

Existing Environmental Conditions

Appendix
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The analysis of existing environmental conditions at the former Allentown State Hospital (ASH) property was developed through review of publicly available environmental assessment reports. Since it is the current property owner's (the Commonwealth of Pennsylvania) intention to mitigate environmental concerns as part the site demolition contract, the Scope of Work for the Demolition Contract (DGS SOW) was also reviewed to determine if all previously identified environmental issues were being mitigated.

Environmental studies utilized to conduct the analysis of existing environmental conditions included:

- 1 Phase 1 Environmental Site Assessment, prepared for the City of Allentown by HDR, Inc., February 24, 2009. (Limited to the 30-acre portion of the ASH property now located at 1900 East Allen Street in the City of Allentown, also known as the former Allentown Commercial and Industrial Development Authority (ACIDA) parcel.)
- 2 Phase 2 Environmental Site Assessment, prepared for LVEDC by Moonstone Environmental, LLC, August 31, 2009. (Limited to the ACIDA parcel.)
- 3 Target Brownfield Assessment (TBA), Subsurface Field Investigations, prepared for U.S. Environmental Protection Agency by Advanced Environmental Solutions, Inc and HDR Inc., September 2010. (Limited to the 30-acre former ACIDA parcel.)
- 4 Phase 1 Environmental Site Assessment, prepared for the City of Allentown via the Lehigh Valley Economic Development Corporation (LVEDC) by HDR, Inc., April 5, 2017. (Focused on the portion of the ASH property located at 1600 Hanover Avenue consisting of approximately 164 acres with 28 individual buildings, but NOT including the 30-acre former ACIDA parcel.)
- 5 Phase 1 Environmental Site Assessment, prepared for the Pennsylvania Department of General Services (DGS) by KCI Technologies, Inc., November 8, 2018. (The subject site of this study is the entire ASH property including two parcels of land totaling approximately 195 acres. The subject site is developed with thirty (30) vacant hospital buildings located near the center of the site and several vacant agricultural and maintenance buildings located on the eastern portion of the site.)
- 6 Screening Level Phase 2 Environmental Site Assessment, prepared for DGS by KCI Technologies, Inc., November 20, 2018. (The Screening Level Phase II ESA was conducted to investigate A) dioxin-impacted soils located south of the former incinerator and B) two diesel aboveground storage tanks (ASTs) and one decommissioned underground storage tank (UST) located on the site. The investigation was both targeted and limited in nature and was conducted to gather additional information concerning the issues referenced above. KCI Technologies, Inc. did not investigate other areas of the site or other issues.)
- 7 Pennsylvania Department of General Services, Request for Proposal for a Design Build Contractor, Project No. DGS-C-0501-0022, Project Manual, Appendix Q, Statement of Work, August 29, 2019. (DGS SOW)

STUDY AREAS OF EACH ENVIRONMENTAL INVESTIGATION

In 2009, ACIDA was considering acquisition of the 30-acre portion of the site now located at 1900 East Allen Street in the City of Allentown from the Commonwealth. The Commonwealth proceeded with a subdivision of the parcel in preparation of the sale to the ACIDA. The 30-acre parcel is presented in Figure 2 from the 2009 report and is included at the end of this section. The first three studies in the above list were conducted on this 30-acre parcel only. Figures 2 and 3 from the 2010 TAB investigation present the Areas of Concern for this parcel. The parcel was conveyed to ACIDA, but it was eventually sold back to the Commonwealth in 2018.

Subsequent environmental studies focused on either the remaining 160+ acres of the ASH property (see Figure 3 from the 2017 Phase 1 report) or on the entire 195-acre property (see Figure ES1 from the 2018 Phase 1). These figures present the Areas of Concern for the larger parcels. The DGS SOW encompasses demolition, remediation, and site reclamation work at the entire 195-acre property.

SUMMARY OF RECOGNIZED ENVIRONMENTAL CONDITIONS

A summary of the findings and conclusions of each investigation report is presented in the Environmental Findings Table at the end of this section. Any corresponding mitigation measures that have been identified in the DGS SOW are also presented in the table. Figures that are relevant from each report are included at the end of this section.

SUMMARY OF DEMOLITION/REMEDIATION SCOPE OF WORK

The DGS project generally consists of abatement, termination of utilities, demolition of the existing buildings/structures, and restoration of the ASH property. There are 44 buildings, including ancillary structures such as sheds, gazebos, and dumpsters, etc., located throughout the approximately 195-acre site that date back to the late 1800s. There is also a system of utility tunnels throughout the main grouping of buildings along with one inactive and two active water reservoirs that currently hold approximately 1.5 million gallons of water. There are several structures and a building on campus that are not in contract (NIC), which are the existing sidewalks and parking lots (not integral to the top of the utility tunnels), the Pennsylvania Department of Environment Protection (PADEP) weather station (nor its power service), Community Services for Children, and townhouses. The construction duration of this project is 546 days. This includes an estimated 120 days, four months for design and 14 months for abatement, utility termination, demolition, removal, fill and seeding.

DGS has contracted with a Design Build Contractor (DBC) to complete the DGS SOW described in the Request for Proposal, which provides details as to the final condition of the site and supporting infrastructure once the work is completed. For example, the DBC shall only grub to the extent required to perform the demolition of the buildings and structures and abatement of environmental hazards. No trees located along the main ingress/egress roads shall be removed. Demolished buildings and subgrade voids (i.e. basements, tunnels, areas of contaminated soil, and USTs) shall be filled with approved fill. These areas shall be filled in two-foot lifts and compacted to 95% compaction. Any portion of existing sidewalk that was removed to abate and demolish the tunnels shall be replaced to match existing. If any portion of tunnel runs under the roadway, the roadway shall be repaired in accordance with Pennsylvania Department of Transportation standards. The disturbed areas of the project site shall be seeded in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements.

CONCLUSION & RECOMMENDATIONS

Based on a review of available environmental reports and the DGS SOW, it appears that all previously identified Recognized Environmental Conditions will be addressed during the planned site preparation work. However, potential developers will need to confirm whether the “pad ready” status of the site is suitable for their proposed end-uses.

There may be several potential outstanding environmentally-related concerns that remain after completion of the DGS SOW. For example, the confirmation sampling to be conducted by the DGS DBC will be crucial to evaluate if remediation has been completed to a level that will attain the PADEP’s residential cleanup standards that will be necessary to support unrestricted redevelopment of the site. Also, in the previously landfilled areas, compaction testing is recommended to confirm buildability of those areas once excavated and backfilled. Similarly, given that building debris will be backfilled into basement areas of buildings during demolition, buildability of former building footprints should be confirmed prior to new construction.

30-Acre Portion of ASH Now Located at 1900 East Allen Street (Former ACIDA Parcel)



 1720 Spillman Drive Suite 280 Bethlehem, PA 18015-2165 ONE COMPANY Many Solutions™	Allentown State Hospital 1520 Hanover Avenue Allentown, PA 18109	Subject Parcel Phase I Environmental Site Assessment	Date	Figure
			1/16/09	2

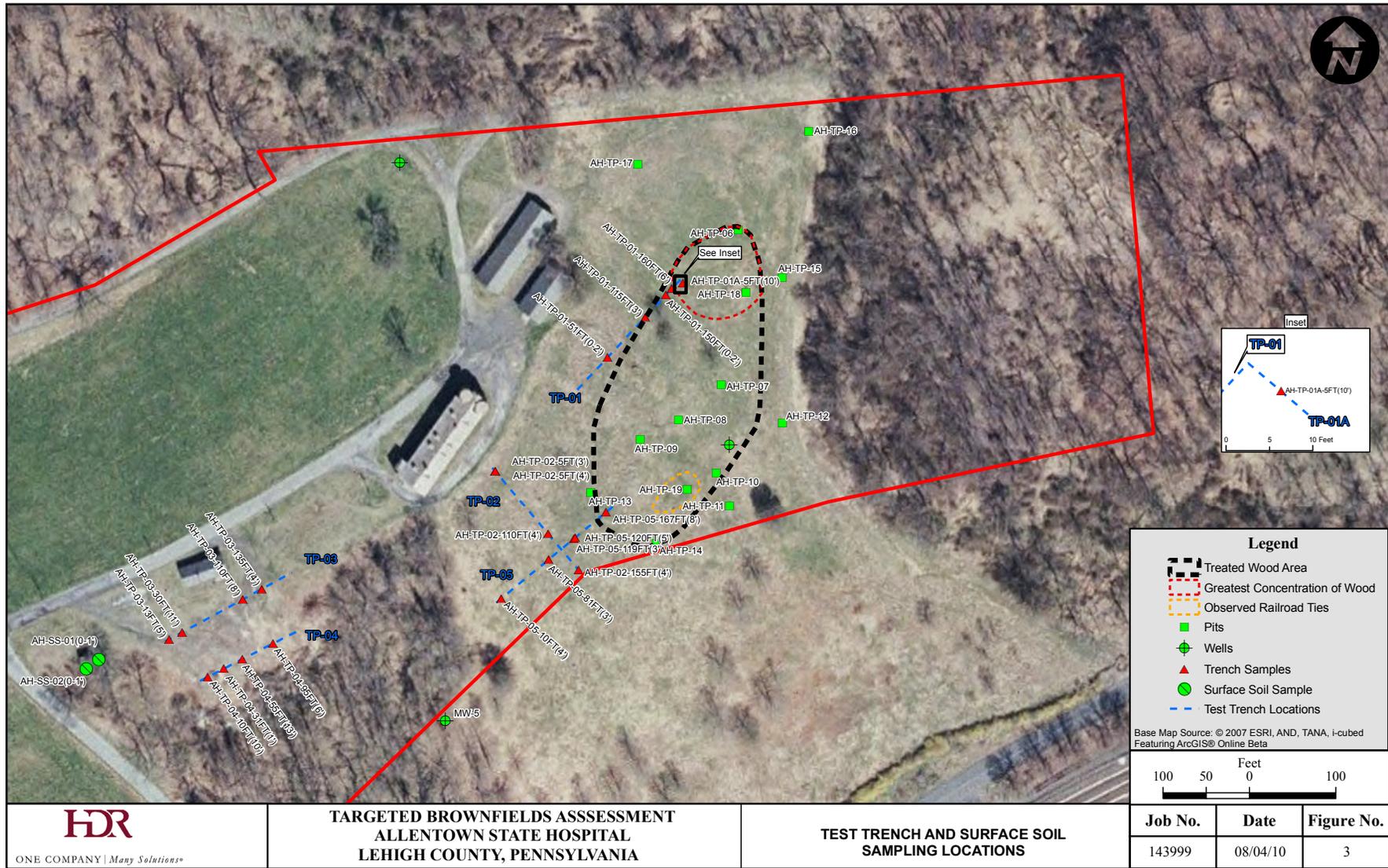
Source: Phase 1 Environmental Site Assessment, prepared for the City of Allentown by HDR, Inc., February 24, 2009.

Areas of Concern for the Former ACIDA Parcel (Map 1)



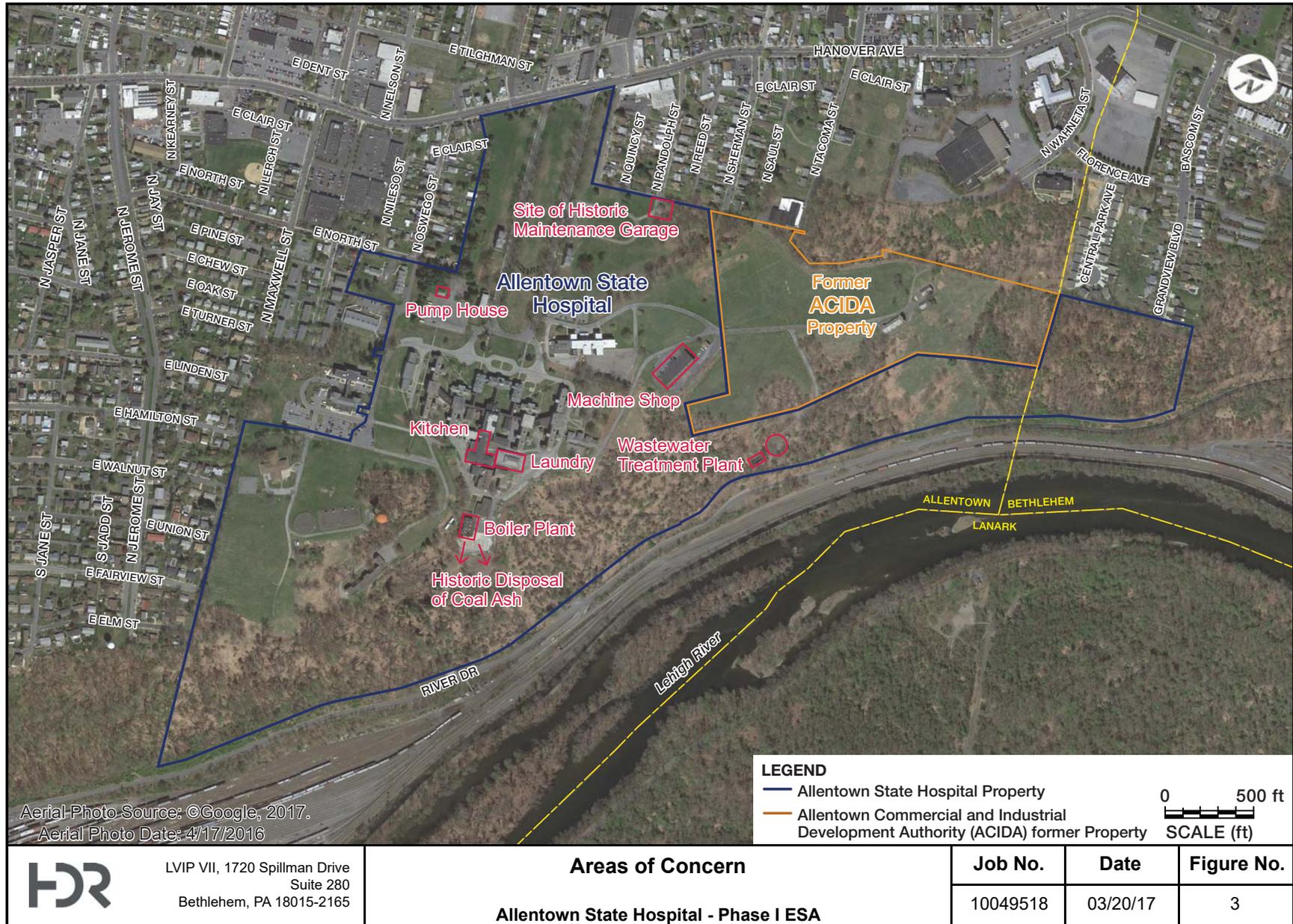
Source: Target Brownfield Assessment (TBA), Subsurface Field Investigations, prepared for USEPA by Advanced Environmental Solutions, Inc and HDR Inc., September 2010.

Areas of Concern for the Former ACIDA Parcel (Map 2)



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Areas of Concern for the Remaining 160-Acre Site (Map 1)



Areas of Concern for the Remaining 160-Acre Site (Map 2)



Source: Phase 1 Environmental Site Assessment, prepared for DGS by KCI Technologies, Inc., November 8, 2018.

	REPORT REFERENCED	PARCEL & PURPOSE	FIELD WORK CONDUCTED	RECS & IDENTIFIED CONCERNS	FIGURE REFERENCES	FINDINGS/ RECOMMENDATIONS AND FOLLOW-UP STUDIES	DGS PLANNED MITIGATION
1	Phase 1 Environmental Site Assessment, prepared for the City of Allentown by HDR, Inc., February 24, 2009.	30-acre portion of the ASH property now located at 1900 East Allen Street, also known as the former ACIDA parcel. The Phase 1 was conducted to support possible acquisition of the parcel by the ACIDA.	N/A	PADEP documents, interviews and aerial photographs indicate that several areas have been backfilled or show signs of soil disturbance. Specifically, documents indicate the eastern boundary of the subject parcel was utilized as a landfill starting in the early 1970s and into the 1980s. The fill material at these locations was never characterized and is considered a recognized environmental condition.	Figure 2 shows 30-acre parcel		See REC 4 from 2018 Phase 1
				Interviews conducted during this assessment indicate that an incinerator operated on the subject parcel and was used to burn primarily paper waste. There is evidence of slag and other fill material in the immediate vicinity of the incinerator. There are no records that document what exactly has been burned and the ultimate disposal of the ash, therefore this is a recognized environmental condition.			See REC 3 from 2018 Phase 1
				Potential asbestos containing material (ACM) including shingles cover the outside walls of the former chicken coop. There is the potential that additional asbestos containing materials requiring additional evaluation exist inside the building.		August 2009 Phase 2 confirmed presence of ACM & recommended abatement prior to demolition. Grey transite siding on the chicken coop and on the storage shed next to the blacksmith shop have been confirmed as asbestos-containing materials.	As per DGS SOW: The DBC will be required to perform abatement of ACM prior to demolition of any buildings on the property. In addition, there is a potential of paint chips in the area surrounding Building 41 (Water Tower). The DBC shall, if paint chips are present, bag and treat the paint chips as if they are lead-based paint chips.
2	Phase 2 Environmental Site Assessment, prepared for LVEDC by Moonstone Environmental, LLC, August 31, 2009.	30-acre portion of the ASH property now located at 1900 East Allen Street, also known as the former ACIDA parcel. The purpose of the limited Phase II investigation was to evaluate the extent of fill material in three areas of suspected landfilling, and to evaluate soil quality in the following areas: suspect landfill areas, the area around the former incinerator, the area near a floor drain outfall at the former blacksmith shop, and the area of a historical herbicide spill.	The investigation of these areas included an electromagnetic survey, installation of 12 test pits, installation of 10 soil borings via GeoProbe™, and collection of discrete soil samples for laboratory analysis. The Phase II assessment also included an asbestos survey for four buildings at the Site: the chicken coop, the blacksmith shop, and the two storage sheds.	Exceedances of the RSHS for benzo(a)pyrene, arsenic, and lead were documented in soil. Only lead exceeded NRHS.	Figure 3 Site Boundaries and APECs on Aerial Photograph	If this area is to be used for future development, the presence of the landfill materials will need to be taken into account, particularly with respect to the presence of wood and large void spaces in the subsurface, which may contribute to structural instability. Remediation will be dependent on end-use.	See REC 4 from 2 018 Phase 1

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3	Target Brownfield Assessment, Subsurface Field Investigations, prepared for USEPA by Advanced Environmental Solutions, Inc and HDR Inc., September 2010.	30-acre portion of the ASH property now located at 1900 East Allen Street, also known as the former ACIDA parcel.	A subsurface investigation was completed during the months of March and April 2010. Trenches were excavated through the areas of known or suspected land filling, shallow soil samples were collected adjacent to the incinerator and monitoring wells were installed and sampled to document groundwater conditions at upgradient and downgradient locations.	<p>The following observations were noted with respect to the soil:</p> <ul style="list-style-type: none"> • Trenching activities confirmed significant thicknesses of debris in four separate landfill areas: behind the blacksmith shop (trenches 1 and 1A), below the chicken coop (trench 2 and 3), and behind the pipe building (trenches 4 and 5). • Fill material was documented to thickness of up to 15 feet in the trenches and up to 18 feet in the area below the Blacksmith shop (railroad tie area). • Landfilled material consisted of bricks, ash, bottles, household items, etc., as described in the trench pit logs. • Apparent ash-like material was observed in all areas. • Trench 1A was added to the investigation to evaluate an obvious disposal location of railroad ties. • Additional trenching conducted in July 2010 in the area below the chicken coop to determine volume and characteristics of the railroad ties disposal area. 	Table in Section 6 presents thickness of landfilled materials in each area. Figures 2 & 3 show landfilled areas.	Based on soil analytical data, remedial actions may be warranted to address potential risks from direct exposure to Site compounds of concern, specifically dioxin. Additionally, the landfill debris may be a hazard to human safety and also pose problems to future development with respect to engineering design issues.	See REC 3 and REC 4 from 2018 Phase 1
				<ul style="list-style-type: none"> • SVOC compounds exceeded Residential SHS in only one soil sample, AH-TP-03-13FT. Compounds exceeding standards were: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and carbazole. • The metals arsenic, lead and cobalt were detected in soil at concentrations above Residential SHS • One dioxin compound (1, 2, 3, 4, 6, 7, 8, 9-OCDD) was detected slightly above the EPA guidance levels in the shallow soil adjacent to the incinerator. 			See REC 3 from 2018 Phase 1
				<p>The following observations were noted with respect to the groundwater:</p> <ul style="list-style-type: none"> • VOC and SVOC analysis did not detect any compounds above PADEP Residential Used Aquifer, TDS<2500 criteria. • Lead and aluminum were detected in groundwater at concentrations above Residential Used Aquifer (TDS<2500) criteria. 		Groundwater impacts, other than dissolved lead and aluminum above standards is not a risk driver, and since the groundwater in the area is not being used for a drinking water supply, no remedial efforts will be required for groundwater.	None

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4	Phase 1 Environmental Site Assessment, Prepared for the City of Allentown via LVEDC by HDR, Inc., April 5, 2017.	164-acre portion of the ASH property located at 1600 Hanover Avenue in the City of Allentown, but NOT including the 30-acre former ACIDA parcel	N/A	Soil potentially impacted with heavy metals and other coal ash constituents in the on-site ash disposal area south of the boiler plant.	Figure 3: Areas of Concern		See REC 3 from 2018 Phase 1
				Potential spills and releases at the reported historic maintenance garage at the property entrance.			See REC 5 from 2018 Phase 1
				Impacts from release through floor drains throughout the facility, including in the maintenance shop, laundry area, boiler plant, and kitchen, all of which have unknown discharge locations and may have conveyed cleaning solvents, heavy metals, petroleum products, or other hazardous materials that may have been released to soil underlying the facility from drain leakage.			See REC 1 and REC 5 from 2018 Phase 1
				Soil potentially impacted with heavy metals and other constituents from wastewater treatment sludge that was disposed of by spreading it on the ground.			See REC 6 from 2018 Phase 1
				PCB-oil containing transformers			As per the DGS SOW : Prior to the broader demolition efforts of the buildings, the DBC must remove all existing electrical power system equipment and devices (e.g. panel boards, transformers, generators, transfer switches, enclosed circuit breakers, receptacles, etc.).
				Asbestos insulation and lead-based paint in the extensive network of utility tunnels that connect the buildings on the Subject Property. The need for abatement of the asbestos and lead-based-paint in the utility tunnel network has the potential to be costly and time-consuming, and may impact a future redevelopment schedule and budget.			As per the DGS SOW: Throughout the site there is a system of utility tunnels that will also need to have selective demolition completed. Once the tunnels are abated and piping and appurtenances disposed of, they will have the top portion demolished and the bottom slab cracked full depth.

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5	Phase 1 Environmental Site Assessment, Prepared for PA Department of General Services by KCI Technologies, Inc., November 8, 2018.	The subject site of this study is the entire ASH property including two parcels of land totaling approximately 195 acres.	N/A	This Phase 1 identified 7 RECs and recommended a Phase 2 ESA. Some of the 7 RECs correspond to RECs previously identified as indicated above. RECs are summarized below.	Figure ES1 - REC Map		NOTE: The mitigation efforts described for each REC has been taken from the DGS SOW for the DBC conducting the demolition and site preparation work.
				REC 1 - Laundry facility in Building 29 may have had dry-cleaning operations.	Figure ES 1 2018 Phase 1 KCI	Previously Identified.	Possible historic dry-cleaning activities occurred around hospital building 29. DBC is to conduct a soil vapor investigation for VOCs and remove elevated contamination if present prior to building demolition, with follow-up soils and groundwater characterization/ delineation if warranted. Results and report(s) are to be prepared and shared with DGS hired QA firm.
				REC 2 - Fire Training area east of WWTP.	Figure ES 1 2018 Phase 1 KCI		The Fire Training area east of the WWTP has the potential for soil contamination from byproducts of burning. DBC is to sample soils for TPH, VOCs, SVOCs, RCRA-8 metals, PFOS/PFAS and characterize and delineate contaminated areas and remove elevated contamination if present. DBC will remove rusted partial drums and large metal tank. Results and report(s) are to be prepared and shared with DGS hired QA firm.
				REC 3 - Coal Ash and dioxin soil contamination in area of former incinerator. 2018 KCI Phase 2 sampling confirmed dioxin levels.	Figure ES 1 2018 Phase 1 KCI	Previously Identified.	The DBC is to excavate and dispose of approximately 14 tons of known dioxin contaminated soil located south and southeast and of the Incinerator. DBC is to investigate, remove and dispose of additional apparent ash deposited near the northeast and northwest corners of the incinerator and remove if determined to be contaminated. DBC is to remove and dispose of ash remaining within the incinerator prior to demolition, and clean stained areas prior to demolition. DBC is to collect confirmatory samples following removal and provide and install clean backfill. DBC shall backfill and perform compaction associated with backfilling in these areas with clean fill.

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5							<p>There is approximately 22,100 CY of coal ash on the project site. The known areas that coal ash exists is above and on the embankment near the lot to the south the boiler plant. Additionally, there is ash remaining in the boilers and boiler area. DBC is to remove all coal ash, dispose in accordance with applicable regulations.</p>
				<p>REC 4 - 3 Unregulated landfill areas: south of boiler plant area; southeast of incinerator and pipe building; in wooded area east end of subject property</p>	<p>Figure ES 1 2018 Phase 1 KCI</p>	<p>Previously Identified.</p>	<p>Three areas of dumping are apparent along embankments and in wooded areas to the south of the boiler plant building, to the southeast of the former incinerator and pipe building, and in the wooded area at the east end of the subject site. The discarded waste included intact and partial/rusted out drums, tires, an aboveground tank (AST), scrap metal, and wood debris. DBC is to characterize drums, soil and groundwater in the three known drum areas for TPH and VOCs. DBC is to remove and dispose of drums and drum contents, tires, AST, scrap metal and wood debris. DBC is to perform targeted soil removal and disposal if required, and backfill to grade with clean fill.</p>
				<p>REC 5- Use and storage of chemicals, oils and evidence of vehicle maintenance in Electric Shop and Maintenance Shop</p>	<p>Figure ES 1 2018 Phase 1 KCI</p>	<p>Previously Identified.</p>	<p>Containers of lubricants, motor oils, paint, vehicle/equipment maintenance chemicals, and tires are present in the electric shop and maintenance shop at the subject site. Oil staining was observed around several transformer/electrical parts on the concrete floor in the electric shop and around equipment in the maintenance shop. DBC is to dispose of containers and all remaining chemicals, lubricants, containers and tires prior to demolition of the shops. DBC is to clean stained areas or remove substrate and dispose prior to demolition of the shops.</p>

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5				REC 6 - Several concerns related to historic operations of the WWTP including disposition of sludge and the presence of leaking drums and containers inside the sludge filter building	Figure ES 1 2018 Phase 1 KCI	Previously Identified.	Three areas of dumping are apparent along embankments and in wooded areas to the south of the boiler plant building, to the southeast of the former incinerator and pipe building, and in the wooded area at the east end of the subject site. The discarded waste included intact and partial/rusted out drums, tires, an aboveground tank (AST), scrap metal, and wood debris. DBC is to characterize drums, soil and groundwater in the three known drum areas for TPH and VOCs. DBC is to remove and dispose of drums and drum contents, tires, AST, scrap metal and wood debris. DBC is to perform targeted soil removal and disposal if required, and backfill to grade with clean fill.
							Three areas of dumping are apparent along embankments and in wooded areas to the south of the boiler plant building, to the southeast of the former incinerator and pipe building, and in the wooded area at the east end of the subject site. The discarded waste included intact and partial/rusted out drums, tires, an aboveground tank (AST), scrap metal, and wood debris. DBC is to characterize drums, soil and groundwater in the three known drum areas for TPH and VOCs. DBC is to remove and dispose of drums and drum contents, tires, AST, scrap metal and wood debris. DBC is to perform targeted soil removal and disposal if required, and backfill to grade with clean fill.

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5							<p>DBC is to investigate the contents of the drum(s) and other containers and properly dispose of the vessels and contents prior to demolition of the structures. DBC to investigate the contents of the UST, remove and dispose of all contents, properly remove the UST in accordance with PA DEP requirements, and backfill the area to existing grade.</p>
				<p>REC 7 - Evidence of an undocumented UST was observed at the former wastewater treatment plant (WWTP) located at the southeast end of the subject site. KCI also identified two (2) 1,000-gallon fuel oil ASTs at the subject site, one located to the south of the electric shop and one located between buildings 25 and 26. One 500-gallon diesel AST was also observed to the northeast of the maintenance building. A 4,000-gallon gasoline UST was located to the northeast of the maintenance building.</p>	<p>Figure ES 1 2018 Phase 1 KCI</p>		<p>(1) 4000 gallon gasoline UST to be removed located northeast of maintenance building. It is pumped out and 'closed' status. (1) 500 gallon diesel AST northeast of maintenance building, (2) 1000 gallon diesel ASTs with some fuel still remaining in each. One is located south of the electrical shop and one located between buildings 25 and 26. DBC to remove all tanks and slabs, all contamination that may exist, and submit closure reports to PA DEP inclusive of all required testing. DBC shall backfill and perform compaction associated with backfilling in the area with clean fill. Refer to Phase 2 ESA for additional information.</p>