
Boateng-B43	1/29/1990	6.0	6.0	521			
Boateng-B43	1/29/1990	9.0	9.0	309			
Boateng-B44	1/29/1990	3.0	3.0	30			
Boateng-B44	1/29/1990	6.0	6.0	16			
Boateng-B44	1/29/1990	9.0	9.0	37			
Boateng-B45	1/29/1990	3.0	3.0	733			
Boateng-B45	1/29/1990	6.0	6.0	441			
Boateng-B45	1/29/1990	9.0	9.0	533			
Boateng-B46	1/29/1990	3.0	3.0	56			
Boateng-B46	1/29/1990	6.0	6.0	773			
Boateng-B46	1/29/1990	9.0	9.0	70			
Boateng-B47	1/29/1990	3.0	3.0	1950			
Boateng-B47	1/29/1990	6.0	6.0	156			
Boateng-B47	1/29/1990	9.0	9.0	303			
Boateng-B48	1/29/1990	3.0	3.0	1,190			
Boateng-B48	1/29/1990	6.0	6.0	1,590			
Boateng-B48	1/29/1990	9.0	9.0	1,080			
Boateng-B49	1/29/1990	3.0	3.0	23			
Boateng-B49	1/29/1990	6.0	6.0	66			
Boateng-B49	1/29/1990	9.0	9.0	102			
Boateng-B50	1/29/1990	3.0	3.0	54			
Boateng-B50	1/29/1990	6.0	6.0	9,090			
Boateng-B50	1/29/1990	9.0	9.0	681			
MS-29	1/29/1990	6.0	6.0	30,822			
MS-30	1/29/1990	6.0	6.0	3,576			
MS-31	1/29/1990	6.0	6.0	1,173			
MS-33	1/29/1990	6.0	6.0	665			
MS-34	1/29/1990	6.0	6.0	45,544			
MS-36	1/29/1990	6.0	6.0	2,030			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
MS-38	1/30/1990	6.0	6.0	2,411			
MS-39	1/30/1990	6.0	6.0	3,065			
MS-40	2/1/1990	3.0	3.0	10,498			
BB18	12/31/1998	6.0	6.0	1,700			
BB42	12/31/1998	6.0	6.0	160			
BB43	12/31/1998	6.0	6.0	1,600			
BB47	12/31/1998	6.0	6.0	33,666			
BB7	12/31/1998	6.0	6.0	2,100			
BB9	12/31/1998	6.0	6.0	190			
SB13	10/16/2001	3.0	5.0	325			
SB13	10/16/2001	5.0	7.0	1,790			
SB14	10/16/2001	3.0	5.0	1,710			
SB14	10/16/2001	5.0	7.0	1,690			
SB15	10/16/2001	3.0	5.0	5,550			
SB15	10/16/2001	5.0	6.0	148			
SB16	10/16/2001	3.0	5.0	141			
SB16	10/16/2001	5.0	7.0	1,320			
SB17	10/17/2001	3.0	5.0	659			
SB17	10/17/2001	5.0	7.0	2,300			
SB18	10/17/2001	3.0	4.0	112			
SB18	10/17/2001	4.0	5.0	272			
SB19	10/17/2001	3.0	5.0	7,970			
SB19	10/17/2001	5.0	7.0	3,790			
SB19	10/17/2001	7.0	7.0	5,510			
SB20	10/17/2001	3.0	5.0	553			
SB20	10/17/2001	6.0	6.0	9,960			
SB20	10/17/2001	5.0	7.0	4,080			
SB21	10/17/2001	3.0	5.0	1,380			
SB21	10/17/2001	5.0	7.0	1,630			
SB22	10/17/2001	3.0	5.0	20,800			
SB22	10/17/2001	5.0	7.0	8,970			
SB23	10/17/2001	3.0	5.0	439			
SB23	10/17/2001	5.0	7.0	611			
SB24	10/17/2001	3.0	5.0	5,500			
SB24	10/17/2001	5.0	6.0	3,640			
SB25	10/17/2001	3.0	5.0	1460			
SB25	10/17/2001	5.0	7.0	1,720			
SB26	10/17/2001	3.0	5.5	590			
SB26	10/17/2001	5.5	7.0	1,160			
SB27	10/17/2001	3.0	4.0	348			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
SB27	10/17/2001	4.0	6.0	1,430			
SB28	10/17/2001	3.0	4.5	418			
SB28	10/17/2001	4.5	6.0	1,040			
SB29	10/17/2001	3.0	5.0	1,700			
SB29	10/17/2001	5.0	6.0	2,290			
SB30	10/17/2001	3.0	5.0	242			
SB30	10/17/2001	5.0	7.0	859			
SB31	10/17/2001	3.0	5.0	1,560			
SB31	10/17/2001	5.0	7.0	810			
SB32	10/17/2001	4.0	5.0	594			
SB32	10/17/2001	5.0	7.0	1,940			
SB32	10/17/2001	7.0	8.0	1,800			
SB33	10/17/2001	4.0	6.0	3,220			
SB33	10/17/2001	6.0	8.0	391			
SB34	10/18/2001	4.0	6.0	481			
SB34	10/18/2001	6.0	8.0	669			
SB35	10/18/2001	4.0	7.0	873			
SB35	10/18/2001	7.0	8.0	583			
SB36	10/18/2001	4.0	6.5	1,310			
SB36	10/18/2001	6.5	8.0	709			
SB37	10/18/2001	4.0	6.0	1,670			
SB37	10/18/2001	6.0	8.0	934			
SB45	10/18/2001	4.0	6.0	219			
SB45	10/18/2001	6.0	8.0	936			
AT-10	4/11/2003	4.0	8.0	410			
AT-10	4/11/2003	12	16	92			
AT-5	4/11/2003	12	16	13	U		
AT-5	4/11/2003	1.0	4.0	110			
AT-6	4/11/2003	1.0	4.0	180			
AT-6	4/11/2003	12	16	150			
AT-7	4/11/2003	4.0	8.0	320			
AT-7	4/11/2003	12	16	150			
AT-8	4/11/2003	12	16	16	U		
AT-8	4/11/2003	4.0	8.0	97			
AT-9	4/11/2003	4.0	8.0	3,000			
AT-9	4/11/2003	12	16	2,200			
AT-11	4/14/2003	4.0	8.0	230			
AT-11	4/14/2003	12	16	1,400			
AT-12	4/14/2003	4.0	8.0	920			
AT-12	4/14/2003	12	16	2,300			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
AT-13	4/29/2003	5.0	8.0	33			
AT-13	4/29/2003	13	16	170			
AT-14	4/14/2003	4.0	8.0	11	U		
AT-14	4/14/2003	12	16	51			
AT-15	4/14/2003	4.0	8.0	46			
AT-15	4/14/2003	12	16	27			
AT-16	4/14/2003	4.0	8.0	14	U		
AT-16	4/14/2003	12	16	15	U		
SB-1	6/26/2003	0.0	9.0	45			
SB-1	6/26/2003	10	11.5	55			
SB-1	6/26/2003	12.5	14	36			
SB-2	6/26/2003	0.0	9.0	192			
SB-2	6/26/2003	10	11.5	45			
SB-2	6/26/2003	12.5	14	45			
SB-3	6/26/2003	0.0	14	223			
SB-4	6/27/2003	0.0	11.5	2.0			
SB-5	6/27/2003	0.0	11.5	11			
SB-5	6/27/2003	12.5	14	188			
SB-6	6/30/2003	0.0	11.5	26			
SB-7	6/30/2003	0.0	4.0	29			
SB-7	6/30/2003	5.0	6.5	7.0	U		
SB-7	6/30/2003	7.5	9.0	7.0	U		
PGG7	1/26/2004	6.0	8.5	151			
PGG7	1/26/2004	9.0	11	74			
PGG7	1/26/2004	11	12	9,140			
PGG7	1/26/2004	13	16	4,020			
PGG8	1/27/2004	4.0	6.0	100			
PGG8	1/27/2004	9.0	11	160			
PGG8	1/27/2004	14	16	3,360			
PGG6	1/28/2004	6.0	8.0	200			
PGG6	1/28/2004	10	12	5,270			
PGG6	1/28/2004	14	16	1,190			
PGG9	1/28/2004	6.0	7.5	21			
PGG9	1/28/2004	9.0	11	297			
PGG9	1/28/2004	14	16	5,580			
PGG3	1/29/2004	7.0	8.0	146			
PGG3	1/29/2004	9.0	10	187			
PGG4	1/29/2004	14	17	7.0	U		
PGG4	1/29/2004	6.0	8.0	52			
PGG4	1/29/2004	11	12.5	1,720			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
PGG1	1/30/2004	4.5	5.5	35			
PGG1	1/30/2004	5.5	6.5	46			
PGG1	1/30/2004	6.5	8.0	144			
PGG1	1/30/2004	10	13	3,090			
PGG1	1/30/2004	14	16	800			
PGG2	2/3/2004	6.0	8.0	355			
PGG2	2/3/2004	10.5	12	250			
PGG2	2/3/2004	12	14	214			
PGG2	2/3/2004	14	15	250			
PGG2	2/3/2004	14.5	16	129			
PGG5	2/3/2004	6.0	8.0	161			
PGG5	2/3/2004	10	12	433			
PGG5	2/3/2004	12	13.5	169			
PGG5	2/3/2004	13.5	14.5	71			
PGG5	2/3/2004	14.5	16	69			
PGG15	4/7/2004	8.0	12	286			
PGG17	4/7/2004	8.0	12	79.4			
PGG19	4/8/2004	10	12	13.9			
PGG20	4/8/2004	6.0	10	5.8			
PGG11	4/9/2004	6.5	10	82.4			
PGG13	4/9/2004	4.8	7.5	257			
PGG18	4/9/2004	6.8	10	123			
SB-7	6/1/2004	10	11.5	6.0	U		
SB-7	6/1/2004	12.5	14	7.0	U		
MA-03	4/24/2007	0.0	0.0	17		46	
MA-03	4/24/2007	6.0	6.0	1.9		6.3	U
MA-04	4/24/2007	0.0	0.0	4.6		30	
MA-04	4/24/2007	6.0	6.0	3.0		23	
MA-27	4/24/2007	0.0	0.0	16		21	
MA-27	4/24/2007	6.0	6.0	210		6.6	U
MA-28	4/24/2007	0.0	0.0	60		78	
MA-28	4/24/2007	6.0	6.0	600		7.8	
MA-29	4/24/2007	0.0	0.0	15		8.8	
MA-29	4/24/2007	6.0	6.0	420		100	
MA-30	4/24/2007	0.0	0.0	150		71	
MA-30	4/24/2007	6.0	6.0	210		90	
MA-31	4/24/2007	0.0	0.0	62		28	
MA-31	4/24/2007	6.0	6.0	770		150	
MA-32	4/24/2007	0.0	0.0	7.3		9.2	
MA-32	4/24/2007	6.0	6.0	62		31	

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
MA-33	4/24/2007	0.0	0.0	5.7		7.9	
MA-33	4/24/2007	6.0	6.0	31		21	
MA-25	4/25/2007	0.0	0.0	37		38	
MA-25	4/25/2007	6.0	6.0	110		15	
MA-26	4/25/2007	0.0	0.0	160		51	J
MA-26	4/25/2007	6.0	6.0	270		58	
PT-31	4/25/2007	0.0	0.0	17		13	
PT-31	4/25/2007	6.0	6.0	210		25	
PT-35	4/25/2007	0.0	0.0	210		70	
PT-35	4/25/2007	6.0	6.0	3,300		330	
PT-36	4/25/2007	0.0	0.0	220		25	
PT-36	4/25/2007	6.0	6.0	630		27	
PT-37	4/25/2007	0.0	0.0	6.2		47	
PT-37	4/25/2007	6.0	6.0	4.4		21	
PT-38	4/25/2007	0.0	0.0	21		100	
PT-38	4/25/2007	6.0	6.0	9.8		6.4	
TLA-08	4/25/2007	0.0	0.0	24	J	17	J
TLA-08	4/25/2007	6.0	6.0	24		11	
MA-08	4/26/2007	0.0	0.0	14		35	
MA-08	4/26/2007	6.0	6.0	27		14	
MA-09	4/26/2007	6.0	6.0	4.1		6.3	U
MA-09	4/26/2007	0.0	0.0	14		31	
PT-39	4/26/2007	6.0	6.0	20		6.3	U
PT-39	4/26/2007	0.0	0.0	69		65	
PT-40	4/26/2007	0.0	0.0	450		59	
PT-40	4/26/2007	6.0	6.0	140		7.2	
PT-41	4/26/2007	0.0	0.0	18		110	
PT-41	4/26/2007	6.0	6.0	3.3		18	
PT-42	4/26/2007	0.0	0.0	7		60	
PT-42	4/26/2007	6.0	6.0	5.1		69	
PT-50	4/30/2007	0.0	0.0	7.4		52	
PT-50	4/30/2007	6.0	6.0	2.8		16	
PT-51	4/30/2007	6.0	6.0	2.4		20	
TLA-07	4/30/2007	0.0	0.0	4.6		10	
TLA-07	4/30/2007	6.0	6.0	12		13	
TLA-21	4/30/2007	0.0	0.0	63		120	
TLA-21	4/30/2007	6.0	6.0	18		31	
TLA-22	4/30/2007	6.0	6.0	8.5		5.9	U
TLA-22	4/30/2007	0.0	0.0	120		160	
TLA-05	5/1/2007	0.0	0.0	7.9		10	

Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
TLA-05	5/1/2007	6.0	6.0	12		14	
TLA-13	5/1/2007	0.0	0.0	44		27	
TLA-13	5/1/2007	6.0	6.0	13		21	
TLA-23	5/1/2007	0.0	0.0	180		28	
TLA-23	5/1/2007	6.0	6.0	43		11	
TLA-25	5/1/2007	0.0	0.0	63		25	
TLA-25	5/1/2007	6.0	6.0	33		6.2	U
TLA-26	5/1/2007	0.0	0.0	93		52	
TLA-26	5/1/2007	6.0	6.0	23		11	
TLA-27	5/1/2007	0.0	0.0	100		45	
TLA-27	5/1/2007	6.0	6.0	280		11	
TLA-28	5/1/2007	0.0	0.0	21		25	
TLA-28	5/1/2007	6.0	6.0	32		9.6	
TLA-29	5/1/2007	0.0	0.0	7.9		8.4	
TLA-29	5/1/2007	6.0	6.0	65		22	
TLA-06	5/2/2007	0.0	0.0	4.1		12	
TLA-06	5/2/2007	6.0	6.0	29		21	
TLA-10	5/2/2007	0.0	0.0	4.7		17	
TLA-10	5/2/2007	6.0	6.0	21		41	
TLA-12	5/2/2007	0.0	0.0	11		17	
TLA-12	5/2/2007	6.0	6.0	7.3		13	
TLA-14	5/2/2007	0.0	0.0	57		25	
TLA-14	5/2/2007	6.0	6.0	6.6		12	
TLA-15	5/2/2007	0.0	0.0	28		9.1	
TLA-15	5/2/2007	6.0	6.0	100		20	
TLA-16	5/2/2007	0.0	0.0	19		14	
TLA-16	5/2/2007	6.0	6.0	15		23	
TLA-17	5/2/2007	0.0	0.0	17		15	
TLA-17	5/2/2007	6.0	6.0	15		48	
TLA-18	5/2/2007	0.0	0.0	17		14	
TLA-18	5/2/2007	6.0	6.0	25		16	
TLA-19	5/2/2007	0.0	0.0	11		18	
TLA-19	5/2/2007	6.0	6.0	68		18	
TLA-20	5/2/2007	0.0	0.0	12		13	
TLA-20	5/2/2007	6.0	6.0	16		40	
TLA-09	5/7/2007	6.0	6.0	57	J	6.2	U
TLA-09	5/7/2007	0.0	0.0	30		20	
TLA-11	5/7/2007	0.0	0.0	4.7		7.7	
TLA-11	5/7/2007	6.0	6.0	12		20	
TLA-24	5/7/2007	0.0	0.0	11		5.2	U

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
TLA-24	5/7/2007	6.0	6.0	180		46	
TLA-30	5/7/2007	0.0	0.0	16		16	
TLA-30	5/7/2007	6.0	6.0	160		26	
TLA-31	5/8/2007	0.0	0.0	5.3		7.2	
TLA-31	5/8/2007	6.0	6.0	21		28	
TLA-32	5/8/2007	0.0	0.0	7.9		8.2	
TLA-32	5/8/2007	6.0	6.0	11		28	
MA-05	5/11/2007	0.0	0.0	66		1,900	
MA-05	5/11/2007	0.5	0.5	33		1,400	
MA-05	5/11/2007	6.0	6.0	3.4		67	
MA-07	5/11/2007	0.0	0.0	2.2		24	
MA-07	5/11/2007	6.0	6.0	1.8		4.1	
MA-34	5/11/2007	0.0	0.0	330		35	
MA-34	5/11/2007	6.0	6.0	350		6.1	U
MA-34	5/11/2007	10	10	570		12	
MA-41	5/11/2007	9.5	9.5	190		6.3	U
MA-41	5/11/2007	0.0	0.0	100		12	
MA-41	5/11/2007	6.0	6.0	170		6.3	U
MA-42	5/11/2007	9.0	9.0	250		6.2	U
MA-42	5/11/2007	0.0	0.0	130		12	
MA-42	5/11/2007	6.0	6.0	280		6.1	U
MA-10	5/14/2007	0.0	0.0	3.1		5.7	
MA-10	5/14/2007	6.0	6.0	1.8		6.2	U
MA-11	5/14/2007	6.0	6.0	11		6.5	U
MA-11	5/14/2007	0.0	0.0	4.3		14	
MA-12	5/14/2007	0.0	0.0	15		22	
MA-12	5/14/2007	6.0	6.0	40		6.3	U
MA-35	5/14/2007	6.0	6.0	380		6.6	U
MA-35	5/14/2007	0.0	0.0	66		11	
MA-35	5/14/2007	9.0	9.0	260		6.3	U
MA-36	5/14/2007	0.0	0.0	100		29	
MA-36	5/14/2007	6.0	6.0	630		6.3	U
MA-37	5/14/2007	6.0	6.0	550		6.3	U
MA-37	5/14/2007	9.0	9.0	170		6.7	U
MA-37	5/14/2007	0.0	0.0	160		11	
MA-38	5/14/2007	0.0	0.0	430		100	
MA-38	5/14/2007	6.0	6.0	150		60	
MA-39	5/14/2007	0.0	0.0	320		6.5	U
MA-39	5/14/2007	6.0	6.0	230		6.4	U
MA-39	5/14/2007	9.0	9.0	50		6.4	U

Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
MA-40	5/14/2007	0.0	0.0	250		10.0	
MA-40	5/14/2007	6.0	6.0	210		7.3	
MA-40	5/14/2007	8.5	8.5	79		6.1	U
PT-43	5/14/2007	0.0	0.0	15		19	
PT-43	5/14/2007	6.0	6.0	21		6.3	U
MA-06	5/15/2007	0.0	0.0	2.1		26	
MA-06	5/15/2007	6.0	6.0	4.3		300	
MA-24	5/15/2007	0.0	0.0	9.0		6.3	U
MA-24	5/15/2007	6.0	6.0	9.6		6.4	U
MA-36	5/15/2007	9.0	9.0	700		6.3	U
PT-34	5/15/2007	0.0	0.0	67		41	
PT-34	5/15/2007	6.0	6.0	550		15	
PT-37A	5/15/2007	0.0	0.0	7.2		5.4	U
PT-37A	5/15/2007	6.0	6.0	1,100		7.4	
PT-38A	5/15/2007	0.0	0.0	24		6.8	
PT-38A	5/15/2007	6.0	6.0	570		17	
PT-48	5/15/2007	0.0	0.0	4.8		6.3	U
PT-48	5/15/2007	6.0	6.0	5.3		6.3	U
PT-49	5/15/2007	0.0	0.0	38		6.2	U
PT-49	5/15/2007	6.0	6.0	8.5		6.3	U
TLA-13	5/15/2007	12	12	19		23	
MA-44	5/16/2007	0.0	0.0	310		21	
MA-44	5/16/2007	6.0	6.0	1,300		6.0	U
MA-44	5/16/2007	9.0	9.0	97		6.6	U
MA-45	5/16/2007	0.0	0.0	240		13	
MA-45	5/16/2007	6.0	6.0	340		6.3	U
MA-45	5/16/2007	9.0	9.0	810		6.4	U
PT-32	5/16/2007	0.0	0.0	720		28	
PT-32	5/16/2007	6.0	6.0	420	J	6.1	U
PT-33	5/16/2007	0.0	0.0	4,200		340	
PT-33	5/16/2007	6.0	6.0	25,000		1,800	
TLA-11	5/16/2007	10	10	19		17	
TLA-16	5/16/2007	10	10	56		21	
TLA-17	5/16/2007	10	10	43		40	
TLA-18	5/16/2007	10	10	45		42	
MA-43	5/29/2007	7.0	7.0	160		15	
MA-46	5/29/2007	6.0	6.0	140		6.2	U
MA-46	5/29/2007	8.0	8.0	720		6.6	U
MA-47	5/29/2007	6.0	6.0	350		6.4	U
MA-47	5/29/2007	8.0	8.0	810		6.4	U

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)(1,2)	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg) Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
MA-48	5/29/2007	6.0	6.0	66		6.4	U
MA-48	5/29/2007	9.5	9.5	880		6.4	U
MA-49	5/29/2007	6.0	6.0	41		6.3	U
MA-49	5/29/2007	8.5	8.5	460		6.5	U
MA-50	5/29/2007	6.0	6.0	300		6.4	U
MA-50	5/29/2007	10	10	120		6.6	U
MA-51	5/29/2007	6.0	6.0	170		6.2	U
MA-51	5/29/2007	9.5	9.5	140		6.6	U
MA-52	5/29/2007	6.0	6.0	230		6.2	U
MA-52	5/29/2007	8.5	8.5	1,200		6.8	U
MA-53	5/29/2007	9.0	9.0	310		6.3	U
MA-54	5/29/2007	6.0	6.0	190		6.3	U
MA-54	5/29/2007	8.5	8.5	400		6.4	U
MA-55	5/29/2007	6.0	6.0	260		6.3	U
MA-55	5/29/2007	10	10	260		6.5	U
MA-56	5/29/2007	6.0	6.0	180		6.3	U
MA-56	5/29/2007	9.5	9.5	88		6.4	U
MA-57	5/29/2007	6.0	6.0	160		11	
MA-57	5/29/2007	9.0	9.0	170		6.3	U
MA-58	5/29/2007	6.0	6.0	110		6.3	U
MA-58	5/29/2007	9.0	9.0	290		6.5	U
TLA-07	5/30/2007	10	10	1.3		11	
TLA-12	5/30/2007	10	10	18		18	
TLA-15	5/30/2007	10	10	3.8		8.0	
TLA-23	5/30/2007	10	10	190		16	
B6E3	10/8/2008	6.0	8.0	300			
B6E3	10/8/2008	12	15.5	3,000			
B7E10	10/8/2008	6.0	8.0	11			
B7E10	10/8/2008	12	13	4.0			
B6D14	10/9/2008	7.0	8.0	400			
B6D14	10/9/2008	14	15	1,500			
B6E5	10/9/2008	6.0	8.0	92			
B6E5	10/9/2008	12	13	700			
B-A	10/10/2008	3.0	4.0	1,600			
B-A	10/10/2008	5.0	6.0	150			
B-A	10/10/2008	7.0	8.0	290			
B-A	10/10/2008	10	11	174			
B-A	10/10/2008	13	14	10			
B-B	10/10/2008	3.0	4.0	15			
B-B	10/10/2008	6.0	7.0	4,200			

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Table B-2: Soil Concentrations for the Arkema Sample Locations Shown on Figure B-2

Sample Location (Site ID)[1,2]	Sample Date	Sample Top (feet bgs)	Sample Bottom (feet bgs)	Soil Concentrations (mg/kg)			
				Arsenic (Lab)	Qualifer	Lead (Lab)	Qualifer
B-B	10/10/2008	9.0	10	290			
B-B	10/10/2008	12	13	3,800			
B-AA	7/22/2012	12	12	7.0	U	3.0	U
B-AA	7/22/2012	3.0	3.0	12		11	
B-BB	7/22/2012	9.0	9.0	29		2.0	U
B-BB	7/22/2012	14	14	11		3.0	U
B-C	7/22/2012	8.0	8.0	19		2.0	U
B-C	7/22/2012	11	11	30		2.0	U
B-C	7/22/2012	13.5	13.5	166		3.0	U
B-C	7/22/2012	12	12	149		3.0	
B-D	7/23/2012	11	11	305		4.0	
B-D	7/23/2012	13	13	252		7.0	
B-E	7/23/2012	10	10	10	U	4.0	U
B-E	7/23/2012	14	14	8.0	U	3.0	U
B-E	7/23/2012	5.0	5.0	12		10	
B-E	7/23/2012	8.0	8.0	23		3.0	
B-F	7/23/2012	12	12	68		2.0	U
B-F	7/23/2012	14	14	25		3.0	U
B-F	7/23/2012	7.0	7.0	109		2.0	U
B-G	7/23/2012	10	10	226		3.5	
B-G	7/23/2012	13	13	262		2.0	

Notes:

J: Estimated value

U: Not detected

If the cell is blank for a given constituent, that means the samples was not analyzed for that constituent.

Numbers are shown as two significant figures in standard notation unless that number is greater than 100. If greater than 100, the number is rounded to a whole n

[1]See Figure B-2 for the locations of these samples (Site IDs).

[2]The locations and soil concentrations for samples associated with MA-29, MA-31, MA-43, PT-31, PT-32, PT-33, PT-35, PT-36, and TLA-26 are presented in Figure B-1 and Table B-1, respectively.

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Appendix C

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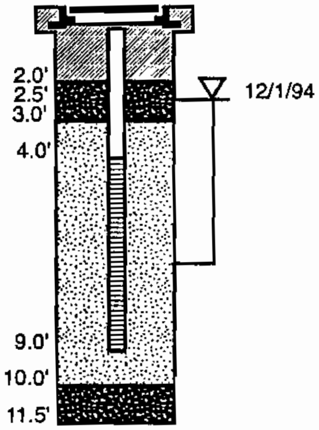
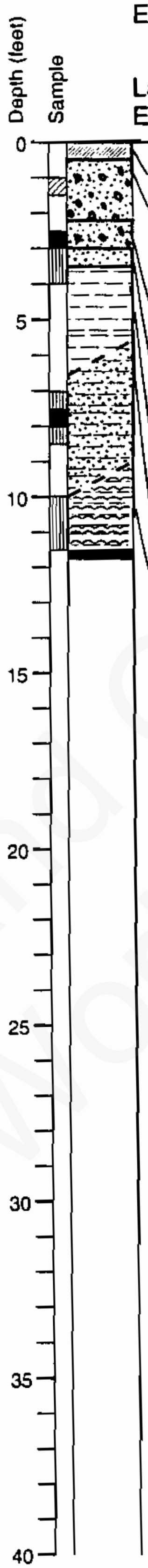
Equipment: Ingersoll Rand T3W

Land Surface Elevation: 11.0 feet *   Date: 10/31/94

Sheen	Retained for chemical/physical analysis	Blows per Foot
	2.5	
		10
	8	7
		4





Asphaltic Concrete

BLACK SANDY GRAVEL (GP) loose, wet; fine to coarse grained, with some silt, and a black, medium grained, spherical, vitreous material (Fill).

BROWN SANDY GRAVEL (GP) loose, wet; mottled, with some silt (Fill).

BROWN SAND (SP) loose, moist; fine grained with trace of silt (Fill).

GRAY SANDY SILT (ML) soft, wet; fine grained sand (Fill).

BLACK SILTY SAND (SM) loose, saturated; fine grained (Fill).

BROWN CLAYEY SILT (OH) soft, moist; with some sand, contains abundant undecomposed marsh grasses.

Boring completed and monitoring well installed 10/31/94.

* Land surface elevations are approximate within 0.5 feet.
Datum: United States Coast and Geodetic Survey, 1929 Mean Sea Level (NGVD29)

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Log of Monitoring Well 9

USG Interiors/Phased Remedial Investigation
Tacoma, Washington

PLATE **B11**

	PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
mw9.cdr	14,937.314	DFF/ALW	30 Nov 94	PJM		

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Tacoma, Washington

Boring No.	Depth (feet)	Description
HA1	0.0 - 0.3	BROWN SILTY SAND (SM) loose, moist; with organics.
	0.3 - 1.0	Becomes gray brown, loose to medium dense, moist; with organics (rootlets) and black medium grain vitreous material and occasional black angular vitreous fragments.
	1.0 - 1.25	BLACK ROUND VITREOUS MATERIAL, medium dense, moist.
	1.25 - 1.9	BROWN SANDY GRAVEL (GP) loose, moist; some silt.
	1.9 - 2.3	BROWN GRAVELLY SAND (SP) loose, moist; trace silt.
		HA1 terminated at approximately 2.3 feet below ground surface (bgs).
		Groundwater not encountered.
HA2	0.0 - 0.17	Asphalt.
	0.17- 0.5	BROWN SANDY GRAVEL (GP) loose, moist.
	0.5 – 1.5	BLACK GRAVELLY SAND (SP) loose, moist; with occasional black angular vitreous fragments.
	1.5 – 1.6	WHITE SANDY SILT (ML) medium stiff, moist.
	1.6 – 3.0	BROWN GRAVELLY SAND (SP) medium dense, moist; with occasional cobble.
		HA2 terminated at approximately 3.0 feet bgs.
		Groundwater not encountered.
HA3	0.0 – 0.17	Asphalt.
	0.17– 0.5	BROWN SANDY GRAVEL (GP) medium dense, moist.
	0.5 – 1.0	BLACK ROUND VITREOUS MATERIAL, loose, moist; with some black angular vitreous fragments.
	1.0 – 2.2	BROWN SANDY GRAVEL (GP) loose, moist.
		Refusal at 2.2 feet.
		Groundwater not encountered.
HA4	0.0 – 0.17	Asphalt.
	0.17– 0.6	BROWN SANDY GRAVEL (GP) medium dense to dense, moist; some silt.
	0.6 – 1.85	BLACK/GRAY SILTY SAND (SM) loose to medium dense, moist; with gravel, some black angular vitreous fragments.
	1.85 – 2.5	BROWN SANDY GRAVEL (GP) medium dense, moist; occasional cobble.
		HA4 terminated at approximately 2.5 feet bgs.
		Groundwater not encountered.

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USG Interiors
MW9 Area Assessment
Tacoma, Washington

Boring No.	Depth (feet)	Description
HA5	0.0 – 0.17	Asphalt.
	0.17– 0.5	BROWN SANDY GRAVEL (GP) medium dense, moist.
	0.5 – 1.25	DARK BROWN GRAVELLY SAND (SP) dense, moist; with black round vitreous material, cobble and black angular vitreous fragments.
	1.25 – 1.5	DARK BROWN SANDY GRAVEL (GP) dense, moist; with black round vitreous material.
		Refusal at 1.5 feet.
		Groundwater not encountered.
HA6	0.0 – 0.17	Asphalt.
	0.17– 0.5	BROWN SANDY GRAVEL (GP) dense, moist; occasional cobble.
		Refusal at 0.5 feet.
		Groundwater not encountered.
HA7	0.0 – 0.5	DARK GRAY SILTY SAND (SM) dense, moist; with gravel, occasional cobble.
		Refusal at 0.5 feet.
		Groundwater not encountered.
HA8	0.0 – 0.25	Asphalt.
	0.25 – 0.75	DARK BROWN SANDY GRAVEL (GP) dense, moist.
	0.75 – 1.0	DARK BROWN/GRAY SANDY GRAVEL (GP) dense, moist; with black round vitreous material and black angular vitreous fragments.
	1.0 – 1.75	BROWN SANDY GRAVEL (GP) dense, moist; with silt, occasional cobble.
		Refusal at 1.75 feet.
		Groundwater not encountered.
HA9	0.0 – 0.17	Asphalt.
	0.17– 0.5	BROWN SANDY GRAVEL (GP) dense, moist.
	0.5 – 1.3	Black round vitreous material and black angular vitreous fragments.
	1.3 – 1.5	BROWN SANDY GRAVEL (GP) dense, moist; with silt, occasional cobble.
		Refusal at 1.5 feet.
		Groundwater not encountered.

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Boring No.	Depth (feet)	Description
HA10	0.0 – 0.1	Grass.
	0.1 – 1.5	DARK BROWN SILTY SAND (SM) loose, moist; with black round vitreous material organics (rootlets), trace black angular vitreous fragments.
	1.5 – 2.0	DARK GRAY SILT (ML) medium stiff, moist.
	2.0 – 2.4	Becomes brown with organics.
	2.4 – 2.5	BROWN GRAVELLY SAND (GP) loose, moist. HA10 terminated approximately 2.5 feet bgs. Groundwater not encountered.
HA11	0.0 – 0.1	Grass.
	0.1 – 0.5	DARK BROWN SILTY SAND (SM) loose, moist; with gravel.
	0.5 – 1.9	REDDISH BROWN SILT (ML) soft to medium stiff, with brown sand interlayers. Brown sand contains black round vitreous material and occasional black angular vitreous fragments
	1.9 – 3.0	BROWN SAND (SP) loose, moist. Becomes wet at 2.5 feet. Becomes saturated at 3.0 feet. HA11 terminated approximately 3.0 feet bgs. Groundwater encountered at approximately 3.0 feet bgs.
HA12	0.0 – 0.17	Asphalt.
	0.17– 0.5	BROWN GRAVELLY SAND (SP) loose, moist.
	0.5 – 1.5	BLACK ROUND VITREOUS MATERIAL, medium dense, moist with black angular vitreous fragments and gravel.
	1.5 – 2.5	GRAY/GREEN SILTY SAND (SM) medium dense, moist to wet; with gravel, occasional cobbles. Becomes wet to saturated at 2.5 feet bgs. HA12 terminated at approximately 2.5 feet bgs. Groundwater not encountered.

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Boring No.	Depth (feet)	Description
HA13	0.0 – 0.17	Asphalt.
	0.17 – 0.5	BROWN GRAVELLY SAND (SP) medium dense, moist.
	0.5 – 0.65	GRAY ANGULAR VITREOUS MATERIAL, very dense, dry; with gravel.
	0.65 – 1.0	BLACK ROUND VITREOUS MATERIAL, dense, moist with black angular vitreous fragments, some sand and gravel.
	1.0 – 1.5	GRAY GREEN SILTY SAND (SM) dense, moist to wet with gravel and some black round vitreous material.
	1.5 – 2.25	BROWN GRAVELLY SAND (SP) dense, moist to wet.
		HA13 terminated at approximately 2.25 feet bgs.
		Groundwater not encountered.
HA14	0.0 – 0.17	Asphalt.
	0.17 – 0.3	BROWN GRAVELLY SAND (SP) loose, moist.
	0.3 – 0.5	GRAY ANGULAR VITREOUS MATERIAL, very dense, dry; with gravel.
		Refusal at 0.5 feet bgs.
		Groundwater not encountered.
HA15	0.0 –0.17	Asphalt.
	0.17 – 0.5	BROWN SANDY GRAVEL (GP) loose to medium dense, moist.
	0.5 – 1.75	BLACK ROUND VITREOUS MATERIAL, medium dense, moist; with black angular vitreous fragments, sand, gravel, and occasional cobbles.
	1.75 – 2.25	BROWN GRAVELLY SAND (SP) medium dense, moist; with occasional cobble.
		HA15 terminated at approximately 2.25 feet bgs.
		Groundwater not encountered.
HA16	0.0 – 0.17	Asphalt.
	0.17 – 0.5	BROWN SANDY GRAVEL (GP) loose, moist.
	0.5 – 1.0	BLACK GRAVELLY SAND (SP) dense, moist; with some black round vitreous material.
	1.0 – 2.0	BROWN GRAVELLY SAND (SP) dense, moist; with occasional cobble and trace black sand.
		HA16 terminated at approximately 2.0 feet bgs.
		Groundwater not encountered.

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Boring No.	Depth (feet)	Description
HA17	0.0 – 0.17	Asphalt.
	0.17 – 0.6	DARK BROWN SILTY SAND (SP) medium dense, moist; with gravel, some black round vitreous material.
	0.6 – 1.75	BROWN GRAVELLY SAND / SANDY GRAVEL (SP/GP) medium dense, moist; trace silt.
		Refusal at 1.75 feet bgs.
		Groundwater not encountered.
HA18	0.0 – 0.17	Asphalt.
	0.17 – 0.5	BROWN SANDY GRAVEL (GP) medium dense, moist.
	0.5 – 1.1	BLACK ROUND VITREOUS MATERIAL, medium dense, moist; with black angular vitreous fragments.
	1.1 – 2.0	BROWN SANDY GRAVEL (GP) dense, moist.
	2.0 – 2.25	BROWN SAND (SP) loose, moist.
		HA18 terminated at approximately 2.25 feet bgs.
		Groundwater not encountered.
HA19	0.0 – 0.1	GRAY SILTY SAND (SM) loose, dry.
	0.1 – 1.0	Cemented rock, very dense.
	1.0 – 1.5	YELLOW BROWN SANDY GRAVEL (GP) dense, moist; with occasional cobble.
	1.5 – 2.5	BROWN SAND (SP) medium dense, moist; trace silt. Sand is fine to medium grain.
	2.5 – 3.0	BROWN SANDY SILT (ML) soft, moist to wet; trace organics at 2.75 feet bgs.
	3.0 – 5.5	MOTTLED BROWN/BLACK/RED SAND (SP) loose to medium dense, moist.
		Becomes wet at 4.5 feet bgs.
		Becomes saturated at 5 feet bgs.
		HA19 terminated at approximately 5.5 feet bgs.
		Groundwater encountered at 5 feet bgs.

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Hand Augered and Soil Boring Logs
USG Interiors
MW9 Area Assessment
Tacoma, Washington

Boring No.	Depth (feet)	Description
HA20	0.0– 0.75	GRAY GRAVELLY SAND (SP) loose, moist; with gravel and brick and metal fragments.
	0.75 – 2.4	BLACK SANDY GRAVEL (GP) dense, moist; with silt and some black round vitreous material.
	2.4 – 2.75	BROWN SAND (SP) medium dense, wet; with occasional cobble.
		Refusal at 2.75 feet bgs.
		Groundwater not encountered.
HA21	0.0 – 0.1	GRAY SILTY SAND (SM) loose, dry.
	0.1 – 0.75	GRAY CEMENTED ROCK, very dense.
	0.75 – 1.0	BLACK ROUND VITREOUS MATERIAL, medium dense, moist.
	1.0 – 2.0	BROWN GRAVELLY SAND/SANDY GRAVEL (SP/GP) medium dense to dense, moist; with silt and occasional cobble.
		Refusal at 2.0 feet bgs.
		Groundwater not encountered.
HA22	0.0 – 0.17	Asphalt.
	0.17 – 1.25	GRAY CEMENTED ROCK, very dense.
	1.25 – 2.1	GRAY SAND (SP) medium dense, moist; with gravel and occasional cobble.
		Refusal at 2.1 feet bgs.
		Groundwater not encountered.
HA28	0.0 – 0.1	Grass.
	0.1 – 2.5	BROWN SAND (SW) medium dense, moist; with trace organics.
	2.5 – 5.0	LIGHT BROWN SAND (SP) medium dense, moist; with yellow mottling.
	5.0 – 5.5	BROWN CLAYEY SILT (MH) soft, wet.
	5.5 – 6.0	BROWN SILTY CLAY (OL) very soft, saturated; with some organics.
		HA28 terminated at 6 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.

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Hand Augered and Soil Boring Logs
USG Interiors
MW9 Area Assessment
Tacoma, Washington

Boring No.	Depth (feet)	Description
HA29	0.0 – 0.1	Grass.
	0.1 – 2.5	BROWN SAND (SW) medium dense, moist; with trace organics.
	2.5 – 4.5	BROWN SANDY SILT (ML) soft, wet; with trace organics.
	4.5 – 5.5	BROWN SILT (ML) soft, saturated; trace sand and organics.
	5.5 – 6.25	CLAYEY SILT (ML) very soft, saturated; with trace sand and organics.
		HA29 terminated at 6.25 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.
HA30	0.0 – 0.1	Grass.
	0.1 – 2.5	BROWN GRAVELLY SAND (SW) dense, dry; with some gravel/cobble.
	2.5 – 3.5	BROWN SAND (SP) medium dense, moist.
	3.5 – 4.0	BROWN SILTY SAND (ML) loose, wet.
	4.0 – 6.25	BROWN SILTY CLAY (OL) very soft, saturated; with organics and trace fine sand.
		HA30 terminated at 6.25 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.
HA31	0.0 – 0.2	Asphalt.
	0.2 – 0.6	BROWN GRAVELLY SAND (SW) dense, dry.
	0.6	GRAY CONSOLIDATED MATERIAL, very dense, dry.
		Refusal at 0.6 feet bgs.
		Groundwater not encountered.
B23	0.0 – 0.35	Asphalt.
	0.35 – 0.8	GRAY CONSOLIDATED MATERIAL, very dense, dry.
	0.8 – 3.0	BLACK GRAVELLY SAND (SW) medium dense, wet (shot).
	3.0 – 4.5	BLACK/BROWN SAND (SW) very loose, wet; with trace of fine sand.
	4.5 – 7.5	BROWN SILT WITH SAND (ML) very soft, saturated
		B-23 terminated at 7.5 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.

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Hand Augered and Soil Boring Logs
USG Interiors
MW9 Area Assessment
Tacoma, Washington

Boring No.	Depth (feet)	Description
B24	0.0 – 0.4	Asphalt.
	0.4 – 1.0	BROWN GRAVELLY SAND (GW) medium dense, dry.
	1.0 – 1.5	BLACK SAND (SW) medium dense, moist; with some gravel.
	1.5 – 4.5	BROWN SAND (SW) very loose, moist; with some gravel.
	4.5 – 6.0	BROWN CLAYEY SILT (MH) very soft, wet; with some wood chips.
	6.0 – 7.0	BLACK/BROWN MOTTLED SILTY SAND (SM) very loose, saturated.
	7.0 – 9.0	BROWN SILTY SAND (SM) very loose, saturated.
		B24 terminated at 9.0 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.
B25	0.0 – 0.35	Asphalt.
	0.35 – 1.0	GRAY CONSOLIDATED MATERIAL, very dense, dry.
	1.0 – 3.0	GRAY/GREEN GRAVELLY SAND (SW) medium dense, moist.
	3.0 – 6.0	BROWN CLAYEY SILT (MH) very soft, saturated.
		B25 terminated at 6.0 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.
B26	0.0 – 0.75	GRAY CONSOLIDATED MATERIAL, very dense, dry.
	0.75 – 2.0	BLACK SAND (SW) medium dense, moist.
	2.0 – 3.0	BROWN GRAVELLY SAND (SW) loose, dry.
	3.0 – 7.5	BROWN SANDY SILT (SM) very soft, saturated.
		B26 terminated at 7.5 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.
B27	0.0 – 0.2	Asphalt.
	0.2 – 1.0	GRAY CONSOLIDATED MATERIAL, very dense, dry.
	1.0 – 2.5	BROWN GRAVELLY SAND (SW) medium dense, moist.
	2.5 – 4.0	BROWN SAND (SW) loose, wet; with trace silt.
	4.0 – 5.5	BROWN SILT (ML) very soft, saturated; with trace sand.
	5.5 – 7.0	BROWN/BLACK MOTTLED SAND (SP) very loose, saturated; with trace organics.
		B27 terminated at 7.0 feet bgs.
		Groundwater encountered at approximately 5 feet bgs.

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Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	BETWEEN DRY FILTER AND BAG HOUSE
DRILLING COMPANY	CASCADE
DRILLER	CASEY
DRILLING METHOD	GEOPROBE
DRILL BIT(S) SIZE:	1.5 INCH
ISOLATION CASING	FROM TO FT.
BLANK CASING	FROM TO FT.
PERFORATED CASING	FROM TO FT.
SIZE AND TYPE OF FILTER PACK	FROM TO FT.
SEAL	FROM TO FT.
GROUT	BENTONITE CHIPS FROM 0.0 TO 6.0 FT.

Boring/Well Name	B13
Project Name	THERMAFIBER
Project Number	026130.00
ELEVATION AND DATUM	
TOTAL DEPTH	6.0
DATE STARTED	10/30/2002
DATE COMPLETED	10/30/2002
INITIAL WATER DEPTH (FT)	
LOGGED BY	DKM
SAMPLING METHODS	SPLIT SPOON
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	WELL NOT CONSTRUCTED	OVA	LITHOLOGY	USCS LOG
S	3.0			B13-1-2		0		SW
				B13-2-3		0		GW/GM
S	1.0		5					ML/CL
			10					
			15					
			20					
			25					
			30					

SAMPLE DESCRIPTION AND DRILLING REMARKS

Concrete surface

Well-graded SAND with gravel

Gray/dark brown/dark gray, gravel and sand mixture with up to 5% silt, contains dark material with a metallic appearance primarily at 1-2 feet, slightly moist.

Well-graded GRAVEL with silt and sand

Light brown/orange/green angular gravel with sand and 5-10% silt, moist.

Clayey SILT

Gray, clayey silt, moist to wet.

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Boring & Well Construction Log

Kennedy/Jenks Consultants

BORING LOCATION	NORTH PORTION OF SITE
DRILLING COMPANY	CASCADE
DRILLER	CASEY
DRILLING METHOD	GEOPROBE
DRILL BIT(S) SIZE:	1.5 INCH

Boring/Well Name B20

Project Name THERMAFIBER

Project Number 026130.00

	FROM	TO	FT.
ISOLATION CASING			
BLANK CASING			
PERFORATED CASING			
SIZE AND TYPE OF FILTER PACK			
SEAL			
GROUT BENTONITE CHIPS	0.0	9.0	

ELEVATION AND DATUM	
TOTAL DEPTH	9.0
DATE STARTED	10/30/2002
DATE COMPLETED	10/30/2002
INITIAL WATER DEPTH (FT)	7
LOGGED BY	DKM
SAMPLING METHODS	SPLIT SPOON
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	WELL NOT CONSTRUCTED	OVA	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
S	3.0			B20-1-3		0.3		SW	**Asphalt surface**
								GW/GM	**Well-graded SAND with gravel** Sand and gravel base layer
S	3.0		5	B20-3-5		0			**Well-graded GRAVEL with silt and sand** Dark gray, angular gravel with sand and 5-10% silt, moist, contains fine metallic particles (shot?) and fragments with metallic surface appearance (slag?).
				B20-5-7	▽	0		SP	
S	3.0							SM	**Poorly graded SAND** Light brown to gray, moist, poorly graded medium to fine sand with up to 5% silt in small pods.
			10						**Silty SAND** Gray, wet, layered fine sand and silty fine sand.
			15						
			20						
			25						
			30						

SHEET 1 OF 1

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Boring & Well Construction Log

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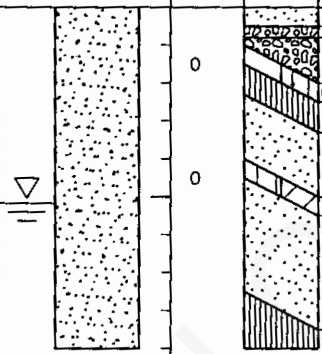
BORING LOCATION	CONCRETE PAD NORTH OF TRESTLE		
DRILLING COMPANY	CASCADE	DRILLER	CASEY
DRILLING METHOD	GEOPROBE	DRILL BIT(S) SIZE:	1.5 INCH
ISOLATION CASING		FROM TO FT.	
BLANK CASING		FROM TO FT.	
PERFORATED CASING		FROM TO FT.	
SIZE AND TYPE OF FILTER PACK		FROM TO FT.	
SEAL		FROM TO FT.	
GROUT	BENTONITE CHIPS	FROM 0.0 TO 9.0 FT.	

Boring/Well Name	B23
Project Name	THERMAFIBER
Project Number	026130.00
ELEVATION AND DATUM	
TOTAL DEPTH	9.0
DATE STARTED	10/30/2002
DATE COMPLETED	10/30/2002
INITIAL WATER DEPTH (FT)	5
LOGGED BY	DKM
SAMPLING METHODS	SPLIT SPOON
WELL COMPLETION	☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	RECOVERY (FEET)	PENETRATION RESIST (BLOWS/6 IN.)	DEPTH (FEET)	SAMPLE NO.	OVA
S	3.0			B23-08-2	0
S	3.0		5	B23-2.5-5	0
S	3.0				
			10		
			15		
			20		
			25		
			30		

WELL NOT CONSTRUCTED



USCS LOG: GW, GW, GW/GM, SM, SP, ML/CL, SP, SM

SAMPLE DESCRIPTION AND DRILLING REMARKS

Concrete surface

Well-graded GRAVEL

Gravel and sand base rock

Well-graded GRAVEL with sand

Dark gray to black, angular gravel (60%) with sand and minor silt, metallic appearance on some fragments (slag?).

Well-graded GRAVEL with silt and sand

Orange, moist, angular gravel (60–65%) with sand and 5–10% silt.

Poorly graded SAND

Gray, moist, poorly graded medium to fine sand with up to 5% silt.

Silty SAND

Brown/gray, moist, layered silty fine sand and sandy silt.

Clayey SILT

Gray, wet, clayey silt, woody material 5.3–5.5 feet.

Poorly graded SAND

Gray, poorly graded medium sand with up to 5% silt in small pods, wet.

Silty SAND

Gray, wet, layered sandy silt and silty sand.

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Boring Log MW1R

Arsenic Using An XRF (ppm)	Sample No.	Moisture Content (%)	Dry Density (pcf)	OVM (ppm)	Penetration Resistance (blows / 6 in.)	Depth (feet)	Sample	USCS	Symbol	DESCRIPTION	Elev. (feet)	Well or Piezometer Completion
						0				4 inch asphalt.		
								GP		Sandy GRAVEL (GP), dark gray, coarse grained, some silt, rounded, medium dense, moist (Fill).		
14 150 282					9 11 16	2				Becomes brown, piece of slag, piece of brick.		
17					6 0 0	4		MH		Clayey SILT (MH), gray/dark gray, some charcoal and marsh grass, very soft, wet (Fill).		
53					0 0 0	6		SM		Silty SAND (SM), dark gray to black, angular, fine gravel, loose, saturated, more silt at 9.2 ft bgs (Fill).		
						8		MH		Clayey SILT (MH), with marsh grass (Tideflat).		
						10				Boring terminated at 9.5 ft bgs. Groundwater encountered at 7.5 ft bgs during drilling		
						12						
						14						
						16						
						18						

Location: See Site Plan
Surface Elevation:
Logged By: PJM

Drill Rig: HSA
Equipment/Hammer: SPT/140
Date Completed: 12-12-06

Taylor Way Property
Supplemental Remedial Investigation
Tacoma, Washington

CDM Smith

Boring Log MW1R
Project No: 19921.106749

Figure: F23
1 of 1

LOG OF BORING WITH WELL_PAM 19921-106749 TAYLOR WAY PROPERTY.GPJ GINT STD US LAB.GDT 3/4/15 REV.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB2**

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711707 E1174083 (NAD83)
Elevation (Ft.): 16.0 (MLLW)
Date Completed: 07/20/12
Weather: Rain 60F
Hammer Type: Direct push

Ground Surface: Asphalt pavement
Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	1-2	0	12	<13	0-5	24	0930	0-0.3' Asphalt concrete
		1.5	<7	<12				0.3-2' Moist, mot gry, gravelly, SAND, w/some silt, trace brick
		2	<9	<12				soft clayey silty in shoe
B	5-6	5	34	<12	5-10	40	0930	5-6' Sat, gry, F-M SAND
C	6-7	6.5	13	<11			0930	6-7.3' Sat, gry, silty, F SAND, w/ F sandy silt interbeds, scattered organics
D	7.5-8.5	8	<8	22			0930	7.3-8.5' Wet, bwn-gry, organic, SILT, w/fiberous organics
		9	<7	<11				
					10-12	6		10-11' Sat, gry, F-M SAND, poor sample

LABORATORY SAMPLES:

Soil:
AKM-S-NB2-A-072012
AKM-S-NB2-B-072012
AKM-S-NB2-C-072012
AKM-S-NB2-D-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

Depth (ft.)	Description
0	-Asphalt concrete
	Moist, mottled gray, gravelly, SAND with some silt, trace brick
5	Saturated, gray, Fine to medium SAND grading to silty fine SAND with silt interbeds
7.3	Wet, brown-gray, organic, SILT with fiberous organics
8.5	Saturated, gray, Fine to Medium SAND
12	(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Environmental Consultants

BORING - DESCRIPTION OF SAMPLES & DATA

NB3

Field Rep: DG Cooper	Location: N711698 E1174162 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Coudy 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	14	25	0-5	36	1215	0-1' Damp, mot bwn, silty, SAND, w/concrete, gravel
B	1-3	1.5	<8	<14			1215	1-3' Moist, gry, F-M SAND, w/some gravel, scattered organics
		2	<8	<13				
C	5-6	5	<8	<13	5-10	36	1215	5-5.5' As above
D	6-8	6	21	<12			1215	5.5-6' Sat gry, F SAND
		7	9	<9			1215	6-6.5' Wet, gry-blk, SILT
								6.5-7' Sat, gry, F SAND
								7-7.5' Wet, blk, fiberous organics, grading to silt
								7.5-8' Wet, gry, SILT
E	10-12	11	<8	<12	10-12	24	1215	10-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB3-A-071812
AKM-S-NB3-B-071812
AKM-S-NB3-C-071812
AKM-S-NB3-D-071812
AKM-S-NB3-E-071812

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Damp, mottled brown, silty, SAND, with concrete

Moist to saturated, gray, Fine to Medium SAND
with some gravel, scattered organics
grading to Fine SAND

6 -Silt

7

Wet, black, fiberous organics, grading to
Wet, gray, SILT

8

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an
interpretation based on samples,
drill action, and interpolation.
Variations between what is shown
and actual conditions should
be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB4

Field Rep: DG Cooper	Location: N711665 E1174153 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	49	40	0-5	30	1100	0-0.5' Damp, bwn, silty, SAND
B	1-3	2	<9	<14			1100	0.5-3' Moist, gry, F-M SAND, w/scattered gravel
C	5-6	5	<8	<14	5-10	36	1100	5-6' Wet, gry, F-M SAND
D	6-8	6.5	<9	<12			1100	6-8' Wet, gry, SILT, w/silty F Sand interbeds, black organics, wood
		7	8	<12				
E	10-12	11	44	<20	10-12	24	1100	10-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB4-A-071812
AKM-S-NB4-B-071812
AKM-S-NB4-C-071812
AKM-S-NB4-D-071812
AKM-S-NB4-E-071812

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty, Fine Sand

Moist to wet, gray Fine to Medium SAND

6

Wet, gray, SILT, with silty Fine Sand interbeds scattered black organics, wood

8

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Environmental Consultants

BORING - DESCRIPTION OF SAMPLES & DATA **NB5**

Field Rep: DG Cooper	Location: N711606 E1174200 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-0.8	0	59	20	0-5	30	1620	0-0.8' Damp, bwn, silty, SAND, w/thin roots
B	1.5-2.5	2.5	<9	<15			1620	0.8-1.5' Wet, dk bwn, organic, silty, SAND, w/bark, wood chip
								1.5-2.5' Moist, gry, gravelly, SAND
C	5-5.6	5	17	<10	5-10	36	1620	5-5.3' Wet. Bwn, F-M SAND
D	6-8	5.5	17	22			1620	5.3-5.6' Wet, gry-blk, SILT, w/blk, F Sand layer
		8	17	<12				5.6-8' Sat, gry, F-M SAND
E	10-11	10	14	<14	10-12	12	1620	10-11' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB5-A-071812
AKM-S-NB5-B-071812
AKM-S-NB5-C-071812
AKM-S-NB5-D-071812
AKM-S-NB5-E-071812

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)
0 **SUMMARY LOG**
-Silty Fine Sand
-Organic silty, SAND , with bark, wood chip
Moist, gray, gravelly, SAND
Moist to wet, gray Fine to Medium SAND
5.3
5.6 Wet, gray-black, SILT
Saturated, gray, Fine to Medium SAND
12
(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB6**

Field Rep: DG Cooper	Location: N711586 E1174264 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	19	46	0-5	40	0845	0-0.5' Damp, bwn, silty, SAND, w/thin roots
B	1-3	2.5	<8	<12			0845	0.5-1' Wet, dk bwn, organic, silty, SAND, w/some gravel, bark, wood chip
								1-3' Moist, bwn, silty, SAND, w/some gravel
C	5	5	31	18	5-10	24	0845	5-5.1' As above
D	5.5-6.5	6	34	<8			0845	5.1-6.5' Sat, gry, F-M SAND
		6.5	8	<12				6.5-7' Sat, Wood
E	10-11	10	16	42	10-12	24	0845	10-11' Wet, bwn, SILT, w/trace SAND
		11	<9	14				11-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB6-A-071912
AKM-S-NB6-B-071912
AKM-S-NB6-C-071912
AKM-S-NB6-D-071912
AKM-S-NB6-E-071912

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty Fine Sand
-Organic silty, SAND , with bark, wood chip
Moist, brown, silty, SAND

5

7 -Wood
Saturated, gray, Fine to Medium SAND

10
Wet, brown, SILT
11
Saturated, gray, Fine SAND
12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB7**

Field Rep: DG Cooper	Location: N711638 E1174235 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	16	50	0-5	40	1700	0-1' Damp, bwn, silty, SAND, w/thin roots, bark @ 1'
B	1-2						1700	1-2' Moist, mot gry-bwn, gravelly, silty, SAND, w/scattered wood
C	2-3.5	2.5	49	110			1700	2-3.5' Moist, mot gry, F-M SAND, w/silt clasts
D	5-7	5	34	<15	5-10	20	1700	5-7 Sat, gry, F-M SAND
		6.5	<8	14				
E	10-11	10	20	<14	10-12	12	1700	10-11' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB7-A-071812
AKM-S-NB7-B-071812
AKM-S-NB7-C-071812
AKM-S-NB7-D-071812
AKM-S-NB7-E-071812

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty Sand, w/bark

Moist, mottled gray-brown, gravelly, silty, SAND with scattered wood

2

Moist to saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB8

Field Rep: DG Cooper	Location: N711581 E1174334 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Gravel Road
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	22	27	0-5	40	0915	0-2' Moist, mot bwn-gry, gravelly, SAND, w/some silt
B	1-2	1.8	88	96			0915	Greenish colored zone @ 1.8'
C	2-3.5	2	101	109			0915	2-3.5' Wet, bwn, silty, F SAND
D	5-5.5	5	11	<12	5-10	30	0915	5-5.5' Wet, bwn/blk, clayey, SILT, w/trace organics
E	5.5-7.5	7	11	<12			0915	5.5-7.5' Sat, gry, F-M SAND
F	10-11	10	<9	<18	10-12	8	0915	10-11' Sat, gry, F-M SAND

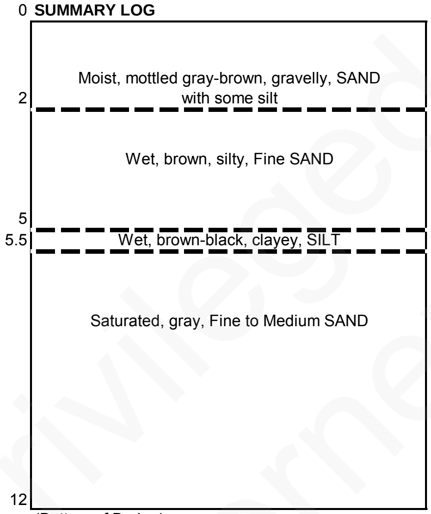
LABORATORY SAMPLES: **Soil:**
AKM-S-NB8-A-071912
AKM-S-NB8-B-071912
AKM-S-NB8-C-071912
AKM-S-NB8-D-071912
AKM-S-NB8-E-071912
AKM-S-NB8-F-071912

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)
0 **SUMMARY LOG**



(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB9

Field Rep: DG Cooper	Location: N711628 E1174172 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.0 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 65F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	27	73	0-5	36	1250	0-1' Damp, bwn, silty, SAND, w/thin roots
B	1-2	1.5	30	<10			1250	1-2' Wet, mot bwn, organic, silty, SAND, w/some gravel, bark, woodchip
C	2-3	2	13	<13			1250	2-3' Wet, gry, F-M SAND
D	6-7	5	<8	<13	5-10	30	1250	5-6' Moist, blk, asphalt concrete, w/crushed conrete
		6.5	14	<13				6-6.5' Wet, gry,-blk, SILT, w/trace organics
								6.5-7' Sat, gry, F-M SAND
E	10-12	10.5	19	<12	10-12	24	1250	10-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB9-A-071812
AKM-S-NB9-B-071812
AKM-S-NB9-C-071812
AKM-S-NB9-D-071812
AKM-S-NB9-E-071812

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty Sand
Wet, mottled brown, organic, silty, SAND with some gravel, wood chip, bark

2

Wet, gray, Fine to Medium SAND

5 -crushed asphalt, concrete

6

Wet, gray-black, SILT, with trace organics

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB10**

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711637 E1174113 (NAD83)
Elevation (Ft.): 20.5 (MLLW)
Date Completed: 07/18/12
Weather: Cloudy 60F
Hammer Type: Direct push

Ground Surface: Grass
Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	31	24	0-5	40	1015	0-0.5' Damp, bwn, silty, SAND, w/trace gravel, thin roots
B	2-4	3	9	<13			1015	0.5-1' As above with bark, wood chips
								1-4' Moist, mot gry-bwn, F-M SAND, w/some gravel, silty sand layers
C	5-5.5	5.2	<9	16	5-10	50	1015	5-5.5' interlayered asphalt concrete and silty sand
CC	5.5-5.6	5.5	2682	9184			1015	5.5-5.6' Black F SAND, w/thin small organic fibers
D	5.6-6	5.7	52	<12			1015	5.6-9' Wet-sat, gray, silty, F SAND, interbedded w/silt, black organics
E	6-8	6	19	<12			1015	9-10' Wet, gry, clayey, SILT
F	9-10	7	<7	<5			1015	
G	10-12	8.5	<7	<11	10-12	24	1015	10-12' Sat, gry, F-M SAND
		11	17	<11				

LABORATORY SAMPLES:

Soil:
AKM-S-NB10-A-071812
AKM-S-NB10-B-071812
AKM-S-NB10-C-071812
AKM-S-NB10-D-071812
AKM-S-NB10-E-071812
AKM-S-NB10-F-071812
AKM-S-NB10-G-071812

Notes: * XRF values were obtained in the field using an INNOVX Model 4000.
* XRF values were obtained in the field using an INNOV-X Model 4000.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty Sand, w/ wood chip

Moist, mottled gray-brown, Fine to Medium SAND
with some gravel, silty sand layers

5 - asphalt and concrete

5.5-5.6 Thin black, organic, Fine SAND layer at base of fill

Wet to saturated, silty Fine SAND
with Silt interbeds, black organics

9 Wet, gray, clayey, SILT

10 Saturated, gray, Fine to Medium SAND

12 (Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB11

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711628 E1174077 (NAD83)
Elevation (Ft.): 21.4 (MLLW)
Date Completed: 07/17/12
Weather: Cloudy 75F
Hammer Type: Direct push

Ground Surface: Berm
Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	57	59	0-5	24	1530	0-2' Moist, mot gry-bwn, gravelly, silty, SAND, w/scattered bark
B	1-2						1530	
C	5-6.5	5	16	36	5-10	36	1530	5-6.5' Wet, gry, silty, SAND, w/minor gravel, scattered wood
CC	6.5-7	6.5	3,009	10,474			1530	6.5-7' Wet, dk bwn, fibrous ORGANICS, grass-like fibers w/yellow trace inside
D	7-8	7	33	<12			1530	black sand matrix with slight sparkle
								7-8' Wet, gry, F SAND, w/black stringers
E	10-11	10	9	<11	10-15	40	1530	10-11' Wet, gry-blk, SILT, w/trace organics
F	11-13	13	82	<10			1530	11-14' Sat, gry, F-M SAND, w/organic interbeds, silt clasts
								14-15' Wet, mot bwn, organic, SILT

LABORATORY SAMPLES:

Soil:
AKM-S-NB11-A-071712
AKM-S-NB11-B-071712
AKM-S-NB11-C-071712
AKM-S-NB11-CC-071712
AKM-S-NB11-D-071712
AKM-S-NB11-E-071712
AKM-S-NB11-F-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

SUMMARY LOG

Depth(ft.)	
0 – 6.5	Moist to wet, mottled gray-brown, silty, SAND with gravel, scattered wood
6.5 – 7	Wet dark brown, fibrous ORGANICS
7 – 10	Wet, gray, Fine SAND
10 – 11	Wet, gray-black SILT
11 – 14	Saturated, gray, Fine to Medium SAND with organic interbeds, silt clasts
14 – 15	Wet, mottled brown, organic, SILT

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB12

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper	Location: N711613 E1173997 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 16.0 (MLLW)	Ground Surface: Asphalt pavement
Driller: Keith	Date Completed: 07/20/12	
Drill Type: Geoprobe 7720DT	Weather: Rain 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0.3-1.3	0	<10	16	0-5	30	1015	0-0.3' Asphalt concrete
B	1.3-2.5	1	18	17			1015	0.3-1.3' Moist, mot bwn, gravelly, SAND, w/trace silt, red brick
		2	10	<13				1.3-2.5' Moist, tan, sandy, GRAVEL, w/trace silt
C	5-6	5.5	<7	<12	5-10	30	1015	5-7.5' Wet, gry, SILT, w/black organic layer @ 6.5'
D	7-8.5	6.5	13	27			1015	grading F Sandy at base
		7.5	8	<10				
					10-12	No recovery		

LABORATORY SAMPLES:

Soil:
AKM-S-NB12-A-072012
AKM-S-NB12-B-072012
AKM-S-NB12-C-072012
AKM-S-NB12-D-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**
-Asphalt concrete
Moist, mottled brown, gravelly, SAND with trace silt, red brick
1.3
Moist, tan, sandy, GRAVEL with trace silt
5
Wet, gray, SILT with black organic layer @ 6' grading fine sandy
7.5
no recovery
12
(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB13

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper	Location: N711590 E1174041 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 21.1 (MLLW)	Ground Surface: Berm
Driller: Keith	Date Completed: 07/17/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	68	67	0-5	24	1445	0-1' Damp, bwn, silty, SAND, w/some gravel, scattered bark
B	1-2	1.5	<8	14			1445	1-1.5' Damp, blk, asphalt, concrete rubble
								1.5-2' Wet, mot bwn, SILT, w/scattered gravel
C	5-6.2	5	9	<12	5-10	36	1445	5-6.2' Wet, mot bwn, SILT, scattered organics, crushed rock
CC	6.5	6	628	731			1445	6.2-6.8 Wet, dk bwn, fibrous ORGANICS, 2mm root-like, fuzzy organic matrix
D	7-8	6.5	705	218			1445	decomposed asphalt atop organics
		8	62	<11				6.8-8' Wet, gry, SILT, root casts with yellow trace in upper 2"
E	10-12	11	57	<12	10-15	60	1445	10-12' Wet, gry, SILT, w/trace organics, yellow trace in cast
F	12-14	12	86	12			1445	12-14' Wet, blk, ORGANICS, interbedded with F-M Sand, silt clasts
		14	15	<12				14-15' Sat, gry, F SAND, w/trace organics

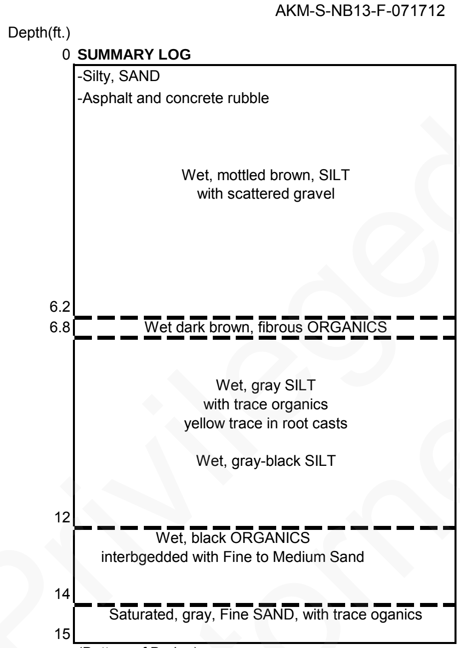
LABORATORY SAMPLES:

Soil:
AKM-S-NB13-A-071712
AKM-S-NB13-B-071712
AKM-S-NB13-C-071712
AKM-S-NB13-CC-071712
AKM-S-NB13-D-071712
AKM-S-NB13-E-071712
AKM-S-NB13-F-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated



(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB14

Field Rep: DG Cooper	Location: N711598 E1174102 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	58	65	0-5	36	0945	0-0.5' Damp, bwn, silty, SAND, w/thin roots
B	2-4	2	14	<14			0945	0.5-1' Damp, dk bwn, WOOD CHIP, BARK in silty sand matrix
								1-3' Moist, mot gry-bwn, gravelly, silty, SAND, interbedded w/F-M Sand
C	5-6	5	314	82	5-10	36	0945	5-8' Wet, gry-blk, SILT, w/scattered organics, thin F Sand interbeds
D	7-8	6	<9	18			0945	reduced-black stained, 6mm blk, F Sand layer @ 5'
		6.5	151	14				
E	10-11	10	14	<13	10-12	12	0945	10-11' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB14-A-071812
AKM-S-NB14-B-071812
AKM-S-NB14-C-071812
AKM-S-NB14-D-071812
AKM-S-NB14-E-071812

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty,SAND
-Wood Chip, Bark

Moist, mottled gray - brown, gravelly, silty, SAND interbedded with Fine to Medium SAND

5

Wet, gray-black, SILT with sand interbeds and scattered organics 6mm black Fine Sand layer @ 5'

10

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB15

Field Rep: DG Cooper	Location: N711583 E1174060 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.4 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/17/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	17	37	0-5	48	1630	0-0.5' Damp, bwn, silty, SAND
B	2-4	2.5	12	11			1630	0.5-4' Moist, mot gry-bwn, gravelly, silty, SAND, w/bark @ 0.5-1'
C	5-6				5-10	60	1630	5-6' As above
CC	6-6.5	6.5	4,653	2,077			1630	6-6.5' Wet, blk, organic, SAND, w/grassy fibers, black sand matrix, yellow trace
D	7-9	8	3,148	29			1630	6.5-10' Wet, gry, SILT, w/trace organics, root casts
								Yellow trace in root casts to 9'
E	11-12	10	117	<12	10-12	24	1630	10-10.5' Wet, gry, SILT
		12	81	<12				10.5-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB15-A-071712
AKM-S-NB15-B-071712
AKM-S-NB15-C-071712
AKM-S-NB15-CC-071712
AKM-S-NB15-D-071712
AKM-S-NB15-E-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty,SAND
-Bark

Moist, mottled gray - brown, gravelly, silty, SAND

6
6.5 Wet, black organic, SAND, black sand matrix

Wet, gray, SILT
with trace organics, root casts
yellow trace in root casts to 9'

10.5
Saturated, gray, Fine to Medium SAND
12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB16

Field Rep: DG Cooper	Location: N711560 E1174104 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	13	24	0-5	36	1415	0-1' Damp bwn, silty, SAND, w/scattered gravel, thin roots
B	2-3	2	68	25			1415	1-1.5' Moist, blk-bwn, organic silty, SAND, w/trace gravel, bark, wood chip
								1.5-2' Damp, blk, asphalt concrete debris
								2-3' Moist, gry, F sandy, SILT, w/some gravel
C	5-5.3	5	30	79	5-10	40	1415	5-5.3' Wet, gry, F-M SAND
CC	5.3-5.5	5.4	1,800	2,588			1415	5.3-5.5' Wet, gry-blk, F SAND, w/fine organic fibers, 12mm black, 12mm grey layers
D	5.5-6.5	6	433	<12			1415	5.5-6.5' Wet, bwn, SILT, w/some organics, yellow trace in root casts
E	7-8.5	7	97	16			1415	6.5-7' Sat, gry, silty, SAND
		8	1211	<12				7-8.5' Wet, gry-blk, SILT, w/black organics
F	10-12	8.2	31	<13	10-12	24	1415	10-12' Sat, gry, F-M SAND
		10	40	<13				
		11	23	<11				

LABORATORY SAMPLES:

Soil:
AKM-S-NB16-A-071812
AKM-S-NB16-B-071812
AKM-S-NB16-C-071812
AKM-S-NB16-CC-071812
AKM-S-NB16-D-071812
AKM-S-NB16-E-071812
AKM-S-NB16-F-071812

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

Depth (ft.)	Summary Log
0	-Silty,SAND -Bark
2	-Asphalt, concrete debris Moist, gray, fine sandy, SILT with some gravel
3	Wet, gray, Fone to Medium SAND
5.5	Wet, black, Fine SAND, with fine organic fibers Wet, brown, SILT with some organics, yellow trace in root casts
6.5	-silty SAND Wet, gray - black, SILT
8.5	Saturated, gray, Fine to Medium SAND
12	(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB17**

Field Rep: DG Cooper	Location: N711554 E1174061 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.0 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	17	29	0-5	48	0900	0-1' Damp, bwn, silty, SAND
B	2-4	2	24	27			0900	1-4' Moist, mot gry, gravelly, silty, SAND, w/scattered wood chip
C	5-6	5	22	<13	5-10	50	0900	5-6' Moist, mot gry, silty, F SAND
CC	6	6	1,348	790			0900	6' 12mm layer of blk, silty F SAND
D	6-8	7	706	37			0900	6-9.5' Wet, bwn-gry, SILT, w/ scattered organics, yellow trace in root casts
		9	264	<14				
E	10-12	12	316	<12	10-12	24	0900	10-12' Sat, gry, F-M SAND
								yellow trace around silt clast @ 11.5'

LABORATORY SAMPLES:

Soil:
AKM-S-NB17-A-071812
AKM-S-NB17-B-071812
AKM-S-NB17-C-071812
AKM-S-NB17-CC-071812
AKM-S-NB17-D-071812
AKM-S-NB17-E-071812

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty,SAND
-Wood chip

Moist, mottled gray, gravelly, silty, SAND
with scattered wood chip

6 -12mm thick black, silty Fine Sand

Wet, brown to gray, SILT
with scattered organics 6-7.5'
yellow trace in root casts

10

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Arkema North Boundary

NB18

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711543 E1174142 (NAD83)
Elevation (Ft.): 18.5 (MLLW)
Date Completed: 07/18/12
Weather: Cloudy 60F
Hammer Type: Direct push

Ground Surface: Grass
Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-0.5	0	129	20	0-5	36	1500	0-0.5' Damp, bwn, silty, SAND
B	0.5-1.5	1.5	57	46			1500	0.5-1.5' Wet, mot bwn, organic, silty, SAND, w/wood chip, slag
C	1.5-3	2	28	25			1500	1.5-3' Wet, gry, gravelly, SAND, w/some silt
D	5-5.5	5	135	20	5-10	24	1500	5-5.3' Wet, gry-blk, silty, F SAND, w/black charred wood
E	5.5-7	6.5	13	<11			1500	5.3-7' Sat, gry, F-M SAND
F	10-12	10	<8	<13	10-12	24	1500	10-12' Sat, gry, F-M SAND
		11	17	<12				

LABORATORY SAMPLES:

Soil:
AKM-S-NB18-A-071812
AKM-S-NB18-B-071812
AKM-S-NB18-C-071812
AKM-S-NB18-D-071812
AKM-S-NB18-E-071812
AKM-S-NB18-F-071812

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty,SAND
-Wood chip

Moist, mottled gray, gravelly, SAND with some silt

5 -gray-black silty Fine SAND with charred wood

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB19

Field Rep: DG Cooper	Location: N711512 E1174181 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	26	41	0-5	30	1130	0-0.5' Damp, bwn, silty, SAND, w/thin roots
B	1-2	1	27	14			1130	0.5-1' Wet, mot bwn, mix of gravelly, SAND and Wood Chip/Bark
		2	<9	14				1-2' Moist, bwn, gravelly, SAND, w/some silt, scattered bark
								2-2.5' Wet, bwn, SILT, plastic
C	5-5.5	5	20	<11	5-10	12	1130	5-5.5' Wet, gry, SILT
D	5.5-6	6	12	<11			1130	5.5-6' Sat, gry, F SAND
E	10-11	10	64	51	10-12	10	1130	10-11' Wet, gry, clayey, SILT, poor sample recovery, carry-down

LABORATORY SAMPLES:

Soil:
AKM-S-NB19-A-071912
AKM-S-NB19-B-071912
AKM-S-NB19-C-071912
AKM-S-NB19-D-071912
AKM-S-NB19-E-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**
-Silty,SAND
Moist, mottled gray, gravelly, SAND with some silt, wood chip, bark
2
Wet gray to brown SILT
6 Saturated, gray, Fine SAND
10 Wet, gray, Clayey, SILT
12
(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB20**

Field Rep: DG Cooper	Location: N711567 E1174185 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.0 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/18/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	43	16	0-5	40	1545	0-0.5' Damp, bwn, silty, SAND, w/thin roots
B	2-3.5	0.5	34	45			1545	0.5-1' Wet, mot bwn, organic, silty, SAND, w/wood chip, bark some sand
		1.5	<8	<13				1-3.5' Moist, mot gry, gravelly, SAND, w/minor silt, asphalt @ 1.5'
		3	20	18				
C	5-6	5	39	13	5-10	30	1545	5-6' Wet, gry, SILT, w/trace organics
D	6-7.5	7	<8	<12			1545	6-7.5' Sat, gry, F-M SAND
E	10-12	10.5	11	<12	10-12	24	1545	10-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB20-A-071812
AKM-S-NB20-B-071812
AKM-S-NB20-C-071812
AKM-S-NB20-D-071812
AKM-S-NB20-E-071812

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty,SAND
-Wood chip

Moist, mottled gray, gravelly, SAND with minor silt

5

Wet, gray, SILT

6

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB21**

Field Rep: DG Cooper	Location: N711541 E1174230 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.0 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	46	56	0-5	40	1045	0-0.5' Damp, bwn, silty, SAND, w/trace gravel, 2' layer of bark at base
B	1-2.5	2	<8	<13			1045	1-2.5' Moist, bwn, gravelly, SAND, w/some silt, scattered wood
		3	23	13				2.5-3' Wet, gry, silty, F SAND
C	5-6	5	30	27	5-10	36	1045	5-6' Wet, gry, clayey, SILT, soft
D	6-7.5	7	8	<10			1045	6-7.5' Sat, gry, F-M SAND
								7.5-8' Wet, bwn, organic, SILT, w/fibrous organics
E	10-12	10	<7	<12	10-12	12	1045	10-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB21-A-071912
AKM-S-NB21-B-071912
AKM-S-NB21-C-071912
AKM-S-NB21-D-071912
AKM-S-NB21-E-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

Depth (ft.)	Description
0	-Silty,SAND -Wood chip Moist, mottled gray, gravelly, SAND with some silt, scattered wood
5 – 6	Wet, gray, clayey, SILT
6 – 7.5	Saturated, gray, Fine to Medium SAND
7.5 – 12	Wet, brown, organic, SILT Saturated, gray, Fine to Medium SAND

12 (Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB22

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711492 E1174255 (NAD83)
Elevation (Ft.): 17.9 (MLLW)
Date Completed: 07/19/12
Weather: Cloudy 60F
Hammer Type: Direct push

Ground Surface: Road gravel
Sampler Type: 2" Macro w/ acrylic liner

Sample No.	Sample Depth (Ft.)	XRF* Depth (Ft.)	XRF* (ppm) As	XRF* (ppm) Pb	Spl Depth (Ft.) From - To	Sample Recovery (inches)	Time	Sample Description
A	0-1	0	<12	32	0-5	36	1030	0-2' Damp-moist, bwn, sandy, GRAVEL, w/some silt
B	2-3	2	76	48			1030	2-3' Wet, mot bwn, F sandy, SILT, w/scattered gravel, wood chip
C	5-6	5	62	19	5-10	36	1030	5-6' Wet, green-gry, sandy, GRAVEL, w/odor
D	6-8	6.5	<8	<13			1030	6-8' Sat, gry, F-M SAND, w/fibrous organics/silt in shoe
E	11-12	10	<7	<12	10-12	24	1030	10-11' Sat, gry, F-M SAND
		11.5	<7	<11				11-12' Wet, bwn, SILT,w/some organics

LABORATORY SAMPLES:

Soil:
AKM-S-NB22-A-071912
AKM-S-NB22-B-071912
AKM-S-NB22-C-071912
AKM-S-NB22-D-071912
AKM-S-NB22-E-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Damp to moist, brown, sandy, GRAVEL with some silt

2

Wet, mottled brown, Fine sandy, SILT with scattered gravel, wood chip

5

Wet, green-gray, sandy, GRAVEL

6

Saturated, gray, Fine to Medium SAND

11

Wet, brown, SILT with some organics

12

(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB23**

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711408 E1174174 (NAD83)
Elevation (Ft.): 16.7 (MLLW)
Date Completed: 07/17/12
Weather: Cloudy 70F
Hammer Type: Direct push

Ground Surface: Road gravel
Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	17	32	0-5	40	1315	0-0.5' Damp, bwn, silty, SAND
B	2-3.5	2.5	11	<13			1315	0.5-3.5' Moist, mot gry, sandy, GRAVEL, w/minor silt
C	5-6	5	<8	17	5-10	30	1315	5-6' Sat, gry, F-M SAND, grading finer
D	6-7	6.5	<6	<10			1315	6-7' Wet, gry-blk, SILT, w/organics
								7-7.5' Wet, bwn, PEAT
E	10-11.5	10.5	<6	<10	10-12	18	1315	10-11.5' Wet, gry-bwn, organic, SILT, w/fibrous organics

LABORATORY SAMPLES:

Soil:
AKM-S-NB23-A-071712
AKM-S-NB23-B-071712
AKM-S-NB23-C-071712
AKM-S-NB23-D-071712
AKM-S-NB23-E-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Silty, SAND

Moist, mottled gray, sandy, GRAVEL
with minor silt

3.5

Saturated, gray, Fine to Medium SAND

6

Wet, gray-black, SILT with organics

7.5 -PEAT

Wet, gray-brown, organic, SILT
with fibrous orgaincs

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB24

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711485 E1174134 (NAD83)
Elevation (Ft.): 17.4 (MLLW)
Date Completed: 07/17/12
Weather: Cloudy 75F
Hammer Type: Direct push

Ground Surface: Grass
Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-0.5	0	20	22	0-5	40	1145	0-0.5' Damp, bwn, silty, SAND, w/roots
B	2-3.5	2	57	22			1145	0.5-1' Wood chip / Bark
								1-3' Moist, mot bwn, gravelly, silty, SAND, w/scattered crushed rock
								3-3.5' Wet, mot gry-wht, SILT, with white deposit @ contact w/upper fill
C	5-7	5	<7	<12	5-10	40	1145	5-7' Wet, gry, SILT, w/black organics @ 6.5-7'
D	7-8.5	7	<8	<12			1145	7-8.5' Sat, gry, F-M SAND
E	10-12	12	<6	<10	10-12	24	1145	10-12' Sat, gry, F-M SAND, trace organics @ 11'

LABORATORY SAMPLES:

Soil:
AKM-S-NB24-A-071712
AKM-S-NB24-B-071712
AKM-S-NB24-C-071712
AKM-S-NB24-D-071712
AKM-S-NB24-E-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**
-Silty, SAND
-Wood Chip/bark

Moist, mottled brown, gravelly, silty, SAND
with scattered crushed rock

3
-white deposit

Wet, gray, SILT
with scattered organics

7

Saturated, gray, Fine to Medium SAND

-trace organics

12
(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB25

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper	Location: N711513 E1174066 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/17/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	18	20	0-5	40	1100	0-1' Damp, bwn, silty, SAND, w/roots trace gravel
B	2-3.5	3	<8	<13			1100	1-3.5' Wet, mot bwn, gravelly, silty, SAND, w/crushed rock, wood, asphalt
C	5-6	5	1281	<13	5-10	40	1100	5-7' Wet, gry, SILT, w/yellow trace in root casts @ 5-6'
D	6-7.5	7.5	125	<11			1100	7-8.5' Sat, gry, F-M SAND
E	10-12	10	57**	58**	10-12	24	1100	10-12' Sat, gry, F-M SAND
		12	116**	<13				

LABORATORY SAMPLES:

Soil:
AKM-S-NB25-A-071712
AKM-S-NB25-B-071712
AKM-S-NB25-C-071712
AKM-S-NB25-D-071712
AKM-S-NB25-E-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.
** Possible carry-down due to rind in core barrel.
Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty, SAND

Moist, mottled brown, gravelly, silty, SAND
with scattered crushed rock, wood, asphalt

5

Wet, gray, SILT
with yellow trace in root casts

7

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB26

Field Rep: DG Cooper	Location: N711545 E1174021 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 19.4 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/17/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	13	31	0-5	40	1100	0-0.8' Damp, bwn, silty, SAND, w/roots, concrete
B	2-3.5	3	<7	<12			1100	0.8-2' Moist, mot bwn, silty, SAND, w/some gravel, wood chip, bark
								2-3.5' Wet, gry, gravelly, silty, SAND
C	5-6				5-10	48	1100	5-6' Wet, gry, SILT
CC	6.5	6.5	2,717	13			1100	6-6.2' Wet, dk bwn, fibrous, ORGANICS
D	8-9	8	797	23				6.2-7' Wet, gry, sandy, GRAVEL, bottom 3" mixed with organics, yellow trace
								7-9' Wet, bwn, SILT, w/scattered organics, grading clayey
E	10-11	10	1234	19	10-12	12	1100	10-11' Wet, gry, SILT, w/root casts, marsh grass, yellow trace 10-10.5'
		10	2603	16				

LABORATORY SAMPLES:

Soil:
AKM-S-NB26-A-071712
AKM-S-NB26-B-071712
AKM-S-NB26-C-071712
AKM-S-NB26-CC-071712
AKM-S-NB26-D-071712
AKM-S-NB26-E-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty, SAND, with roots

Moist, mottled brown to gray, gravelly, silty, SAND
with scattered crushed rock, wood, asphalt

5

Wet, gray, SILT

6

Wet, dark brown fibrous ORGANICS
7 with yellow trace, sandy gravel mixed in

Wet, brown to gray,SILT
with scattered organics, root casts

-Yellow trace

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Dalton, Olmsted & Fuglevand, Inc.
Environmental Consultants

BORING - DESCRIPTION OF SAMPLES & DATA

NB27

Field Rep: DG Cooper	Location: N711541 E1173953 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 16.8 (MLLW)	Ground Surface: Asphalt Pavement
Driller: Keith	Date Completed: 07/20/12	
Drill Type: Geoprobe 7720DT	Weather: Rain 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0.5-1.5	1	67	100	0-5	30	1130	0-0.3' Asphalt concrete
B	1.5-2.5	2	27	16			1130	0.3-1.5' Moist, mot bwn, gravelly, SAND, w/trace red brick, asphalt
								1.5-2.5' Moist, bwn, sandy, gravel, w/trace silt, fire brick
C	5-6	5	197	<12	5-10	48	1130	5-7' Wet, gry, clayey, SILT, w/trace fine organics
D	7-8	6.5	17	<11			1130	7-8' Wet, gry-blu, SILT, w/black organic interbeds
		8	<7	12				8-9' Wet, bwn, fibrous, PEAT
		9	<6	<10				
					10-12	0		
						no recovery		

LABORATORY SAMPLES:

Soil:
AKM-S-NB27-A-072012
AKM-S-NB27-B-072012
AKM-S-NB27-C-072012
AKM-S-NB27-D-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Asphalt concrete

Moist, mottled brown gravelly SAND or sandy, GRAVEL, with trace silt, brick

5

Wet, gray, clayey, SILT

Wet, gray-black SILT with organic interbeds

9 -Fibrous PEAT

no recovey

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB29**

Field Rep: DG Cooper	Location: N711508 E1173921 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 16.7 (MLLW)	Ground Surface: Asphalt Pavement
Driller: Keith	Date Completed: 07/20/12	
Drill Type: Geoprobe 7720DT	Weather: Rain 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0.5-1.5	1	10	<13	0-5	40	1215	0-0.3' Asphalt concrete
B	2-2.5	2	17	22			1215	0.3-2' Moist, mot bwn-blk, sandy, GRAVEL - recycled asphalt
C	2.5-3.5	2.5	49	<13			1215	2-2.5' Moist, tan-green, sandy, GRAVEL
		3	88	<12				2.5-3.5' Wet, gry-blk, SILT, w/trace black organics
D	5-6.5	5	30	<12	5-10	40	1215	5-6.5' Wet, gry, clayey, SILT, w/trace black organics
E	6.5-8	6.5	<7	12			1215	6.5-8' Wet, gry-blk, SILT, w/organic interbeds
		8.5	7	<11				8-8.5' Wet, bwn, fibrous PEAT
F	10-12	11	<7	<12	10-12	24	1215	10-12' Wet, gry, organic, SILT, w/fibrous organics, marsh grass

LABORATORY SAMPLES:

Soil:
AKM-S-NB29-A-072012
AKM-S-NB29-B-072012
AKM-S-NB29-C-072012
AKM-S-NB29-D-072012
AKM-S-NB29-E-072012
AKM-S-NB29-F-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

Depth (ft.)	
0	-Asphalt concrete Moist, mottled brown gravelly SAND or sandy, GRAVEL, with trace silt, brick
2.5	Wet, gray-black, SILT with trace organics
5	
8	-Fibrous PEAT Wet, gray, organic SILT, with fibrous organics, marsh grass
12	(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB30

Field Rep: DG Cooper	Location: N711470 E1173952 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.2 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	14	30	0-5	36	1445	0-0.5' Damp, bwn, silty, SAND, w/roots
B	2-3	1.5	42	25			1445	0.5-2.5' Moist, mot bwn, silty, SAND, w/some gravel, asphalt @ 2.5'
		2.5	<8	<13				2.5-3' Wet, gry-blk, F-M SAND, w/organic and silt interbeds
C	6-8	6.5	302	<13	5-10	48	1445	6-9' Sat, gry, F-M SAND, w/silt interbed @ 7'
D	8-10	9	29	<12			1445	9-10' Wet, gry, SILT, w/black organics 9.5-10'
E	10-12	12	<7	<11	10-12	24	1445	10-12' Sat, gry,SILT, w/scattered organics

LABORATORY SAMPLES:

Soil:
AKM-S-NB30-A-071612
AKM-S-NB30-B-071612
AKM-S-NB30-C-071612
AKM-S-NB30-D-071612
AKM-S-NB30-E-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty, SAND

Moist, mottled brown, silty, SAND
with some gravel

2.5

Wet to saturated, gray, Fint to Medium SAND
with organic and silt interbeds

9

Wet, gray, SILT
with scattered organics

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB31

Field Rep: DG Cooper	Location: N711510 E1173990 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/17/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 65F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	16	32	0-5	30	0950	Damp, bwn, silty, SAND, w/thin roots
B	1.5-2.5	1.5	11	<11			0950	0.5-1.5' Moist, mot bwn, gravelly, silty, SAND, w/asphalt
								1.5-2.5' Moist, gry, F-M SAND
CC	5.3	4.9	452	105	5-10	36	0950	5-5.3' Wet, bwn fibrous ORGANICS interbedded with fine sand
D	5.5-6	5	1,647	2,973			0950	5.3-5.4' Wet, gry, silty, F SAND, w/silver metallic flakes, yellow trace on organics
E	6-8	6	203	<11			0950	5.4-6' Wet, gry, SILT, w/yellow trace in root casts
		7	17	<12				6-7.5' Sat, gry, F-M SAND, w/some silt
								7.5-8' Wet, gry, SILT
F	10-11.5	11.5	<7	<12	10-12	18	0950	10-11.5' Wet, gry-blk, organic, SILT

LABORATORY SAMPLES:

Soil:
AKM-S-NB31-A-071712
AKM-S-NB31-B-071712
AKM-S-NB31-CC-071712
AKM-S-NB31-D-071712
AKM-S-NB31-E-071712
AKM-S-NB31-F-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**
-Silty, SAND

Moist, mottled brown, gravelly, silty, SAND
with scattered crushed rock, asphalt

5
-Wet, brown Fibrous ORGANICS, yellow trace
-metallic flakes in underlying Fine SAND interbed
Wet, gray, SILT
with yellow trace in root casts
6
Saturated, gray, Fine to Medium SAND
7.5
Wet, gray, Silt

12 -organic SILT
(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB32

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper
Drilling Co.: Cascade
Driller: Keith
Drill Type: Geoprobe 7720DT
Size/Type Casing: 2" Rod

Location: N711470 E1174027 (NAD83)
Elevation (Ft.): 18.4 (MLLW)
Date Completed: 07/17/12
Weather: Cloudy 70F
Hammer Type: Direct push

Ground Surface: Grass
Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	26	16	0-5	30	0930	0-0.5' Damp, bwn, silty, SAND, w/roots
B	1.5-2.5	1.5	<8	<12			0930	0.5-1.5' Moist, mot bwn, silty, SAND, w/some gravel, crushed rock
								1.5-2.5' Wet, gry, silty, SAND, w/some gravel
C	5-6	5	15	<13	5-10	36	0930	5-6' Wet-sat, gry, F-M SAND
D	6-7	7	<7	14			0930	6-7' Wet, gry, SILT, w/black organics
					10-12	0		
						no recovery		

LABORATORY SAMPLES:

Soil:
AKM-S-NB32-A-071712
AKM-S-NB32-B-071712
AKM-S-NB32-C-071712
AKM-S-NB32-D-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

0
-Silty, SAND

Moist, mottled brown, silty, SAND
with some gravel

5
Wet to saturated, gray, Fint to Medium SAND

7
Wet, gray, SILT

no recovery

12
(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB33**

Field Rep: DG Cooper	Location: N711430 E1174072 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.7 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/17/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 65F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	19	20	0-5	48	0845	0-0.5' Damp, bwn, silty, SAND, w/roots
B	2-4	2	12	<14			0845	0.5-2.5' Moist, mot bwn, silty, SAND, w/some gravel, crushed rock, wood chip
		3.5	12	<13				2.5-4' Wet, mot bwn, F SAND, w/trace silt, oxidation
C	5-6	6	27	<12	5-10	50	0845	5-6' Sat, gry, F SAND, w/trace silt
D	6-8.5	9	<7	<12			0845	6-8.5' Wet, gry-blk, SILT, w/trace F sand, scattered organics
E	8.5-10						0845	8.5-10' Sat, gry, F-M SAND, w/silt clasts
F	10-12	12	<7	<12	10-12	24	0845	10-12' Sat, gry, F-M SAND, w/scattered gravel, silt clasts

LABORATORY SAMPLES:

Soil:
AKM-S-NB33-A-071712
AKM-S-NB33-B-071712
AKM-S-NB33-C-071712
AKM-S-NB33-D-071712
AKM-S-NB33-E-071712
AKM-S-NB33-F-071712

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

Depth (ft.)	
0	-Silty, SAND Moist, mottled brown, silty, SAND with some gravel, crushed rock, wood chip
2.5	Wet to saturated, brown to gray, Fine SAND with trace silt
6	Wet, gray-black SILT with trace fine sand, scattered organics
8.5	Saturated, gray, Fine to Medium SAND
12	(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB34

Field Rep: DG Cooper	Location: N711378 E1174097 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.4 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	As (ppm)	Pb (ppm)	From - To	Recovery (inches)		
A	0-1	0	13	35	0-5	30	1645	0-0.5' Damp, bwn, silty, SAND, w/roots
B	2-2.5	2	25	53			1645	0.5-2' Moist, mot bwn, silty, SAND, w/some gravel, brick, wood chip
		2.5	73	105				2-2.5' Wet, gry-blk, F SAND, w/organics
C	6-7	7	<8	<12	5-10	40	1645	6-7" Sat, gry, F-M SAND
D	7-9	9	<8	<12			1645	7-9' Wet, gry, SILT, w/trace black organics
								9-10' Sat, gry, F-M SAND
E	10-12	12	<7	<12	10-12	24	1645	10-12' Sat, gry, F-M SAND, w/scattered silt clasts

LABORATORY SAMPLES:

Soil:
AKM-S-NB34-A-071612
AKM-S-NB34-B-071612
AKM-S-NB34-C-071612
AKM-S-NB34-D-071612
AKM-S-NB34-E-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Silty, SAND
Moist, mottled brown, silty, SAND
with some gravel, brick, wood chip

2

Wet to saturated, brown to gray, Fine SAND
with trace silt

7

Wet, gray-black SILT
with trace black organics

9

Saturated, gray, Fine to Medium SAND

12
(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB35

Field Rep: DG Cooper	Location: N711286 E1174008 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Cloudy 65F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 1" dual-tube w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	<7	<11	0-4	36	1000	0-1' Damp, mot bwn gravelly, silty, SAND, w/wood chip
AA	1.5	1	<20	240			1000	1.5' Thin black layer of F SAND with thin organics-like fibers
B	2-4	1.5	911	3724			1000	1.5-4' Wet gry, F-M SAND
		2.5	56	20				
		4	10	<14				
C	4-6	6	<8	<12	4-8	36	1000	4-6' As above becoming saturated
D	6-8	7.5	12	15			1000	6-8' Wet, gry, SILT, w/black organics from 7-8'
E	8-10	8	<7	<12	8-12	24	1000	8-8.5' Wet, gry, SILT
F	10-12	10	<7	<11			1000	8.5-12' Sat, gry, F SAND, w/trace silt

LABORATORY SAMPLES:

Soil:
AKM-S-NB35-A-071612
AKM-S-NB35-AA-071612
AKM-S-NB35-B-071612
AKM-S-NB35-C-071612
AKM-S-NB35-D-071612
AKM-S-NB35-E-071612
AKM-S-NB35-F-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Damp, mottled brown, gravelly, silty, SAND
with wood chip
1.5 -Thin black layer of Fine SAND with thin organic fibers

Wet to saturated, gray, Fine to medium SAND
with trace silt

6

Wet, gray-black SILT
with trace black organics

8.5

Saturated, gray, Fine SAND
with trace silt

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB36**

Field Rep: DG Cooper	Location: N711347 E1174022 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 1" dual-tube w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	18	34	0-5	30	1600	0-1' Damp, bwn, silty, SAND, w/wood chip
AA	2	2	124	307			1600	1-2' Moist, mot bwn, gravellysilty, sand
B	2-2.5	2.5	78	70			1600	2' 1/2' layer of black F SAND
								2-2.5' Wet, gry, F-M SAND
C	9-10	6	<8	13	5-10	12	1600	5-6' Sat, gry, F-M SAND
D	10-12	11	8	<12	10-12	24	1600	10-12' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB36-A-071612
AKM-S-NB36-AA-071612
AKM-S-NB36-B-071612
AKM-S-NB36-C-071612
AKM-S-NB36-D-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Damp, mottled brown, gravelly, silty, SAND
with wood chip
-Thin black layer of Fine SAND

2

Wet to saturated, gray, Fine to medium SAND

-poor recovery

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB37

Field Rep: DG Cooper	Location: N711408 E1173983 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.4 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	15	21	0-5	36	1530	0-0.5' Damp, bwn, silty, SAND,w/crushed rock
AA	2.5	2.5	1,288	5,975			1530	0.5-1' Moist, mot bwn, silty, SAND, w/wood chip
B	2.5-3	3	44	<13			1530	1-2.5' Moist, bwn, silty, SAND, w/trace gravel
								2.5' - 2" layer of black organics / F SAND
								2.5-3' Wet, gry-black, F-M SAND
C	6-8	6-8	<7	<13	5-10	48	1530	6-9.5' Wet-sat, gry, F-M SAND
D	8-9.5	9	11	<11				9.5-10' Wet, gry, F sandy, SILT
E	10-12	10.5	<8	17	10-12	24	1530	10-11' Wet, gry-blk, SILT, w/scattered organics
		12	<7	<13				11-12' Wet, gry-bwn, organic, SILT

LABORATORY SAMPLES:

Soil:
AKM-S-NB37-A-071612
AKM-S-NB37-AA-071612
AKM-S-NB37-B-071612
AKM-S-NB37-C-071612
AKM-S-NB37-D-071612
AKM-S-NB37-E-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

0 — Damp to moist, brown, silty, SAND wiht wood chip and trace gravel
-Thin black layer of Fine SAND

2 — Wet to saturated, gray, Fine to medium SAND

9.5 — -Fine sandy SILT
Wet, gray -black SILT becoming Wet, gray-brown, organic SILT

12 — (Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB38

Field Rep: DG Cooper	Location: N711416 E1173909 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 18.0 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	24	24	0-5	36	1400	0-0.5' Damp, bwn, silty, SAND
B	2-3	1	37	33			1400	0.5-1.5' Moist, mot bwn, Wood chip
		1.5	17	15				1.5-3' Moist, bwn-gry, silty, SAND, w/some gravel
		3	40	<11				
C	5-7	6.5	10	17	5-10	36	1400	5-7' Wet-sat, gry, F SAND
D	7-8	8	<7	18			1400	7-8' Wet, gry, SILT, w/trace organics, root casts
					10-12	0		
						no recovery		
						2 attempts		

LABORATORY SAMPLES:

Soil:
AKM-S-NB38-A-071612
AKM-S-NB38-B-071612
AKM-S-NB38-C-071612
AKM-S-NB38-D-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-silty, Sand
-wood chip
Moist, brown-gray, silty, SAND
with some gravel

3 - - - - - - - - - - - - - - - -

Wet to saturated, Fine SAND

7 - - - - - - - - - - - - - - - -

Wet, gray, SILT
with trace organics, root casts

-Poor recovery

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB40

Field Rep: DG Cooper	Location: N711462 E1173879 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.0 (MLLW)	Ground Surface: Asphalt Pavement
Driller: Keith	Date Completed: 07/20/12	
Drill Type: Geoprobe 7720DT	Weather: Rain 60F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0.5-1.5	1	14	18	0-5	36	1315	0-0.3' Asphalt concrete
AA	1.8-2.1	2	1286	1737			1315	0.3-1.8' Moist, mot bwn, gravelly, SAND, w/greenish gravel at base
B	2.1-3	2.5	110	160			1315	1.8-2.1' Damp, blk, SAND, w/slag-like fragments/matrix
		3	<8	<14				2.1-3' Moist, mot gry-blk, sandy, GRAVEL, w/recycled concrete
C	5-7	5	14	<12	5-10	48	1315	5-7' Wet, gry, clayey, SILT, w/trace organics, soft
D	7-8	6.5	<7	13			1315	7-8' Wet, gry, SILT, w/black organic interbed
		8.5	<6	<10				8-9' Wet, bwn, fibrous PEAT
E	10-11	10.5	<7	<12	10-12	24	1315	10-12' Wet, gry-bwn, organic, SILT, w/fibrous organics, marsh grass

LABORATORY SAMPLES:

Soil:
AKM-S-NB40-A-072012
AKM-S-NB40-AA-072012
AKM-S-NB40-B-072012
AKM-S-NB40-C-072012
AKM-S-NB40-D-072012
AKM-S-NB40-E-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Asphalt concrete
Moist, mottled brown gravelly SAND
2 Black sand layer with Slag-like matrix
Moist, mottled gray-black sandy, GRAVEL with concrete
3
Wet, gray, SILT
8
Fibrous PEAT
9
Wet, gray-brown, organic SILT, with fibrous organics, marsh grass
12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB41

Field Rep: DG Cooper	Location: N711427 E1173844 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.6 (MLLW)	Ground Surface: Asphalt Pavement
Driller: Keith	Date Completed: 07/20/12	
Drill Type: Geoprobe 7720DT	Weather: Rain 65F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0.3-1.3	1	<9	15	0-5	40	1400	0-0.3' Asphalt concrete
B	1.3-2.3	2	193	126			1400	0.3-1.3' Moist, mot bwn, gravelly, SAND, w/trace silt, red brick
BB	2.3-2.5	2.5	152	48			1400	1.3-2.3' Moist, bwn-blk, sandy, gravel, w/recycled asphalt
C	2.5-3.5						1400	2.3-2.5' Moist, blk, gravelly, SAND, no obvious slag but similar to NB40
								2.5-3.5' Moist, grn-bwn, sandy, GRAVEL
D	5-7	5	<6	<10	5-10	36	1400	5-7.5' Wet, gry, clayey, SILT, w/fibrous organic layer @ 6.5'
E	7.5-8	6.5	<7	14			1400	7.5-8' Wet, gry, F-M SAND, w/thin roots
		8	34	<13				
					10-12	0	1400	
						no recovery		

LABORATORY SAMPLES:

Soil:
AKM-S-NB41-A-072012
AKM-S-NB41-B-072012
AKM-S-NB41-BB-072012
AKM-S-NB41-C-072012
AKM-S-NB41-D-072012
AKM-S-NB41-E-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Asphalt concrete
Moist, mottled brown gravelly SAND

2.5 Black sand layer with Slag-like matrix

Moist, green-brown, sandy, GRAVEL

3.5

Wet, gray, clayey, SILT

6.5 -Fibrous organic layer

7.5

Wet, gray, Fine to Medium SAND

No Recovery

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB42

Field Rep: DG Cooper	Location: N711309 E1173938 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
		0	37	43	0-5	36		0-2' Damp, bwn, gravelly, silty, SAND
A	0.5-1.5	1.5	57	<12			1045	2-2.2' red-blk, F SAND, oxidized, w/thin fibers
AA	2	2	873	571			1045	2.2-3' Wet, mot gry-bwn, SILT. w/some F Sand
B	2.5-3	3	<8	<13			1045	
C	5-7	7	<7	<11	5-10	48	1045	5-8' Wet, gry, SILT
D	7-9	9	<9	30			1045	8-9' Wet, gry-blk, SILT, w/organics
E	10-12	10	<9	<14	10-12	24	1045	10-12' Wet, gry, organic, SILT, fibrous organics throughout
		12	<7	17				

LABORATORY SAMPLES:

Soil:
AKM-S-NB42-A-071612
AKM-S-NB42-AA-071612
AKM-S-NB42-B-071612
AKM-S-NB42-C-071612
AKM-S-NB42-D-071612
AKM-S-NB42-E-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Damp, brown, gravelly, silty, SAND

2 -Red-brown layer of Fine SAND, oxidized, thin fibers

Wet, gry-bwn, SILT

10 Wet, gray, organic, SILT
fibrous organics throughout

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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NB43

BORING - DESCRIPTION OF SAMPLES & DATA

Field Rep: DG Cooper	Location: N711367 E1173916 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.5 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
		0	11	18	0-5	36		0-1.5' Damp, mot bwn, silty, SAND, w/some gravel
A	0.5-1.5	1	<9	15			1145	1.5-2.5' Moist, mot bwn-blk, silty, SAND, w/some gravel, wood
B	2-3	1.5	55	25			1145	2.5-3' Wet, gry, gravelly, silty, SAND
		2	21	<14			1145	
		3	28	<12				
C	5-6	6	24	<12	5-10	24	1145	5-7' Sat, gry, F-M SAND, w/silt interbeds
D	10-12	9.5	<6	<9	10-12	24	1145	10-12' Wet, gry, SILT, very soft, with peat interbeds
		12	<8	15				

LABORATORY SAMPLES:

Soil:
AKM-S-NB43-A-071612
AKM-S-NB43-B-071612
AKM-S-NB43-C-071612
AKM-S-NB43-D-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

Damp, mottled brown, silty, SAND
with some gravel

3

Saturated, gray, Fine to Medium SAND
with silt interbeds

10

Wet, gray, SILT, very soft
with peat interbeds

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB44

Field Rep: DG Cooper	Location: N711363 E1173874 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.9 (MLLW)	Ground Surface: Grass
Driller: Keith	Date Completed: 07/16/12	
Drill Type: Geoprobe 7720DT	Weather: Clear 70F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro and Dual-Tube w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	(ppm) Pb	From - To	Recovery (inches)		
A	0-1	0	29	<14	0-5	24	1300	0-1' Damp, mot bwn, silty, SAND, w/some gravel, wood chip
B	1-2	1	28	45			1300	1-2' Moist, gry, gravelly, silty, SAND
					5-10	0		No Recovery - two attempts using both Macro and Dual-Tube samplers
						no recovery		Also tried insertion of drive tips and catchers.
								Poor recovery likely due to denser fill atop soft underlying soils
					10-15	0		
						no recovery		

LABORATORY SAMPLES:

Soil:
AKM-S-NB44-A-071612
AKM-S-NB44-B-071612

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

SUMMARY LOG

Depth(ft.)	
0	Damp, mottled brown, silty, SAND with some gravel. Wood chips
2	Moist, gray, gravelly, silty, SAND
	No recovery
15	(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Arkema North Boundary

BORING - DESCRIPTION OF SAMPLES & DATA

NB45

Field Rep: DG Cooper	Location: N711390 E1173805 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.3 (MLLW)	Ground Surface: Asphalt Pavement
Driller: Keith	Date Completed: 07/20/12	
Drill Type: Geoprobe 7720DT	Weather: Rain 65F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0.3-1	0	10	<13	0-5	30	1400	0-0.3' Asphalt concrete
B	1-2	1	13	16			1400	0.3-1' Moist, mot bwn, gravelly, SAND, w/trace red brick
BB	2-2.3	2	61	40			1400	1-2' Moist, bwn-blk, sandy, gravel, w/recycled asphalt
							1400	2.0-2.3' Moist, blk, silty, F SAND, w/fine organic fibers
								2.3-2.5' Wet, bwn, gravelly, silty, SAND
C	5-6	5	52	22	5-10	30	1400	5-6' Wet, gry, SILT, w/scattered organics, wood, yellow trace @ 5.5'
D	6-7	7	34	<13			1400	6-7.5' Sat, gry, F-M SAND
					10-12	0	1400	
						no recovery		

LABORATORY SAMPLES:

Soil:
AKM-S-NB45-A-072012
AKM-S-NB45-B-072012
AKM-S-NB45-BB-072012
AKM-S-NB45-C-072012
AKM-S-NB45-D-072012

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-Asphalt concrete
Moist, mottled brown gravelly SAND
with red brick

2 -Black silty Fine Sand layer with thin organic fibers
Wet, brown, gravelly, silty, SAND

Wet, gray, SILT
with scattered organics, yellow trace

6

Saturated, gray, Fine to Medium SAND

No Recovery

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB46

Field Rep: DG Cooper	Location: N711311 E1173886 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 16.0 (MLLW)	Ground Surface: Railroad siding
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Sunny, 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	12	21	0-5	18	1630	0-1' Damp, bwn, silty, SAND,w/some gravel
		1	37	73				1-1.5' Wet, bwn, silty, SAND
B	5-7	5	100	68	5-10	30	1630	5-7.5' Wet, bwn, organic, SILT, fibrous organics throughout
		6	141	48				
		7	154	35				
C	10-11	10	569**	31	10-15	40	1630	10-11.5' Wet, gry, organic, SILT, decreasing organis with depth
D	11.5-12.5	10.5	33	<13			1630	11.5-13.5' Wet, gry, SILT, plastic
		11	50	33				
		12	<7	<12				

LABORATORY SAMPLES:

Soil:
AKM-S-NB46-A-071912
AKM-S-NB46-B-071912
AKM-S-NB46-C-071912
AKM-S-NB46-D-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.
** carry-down observed in sample
Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

1.5 Damp to wet, brown, silty, SAND with some gravel

5 Wet, brown, organic, SILT with fibrous organics throughout

10 Wet, gry, organic, SILT

Wet, gray, SILT, plastic

15 (Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA **NB47**

Field Rep: DG Cooper	Location: N711361 E1173835 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 16.1 (MLLW)	Ground Surface: Railroad siding
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Sunny 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0-1	0	37	76	0-5	18	1530	0-1' Damp, bwn, silty, SAND,w/some gravel, scattered wood
		1.8	16	42				1-1.5' Wet, bwn, F sandy, SILT
B	4-5	4	123	24	4-10	30	1530	4-5' Wet, gry-blk, SILT
C	5-6.5	4.5	261	<11			1530	5-6.5' Sat, gry, SAND
		5	31	16				6.5-6.7' wet, gry, clayey, SILT
		6	28	<14				6.7-7' Wet, bwn, fibrous, PEAT
		8	<5	<8				7-7.5' Wet, bwn, organic, SILT
D	10-12	10	7	<10	10-15	30	1530	10-12' Wet, gry, organic, SILT, w/marsh grass
		12	<8	<13				12-12.5' Wet, gry-bwn, clayey, SILT, w/trace organics

LABORATORY SAMPLES:

Soil:
AKM-S-NB47-A-071912
AKM-S-NB47-B-071912
AKM-S-NB47-C-071912
AKM-S-NB47-D-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

SUMMARY LOG

Depth (ft.)	
0	Damp, brown, silty, SAND with some gravel, scattered wood
1	Wet, brown, Fine sandy, SILT
5	Saturated, gray, SAND -Clayey, SILT -Fibrous PEAT
7	Wet, brown, organic, SILT
10	-Marsh grass
15	(Bottom of Boring)

NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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BORING - DESCRIPTION OF SAMPLES & DATA

NB48

Field Rep: DG Cooper	Location: N711413 E1174127 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.0 (MLLW)	Ground Surface: grassy depression
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Sunny 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0.5-1.5	0	64	96	0-5	30	1215	0-0.5' Damp, bwn, silty, SAND, w/trace gravel
B	1.5-2.5	1.5	40	18			1215	0.5'-1.5' Moist, mot blk, bwn, gravelly, SAND, w/bark, asphalt, concrete
		2	83	45				1.5-2.5' Wet, gry-blk, F sandy, SILT
C	5-6	5	53	66	4-10	30	1215	5-6' Wet, gry, SILT, w/some organics, soft
D	6-7.5	6	37	<11			1215	6-7.5' Sat, gry, F-M SAND
		7	<8	<13				
E	10-11	10	<7	<13	10-12	12	1215	10-11' Sat, gry, F-M SAND

LABORATORY SAMPLES:

Soil:
AKM-S-NB48-A-071912
AKM-S-NB48-B-071912
AKM-S-NB48-C-071912
AKM-S-NB48-D-071912
AKM-S-NB48-E-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**

-silty SAND
Moist, mottled brown-black, gravelly, SAND with bark, concrete, asphalt debris

Wet, gray-black, Fine sandy, SILT

Wet, gray, SILT with some organics

6

Saturated, gray, Fine to Medium SAND

12

(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Dalton, Olmsted & Fuglevand, Inc.
Environmental Consultants

BORING - DESCRIPTION OF SAMPLES & DATA **NB49**

Field Rep: DG Cooper	Location: N711329 E1173972 (NAD83)	
Drilling Co.: Cascade	Elevation (Ft.): 17.0 (MLLW)	Ground Surface: grassy depression
Driller: Keith	Date Completed: 07/19/12	
Drill Type: Geoprobe 7720DT	Weather: Sunny 75F	
Size/Type Casing: 2" Rod	Hammer Type: Direct push	Sampler Type: 2" Macro w/ acrylic liner

Sample		XRF*			Spl Depth (Ft.)	Sample	Time	Sample Description
No.	Depth (Ft.)	Depth (Ft.)	(ppm) As	Pb	From - To	Recovery (inches)		
A	0.5-1.5	0	23	22	0-5	24	1300	0-0.5' Damp, bwn, silty, SAND, mixed with wood chip
AA	1	0.8	12	<12			1300	0.5'-1' Moist, gry, gravelly, silty, SAND
B	1-2	1	686	1592			1300	1' - 1" thick layer of black F SAND, w/fine fibers
		1.5	<8	<13				1-2' Wet, gry, F-M SAND
C	5-6	5	<10	<6	4-10	48	1300	5-6' As above, sat
D	6-7	7	<7	<12			1300	6-7' Sat, gry, F SAND, w/some silt
E	7-9	8	13	21				7-9' Wet, gry, SILT, soft, black organics 8-9'
								fibrous PEAT in sampler shoe
					10-12	0		
						no recovery		
						two tries		

LABORATORY SAMPLES:

Soil:
AKM-S-NB48-A-071912
AKM-S-NB48-B-071912
AKM-S-NB48-C-071912
AKM-S-NB48-D-071912
AKM-S-NB48-E-071912

Notes: * XRF values were obtained in the field using an INNOV-X Model 4000.
Direct readings of the soil core were made by a representative of CDM Smith.

Completed boring backfilled with granular bentonite

F - fine
M - medium
Sat. - saturated

Depth(ft.)

0 **SUMMARY LOG**
-silty SAND with wood chip
Moist, gray, gravelly, silty, SAND
1 -1' thick layer of black Fine SAND with fine fibers

Wet to saturated, gray, Fine to Medium SAND

-Fine SAND with some silt
7

Wet, gray, SILT
9 -Fibrous PEAT

No recovery

12
(Bottom of Boring)
NOTE: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

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Malcolm Pirnie 2007

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Log By: JS
Date: 4/23/07
Sheet 1 of 1

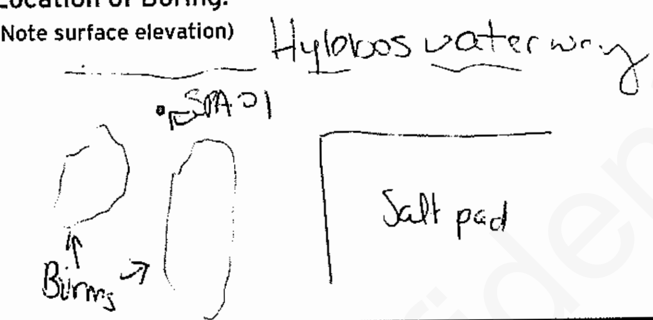
Borehole/Well Log

1423 sample time

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: ~~SB~~ SPA01

Location of Boring:
(Note surface elevation)



Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)

Depth in Feet	Gravel / Sands / Fines	USCS Symbol	Blows per 6"	Recovery	Description
0-	58510				did not hit water table
1-	5905				mostly sand w/ some fine st gravel
2-	5905				clay band layer @ ~2 ft thin (1 inch)
3-					
4-	955				
5-					
6-					
7-					
8-					
9-					
10-					
1-					
2-					
3-					
4-					
5-					
6-					
7-					
8-					
9-					

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Log By: JS
Date: 5/29/07
Sheet 1 of 1

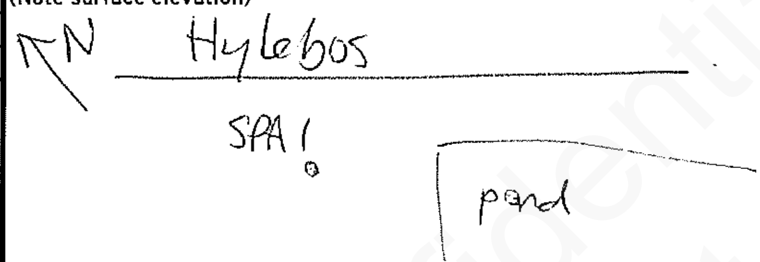
6'-10'

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jaymen

BORING ID: SPA1

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel / Sands / Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
					vegetation
0-5					
5-10					@6.5' 2" distinct yellow/orange/brown layer (see picture) Sand @8' saturated @9' 0.5' orange gw
10-15					
15-19					

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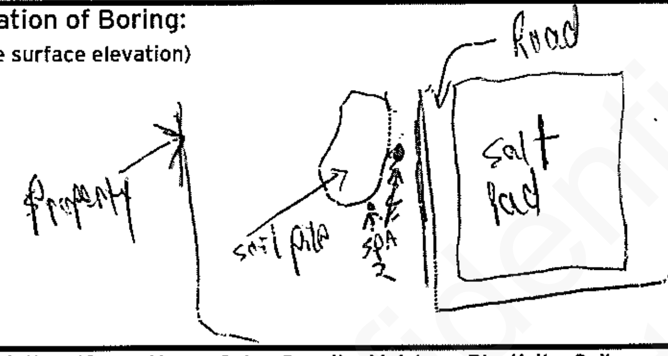
Log By: SS
Date: 4/23/07
Sheet of

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA-2

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
	10	75	15				sand w/ silt
0-							@0.5 sand w/ ~~silt~~ clay
1-		90	10				
2-							
3-							
4-	—	—	100				@4 2" thick clay
		100	0				sand
5-							
6-							
7-							
8-							
9-							
10-							
1-							
2-							
3-							
4-							
5-							
6-							
7-							
8-							
9-							

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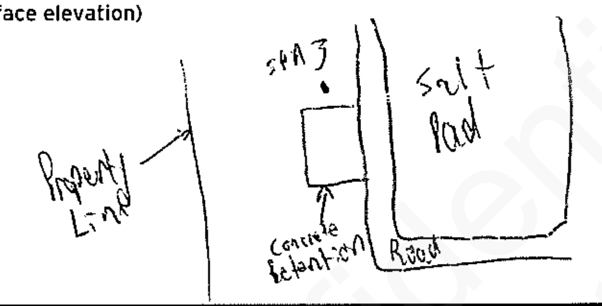
Log By: JS/SS
Date: 4/23
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA03

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
	10	60	30				Clayey sand
0-							
1-							w/ wood & debris @ 6"
2-	5	85	10				@ 2 sand + clay
3-							
4-							@ 4.5 Brown Clay
5-		95	5				@ 5.5 1" sand
6-							sand 1" clay
7-							
8-							
9-							
10-							
1-							
2-							
3-							
4-							
5-							
6-							
7-							
8-							
9-							

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Log By: SS
Date: 4/27/07
Sheet 1 of

Borehole/Well Log

PROJECT NAME: Ankeny
PROJECT NUMBER: 0315 233
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA-5

Location of Boring:
(Note surface elevation)

Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
0	5	85	10				sand w/ silt
1							Wood & debris
2							
3		95	5				Sand @ 3.75 1" thick Clay ← 3.75-5 ft. sand
4			100				Clay
5							
6							
7							
8							
9							
10							
1							
2							
3							
4							
5							
6							
7							
8							
9							

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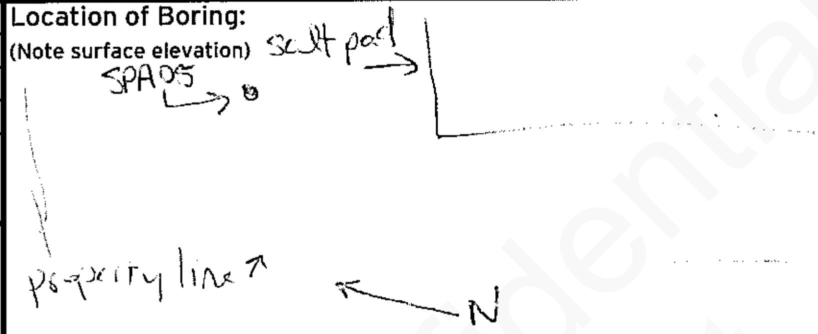
Log By: JS/SS
Date: 4/23/07
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA05

Location of Boring:
(Note surface elevation)



Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)

Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description
0-	90	90	10				0.5'-1.5' dredge mat'l/fill
1-							
2-							2' water table
3-							
4-	0	0	100				@4.5 clay (black staining) photos 0096, 0097
5-							
6-							
7-							
8-							
9-							
10-							
1-							
2-							
3-							
4-							
5-							
6-							
7-							
8-							
9-							

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MALCOLM PIRNIE

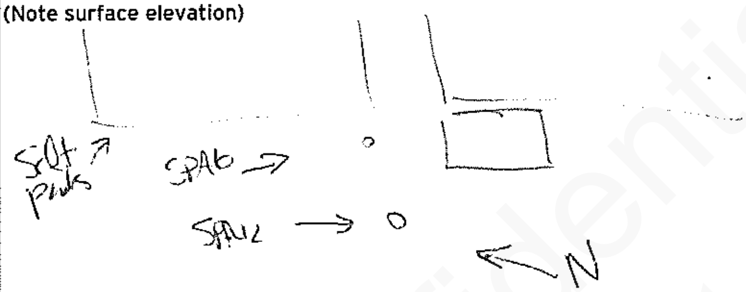
Log By: JS/SS
Date: 4/23/07
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA 6

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
		10	90				3-9 inches; silt w/ wood debris
0							@9-12 sandy gravelly silt
1	20	30	50				@12 sand
2		95	5				
3		70	30				@ 3.5 clayey sand ⇒ 3 inches
4		95	5				@ 3.75 sand
5							
6		85	15				@ 5.5 sand w/ clay
7							
8							
9							
10							
1							
2							
3							
4							
5							
6							
7							
8							
9							

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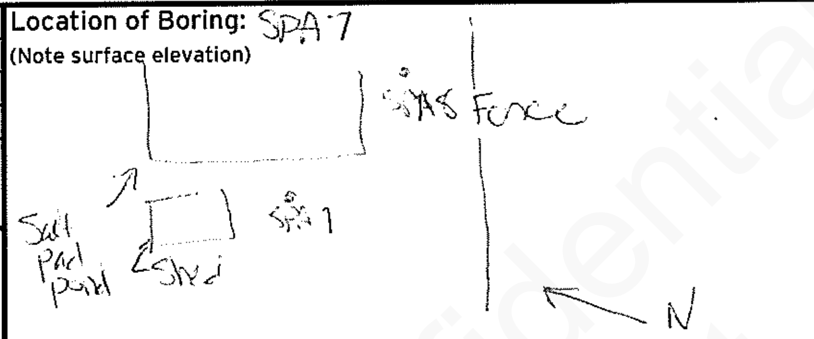
Log By: JS
Date: 4/23
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA7

Location of Boring: SPA 7
(Note surface elevation)



Depth in Feet	Gravel / Sands / Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
	~~40 60~~ 10 90				Silt
0 (0.5)	40 60				Gravelly sand
1					Saturated @1.5 feet
2	95 5				@2 soil staining dark brown; sand (poorly graded)
3	80 20				@2.5 clayey sand
4	5 95				Clay
5					
6					
7					
8					
9					
10					
1					
2					
3					
4					
5					
6					
7					
8					
9					

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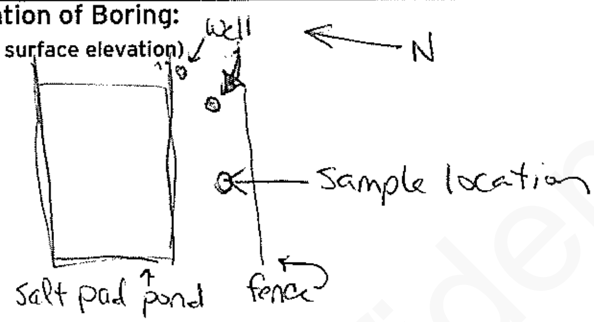
Log By: JS
Date: 4/23/07
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA-8

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
0-	30	70					6" down ~~saturated~~ less coarse soil gravely sand
1-							
2-	5	95	5				Sand from here down saturated
3-							
4-							
5-							
6-							
7-							
8-							
9-							
10-							
1-							
2-							
3-							
4-							
5-							
6-							
7-							
8-							
9-							

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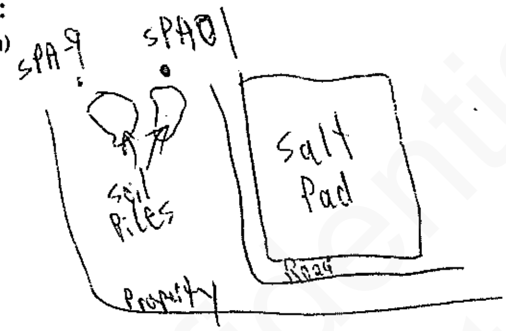
Log By: SS
Date: 4/23/07
Sheet of

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA-07-9

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
	10	90	–				sand
0							
1							
2							
3		–	100				@ 3.5 1" thick Clay
4							sand — no sat zone
5							
6							
7							
8							
9							
10							
1							
2							
3							
4							
5							
6							
7							
8							
9							

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Log By: JS
Date: 5/30/07
Sheet 1 of 1

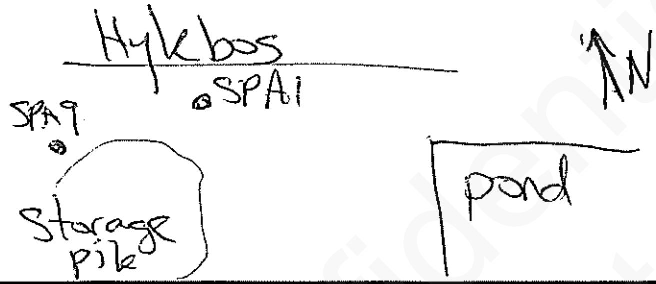
6–10'

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay man

BORING ID: SPA9

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel Sands Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
					vegetation
0-					
1-					
2-					
3-					
4-					
5-					
6-					Sand; saturated @6'
7-					
8-					
9-					@ 8' 1" clay
10-					@ 9' silty sand
1-					10' end of boring
2-					
3-					
4-					
5-					
6-					
7-					
8-					
9-					

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MALCOLM PIRNIE

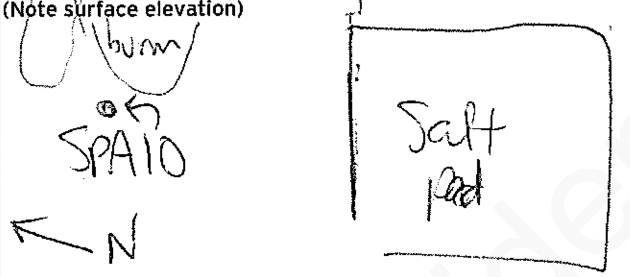
Log By: JS/SS
Date: 4/13
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA10

Location of Boring: Hylebos
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
0	10	60	30				silty sand w/ wood debris
1	10	85	5				@1.5 saturated sand
2							
3							
4			100				@4.5 clay some black layers
5							
6							
7							
8							
9							
10							
1							
2							
3							
4							
5							
6							
7							
8							
9							

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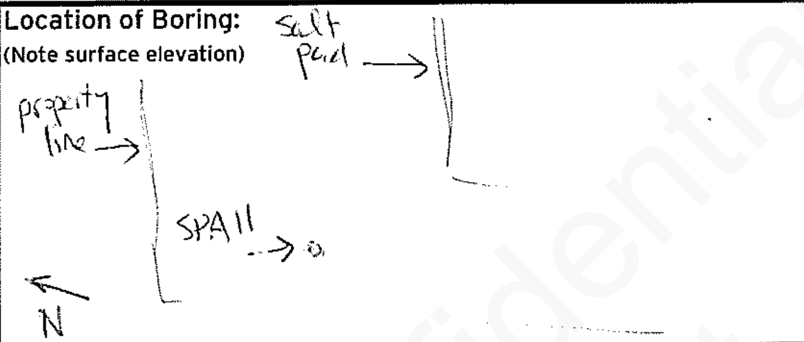
Log By: JS/SS
Date: 4/23/07
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Troy

BORING ID: SPA11

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
							0–2.5 silt w/ abundant wood debris
0-							
1-							
2-	40	30	30				sandy clayey gravel (gray
3-							
4-	0	80	20				water table @ 4.3'
5-							@ 4' clayey sand
6-							
7-							
8-							
9-							
10-							
1-							
2-							
3-							
4-							
5-							
6-							
7-							
8-							
9-							

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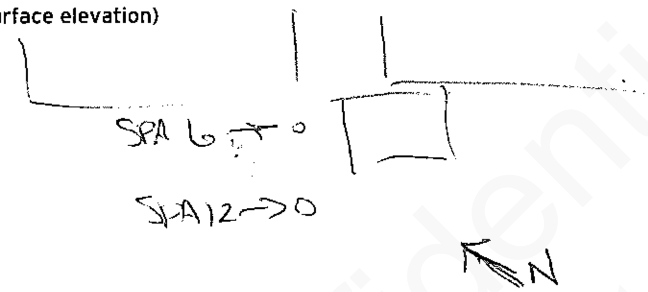
Log By: JS
Date: 4/23/07
Sheet 1 of 1

Borehole/Well Log

PROJECT NAME: Arkema
PROJECT NUMBER: 0315253
DRILLING FIRM/METHOD: Cascade
DRILLER AND HELPERS: Jay

BORING ID: SPA 12

Location of Boring:
(Note surface elevation)



Depth in Feet	Gravel	Sands	Fines	USCS Symbol	Blows per 6"	Recovery	Description: (Group Name, Color, Density, Moisture, Plasticity, Soil sampling method, Hourly air monitoring instrument readings, Daily water level and TD readings, Other)
0	5		90				0-3 inches fine OM
	50		50				3-6 inches white/grey sand/gravel
1	5		90				6-18 inches clay loam
2							18-20" wood chips water table @ 2.5'
3							20-26" clay
4							26-30" sand
							~~30" clay/sand mix~~ 30" sand (G/S/F - 0/95/5)
5							5' clay
6							
7							
8							
9							
10							
1							
2							
3							
4							
5							
6							
7							
8							
9							

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Appendix E

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USG Notices of Violation Between 1967 and 1975

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Tacoma Office

~~5-~~ N&F

April 23, 1968

U. S. Gypsum Co.
2301 Taylor Way
Tacoma, Washington 98421

NOTICE OF VIOLATION

Dear Mr. Schairbaum:

You are hereby notified of the following violation of Sections 9.02 and 9.03 of this Agency's Regulation I by the outdoor fire located at the above address:

Date	Time	Duration	Plume Density		Color
4/3/68	2:20 PM	10 minutes	Sec. 9.03	#3-4	Black
			Sec. 9.02	Unauthorized outdoor burning.	

This observation was made by an Agency Air Pollution Control Inspector.

We are enclosing outdoor fire instructions, including a copy of Section 9.02. Please inform your employees of these provisions so that future violations will not occur.

In the meantime, if we can be of any assistance in solving this problem, please do not hesitate to write.

For the Air Pollution Control Officer

Harry Watters
Chief Engineer

Encl.

Cert. Mail #416268

5/23/68 AB

Mr Schairbaum informs me outdoor burning has been stopped. At Present he is utilizing an unused cupola to burn his waste material. As requested in your letter of 4/30/68 I briefed Mr Schairbaum of Incineration sources and requested he ~~follow~~ follow procedures outlined in Reg I.

Privileged and Confidential
Attorney Work Product

Tacoma Office

June 11, 1968

U. S. Gypsum Co.
2301 Taylor Way
Tacoma, Washington 98421

NOTICE OF VIOLATION

Gentlemen:

You are hereby notified of the following emission in violation of Section 9.03 of this Agency's Regulation I from your cupola stack located at the above address:

Date	Time	Duration	Plume Density	Color
5/23/68	9:25 A.M.	20 minutes	90% opacity	grey

This observation was made by an Agency Air Pollution Control Inspector.

You are hereby granted thirty (30) days in which either to comply with this Regulation or to submit a compliance schedule if more time is required.

In the meantime, if we can be of any assistance in solving this problem, please do not hesitate to write.

For the Air Pollution Control Officer

Harry Watters
Chief Engineer

Cert Mail #058465

Privileged and Confidential
Attorney Work Product

~~SEATTLE-KING COUNTY~~ DEPARTMENT OF PUBLIC HEALTH - AIR POLLUTION CONTROL DIVISION

Tacoma

SMOKE DENSITY	2	3	4	PLANT CLASS	VIOLATION	
TOTAL MIN.					(Yes)	No

SMOKE OBSERVATION REPORT
One Stack Only on This Report

Complaint ______ Date 8/16/67 District ______

Address 2301 Taylor Way

Name U.S. Gypsum

Party in control of building Agent, Lessee, Owner Same

Address

Observed from West end Taylor Wy

Wind: N. S. E. W. Calm Weather Clr

Obs. Began 1018 A M.

Obs. Ended 1024 A M.

Obs. Interval 6 Min.

Number of Stacks on Plant 3

Brick ______ Steel X

Concrete ______ Tile ______

SMOKE						SMOKE		
BEGAN		STOPPED		NO. MIN.		DENSITY	COLOR	UNITS
10	18	10	24	6		4-5	Bl Grey	

TOTAL SMOKE UNITS

This Report Covers Main Cupola Stack

Interviewed Al Sherbaum Title Plan Mgr Phone FU 3-1537

ORDER: Informed Mr Sherbaum this occurred all morning and they were in violation. This is not a Boiler stack but a Cupola Stack. He was quite surprised that someone was watching them, and that he would check it out.

OBSERVER Brannock

DISPOSITION PSAPCA Seattle + files

INSPECTION REPORT

Routing:	Init.	Date
1. Supvr. Insp.	[initials]	9/25/69
2. File		
3.		
4. Engr'g Info Action		
5. Enf.		

RECEIVED
SEP 29 1969
PUGET SOUND AIR POLLUTION CONTROL AGENCY

Office:
- ☐ Seattle
- ☒ Tacoma
- ☐ Everett

Type of Report:
- ☒ Violation
- ☐ Inspection
- ☐ Re-Inspection

☐ Complaint
- ___ Smoke
- ___ Odor
- ___ Open Fire
- ___ Dust
- ___ Other

Company United States Gypsum Co.

City Tacoma Zip 98421 Phone

Source Location 2301 Taylor Way

Responsible Person Schirbaum Title Plant Mgr

Complainant, Person Contacted

Address Phone

Comments:

Inspector's Report attached VEW of cupola emission
Mailed notice of violation to Mr. Schirbaum.

☐ Continued on reverse side

Recommendations:

Complainant advised of action ☐ Yes ☐ No Date

Inspector's Name Walter De Haan Date 9-23-69 Time 1100AM

PSAPCA Form 40-101
7/69

☐ Seattle
☒ Tacoma
☐ Everett

TYPE OF REPORT
☒ Violation
☐ Inspection
☐ Re-Inspection

Routing:	Init.	Date
1. Supvr. Insp.	AB	5/8/69
2. File		
3.		
4. ☐ Engr'g ☐ Info ☐ Action		
5. Enf.		

Company U.S. Gypsum

Source Location Cyclone / 2301 Taylor Way

City Tacoma Zip 98421 Phone

Responsible Person Al Schaubaum Title Mgr

Interviewed " Title "

INSPECTOR'S REPORT: After investigating Complainants report I visited U.S. Gypsum plant and noticed rock wool insulation material floating to the ground, evidently from roof of bldg adjacent to Cyclone which picks up residual from blow chambers.

#0588

Recommendations: Recycle effluent back thru blowchamber.

Arnold E. Brannock
Inspector's Name

No.

5/8/69
Date

1400
Time

Form #40-103 12/68 PSAPCA

Privileged and Confidential Attorney Work Product

PUGE OUND AIR POLLUTION CONTROL AGI Y
410 WEST HARRISON STREET
SEATTLE, WASHIHGTON 98119
(206) AT 4-2050

№ 1090

901 Tacoma Avenue So.
Tacoma, Wn. 98402
FU 3-5851

2730 Colby Avenue
Everett, Wn. 98201
AL 9-0288

NOTICE OF VIOLATION

Date of Violation Sept 23 1969 at 1055 A.M.

United States Gypsum Co.
Name

2301 Taylor Way.
Address

Tacoma 98421 Wash.
City Zip # State

DID UNLAWFULLY CAUSE OR ALLOW:

At 2301 Taylor Way Tacoma Pierce
Address City County

☐ OUTDOOR FIRE in violation of Sec. 9.02 of Reg. I

☒ VISUAL EMISSIONS in violation of Sec. 9.03 of Reg. I

Period 1040-1045 Ringelmann >5 opacity 100% Color GREY-White
From METAL STACK ON CUPOLA

☐ INCINERATOR BURNING in violation of Sec. 9.05 of Reg. I

☐

~~Advise the TACOMA Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.~~

X
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer
X Walter N. McStraan 9-23-69 1055 AM
Notice Issued By Date Time

Form No. 40-105 4/69

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

901 Tacoma Avenue So.
Tacoma, Wn. 98402
FU 3-5851

410 WEST HARRISON STREET
SEATTLE, WASHINGTON 98119
(206) AT 4-2050

2730 Colby Avenue
Everett, Wn. 98201
AL 9-0288

№ 2325

NOTICE OF VIOLATION

Date of Violation October 26 1970 at 145P. M.

U.S. Gypsum
Name

2301 Taylor Way
Address

Tacoma 98421 Wn
City Zip # State

DID UNLAWFULLY CAUSE OR ALLOW:

At 2301 Taylor Way Tacoma Pierce
Address City County

☐ OUTDOOR FIRE in violation of Sec. 9.02 of Reg. I

☒ VISUAL EMISSIONS in violation of Sec. 9.03 of Reg. I

Period 139 - 145 Ringelmann 3 1/2 Color light grey
From large metal stack on Dryer.

☐ INCINERATOR BURNING in violation of Sec. 9.05 of Reg. I

☐

Advise the Tacoma *Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.*

X [signature]
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X Walter DeHaan 10-26-70 1 50 P.M.
Notice Issued By Date Time

Form No. 40-105 4/69

PUGET SOUND AIR POLLUTION CONTROL AGENCY **№ 2996**

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

Date of Violation Feb 17 1971 at 332 P M.

NAME:			
U. S. Gypsum Co			
Location of Violation (Address)	City	County	Zip
2301 Taylor Way	Tacoma	Pierce	98421
Responsible Person, Owner and/or Agent			
Lee Andrews			
Mailing Address	City	State	Zip
2301 Taylor Way	Tacoma	Wn	9
Description of Violating Source			
Cupola Stack			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☒ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 332-335 Ringelmann 3½ Color Grey

From Stack of Cupola

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the Tacoma **Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.**

X D. R. Hansen

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X Arnold E. Brannock — 2/17/71 — 3:45 PM

Notice Issued By — Date — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

NVT# 2996

INSPECTORS REPORT

Bag house not in operation, After Checking for 9.16 upset condition, I issued violation for 9.03 + 9.12.
No Manager available, has been transferred, Plant engineer on 2 day vacation.
Plant has been having too much trouble with this bag system, it has been inoperative more often than on line.
New Manager will be in 1 March and will have to correct deficiencies.

☐ YES WERE PHOTOGRAPHS TAKEN?
☒ NO ROLL No. ________ PICS. ________

☒ YES WAS MANAGEMENT CONTACTED?
☐ NO NAME: D. R. Hansen TITLE: Office Supt.

HIS REMARKS: Unfamiliar with procedures.

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY **Nº 2997**

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

Date of Violation Feb 17 19 71 at 332 M.

NAME: U.S. Gypsum Co			
Location of Violation (Address) 2301 Taylor Way	**City** Tacoma	**County** Pierce	**Zip** 98421
Responsible Person, Owner and/or Agent Lee Andrews			
Mailing Address 2301 Taylor Way	**City** Tacoma	**State** WN	**Zip** 98421
Description of Violating Source Cupola			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☐ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period ______ Ringelmann ______ Color ______

From ______

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☒ 9.12 Control apparatus not in operation

Advise the Tacoma **Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.**

x D.R. Hansen
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

x [illegible] 2/17/71 3:45 PM
Notice Issued By Date Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

NV# 2997

INSPECTORS REPORT

See Report On 2996

☐ YES WERE PHOTOGRAPHS TAKEN?

☐ NO ROLL No. ________ PICS. ________

☐ YES WAS MANAGEMENT CONTACTED?

☐ NO NAME: TITLE:

HIS REMARKS:

Privileged and Confidential
Attorney Work Product

RECEIVED
SEP 23 1971
PUGET SOUND AIR POLLUTION CONTROL AGENCY

PUG[illegible] SOUND AIR POLLUTION CONTR[illegible] AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	[illegible]

NOTICE OF VIOLATION No. 4073

Date of Violation SEPT 23 19 71 at 1030 A M.

NAME:			
UNITED STATES GYPSUM (TACOMA)			
Location of Violation (Address) 2301 TAYLOR WAY	**City** TACOMA	**County** PIERCE	**Zip** 98421
Responsible Person, Owner and/or Agent LESLIE SHOEMAKER WORKS MANAGER			
Mailing Address SAME	**City**	**State**	**Zip**
Description of Violating Source CUPOLA STACK			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☑ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 1025-1030 AM Ringelmann EXCESS OF 4 EQUIV. OPAC. Color BROWN-WHITE

From CUPOLA STACK

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the TACOMA Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

X Leslie J. Shoemaker
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X [signature] Thomsen
Notice Issued By

23 Sept 71
Date

1040
Time

Form No. 40-105 (7/70)

NV# 4073

INSPECTORS REPORT

This source's compliance program expired 22 Sept '71. An inspection made this date 23 Sept '71 reveals this source to be in violation.

- [x] YES
- [ ] NO

WERE PHOTOGRAPHS TAKEN?

ROLL No. 268 PICS. 1 + 2

- [x] YES
- [ ] NO

WAS MANAGEMENT CONTACTED?

NAME: L. Shoemaker TITLE: Works Manager

HIS REMARKS:

The contractor is still working on the system trying to work out the problems. They will probably be requesting another extension.

N013

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY
INSPECTION REPORT

ROUTING		
	Init.	Date
1. Supvr Insp.		11-15-71
2. Chief Enf.		✓
3. Radio		
4.		
5.		
6.		
7.		
8. File		✓

[ ] King [ ] Inspection [ ] Complaint
[ ] Snohomish [ ] Burn Request
[✓] Pierce [✓] Violation
[ ] Kitsap [ ] ______

___ Smoke
___ Odor
___ Open Fire
___ Dust
___ Other

Date ______
Time ______
Init. ______
Insp. Time ______

Source U.S. Gypsum (TACOMA PLANT)

Source Location 2301 TAYLOR WAY

Mailing Address SAME

City TACOMA Zip 98421 Phone FU3-1537

Responsible Person LEE ANDREWS Title CHIEF ENGR.

~~Complainant~~, Person Contacted SAME

Address SAME City ______ Phone ______

Comments: VIOLATION 9.03

Inspector's Report Noted Brown-Grey smoke emitting from cupola stack in 20 second increments. The frequency was 1 minute intervals ie, 20 seconds of smoke out of each 60 seconds. observed stack for 15 minutes of which 5 minutes was R 4-5 equivalent. contacted Mr. Andrews + issued V.N.

Film Roll No. 294 #11+12

Notice of Violation No. 4673 [ ] Report Continued on Next Page

Recommendations: await response

[ ] Recommendations Continued on Next Page

Inspector's Name L. L. Thomsen Date 11/15/71 Time ______

Form No. 40-101
10/71

PUG[illegible] SOUND AIR POLLUTION CONTR[illegible] AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION No. 4907

RECEIVED
DEC 16 1971
PUGET SOUND AIR POLLUTION CONTROL AGENCY

Date of Violation Dec. 15 19 71 at 10:10 A. M.

NAME: U.S. Gypsum			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent L. Andrews Plt. Eng.			
Mailing Address 2301 Taylor Way	City Tacoma	State WA.	Zip 98421
Description of Violating Source Batt Curing Oven			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☑ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 0955-1000 Ringelmann 4 Color White

From Batt Curing Oven

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the No Reply Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

X [signature] For Record Purposes

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X [signature] Dec 15, 71 10 20

Notice Issued By Date Time

Form No. 40-105 (7/70)

PUGET)UND AIR POLLUTION CONTROL ˋENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION № 4920

Date of Violation JAN 17 19 72 at 2:00 P. M.

NAME:			
U.S. GYPSUM			
Location of Violation (Address): 2301 TAYLOR WAY	City: TACOMA	County: PIERCE	Zip: 98421
Responsible Person, Owner and/or Agent: LEE ANDREWS (PLT. ENGR.)			
Mailing Address: 2301 TAYLOR WAY	City: TACOMA	State: WN.	Zip: 98421
Description of Violating Source: ROOF VENT			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☑ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 1350-1355 Ringelmann 3 Color WHITE

From BATT CURING OVENS

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the NO REPLY - FOR RECORD ONLY ~~Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.~~

X [signature]
Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X [signature] — Notice Issued By | JAN 17, 1972 — Date | 2:00 PM. — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG SOUND AIR POLLUTION CONTRC AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

№ 5097

Date of Violation FEB 28 19 72 at 1030 A. M.

NAME:
U. S. GYPSUM (TACOMA PLANT)

Location of Violation (Address)	City	County	Zip
2301 TAYLOR WAY	TACOMA	PIERCE	98421

Responsible Person, Owner and/or Agent
LEE ANDREWS PLT. ENGR.

Mailing Address	City	State	Zip
SAME		WN.	

Description of Violating Source
BAG HOUSE DISCHARGE VENT

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☑ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1
Period 1030-1035 Ringelmann 3 Color BROWN
From CUPOLA EMMISSIONS THROUGH BAG-HOUSE

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the PIERCE COUNTY Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

X [signature]
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer
X [signature]
Notice Issued By

2/28/72
Date

1040 AM
Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG SOUND AIR POLLUTION CONTRC AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

№ 5432

Date of Violation June 6 19 72 at 638A.M.

NAME: U. S. Gypsum

Location of Violation (Address)	City	County	Zip
2301 Taylor Way	Tacoma	Pierce	98421

Responsible Person, Owner and/or Agent: L. S. Shoemaker Works Mgr.

Mailing Address	City	State	Zip
2301 Taylor Way	Tacoma	Wa	98421

Description of Violating Source: Plate Metal Stack

DID UNLAWFULLY CAUSE OR ALLOW:

☐ OUTDOOR FIRE in violation of Sec. 9.02 of Reg. 1

☒ VISUAL EMISSIONS in violation of Sec. 9.03 of Reg. 1

Period 630-637 Ringelmann 2 1/2 - 3 1/2 Color Grey Brown

From Metal stack venting cupola

☐ INCINERATOR BURNING in violation of Sec. 9.05 of Reg. 1

☐

Advise the ~~Pierce~~ County Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

x Mailed No Response Needed.

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

x Walter A. DeHaan — 6-6-72 — 810 AM

Notice Issued By — Date — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG SOUND AIR POLLUTION CONTRC AGENCY

KING COUNTY: 410 WEST HARRISON ST. SEATTLE, WA. 98119 AT 4-2050

KITSAP COUNTY: ASK OPERATOR FOR TOLL FREE ZENITH 8385

PIERCE COUNTY: 213 HESS BLDG. TACOMA, WA. 98402 FU 3-5851

SNOHOMISH COUNTY: 703 MEDICAL-DENTAL BLDG. EVERETT, WA. 98201 AL 9-0288

NOTICE OF VIOLATION

№ 5433

Date of Violation June 6 19 72 at 6:40 A.M.

NAME: U. S. Gypsum			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent L. S. Shoemaker.			
Mailing Address 2301 Taylor Way	City Tacoma	State Wa	Zip 98421
Description of Violating Source Retangular Stack.			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ OUTDOOR FIRE in violation of Sec. 9.02 of Reg. 1

☐ VISUAL EMISSIONS in violation of Sec. 9.03 of Reg. 1
Period 630-642 Ringelmann 2 Color Grey
From Metal stack venting bag house.

☐ INCINERATOR BURNING in violation of Sec. 9.05 of Reg. 1

☐

Advise the Pierce County Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

x Mailed No Response Needed.
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer
x Walter A. DeHaan 6-6-72 8:10 AM
Notice Issued By Date Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUGI SOUND AIR POLLUTION CONTRO \GENCY

KING COUNTY: 410 WEST HARRISON ST. SEATTLE, WA. 98119 AT 4-2050

KITSAP COUNTY: ASK OPERATOR FOR TOLL FREE ZENITH 8385

PIERCE COUNTY: 213 HESS BLDG. TACOMA, WA. 98402 FU 3-5851

SNOHOMISH COUNTY: 703 MEDICAL-DENTAL BLDG. EVERETT, WA. 98201 AL 9-0288

NOTICE OF VIOLATION № 5502

Date of Violation July 20 19 72 at 11 00 A M.

NAME: United States Gypsum			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent Mr R. D. Shoemaker			
Mailing Address 2301 Taylor Way	City Tacoma	State Wash	Zip 98421
Description of Violating Source Cupola Stack			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☒ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period # 10 45 AM to 11 00 AM Ringelmann # 2½ to 5 Color Gray Brown

From Cupola Stack

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the pierce county **Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.**

X [signature]

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X Donn R Cox — Notice Issued By | 7/20/72 — Date | 11 00 AM — Time

Form No. 40-105 (7/70)

PUGE' 'OUND AIR POLLUTION CONTROI GENCY

KING COUNTY: 410 WEST HARRISON ST. SEATTLE, WA. 98119 AT 4-2050

KITSAP COUNTY: ASK OPERATOR FOR TOLL FREE ZENITH 8385

PIERCE COUNTY: 213 HESS BLDG. TACOMA, WA. 98402 FU 3-5851

SNOHOMISH COUNTY: 703 MEDICAL-DENTAL BLDG. EVERETT, WA. 98201 AL 9-0288

NOTICE OF VIOLATION

№ 5669

Date of Violation 5/5 19 72 at 2/30 P M.

NAME: United States Gypsum			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent Mr Les Shoemaker			
Mailing Address 2301 Taylor Way	City Tacoma	State Wash	Zip 98421
Description of Violating Source			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☐ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period ______ Ringelmann ______ Color ______

From ______

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☑ 9.12 - of Reg I. Odor & nuisance control measures

Advise the Pierce County **Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.**

X L J Shoemaker
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X D. D Cox — Notice Issued By

5/5/72 — Date

4 40 pm — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUGE" OUND AIR POLLUTION CONTROL GENCY

KING COUNTY: 410 WEST HARRISON ST. SEATTLE, WA. 98119 AT 4-2050

KITSAP COUNTY: ASK OPERATOR FOR TOLL FREE ZENITH 8385

PIERCE COUNTY: 213 HESS BLDG. TACOMA, WA. 98402 FU 3-5851

SNOHOMISH COUNTY: 703 MEDICAL-DENTAL BLDG. EVERETT, WA. 98201 AL 9-0288

NOTICE OF VIOLATION

№ 5680

Date of Violation 6/22 19 72 at 10 25 A M.

NAME: U. S. Gypsum Co.			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent L. J. Shoemaker (works manager)			
Mailing Address 2301 Taylor Way	City Tacoma	State Wash	Zip 98421
Description of Violating Source Bag house			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☐ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 10 10 AM to 10 20 AM Ringelmann #3½ Color Red - Brown

From Bag house

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the (not required) Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

X [signature]
Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X D D Cox
Notice Issued By

6/22/72
Date

10 20
Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG SOUND AIR POLLUTION CONTRO AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

№ 5690

Date of Violation 6/30/ 19 72 at 3⁰⁰ P M.

NAME: U.S. Gypsum			
Location of Violation (Address) 2301 Tayor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent Les Shoemaker			
Mailing Address 2301 Taylor Way	City Tacoma	State Wash	Zip 98421
Description of Violating Source Cupola Stack			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☐ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 2⁴⁸ pm to 3⁰⁰ pm Ringelmann #4 + 5 Color White

From Cupola Stack

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the Pierce County **Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.**

X L. J. Shoemaker

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X RD Cox — Notice Issued By

6/30/72 — Date

3¹⁵ — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG SOUND AIR POLLUTION CONTRC AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

Nº 5739

Date of Violation 6/5 19 72 at 1 30 A M.

NAME: United States Gypsum

Location of Violation (Address)	City	County	Zip
2301 Taylor Way	Tacoma	Pierce	98421

Responsible Person, Owner and/or Agent: Mr L. J. Shoemaker

Mailing Address	City	State	Zip
2301 Taylor Way	Tacoma	Wash	98421

Description of Violating Source: Down Draft fans from Blow Chamber

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☒ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 1 20 to 1 30 Ringelmann #3+ Color Blue

From Down Draft fans from Blow Chamber

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the Pierce County **Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.**

x L J Shoemaker
Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

x R D Cox — Notice Issued By

6/5/72 — Date

145 pm — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG SOUND AIR POLLUTION CONTRO AGENCY

KING COUNTY:
410 WEST HARRISON ST.
SEATTLE, WA. 98119
AT 4-2050

KITSAP COUNTY:
ASK OPERATOR FOR
TOLL FREE
ZENITH 8385

PIERCE COUNTY:
213 HESS BLDG.
TACOMA, WA. 98402
FU 3-5851

SNOHOMISH COUNTY:
703 MEDICAL-DENTAL BLDG.
EVERETT, WA. 98201
AL 9-0288

NOTICE OF VIOLATION

No. 5785

Date of Violation APRIL 26 1972 at 0845 A.M.

NAME: U.S. Gypsum Co.			
Location of Violation (Address) TAYLOR WAY	City TACOMA	County PIERCE	Zip 98421
Responsible Person, Owner and/or Agent L. SHOEMAKER PLT. MGR.			
Mailing Address 2301 SAME	City	State WA	Zip
Description of Violating Source BAGHOUSE CLEAN AIR DISCHARGE			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☑ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 0830-0845 Ringelmann 3½ Color BROWN

From CUPOLA FURNACE OFF GAS

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the NO REPLY Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

X D.R. Hansen
Person Receiving Notice
Signing this Notice is not an admission of guilt.

FOR RECORD ONLY

A. R. Dammkoehler, Control Officer

X [signature]
Notice Issued By

april 26 1972 — Date

0900 — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

PUG' SOUND AIR POLLUTION CONTRC AGENCY

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
AT 4-2050	ZENITH 8385	FU 3-5851	AL 9-0288

NOTICE OF VIOLATION

№ 5786

Date of Violation APRIL 26 19 72 at 0845 A.M.

NAME:			
U. S. Gypsum Co.			
Location of Violation (Address)	City	County	Zip
2301 TAYLOR WAY	TACOMA	PIERCE	98421
Responsible Person, Owner and/or Agent			
L. SHOEMAKER PLT. WORKS MGR.			
Mailing Address	City	State	Zip
SAME		WA.	
Description of Violating Source			
ROOF VENTS			

DID UNLAWFULLY CAUSE OR ALLOW:

☐ **OUTDOOR FIRE** in violation of Sec. 9.02 of Reg. 1

☑ **VISUAL EMISSIONS** in violation of Sec. 9.03 of Reg. 1

Period 0830 - 0845 Ringelmann 2 1/2 - 4 Color WHITE-BLUE

From BATT CURING OVENS

☐ **INCINERATOR BURNING** in violation of Sec. 9.05 of Reg. 1

☐

Advise the NO REPLY Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

X D.R. Hansen

Person Receiving Notice

Signing this Notice is not an admission of guilt.

FOR RECORD ONLY

A. R. Dammkoehler, Control Officer

X L S Thomas

Notice Issued By

April 26, 1972 — Date

0900 — Time

Form No. 40-105 (7/70)

Privileged and Confidential Attorney Work Product

U. S. Gypsum

PUGET SOUND AIR POLLUTION CONTROL AGENCY
INSPECTION REPORT

ROUTING Init.	Date
1. Supvr Insp.	1/15/73
2. Chief Enf.	1/19/73
3. Radio	
4.	
5.	
6.	
7.	
8. File	✓

☐ King ☒ Inspection ☒ Complaint Date 1/12/73

☐ Snohomish ☐ Burn Request __ Smoke Time ____

☒ Pierce ☒ Violation __ Odor Init. ____

☐ Kitsap ☐ ______ __ Open Fire

__ Dust Insp.

__ Other Time

Source U. S. Gypsum

Source Location 2301 Taylor Way

Mailing Address Same

City Tacoma Zip 98421 Phone

Responsible Person L. J. Shoemaker Title works manager

~~Complainant,~~ Person Contacted L. J. Shoemaker

Address City Phone

Comments:

Inspector's Report 1430 - 1/12/73. Senior inspector Donn Cox and I investigated complaint at 2002 Marine view Drive. Complainant was not at home. We proceeded to gather samples of the mat'l. deposited on real property and boats in area behind complainant's trailer. Contacted Mr. L. J. Shoemaker of U.S. Gypsum and informed him of the violation of sec. 9.04 of Reg. I. Showed Mr. L. J. Shoemaker the samples we collected at 2002 Marine View Drive. He stated it had come from the plant and that the conveyor belt which carries insulation had torn screen from vent allowing escape of mat'l.

Film Roll No. N/A. ☐ Complainant Advised Date

Notice of Violation No. 6847 ☐ Report Continued on Next Page

Recommendations: Civil Penalty $100.00

☐ Recommendations Continued on Next Page

Inspector's Name Victor L. Aguilar & Donn Cox Date 1/12/73 Time 1500

Form No. 40-101
10/71

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY
INSPECTION REPORT

U.S. Gypsum

ROUTING	
Init.	Date
1. Supvr Insp.	2/20/73
2. Chief Enf.	2/23/73
3. Radio	
4.	
5.	
6.	
7.	
8. File	✓

☐ King ☐ Inspection ☐ Complaint
☐ Snohomish ☐ Burn Request
☒ Pierce ☒ Violation
☐ Kitsap ☐ ____

Smoke
Odor
Open Fire
Dust
Other

Date 2/17/73
Time 1801
Init. A/S
Insp. Cox
Time

RECEIVED
FEB 23 1973
PUGET SOUND AIR POLLUTION CONTROL AGENCY

Source U.S. Gypsum Co.

Source Location 2301 Taylor Way

Mailing Address 2301 Taylor Way

City Tacoma Wash Zip 98421 Phone Fu 3-1531

Responsible Person L.J. Shoemaker Title Works Manager

Complainant, Person Contacted Mr. L.J. Shoemaker

Address ____ City ____ Phone ____

Comments:

Inspector's Report February, 17, 1973 @ 1630 hrs. At the instigation of the answering service I was at Hylebos Boat Haven, 1940 Marine View Drive, talking to Mrs C. Rowland who complained of fall out particulate from U.S. Gypsum Co. She said that there was a particularly heavy fall-out, though lite in weight, in her area. I gathered some of the fiberous batting material and went around to talk to some one at U.S. Gypsum who would be responsible for the particulate fall-out. On the way I passed the Reichhold Chem. Co.'s parking

Film Roll No. 653 - number 5 thru 12 pic's ☐ Complainant Advised Date

Notice of Violation No. 7242 ☒ Report Continued on Next Page

Recommendations: Civil Penalty $250.00

☐ Recommendations Continued on Next Page

Inspector's Name D.D. Cox Date Feb/20/73 Time 0945 hrs

Form No. 40-101
10/71

lot at 2340 Taylor Way. The parking lot surface was covered with fall-out and it was continuing to fall.

I took pictures of the parking lot and from the direction of the wind at this time was able to follow the fall-out back to the plant at U.S. Gypsum. I went to the parking lot at 2301 Taylor Way, belonging to U.S. Gypsum, and gathered from its' surface some of the fiberous batten material that was continuing to fall from the plant stream. Since there was noeone (but the shift foreman) there I will call again on Tuesday.

February 20, 1973, at 0945 hours I went into the U.S. Gypsum plant to talk to Mr. Shoemaker and his comment was, "The white and grey material is much easier to see than the black." He said he will answer by mail the N/V within the alloted time.

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION № 7749

Date of Violation June 5 1973 at 2:00 PM.

NAME:			
U.S. Gypsum			
Location of Violation (Address): 2301 Taylor Way	City: Tacoma	County: Pierce	Zip: 98421
Responsible Person, Owner and/or Agent: L. J. Shoemaker		Phone: 383-1537	
Mailing Address: 2301 Taylor Way	City: Tacoma	State: Wn.	Zip: 98421

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☐ Section 9.03 - Emission of Air Contaminant: Visual Standard

  Period ______ of ______ Minutes Density ______ Color ______
- ☒ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☒ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ______

Description of Violation:

Allowing particulate matter to become air-borne and to be deposited on property of others from down draft vent

Advise the circled Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

x L. J. Shoemaker
Person Receiving Notice
Signing this Notice is not an admission of guilt.

This Notice of Violation may be subject to penalties or other enforcement action

A. R. Dammkoehler, Control Officer
x [signature] + Cox   6-5-73   1440
Notice Issued By   Date   Time

Form No. 40-105 (10/72)

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION № 7794

Date of Violation August 2 19 73 at 8 30 A. M.

NAME: U.S. Gypsum			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent Mr. L. J. Shoemaker		Phone 383-1534	
Mailing Address 2301 Taylor	City Tacoma	State Wash	Zip 98

DID UNLAWFULLY CAUSE OR ALLOW:

☐ Section 9.02 - Unlawful Outdoor Fire
☐ Section 9.03 - Emission of Air Contaminant: Visual Standard

Period ______ of ______ Minutes Density ______ Color ______

☒ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
☐ Section 9.05 - Unlawful Incinerator Burning.
☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
☐ Section 9.12 - Odor and Nuisance Control Measures.
☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
☐ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
☐ Section ____ - ______

Description of Violation: Discharge of fly wool on Pennwalt parking lot.

Advise the circled Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X L. J. Shoemaker
Person Receiving Notice
Signing this Notice is not an admission of guilt.

This Notice of Violation may be subject to penalties or other enforcement action.

A. R. Dammkoehler, Control Officer

X D D Cox — Notice Issued By
Aug. 2. 1973 — Date
0840 hrs — Time

Form No. 40-105 (10/72)

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION № 8615

Date of Violation January 10 19 74 at 4:02 p M.

NAME: U.S. Gypsum Co.			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent L.J. Shoemaker		Phone FU 3-1537	
Mailing Address 2301 Taylor Way	City Tacoma	State Wash	Zip 98421

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☑ Section 9.03 - Emission of Air Contaminant: Visual Standard
  Period 8 of 17 Minutes Density 2 3/4 to 4 Color Black
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☐ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ____

Description of Violation:

from power boiler ~~#~~ #1 (Decoy)

~~Advise the circled Office in writing within 10 days of the corrective action you have taken, or will take, to prevent continued or recurrent violation.~~

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X L.J. Shoemaker
Person Receiving Notice
Signing this Notice is not an admission of guilt.

This Notice of Violation may be subject to penalties or other enforcement action.

A. R. Dammkoehler, Control Officer

X Donn D. Cox — Notice Issued By | 1/18/74 — Date | 10:00 — Time

Form No. 40-105 (10/72)

Privileged & Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION Nº 8675

Date of Violation DEC 17 1973 at 10:20 AM.

NAME:			
U.S. GYPSUM			
Location of Violation (Address): 2301 TAYLOR WAY	City: TACOMA	County: PIERCE	Zip: 98421
Responsible Person, Owner and/or Agent: L. J. SHOEMAKER		Phone: FU3-1537	
Mailing Address: 2301 TAYLOR WAY	City: TACOMA	State: WN.	Zip: 98421

DID UNLAWFULLY CAUSE OR ALLOW:

☐ Section 9.02 - Unlawful Outdoor Fire
☒ Section 9.03 - Emission of Air Contaminant: Visual Standard
Period 10 of 10 Minutes Density #3 Color BLACK
☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
☐ Section 9.05 - Unlawful Incinerator Burning.
☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
☐ Section 9.12 - Odor and Nuisance Control Measures.
☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
☐ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
☐ Section ____ - ____

Description of Violation:
EMISSIONS FROM BOILER STACK #1

[redacted]

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X L. J. Shoemaker
Person Receiving Notice
Signing this Notice is not an admission of guilt.

This Notice of Violation may be subject to penalties or other enforcement action.

A. R. Dammkoehler, Control Officer
X Victor L. [signature]
Notice Issued By

12/17/73
Date

1150
Time

Form No. 40-105 (10/72)

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION № 9124

Date of Violation Dec. 17 19 74 at 2:00 P. M.

NAME: U. S. Gypsum Co.			
Location of Violation (Address) 2301 TAYLOR WAY	City TACOMA	County PIERCE	Zip 98421
Responsible Person, Owner and/or Agent FRANK P. MAY WORKS MGR.		Phone 383-1537	
Mailing Address 2301 TAYLOR WAY	City TACOMA	State WA	Zip 98421

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☐ Section 9.03 - Emission of Air Contaminant: Visual Standard
  Period ________ of ________ Minutes Density ________ Color ________
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☑ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ____________________
- ☐ Section ____ - ____________________

Description of Violation:

NOT TAKING REASONABLE PRECAUTIONS TO PREVENT PARTICULATE MATTER FROM BECOMING AIRBORNE FROM #2 BLOWCHAMBER Str VENT

This Notice of Violation may be subject to penalties or other enforcement action.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X F. P. May 4/2/75
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X [signature] — Notice Issued By — 4-2-75 Date — 1415 Time

Form No. 40-105 (7/73)

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION № 9125

Date of Violation APRIL 1 19 75 at 11:00 A.M.

NAME:			
U. S. Gypsum Co.			
Location of Violation (Address): 2301 TAYLOR WAY	City: TACOMA	County: PIERCE	Zip: 98421
Responsible Person, Owner and/or Agent: FRANK P. MAY WORKS MGR.		Phone: 383-1537	
Mailing Address: 2301 TAYLOR WAY	City: TACOMA	State: WA.	Zip: 98421

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☐ Section 9.03 - Emission of Air Contaminant: Visual Standard

  Period ______ of ______ Minutes Density ______ Color ______
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☑ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ____
- ☐ Section ____ - ____

Description of Violation:

NOT TAKING REASONABLE PRECAUTIONS TO PREVENT PARTICULATE MATTER FROM BECOMING AIRBORNE FROM #1 BLOWCHAMBER VENT.

This Notice of Violation may be subject to penalties or other enforcement action.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X F. P. May 4/2/75

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X L. A. Thomsen [signature] — 4-2-75 — 1415

Notice Issued By — Date — Time

Form No. 40-105 (7/73)

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY U.S. Gypsum Co.

NO ICE OF VIOLA ION

№ 10183

Date of Violation DECEMBER 17 19 74 at ____ M.

NAME:			
UNITED STATES GYPSUM COMPANY			
Location of Violation (Address)	**City**	**County**	**Zip**
2301 TAYLOR WAY	TACOMA	PIERCE	98421
Responsible Person, Owner and/or Agent		**Phone**	
FRANK MAY		383-1537	
Mailing Address	**City**	**State**	**Zip**
2301 TAYLOR WAY	TACOMA	Wa.	98421

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☐ Section 9.03 - Emission of Air Contaminant: Visual Standard

  Period ____ of ____ Minutes Density ____ Color ____
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☒ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☐ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ____
- ☐ Section ____ - ____

Description of Violation:

EMISSIONS IN EXCESS of that AllowABle from middle STACK of No. 2 BLOW CHAMBER

This Notice of Violation may be subject to penalties or other enforcement action.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X ____________________

Person Receiving Notice

Signing this Notice is not an admission of guilt.

Certified Mail #616573

A. R. Dammkoehler, Control Officer

X Arnold E Brannock — January 14, 1975 — 1515

Notice Issued By — Date — Time

Form No. 40-105 (7/73)

Privileged & Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION № 10194

Date of Violation *April 22* 19 *75* at *11:00 A.* M.

NAME:			
U. S. Gypsum			
Location of Violation (Address)	**City**	**County**	**Zip**
2301 Taylor Way	*Tacoma*	*Pierce*	*98421*
Responsible Person, Owner and/or Agent		**Phone**	
Frank May Works Mgr		*383-1537*	
Mailing Address	**City**	**State**	**Zip**
Same		*WA.*	

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☐ Section 9.03 - Emission of Air Contaminant: Visual Standard

  Period ________ of ________ Minutes Density ________ Color ________
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☑ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ____________________
- ☐ Section ____ - ____________________

Description of Violation:

9.15a - Failure to take reasonable precautions to prevent particulate matter from becoming airborne from #2 Blowchamber vents

This Notice of Violation may be subject to penalties or other enforcement action.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X *F. L. May*
Person Receiving Notice
Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X *Lawrence S. Thomson* — Notice Issued By

V. L. [signature]

4/23/75 — Date

1020 — Time

Form No. 40-105 (7/73)

Privileged and Confidential Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY

NOTICE OF VIOLATION

№ 10195

Date of Violation April 22 19 75 at 12:15 P.M.

NAME: U.S. Gypsum			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent Frank May Works Mgr		Phone 383-1537	
Mailing Address Same	City	State WA.	Zip

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☐ Section 9.03 - Emission of Air Contaminant: Visual Standard

  Period ______ of ______ Minutes Density ______ Color ______
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☑ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ______
- ☐ Section ____ - ______

Description of Violation:

9.15a failure to take reasonable precautions to prevent particulate matter from becoming airborne while discharging collected dust from bag house

This Notice of Violation may be subject to penalties or other enforcement action.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X [signature]

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X [signature]

Notice Issued By

[signature]

Date 4/23/75 Time 1020

Form No. 40-105 (7/73)

Privileged & Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY U.S. Gypsum

NOTICE OF VIOLATION

№ 10204

Date of Violation DEC 13 19 74 at 2:12 P M.

NAME:			
U. S. Gypsum Co.			
Location of Violation (Address) 2301 Taylor Way	City Tacoma	County Pierce	Zip 98421
Responsible Person, Owner and/or Agent Frank May		Phone FU 3-1537	
Mailing Address 2301 Taylor Way	City Tacoma	State Wn.	Zip 98421

DID UNLAWFULLY CAUSE OR ALLOW:

- ☐ Section 9.02 - Unlawful Outdoor Fire
- ☒ Section 9.03 - Emission of Air Contaminant: Visual Standard

  Period 8 of 8 Minutes ~~Density~~ OPACITY 55%-70% Color BLUE
- ☐ Section 9.04 - Allowing Particulate Discharge onto Real Property of Others.
- ☐ Section 9.05 - Unlawful Incinerator Burning.
- ☐ Section 9.06 - Operating Refuse Burning Equipment Other Than Lawful Time.
- ☐ Section 9.07 - Excessive Emission of Sulfur Oxides.
- ☐ Section 9.09 - Emission of Particulate Matter: Weight Rate Standard.
- ☐ Section 9.11 - Emission of Air Contaminant or Water Vapor: Detriment to Person or Property.
- ☐ Section 9.12 - Odor and Nuisance Control Measures.
- ☐ Section 9.13 - Emission of Air Contaminant: Concealment and Masking Restricted.
- ☐ Section 9.15 - Preventing Particulate Matter From Becoming Airborne.
- ☐ Section ____ - ____
- ☐ Section ____ - ____

Description of Violation:

EMISSIONS FROM VENT OF BAG-HOUSE

This Notice of Violation may be subject to penalties or other enforcement action.

KING COUNTY:	KITSAP COUNTY:	PIERCE COUNTY:	SNOHOMISH COUNTY:
410 WEST HARRISON ST.	ASK OPERATOR FOR	213 HESS BLDG.	703 MEDICAL-DENTAL BLDG.
SEATTLE, WA. 98119	TOLL FREE	TACOMA, WA. 98402	EVERETT, WA. 98201
344-7330	ZENITH 8385	383-5851	259-0288

X F. G. May

Person Receiving Notice

Signing this Notice is not an admission of guilt.

A. R. Dammkoehler, Control Officer

X Victor R. [signature]

Notice Issued By

12/13/74

Date

1435

Time

Form No. 40-105 (7/73)

Privileged and Confidential Attorney Work Product

USG Civil Penalties Between 1967 and 1975

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL)
AGENCY, a municipal corporation of the)
State of Washington, 410 W. Harrison St.,) NO. 358
Seattle, Washington 98119)
VS) NOTICE OF
United States Gypsum Company) CIVIL PENALTY
2301 Taylor Way)
Tacoma, Washington 98421)

Attention: Mr. L. D. Shoemaker, Manager

You are hereby notified that, pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.03(a) of Regulation I, and a fine of $250.00 is assessed against you. The violation is as follows:

On or about the 20th day of July 1972 in Pierce County, State of Washington, you violated Section 9.03(a) by causing or allowing the emissions of an air contaminant for a period or periods aggregating more than three (3) minutes in any one hour, which is:

(1) Darker in shade than that designated as No. 2 (40% density) on the Ringelmann Chart, as published by the United States Bureau of Mines; or

(2) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection 9.03(a) (1) ..... from cupola stack located at the above address as per attached page.

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure). If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

[signature]
Air Pollution Control Officer

Dated: July 27, 1972

Form No. 40-122-3
1/6/72

Certified Mail No. 779521

Rec'd 7-28-72

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 West Harrison Street, Seattle, Washington 98119

VS

U. S. Gypsum Co.
2301 Taylor Way
Tacoma, Wash. 98421

NO. 648

NOTICE OF CIVIL PENALTY

Attention: Mr. L. J. Shoemaker, Works Mgr.

You are hereby notified that pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.04 of Regulation I, and a fine of $ 100.00 is assessed against you. The violation is as follows:

On or about the 12th day of January 1973 in Pierce County, State of Washington, you violated Section 9.04 by causing or allowing the discharge of particulate matter which becomes deposited upon the real property of others; as per attached page.

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure).

If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Pollution Control Hearings Board of Washington and the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

Dated this 24th day of January 1973

Certified Mail 768454

ORIGINAL SIGNED BY
A. R. DAMMKOEHLER

A. R. Dammkoehler
Air Pollution Control Officer

Form No. 40-122
1/71

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 W. Harrison St., Seattle, Washington 98119)

VS)

U. S. Gypsum Company)
2301 Taylor Way)
Tacoma, Washington 98421)

Attention: Mr. L. J. Shoemaker, Works Manager

RECORD OF VIOLATIONS ISSUED BY THE PUGET SOUND AIR POLLUTION CONTROL AGENCY

Date	Time	Location	Violation ~~Duration~~ ~~Density~~ ~~Color~~	N/V#	Section
1/12/73	2:30 p.m.	2301 Taylor Way Tacoma, Washington	Allowing particulate matter to be deposited on real property of others.	6847	9.04

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 West Harrison Street, Seattle, Washington 98119)
VS)

U. S. Gypsum Company)
2301 Taylor Way)
Tacoma, Washington 98421)

U. S. Gypsum

NO. 705

NOTICE OF CIVIL PENALTY

Attention: Mr. L. J. Shoemaker, Works Manager

You are hereby notified that pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.04 of Regulation I, and a fine of $ 250.00 is assessed against you. The violation is as follows:

On or about the 17th day of February 1973 in Pierce County, State of Washington, you violated Section 9.04 by causing or allowing the discharge of particulate matter to become deposited upon the real property of others; as per attached page.

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure).

If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Pollution Control Hearings Board of Washington and the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

Dated this 2nd day of March 1973

ORIGINAL SIGNED BY
A. R. DAMMKOEHLER
A. R. Dammkoehler
Air Pollution Control Officer

Form No. 40-122
1/71

Certified Mail No. 587596

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 W. Harrison St., Seattle, Washington 98119)

VS)

U. S. Gypsum Company)
2301 Taylor Way)
Tacoma, Washington 98421)

Attention: Mr. L. J. Shoemaker, Works Manager

RECORD OF VIOLATIONS ISSUED BY THE PUGET SOUND AIR POLLUTION CONTROL AGENCY

Date	Time	Location	Violations ~~Duration~~ ~~Density~~ ~~Color~~	N/V#	Section
1/12/73	2:30 p.m.	2301 Taylor Way, Tacoma, Washington	Causing or allowing particulate matter to become deposited on real property of others.	6847	9.04
2/17/73	4:30 p.m.	Same	Same	7242	9.04

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 West Harrison Street, Seattle, Washington 98119	)	NO. 1075
VS	)	
U. S. Gypsum Company 2301 Taylor Way Tacoma, Wash. 98421	)	NOTICE OF CIVIL PENALTY

Attention: Mr. L. J. Shoemaker

You are hereby notified that pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.04 of Regulation I, and a fine of $ 250.00 is assessed against you. The violation is as follows:

On or about the 2nd day of August 1973 in Pierce County, State of Washington, you violated Section 9.04 by causing or allowing the discharge of particulate matter to become deposited upon the real property of others.

	Time	Notice of Violation No.
	8:30 a.m.	7794

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure).

If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Pollution Control Hearings Board of Washington and the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

Dated this 13th day of August 1973

Certified Mail #545134

A. R. Dammkoehler
Air Pollution Control Officer

Form No. 40-122
1/71

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL)
AGENCY, a municipal corporation of the)
State of Washington, 410 W. Harrison St.,)
Seattle, Washington 98119)
VS)
)
U. S. Gypsum Company)
2301 Taylor Way)
Tacoma, Washington 98421)

NO. 1357

NOTICE OF
CIVIL PENALTY

Attention: L. J. Shoemaker, Works Manager

You are hereby notified that, pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.03(a) of Regulation I, and a fine of $ 100.00 is assessed against you. The violation is as follows:

On or about the 10th day of January 1974 in Pierce County, State of Washington, you violated Section 9.03(a) by causing or allowing the emissions of an air contaminant for a period or periods aggregating more than three (3) minutes in any one hour, which was:

(1) Darker in shade than that designated as No. 2 (40% density) on the Ringelmann Chart, as published by the United States Bureau of Mines; or

(2) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection 9.03(a)(1) .... from power boiler #1 at 2301 Taylor Way, Tacoma, Washington 98421.

Time	Duration	Density/Opacity	Color	N.V. Number
4:02 P.M.	8 minutes	2 3/4-4 Ringelmann	Black	8615

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure). If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Pollution Control Hearings Board of Washington and the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

Dated this 23rd day of January 1974

Certified Mail No. 545336
Form No. 40-122-3
5/17/73

A. R. Dammkoehler
Air Pollution Control Officer

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 West Harrison Street, Seattle, Washington 98119

VS

U. S. Gypsum Company
2301 Taylor Way
Tacoma, Washington 98421

NO. 2016

NOTICE OF CIVIL PENALTY

Attention: Mr. Frank May, Works Manager

You are hereby notified that pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.15(a) of Regulation I, and a fine of $ 250.00 is assessed against you. The violation is as follows:

On or about the 22nd day of April 1975 in Pierce County, State of Washington, you violated Section 9.15(a) by causing or permitting particulate matter to be handled, transported or stored without taking reasonable precautions to prevent the particulate matter from becoming airborne at 2301 Taylor Way, Tacoma, Washington 98421.

Time	Description	N/V#
11:00 A.M.	Particulate matter from #2 Blowchamber vents	10194

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure).

If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Pollution Control Hearings Board of Washington and the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

Dated this 29th day of April 1975

A. R. Dammkoehler
Air Pollution Control Officer

Certified Mail No. 750437

Form No. 40-122
1/71

Privileged and Confidential
Attorney Work Product

...GET SOUND AIR ...LUTION CONTROL AGENCY, a municipal corporation of the State of Washington, 410 West Harrison Street, Seattle, Washington 98119 VS U. S. Gypsum Company 2301 Taylor Way Tacoma, Washington 98421	)	NO. 2017 NOTICE OF CIVIL PENALTY

Attention: Mr. Frank May, Works Manager

You are hereby notified that pursuant to RCW 70.94 and Regulation I, you are in violation of Section 9.15(a) of Regulation I, and a fine of $250.00 is assessed against you. The violation is as follows:

On or about the 22nd day of April 1975 in Pierce County, State of Washington, you violated Section 9.15(a) by causing or permitting particulate matter to be handled, transported or stored without taking reasonable precautions to prevent the particulate matter from becoming airborne at 2301 Taylor Way, Tacoma, Washington 98421.

Time	Description	N/V #
12:15 P.M.	Discharging collected dust from baghouse.	10195

Such penalty is due and payable within 30 days of receipt of this notice, unless within such time a request for hearing is filed. (See attachment for hearing procedure).

If such penalty is not paid on or before the last mentioned date, or a request for hearing has not been made to the Pollution Control Hearings Board of Washington and the Air Pollution Control Officer, action will be commenced in court to recover such penalty.

Dated this 29th day of April 19 75

A. R. Dammkoehler
Air Pollution Control Officer

Certified Mail No. 750437
Form No. 40-122
1/71

Privileged and Confidential
Attorney Work Product

Other PSAPCA Documentation Referenced in this Report

Privileged and Confidential
Attorney Work Product

GSB

MEMORANDUM - June 5, 1969

TO: H. A. Watters, Chief Engineer

CC: A. R. Dammkoehler
C. McCord
W. DeHaan
S&C Files

FROM: G. S. Beckwith, Air Pollution Engineer

SUBJECT: Summary of Plant Visit Observations, U. S. Gypsum Rockwool Plant, Taylor Way, Tacoma on May 26, 1969

On May 26, 1969, George Beckwith, Engineer, and Walter DeHaan, Inspector, visited U. S. Gypsum Rockwool Plant at Tacoma and contacted Mr. Lee Anderson, Plant Manager, and Mr. A. W. Schairbaum, Manager (telephone FU3 1537).

1. The plant is situated approximately 1,000 feet west of Kaiser Aluminum on the Tacoma Industrial Tide Flats. One of three slag melting furnaces was in continuous operation (24 hours, 5-day week).

2. Emissions were observed and sensed as follows:

A. From the cupola furnace stacks, approximately 60 feet above ground level, black to brown smoke, 60% + dense with substantial residual. (Black on furnace charging).

B. From the drying ovens vent, visible vapor and smoke. This is approximately 40% dense and produces eye irritation and distasteful odor. Phenol and formaldehyde content of the roof level release probably exceeds ACGIH 5 ppm 8 hr. exposure limits for on the site exposures.

C. From ventilation and process fan vents, quantities of agglomerated rock wool plus grit beads of slag in the 50+ micron size range. It is believed that an appreciable amount of short silicate-glass fibers (approximately 5x50 mincrons) are also entrained. These fibers have a much longer settling period than similar weight spheres, hence tend to travel appreciable distances.

The six-inches deep accumulations of the wool and slag beads on the plant roof and grounds is a positive evidence of its release and of poor industry housekeeping.

George Beckwith
PSAPCA Engr

Privileged and Confidential
Attorney Work Product

3. No emission control equipment is installed or on order, according to Mr. Schairbaum. Statements of 4/15/69 letter regarding U.S.G. plans for UOP scrubber were placed in doubt by mention that other devices and vendors were now being considered. A considerable interest was expressed in the precise particle size distribution in the emissions. The RAC Source Test equipment (which has no sizing capacity) was discussed.

COMMENT AND RECOMMENDATION

The following emissions should be controlled by any suitable means (filter, scrubbers, cyclone and afterburners are discussed in APEM, pp 342-349.)

a. Cupola Furnace stack emissions - largely fumes, particulate, SO_x, Fl and smoke. (Possibly arsenic and other metallic compounds.)

b. The drying oven vent - largely fumes, phenol and formaldehyde and silicate particles.

c. The blow chamber and Batt machine and plant vents - largely mineral fiber particles and agglomerations.

Means are well developed to accomplish this type of control and, without question, filters could meet PSAPCA process weight limits, however the election of filters may not be the obvious choice because of the active SO_x and HFl and the cupolo's heat. A wet collector would tend to assure the community of better fluoride and SO_x protection.

Some allowance for the light weight nature of the product is warranted in considering process weight limitations.

I feel that the manager has not moved with reasonable speed in selecting and procuring equipment since more than one year has passed since he was notified of opacity violation and no improvements are committed.

I propose that he be invited to a hearing at which time we could press for substantial compliance within six months, (with Regulation I emission limits.)

[signature]
PSAPCA Engr

GSB/bc

Privileged and Confidential
Attorney Work Product

PUGET SOUND AIR POLLUTION CONTROL AGENCY
INSPECTION REPORT

ROUTING		
	Init.	Date
1. Supvr Insp.		8/22/72
2. Chief Enf.		
3. Radio		
4.		
5.		
6.		
7.		
8. File		

☐ King ☐ Inspection ☒ Complaint — Date 8/21/72
☐ Snohomish ☐ Burn Request — Smoke, Odor, Open Fire, Dust, Other — Time 1243, Init. MR
☐ Pierce ☐ Violation — Insp. Cox, Time 130
☐ Kitsap ☐ ______

Source: U.S. Gypsum

Source Location: ______

Mailing Address: ______

City ______ Zip ______ Phone ______

Responsible Person ______ Title ______

Complainant, Person Contacted [redacted]

Address [redacted] City [redacted] Phone [redacted]

Comments: Husband works at [redacted] Graveyard shift. They blow out insulation pollution in wee hours around 4 or 5 O'clock. He has to wash his car every morning.

Inspector's Report: [redacted] works the graveyard shift at [redacted] and anyone working on the flats could automaticly wash his car once a day, it's that thick. I will however keep my eyes open.

Film Roll No. ______ ☒ Complainant Advised Date 8/22/72

Notice of Violation No. ______ ☐ Report Continued on Next Page

Recommendations: ______

☐ Recommendations Continued on Next Page

Inspector's Name DDCox Date 8/22/72 Time 140

Form No. 40-101
10/71

PUGET SOUND AIR POLLUTION CONTROL AGENCY
INSPECTION REPORT

ROUTING Init.	Date
1. Supvr Insp.	8/3/73
2. Chief Enf.	8/6/73
3. Radio	
4.	
5. KMD.	
6.	
7.	
8. File ✓	

☐ King ☐ Inspection ☐ Complaint Date
☐ Snohomish ☐ Burn Request __ Smoke Time
☒ Pierce ☒ Violation __ Odor Init.
☐ Kitsap ☐ ______ __ Open Fire
__ Dust Insp. Cox
__ Other Time

RECEIVED
AUG 6 1973
PUGET SOUND AIR POLLUTION CONTROL AGENCY

Source U.S. Gypsum

Source Location 2301 Taylor Way

Mailing Address 2301 Taylor Way

City Tacoma Wash Zip 98421 Phone 383-1537

Responsible Person MR. L. J. Shoemaker Title Gen Manager

Complainant, Person Contacted MR. Shoemaker

Address ______ City ______ Phone ______

Comments:

Inspector's Report August 2, 1973 @ 0830 hrs. Was called to the parking lot of Pennwalt, by Dennis Roths, to see fly wool falling on the lot and adjacent property. I took a picture of it, examined it, and took a sample of it. I then went back to the parking lot of U.S. Gypsum where the same conditions prevailed. I Took a sample there and went in to see MR. Shoemaker. He told me they had slipped and no-one had called in a 9:16. The Down Draft Fans & Vent were at fault and MR Shoemaker will attempt to remedy the situation "post haste"

Film Roll No. ☐ Complainant Advised Date

Notice of Violation No. 7794 ☐ Report Continued on Next Page

Recommendations: Civil Penalty $250.00

* Note – Sample retained in Tacoma File.

☐ Recommendations Continued on Next Page

Inspector's Name D D Cox Date 8/2/73 Time 1200

Form No. 40-101
10/71

Privileged and Confidential Attorney Work Product

Sample of fly wool picked up at Pennwalt's parking lot.

RECEIVED

AUG 6 - 1973

PUGET SOUND AIR POLLUTION
CONTROL AGENCY

Still falling

Sample of fly wool picked up at U.S. Gypsum's parking lot.

RECEIVED

AUG 6 - 1973

PUGET SOUND AIR POLLUTION
CONTROL AGENCY

Still Falling

Privileged and Confidential
Attorney Work Product