

Site Inspection

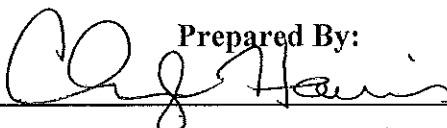
Former Black Leaf Chemical
1391 Dixie Highway
Louisville (Jefferson County), Kentucky

AI # 52202
KYD980559520

Prepared For:

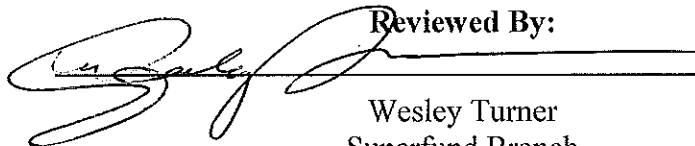
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1.0 Introduction

Under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Kentucky Department for Environmental Protection (KDEP), Division of Waste Management (KDWM), Superfund Branch presents this Site Inspection (SI) for the former Black Leaf Chemical Company (hereinafter referred to as the “site”), located in Louisville, Jefferson County, Kentucky, using the *Hazard Ranking System* (HRS) as the evaluating tool, as well as the document titled *Guidance for Performing Site Inspections Under CERCLA*, United States Environmental Protection Agency (EPA), September 1992, as guides for this Site Inspection (Refs. 1, 2).

2.0 Site Description

2.1 Site Location

The site is located in northwestern Jefferson County at 1391 Dixie Highway, Louisville, Kentucky, approximately 2.5 miles south of I-64 and 2.2 miles east of the Shawnee Expressway. The site is located on a portion of a 29-acre parcel of land currently owned by Louisville Industrial Park, LLC. This address is the official address of Louisville Industrial Park (Ref. 3). Locally, the site can be accessed by vehicle from Dixie Highway or from 17th Street. The address listed in CERCLIS is 1350 N 17th Street, however, this is incorrect (Ref. 19). The 1987 Preliminary Assessment (PA) lists the address as 1340 South 17th Street (Ref. 20). City Directories indicate that the correct address was 1350 S. 17th Street (Ref. 31).

GPS coordinates at the 17th Street entrance are Latitude 38.232967° North and Longitude 85.782500° West (Ref. 8). The site is situated in an inner city area known as the Park Hill neighborhood. The site is bordered by a residential area to the north, a large rail yard to the south, and industry/commercial areas to the east and west. Dixie Highway borders the site to the west and an alley behind residences on Wilson Street borders the site to the north. 16th and 17th Streets run into the site along the northern part of the property. St. Louis Avenue runs into the site from the west. An alley running parallel to 15th Street borders the site to the east. At present, the site is abandoned.

2.2 Site Description

The site operated on a parcel of land that is now part of a larger parcel owned by Louisville Industrial Park, LLC. The Jefferson County Property Valuation Administration identifies this property as Parcel 039H00260000 (Ref. 3). The Louisville Industrial Park property has several buildings/areas that are presently identified by numerical designations 1-20. Historical information indicates that Buildings 16-20 were

part of the property owned and operated by Black Leaf Chemical (Ref. 4). Exact historical usage of these building is unknown, however, labels on Sanborn Fire Insurance Maps and records from the Louisville Fire Department identify possible usages. Buildings 16-18 are currently empty while Buildings 19 and 20 have debris dumped in them. Building 20 also has a recreational boat stored inside (Refs. 6, 15, 29).

Building 20 is approximately 250 feet by 65 feet and is identified on Sanborn Fire Insurance Maps as an insecticide manufacturing building during the time Black Leaf operated at the site. This building was used to store old staves for whiskey barrels while Schenley Distillers operated at the site. The current owners have used this building as office space and a personal workspace, possibly for the restoration of a small boat. Building 19 is approximately 175 feet by 60 feet and only has two walls and a roof. A rail spur runs into this structure. Historical usage is unknown, however, it may have been used to unload rail cars in the past. Building 18 is approximately 310 feet by 70 feet and is identified on Sanborn Fire Insurance Maps as housing a laboratory and extraction room while Black Leaf operated at the site. While Schenley operated, this building was used as employee offices, a lunch room, and for storage of old barrels and staves. It may have been used as warehouse space by the current owners. Building 17 is approximately 310 feet by 70 feet and is identified on Sanborn Fire Insurance Maps as being a storage area and mill building while Black Leaf operated at the site. Schenley used this building as a maintenance shop and for old barrel reconditioning. It may have been used as warehouse space by the current owners. Building 16 is approximately 200 feet by 70 feet and is identified on Sanborn Fire Insurance Maps as warehouse storage for finished product while Black Leaf operated at the site. Schenley used this building to store old staves for whiskey barrels. It may have been used as warehouse space by the current owners (Refs. 6, 8, 15, 29).

For the purposes of this assessment, KDWM has divided the Louisville Industrial Park, LLC, property into two sections (Appendix A, Figure 2). Black Leaf Chemical did not own or reportedly operate on the entire 29 acre parcel. The eastern section contains the Black Leaf Chemical site and was included in Site Inspection activities. The western section has been designated as the former Schenley Distillers site for site assessment purposes, however, records indicate that they owned and operated on the entire 29 acre site. Louisville Cooperage, a division of Schenley Distillers, manufactured whiskey barrels at the site from the 1950s-1980s. A Pre-CERCLIS Screening Assessment has been conducted on the western section of the property under the name Schenley Distillers for EPA. KDWM estimates the Black Leaf Chemical portion of the property to be approximately 16 acres while the western portion of the property is approximately 13 acres. It should be noted that KDWM did not have information indicating that Schenley Distillers operated on the entire 29 acre parcel at the time it designated only the western section as Schenley Distillers (Ref. 29).

The site is located in the northwestern portion of Jefferson County, Kentucky (Appendix A, Figure 1). The topography in this area is mostly flat to gently sloping. The elevation in the vicinity of the site is 462 feet. Soils at the site consist of Urban Land (Ua), Urban

land-Alfic Udarents complex, loamy substratum, 0 to 12 percent slopes (Ubc), and Urban land-Udorthents complex, 0 to 12 percent slopes (UahC) (Ref. 18). Fill material and gravel have been observed covering the majority of the eastern half of the Black Leaf site. Geologic deposits underlying the site consist of Glacial Outwash (Wisconsinan). Groundwater is contained in Glacial Outwash and is typically found approximately 25-30 feet below ground surface in the vicinity of the site (Ref. 7).

The average annual temperature in the Louisville, Kentucky area is 56.1° Fahrenheit. Average temperatures in January are 31.7° Fahrenheit and temperatures in August average 75.8° Fahrenheit. The average annual precipitation in the Louisville area is reported to be 44.4 inches (Ref. 12).

2.3 Operational History and Waste Characteristics

EPA first became aware of the site in 1981 upon receipt of a Notification of Hazardous Waste Site form. The Notification form indicated that Diamond Shamrock Corporation handled pesticides at the site from 1955-1970 (Ref. 20). A PA was performed by KDWM in 1987, however, no samples were taken and no substantial information relating to the site's operations was included.

Information relating to site history was presented in a Phase 1 Environmental Site Assessment completed by ATC Associates in 1999 (Ref. 4). According to that report, the chain-of-ownership for the portion of the property where the site is located is as follows:

1910-1928	Tobacco Bi-Products (and Chemical)
1928-1933	Diamond Black Leaf
1933-1959	Diamond Alkali Corp
1959-1982	Schenley Distillers/Louisville Cooperage
1982-1987	Lanham Lumber & Dry Kiln Company
1987-1993	Dunaway/Louisville Hardwoods Inc.
1993-2001	Down River Forest Products
2001-present	Louisville Industrial Park, LLC

Sanborn Fire Insurance Maps (Louisville 1928-Feb 1951 Vol. 5 pages 504-505) show an insecticide manufacturing building (presently identified as Building 20) on the property (Appendix A, Figures 3a-3c) as well as a Laboratory and Extraction Room (Ref. 15). Little information is available regarding the type of operations that took place at the Louisville plant.

Diamond Black Leaf/Alkali manufactured pesticides, including DDT and benzene hexachloride at different plants around the United States. Diamond also manufactured and sold chlorinated products, cement-coke, chromium chemicals, electrochemicals, plastics, silicate, detergent, calcium, and soda products (Ref. 9). It is possible that some of these materials were used or manufactured at the site.

Little is known about what the lumber-related companies produced at the site. Equipment at the site appears to be consistent with wood treating/dry kiln operations. Chemicals that could have been associated with wood treatment operations at this site include creosote, chromium, arsenic, copper, and pentachlorophenol (Ref. 16). It should be noted that the Black Leaf Chemical side of the property may have only been used for storage as the kilns are present on Schenley Distillers side of the property.

The site has been used primarily as warehouse storage since 2001 and is currently abandoned. KDWM identified and removed leaking drums and other containers from the site in 2009. Paint related material, waste aerosols, and methyl ethyl ketone (MEK) were listed as some of the hazardous wastes removed at that time (Ref. 5).

KDWM had not collected samples at the site prior to this SI. Limited soil and waste removal occurred between 1999 and 2001 related to the purchase of the property by Louisville Industrial Park, however, only Toxicity Characteristic Leaching Procedure (TCLP) analysis of soils disposed of in the landfill was conducted. No confirmatory sampling was conducted on soils left at the site at that time (Ref. 4).

It should be noted that First Capital Bank of Kentucky, the mortgage holder on the property, contracted with Pettit Environmental, Inc. to conduct Phase II sampling at the site. The sampling was conducted in June 2010. Soil samples and groundwater samples were collected as part of that sampling event, however, samples were only analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) (Ref. 22).

2.4 Source Area

For the purposes of this SI, the source was considered to be contaminated soil. Based on sample results, the area of contamination was determined to be approximately 10.7 acres (466,433 square feet) (Appendix A, Figure 7). Contaminants identified during sampling can be found in Appendix B, Table 4 and are discussed in Section 5.3. Contaminants identified at levels above EPA Regional Screening Levels include arsenic, 4,4'-DDT (p,p'-DDT), 4,4'-DDD (p,p'-DDD), 4,4'-DDE (p,p'-DDE), Aldrin, Dieldrin, alpha-BHC, beta-BHC, gamma-BHC (Lindane), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, ideno(1,2,3-d)pyrene, and naphthalene.

3.0 Groundwater Migration Pathway

Jefferson County lies within both the Ohio River Valley and the Bluegrass regions of North Central Kentucky on the west flank of the Cincinnati Arch within the Central Lowlands Physiographic Region (Ref. 17). The topography of the area ranges from nearly flat to fairly rugged. The majority of the county is drained by small tributaries of the Ohio River. The present valley of the Ohio River was cut into the shale and limestone bedrock during glacial times. The rock valley was filled with alluvium of

Quaternary age which underlies the Ohio River flood plain at a maximum depth of 130 feet (Ref. 17).

The alluvium of the Ohio River flood plain is the principal aquifer and is an important source of water in the area. The aquifer is comprised of outwash sand and gravel of Pleistocene age ranging from 0 to 100 feet in thickness, overlain by a blanket of silt and clay as much as 40 feet thick. Very thick deposits of clay and silt of recent age cover parts of the flood plain. The entire thickness of alluvium, known as the Ohio River Valley Series, is considered a single hydrologic unit. The alluvial aquifer is hydraulically connected with the Ohio River in this area. Infiltration from the Ohio River and flow through the limestone valley wall are major contributors of recharge to the aquifer (Ref. 11). Groundwater flows generally west toward the Ohio River (Ref. 7).

The Louisville Limestone of Silurian age and the Jeffersonville and Sellersburg Limestones of Devonian age underlie the alluvium. These formations are considered a single aquifer. Water in this aquifer is contained in and moves along interconnected cracks and solution channels. The limestone beneath the floodplain is hydraulically connected with the deposits of sand and gravel, from which a continuing source of recharge is available. In the Bluegrass Region, the limestone supplies small quantities of water to domestic wells, but beneath the Ohio River alluvium, it is capable of yielding large quantities of water, mostly for industrial use (Refs. 11, 17).

Geologic deposits underlying the site consist of Glacial Outwash (Wisconsinan). This outwash consists of sand, gravel, silt, and clay. The Outwash Formation is 0-130 feet thick (Ref. 30). Groundwater is contained in Glacial Outwash and is typically found at depths of 25-30 feet below ground surface in the vicinity of the site (Ref. 7).

3.1 Groundwater Targets

The drinking water intake for the City of Louisville Water Company is located to the northeast of the site and is not within a 4-mile radius (Refs. 8, 10, Appendix A, Figure 1). The majority of the area residences are on city water. According to the Kentucky Division of Water (KDOW), there are four (4) domestic wells (Appendix A, Figure 1) located within a 4-mile radius of the site (Ref. 8). The nearest domestic-single household well is AKGWA # 00018220 with is located 2.1 miles to the southwest of the site near the intersection of Ralph Avenue and Ramser (Ref. 8). This well is located at a depth of 54 feet below ground surface and appears to be within the Glacial Outwash Formation. Several industrial use wells are also located within a 4-mile radius of the site (Refs. 8, 10). Groundwater users within a 4-mile radius are presented in Table 1 below. Estimated population served is based on a county average of 2.2 persons per household (Ref. 23):

Table 1: Groundwater Water Wells within a 4-mile Radius

Radius/Distance	# of wells in radius	Estimated population served	Type of well
0 -1 mile	10	0	1 Industrial, 9 Decommissioned, 0 Domestic
1-2 mile	13	0	7 Industrial, 6 Decommissioned, 0 Domestic
2-3 mile	52	4.4	33 Industrial, 17 Decommissioned, 2 Domestic-Single Household
3-4 mile	36	4.4	23 Industrial, 10 Decommissioned, 1 Agricultural-Irrigation, 2 Domestic-Single Household

There are also four (4) springs located within a 4-mile radius of the site. The only active spring is known as CSO 151 Spring and is located in the 3-4 mile radius, however, this spring is not used as a domestic drinking water source. The CSO 151 Spring is located east of Beargrass Creek and is presently part of the Louisville Metropolitan Sewer Districts Combined Sewer Overflow (CSO) system (Ref. 24). Two (2) springs, Eleven Jones Spring and Cave Hill Spring, are located within the 3-4 mile, however, they are listed as inactive and are not used for domestic drinking water purposes. CSO 91 Spring located within the 2-3 mile radius and is also not used for domestic drinking water purposes (Ref. 8).

3.2 Groundwater Sampling

Due to the fact that there are only four (4) domestic drinking water wells within a 4-mile radius, groundwater was not sampled as part of the SI sampling event. The groundwater pathway is not a concern due to insufficient targets.

4.0 Surface Water Migration Pathway

The site is mostly flat and covered with grass and gravel. The average annual precipitation in the Louisville area is reported to be 44.4 inches (Ref. 12). The 2-year, 24-hour rainfall frequency for Jefferson County is 3.2 inches (Ref. 25). The site lies in the 500-year floodplain (Ref. 8).

4.1 Overland Flow Route

The Overland Flow Route is the migration route that run-off would follow from a particular on-site source to a perennial surface water body (Refs. 1, 2). Furthermore, any point at which site run-off enters a perennial surface water body is considered a Probable Point of Entry (PPE).

Elevation at the site is 462 feet. Elevation decreases from 470 feet just south of the site to 455 feet just north of the site (Ref. 30). Surface water flows from the south to the north of the property and whatever is not absorbed by the soil flows into the alley south of Wilson Ave. Water then flows through the alley into one of two drains on either side of 17th Street near the entrance to the site. From there, the water flows into the Louisville sewer system (Ref. 14).

As shown in a map provided by the Louisville Metropolitan Sewer District (Ref. 14), run-off from the site is directed into the City of Louisville Sewer System. According to the Louisville Metropolitan Sewer District, water from this site flows into a combined sewer and goes to the Morris Forman Treatment Plant (Ref. 14). The PPE would be the discharge point at the Morris Forman Treatment Plant. Water from the treatment plant is discharged to the Ohio River. The point of discharge/Probable Point of Entry (PPE) into the perennial stream (Ohio River) is located over 2 miles away from the site, therefore, the Surface Water Pathway is not of concern.

According to the HRS Rule, the Surface Water/Overland Flow Route Migration Pathway should not be considered if the PPE is not within 2 miles of the site. The PPE would be the discharge point at the Morris Forman Treatment Plant, which is greater than two (2) miles from the site. The Surface Water/Groundwater to Surface Water Migration Pathway should not be considered if a portion of the surface water is not within one (1) mile of one more sources at the site. The nearest perennial stream from the site is Beargrass Creek, however, this creek is not within a mile of the site. Surface waters from this site would not reach Beargrass Creek.

Untreated surface water does not come into contact with any wetlands or fisheries and does not impact endangered species (Ref. 8). This pathway is not of concern.

4.2 Target Distance Limit

The surface water Target Distance Limit (TDL) is the migration route that site generated run-off would follow from the point it enters a perennial surface water body (i.e., the PPE) to a point 15 miles downstream of the PPE (Refs. 1, 2). As stated above, since the PPE is located over two (2) miles away and there is no perennial stream within one (1) mile of the site, the Surface Water Migration Pathway is not of significance.

4.3 Surface Water Targets

There are no surface water targets impacted by the site. Untreated surface water does not come into contact with any wetlands or fisheries and does not impact endangered species. This pathway is not of concern.

4.4 Surface Water Sampling

No surface water sampling was performed as there are no targets.

5.0 Soil Exposure Pathway

Soils at the site consist of Urban Land (Ua), Urban land-Alfic Udarents complex, loamy substratum, 0 to 12 percent slopes (Ubc), and Urban land-Udorthents complex, 0 to 12 percent slopes (UahC) (Ref. 18). Structures, grassy areas and gravel have been observed covering the site. Due to the fact that this site is located in an urban area, soils have likely been disturbed at some point. Based on soil boring logs from October 2010, the upper two (2) feet of soils/material at the site are described as gravel, black foundry sand, black cinder-like material, or silt with brick fragments. Soils three (3) to ten (10) feet below ground surface are described as brown, silty or sandy clay with some fine to medium-grained sand near ten (10) feet. Most borings are described as brown sand, fine or medium-grained, in the ten (10) to twelve (12) feet interval. The exception was the northeastern portion of the property, where soil is described as being a hard, gray-brown mottled clay or brown silty clay from five (5) to twelve (12) feet below ground surface (Appendix E, Soil Logs). Groundwater at the site can be found at 25 feet below ground surface, so it is likely that the sandy soil extends beyond the twelve (12) foot mark (Ref. 7).

5.1 Soil Exposure Targets

The site is currently abandoned. There are no workers on site, however, the site is not adequately secured and what appeared to be homeless people have been observed at the site (Ref. 6). A chain link fence surrounding the site has large gaps and the 17th Street gate is no longer locked. The northern portion of the property is bordered by a low income, minority neighborhood (Ref. 21). Approximately 25 single family homes are presently located within 200 feet of the site. Based on a county average of 2.2 persons per household, approximately 55 people live within 200 feet of the site (Ref. 23).

The property owner, Louisville Industrial Park, had previously proposed to construct a low-income residential housing development on the site. Various proposals had been submitted, however, most proposals included construction of 76 single and multi-family residences on the site (Ref. 13). Those potential future residents were included as targets to justify the soil sampling for this SI, however, the proposal to develop a neighborhood has since been denied by the City of Louisville. The property owner still believes the site has the possibility of being developed for residential use (Ref. 13).

There are no known schools within 200 feet of the site. There is one (1) daycare licensed by the Kentucky Cabinet for Health and Family Services within 200 feet of the site. That

daycare is located at 1612 Wilson Avenue and is an in-home daycare known as A Grandma's Place. The capacity of that daycare is six (6) children. The daycare was not contacted (Ref. 26). For purposes of this report, it is assumed that six (6) children are present at the daycare at all times.

The 2000 Census indicates that there are 707 residents within ¼ mile of the site. The population within a 1 mile radius is 14,902 (Ref. 21).

5.2 Soil Sample Locations

Soil sampling was performed by the EPA's Superfund Technical Assessment and Response Team (START) contractor, Oneida Total Integrated Services (OTIE) from October 26-28, 2010. KDWM prepared the Sampling and Analysis Plan (SAP). Both KDWM and OTIE prepared Quality Assurance Project Plans (QAPPs) which were approved by EPA prior to the sampling event (Appendix C, SAP/QAPP). OTIE was responsible for ensuring that the SAP and QAPPs were followed with deviations noted in the field notes (Appendix E).

A total of 68 soil samples were collected as part of the SI sampling event. The background sample consisted of one (1) surface sample collected at the 0-1 foot interval and three (3) subsurface samples collected at intervals of 0-4, 4-8 and 8-12 feet. The background sample was collected at an off-site property west, northwest of the site. The property is a senior apartment complex known as Strothers School Apartments. On-site sampling consisted of 29 surface soil samples and 29 subsurface soil samples. As with the background sample, the on-site surface soil was collected at the 0-1 foot interval. Subsurface sample depth varied, but samples were generally collected within the 8-12 foot interval as close to twelve (12) feet as possible. The SAP/QAPP for the project dictated that the subsurface samples be collected at the point of the interval at which photo ionization detector (PID) readings were the highest, or, in the absence of PID readings, at twelve (12) feet. No borings exceeded twelve (12) feet in depth (Appendix C, SAP/QAPP, Appendix E, Soil Boring Logs). In addition, a total of six (6) duplicate samples were collected to comply with EPA's Science and Ecosystem Support Division (SED) guidance. All soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), cyanide, total metals, total mercury, organochlorine pesticides, and PCB Aroclors. Appendix B, Table 2 provides detailed information regarding the rationale of the chosen sample locations. Appendix B, Table 3 provides GPS coordinates of the final sample locations.

5.3 Analytical Results

All analytical results were compared to EPA Region 3's Regional Screening Levels (RSLs) for Residential Soils. All on-site metals results were also compared to three times the background sample levels as required by EPA (Ref. 2). Analytical data can be found in tabular format in Appendix B, Table 4. Actual data and documentation from the laboratory can be found in Appendix D.

The background samples were designated as BLCBG-SS-01, BLCBG-SB-01, BLCBG-SB-02 and BLCBG-SB-03. All background samples contained Arsenic at levels above the RSL. Benzo(a)pyrene was detected at a level slightly above the RSL. No other constituents were detected above the RSLs in the background samples.

The on-site samples were designated as BLC-SS-01 through BLC-SS-30 for surface soil samples and BLC-SB-01 through BLC-SB-30 for subsurface soil samples. BLC-SS-12 and BLC-SB-12 were omitted from the sampling event because the sample location was in close proximity to an underground water line. Since the exact location of the water line was not known, this sample location was eliminated.

Duplicate samples were designated as BLC-SS-31 through BLC-SS-36. If results from a duplicate sample were elevated, but the original sample itself was not, then the duplicate result is used in place of the original sample.

Metals

As stated above, arsenic levels exceeded the RSL in all four (4) background samples. Arsenic levels also exceeded the RSL in all surface and subsurface soil samples on the Black Leaf property. For the purposes of the SI, only results in excess of three times background are considered to be elevated by EPA. Arsenic levels exceeded three times background in the following eight (8) surface samples: BLC-SS-19, BLC-SS-21, BLC-SS-24, BLC-SS-25, BLC-SS-26, BLC-SS-32 (duplicate of BLC-SS-19), BLC-SS-33 (duplicate of BLC-SS-20), and BLC-SS-34 (duplicate of BLC-SS-30).

Pesticides

Several pesticides were detected at levels exceeding RSLs. These include 4,4'-DDT (p,p'-DDT), 4,4'-DDD (p,p'-DDD), 4,4'-DDE (p,p'-DDE), Aldrin, Dieldrin, alpha-BHC, beta-BHC, and gamma-BHC (Lindane). Some pesticides were detected at significantly elevated levels. The most significant levels included samples containing alpha-BHC at levels 18,181 times the RSL, DDT at levels 217 times the RSL, and Dieldrin at levels 600 times the RSL. Levels of pesticides were most elevated around the former insecticide manufacturing building, as expected. Most of the elevated levels were only identified in surface soil samples.

4,4'-DDT (p,p'-DDT) and its breakdown products, 4,4'-DDD (p,p'-DDD) and 4,4'-DDE (p,p'-DDE) were detected at levels above RSLs at several locations. DDT was elevated at BLC-SS-01, BLC-SS-03 through BLC-SS-08, BLC-SS-11, BLC-SS-14 (and its duplicate, BLC-SS-36) and BLC-SS-16. As shown on the Sample Locations Map (Appendix A, Figure 4), the majority of these samples were collected just outside the insecticide manufacturing building. All sample locations with elevated DDT levels are located within approximately 200 feet of that building. 4,4'-DDD (p,p'-DDD) was detected at levels above the RSL at all the same locations as DDT with the exception of

BLC-SS-11 and BLC-SS-14. 4,4'-DDE (p,p'-DDE) was detected at levels above the RSL at all the sample locations as DDT with the exception of BLC-SS-06. In addition, DDE was also elevated at BLC-SS-02 and BLC-SS-27. BLC-SS-27 is located in the middle of an open field approximately 350 feet northeast of the insecticide manufacturing building.

Aldrin and Dieldrin are pesticides that are similar in structure. Aldrin readily changes to Dieldrin once it enters the environment (Ref. 27). Aldrin was detected at levels above the RSL in BLC-SS-07 and BLC-SS-08. It should be noted that the analytical data for Aldrin was given a 'J' flag by the laboratory, meaning the numerical result was an estimated value. Dieldrin was detected at levels above the RSL in BLC-SS-01 through BLC-SS-05, BLC-SS-07 through BLC-SS-09, BLC-SS-11, BLC-SS-14 (and its duplicate, BLC-SS-36), BLC-SS-16, BLC-SS-18, BLC-SS-19 (and its duplicate BLC-SS-32) and BLC-SS-34 (which is a duplicate of BLC-SS-30). It should be noted that Dieldrin levels were elevated in samples collected along both the northern (BLC-SS-18) and southern (BLC-SS-16 and BLC-SS-34/30) edges of the property. No off-site samples other than the background samples were collected, however, it is possible that Dieldrin has migrated off-site based on the locations where elevated levels were detected. It should also be noted that BLC-SS-18 is located within 200 feet of the property where a small daycare operates (located at 1612 Wilson Ave.).

Soil samples were analyzed for the four (4) commercially significant isomers of benzene hexachloride (BHC). Technical grade BHC is a synthetic mixture of several isomers, typically 60-70% alpha-BHC, 5-12% beta-BHC, 10-15% gamma-BHC, and 6-10% delta-BHC (Ref. 28). Alpha-BHC was detected at levels above the RSL in BLC-SS-01, BLC-SB-01, BLC-SS-03, BLC-SS-04, BLC-SS-07, and BLC-SS-08. Alpha-BHC was the only pesticide with elevated levels located in a subsurface sample. BLC-SB-01 was collected at eleven (11) feet below ground surface (Appendix E, Soil Logs). Beta-BHC was detected at levels above the RSL in the same areas as alpha-BHC except that it was not detected in BLC-SB-01 and was detected in BLC-SS-05 and BLC-SS-36 (duplicate of BLC-SS-14). Delta-BHC does not have a RSL, however, it was detected at some level in several samples. The highest detection was in BLC-SS-01. Gamma-BHC (commercially known as Lindane), was detected at levels above the RSL in BLC-SS-01 and BLC-SS-08.

VOCs

No volatile organic compounds (VOCs) were detected above RSLs.

SVOCs/PAHs

Several polycyclic aromatic hydrocarbons (PAHs) were detected at levels above RSLs. These include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, ideno(1,2,3-d)pyrene, and naphthalene. Most of the elevated

levels of PAHs were found in surface soils, however, some subsurface soils contained elevated levels as well.

Benzo(a)anthracene was detected at levels above the RSL in BLC-SS-01 through BLC-SS-04, BLC-SS-07, BLC-SS-08, BLC-SS-10, BLC-SS-11, BLC-SS-14, BLC-SS-16, BLC-SS-18 through BLC-SS-20 (and their duplicates, BLC-SS-35, BLC-SS-32, and BLC-SS-33), BLC-SS-22 through BLC-SS-24, BLC-SS-26 and one (1) subsurface location, BLC-SB-23. The subsurface sample was collected at eight (8) feet below ground surface.

Benzo(a)pyrene was detected at levels above the RSL in BLC-SS-01 through BLC-SS-11, BLC-SS-14, BLC-SS-16, BLC-SS-18 through BLC-SS-27, BLC-SS-29, BLC-SS-30, all of the duplicate samples, and two (2) subsurface samples, BLC-SB-15 and BLC-SB-23. The subsurface samples were collected at eleven (11) and eight (8) feet below ground surface, respectively. Benzo(a) pyrene was also the only constituent other than arsenic that was detected in the background samples above the RSL. It was identified in the surface soil sample, BLCBG-SS-01, at levels just above the RSL.

Benzo(b)fluoranthene was detected at levels above the RSL in BLC-SS-01 through BLC-SS-05, BLC-SS-07, BLC-SS-08, BLC-SS-10, BLC-SS-11, BLC-SS-14, BLC-SS-16, BLC-SS-18 through BLC-SS-20 (and their duplicates, BLC-SS-35, BLC-SS-32 and BLC-SS-33), BLC-SS-22 through BLC-SS-26, BLC-SS-34 (a duplicate of BLC-SS-30) and one (1) location, BLC-SB-23. The subsurface sample was collected at eight (8) feet below ground surface.

Dibenzo(a,h)anthracene was detected at levels above the RSL in BLC-SS-1 through BLC-SS-11, BLC-SS-14, BLC-SS-16, BLC-SS-18 through BLC-SS-20, BLC-SS-22 through BLC-SS-26, BLC-SS-30, all of the duplicate samples, and one (1) subsurface sample, BLC-SB-23. The subsurface sample was collected at eight (8) feet below ground surface.

Ideno(1,2,3-d)pyrene was detected at levels above the RSL in BLC-SS-01 through BLC-SS-03, BLC-SS-07, BLC-SS-08, BLC-SS-11, BLC-SS-16, BLC-SS-18 through BLC-SS-20 (and their duplicates, BLC-SS-35, BLC-SS-32, and BLC-SS-33), BLC-SS-23, BLC-SS-24, and BLC-SS-26. No subsurface samples contained elevated levels of ideno(1,2,3-d)pyrene.

Chrysene and naphthalene were also present above the RSL in a few samples. Chrysene was detected at levels above RSLs in BLC-SS-19. Naphthalene was detected at levels above the RSL in BLC-SS-07 and BLC-SS-19. No subsurface samples contained either of these constituents.

5.4 Conclusions

The site borders a residential neighborhood and is not well secured. A licensed daycare was identified within 200 feet of the site and within 200 feet of BLC-SS-18, which contained Dieldrin and several PAH constituents at levels equaling or exceeding RSLs.

Elevated pesticides and PAH constituents were detected primarily in surface samples in the area around the insecticide manufacturing building. Alpha-BHC was detected in a subsurface sample in the area around the insecticide building as well. While most pesticides were detected primarily within 200 feet of the insecticide manufacturing building, Dieldrin was elevated in a surface sample over 325 feet away from the insecticide building along the northern edge of the property bordering the neighborhood. Dieldrin was also identified over 625 feet away from the insecticide building near the southeastern edge of the property.

PAH constituents were detected above RSLs all over the property in surface soils. PAHs were detected in subsurface soil samples in BLC-SB-15, which is located along the northern edge of the property adjacent to the neighborhood, and BLC-SB-23, which is located in an open field in the northeastern portion of the property.

Only three (3) sample locations, BLC-13, BLC-17 and BLC-28, did not contain any constituents above RSLs.

6.0 Air Migration Pathway

This is an abandoned facility with no active air emissions. Very little exposed soil is present as much of the site is covered by grassy vegetation or gravel. Based on the above information, air samples will not be collected as part of the SI.

6.1 Air Sampling

Due to the lack of targets, no air sampling was performed as part of this SI.

7.0 Summary and Conclusions

This site has had several historical uses, but the primary activity of concern is an insecticide manufacturing facility that operated in the 1950s. There are no known surface water or air targets and minimal groundwater targets were identified. The pathway of primary concern is the soil exposure pathway. The site is located adjacent to a residential neighborhood. Approximately 25 single family homes and one daycare are located within 200 feet of the site. The site is not well secured and easily accessible on foot.

Soil samples at the site contained several different pesticides and PAH constituents as well as arsenic at levels above RSLs. The daycare is within 200 feet of the site and within 200 feet of BLC-SS-18, which contained Dieldrin and several PAH constituents at levels equaling or exceeding RSLs.

Elevated pesticides and PAH constituents were detected primarily in surface samples in the area around the insecticide manufacturing building. Alpha-BHC was detected in a subsurface sample in the area around the insecticide building as well. While most pesticides were detected primarily within 200 feet of the insecticide manufacturing building, Dieldrin was elevated in a surface sample over 325 feet away from the insecticide building along the northern edge of the property bordering the neighborhood. Dieldrin was also identified over 625 feet away from the insecticide building near the southeastern edge of the property. Since no off-site sampling was conducted (other than the background sample), it is not known if any contaminants have migrated off site.

PAH constituents were detected above RSLs throughout the property in surface soils. PAHs were detected in subsurface soil samples in BLC-SB-15, which is located along the northern edge of the property adjacent to the neighborhood, and BLC-SB-23, which is located in an open field in the northeastern portion of the property.

Since no off-site sampling was conducted (other than the background sample), it is not known if any contaminants have migrated off site. Due to the fact that elevated levels of pesticides and PAHs were detected close to the property boundaries, it is possible that contamination has migrated off-site and could potentially be impacting residential properties to the north of the site. Also, some samples near Building 20 contained pesticides at levels above EPA's emergency action levels.

KDWM recommends that EPA conduct an emergency removal at the site and additional sampling to determine if contamination has migrated off-site.

8.0 References

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