VOLUNTARY CLEANUP INVESTIGATION WORK PLAN

Phase II Environmental Site Assessment

Former City Garage Operations
City of Leavenworth, Kansas
2109 South 3rd Street
Leavenworth, Kansas 66048

Project Code: C4-052-73682

Kansas Department of Health and Environment
Bureau of Environmental Remediation
Voluntary Cleanup and Property Redevelopment Program
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August 4, 2020

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1.0 INTRODUCTION & WORK PLAN RATIONALE

This Voluntary Cleanup Investigation (VCI) Work Plan has been prepared on behalf of the City of Leavenworth, Kansas (City) for submission to the Kansas Department of Health and Environment (KDHE) – Voluntary Cleanup and Property Redevelopment Program (VCPRP) for real property herein identified as the City of Leavenworth Former City Garage Operation (Subject Site). The Subject Site is listed in correspondence from the KDHE VCPRP (dated May 28, 2020) with an address of 2109 South 3rd Street, Leavenworth, Kansas 66048. The affiliated KDHE Project ID #C4-052-73682 was provided in earlier KDHE correspondence dated February 24, 2020.

A Subject Site Vicinity Map is shown in **Figure 1**. The Subject Site as defined in the VCPRP application is generally located east of South 4th Street and north of Marion Street, with South 3rd Street entering the south-center portion of the Subject Site. The Subject Site boundaries as defined for the VCPRP are shown on **Figure 2**.

The Subject Site has been enrolled in the VCPRP in response to KDHE – Bureau of Environmental Remediation (BER) correspondence dated February 24, 2020. This letter specifies the Subject Site as the City of Leavenworth Former City Garage/Old City Landfill. In this correspondence, KDHE summarizes environmental assessments completed as part of a property transaction due-diligence effort for land containing the commercial business located immediately to the south and southwest (Price Chopper Supermarket; 2107 South 4th Street). Work completed by another environmental consultant in 2019 identified petroleum hydrocarbons and metals in groundwater exceeding allowable state concentrations. Additionally, polychlorinated biphenyls (PCBs) were identified in soil below the 50 milligrams per kilograms (mg/kg) action level documented in the Toxic Substance Control Act (TSCA) guidance.

This VCI Work Plan has been prepared in accordance with the requirements and format detailed in the KDHE-BER *Voluntary Cleanup and Property Redevelopment Manual* dated January 2020. The work plan includes a Site-Specific Quality Assurance Project Plan (QAPP) as **Attachment A** and a Site-Specific Health and Safety Plan (HASP) as **Attachment B**.

1.1 VCI OBJECTIVES & RATIONALE

As introduced above, currently regulated substances were identified in 2019 at the south/southwest adjoining property. It is possible this environmental impact may have originated from past City Subject Site operations. Additionally, it is possible that the impacts may have originated from another offsite property located immediately east of South 3rd Street (Lakes Auto Salvage). Therefore, it is the City's objective to collect additional environmental data to support further evaluation of potential source areas. It is important for the users of this document to understand the development history of the Subject Site and adjoining properties as summarized in Sections 1.1.2 and 1.1.3. Previous environmental studies have obtained assessment data from the Subject Site and adjoining properties. These assessments are summarized in Section 1.1.4.

1.1.1 Current Subject Site and Adjoining Properties Description

The Subject Site is located on land owned by the City since late 1960 The Subject Site presently includes the Leavenworth Animal Control (LAC) operations initiated in 2013 (**Figure 3**). This facility includes one single-story building constructed as slab on grade supported by piers. Affiliated parking

areas are located to the north (employees) and to the west-southwest. The north parking area was constructed with the building in 2013 and the south-southwest parking area existed previously. The balance of the Subject Site is undeveloped land.

Immediately adjoining properties include:

- **North** – Land to the north and northeast is undeveloped and was part of the former Leavenworth Municipal Landfill (Landfill). The Landfill is described in greater detail in Section 1.1.2. The area immediately northwest of the Subject Site is owned by Tire Town and is presently used for tractor-trailer parking.

- **West** – The immediately adjoining properties include by Great Western Manufacturing (west and northwest) and parking area for the Price Chopper (west and southwest).

- **South** – The Price Chopper building and northern vehicle access area is located immediately to the south. Lakes Auto Salvage is located immediately south of the southeast portion of the Subject Site. South 3rd Street, constructed in a north-south orientation, extends to the Subject Site from Marion Street located one block south.

- **East** – Five-Mile Creek (Creek) and the associated flood plain is located immediately east; land in this area is presently owned by the City. This area in part formerly included City Landfill operations. South 2nd Street is located further east of the Creek approximately 490 feet east of the eastern Subject Site Boundary.

1.1.2 Subject Site History

This summary of Subject Site history has been developed using numerous sources. The sources include discussions with former and current City Public Works personnel, environmental and geotechnical investigations conducted from 1989 through 2019, aerial photography and Google imagery, and City operational documents. Sources are referenced as applicable in the provided summary.

As mentioned earlier, the Subject Site and surrounding land has been owned by the City since 1960. Prior to establishing the former City Municipal Landfill and former City Garage, the Subject Site as defined in this work plan and adjoining land to the north has historically been undeveloped as it included the Creek and the associated floodplain; this area was best described at the time as unusable for property development. The Creek has historically trended north-south and meandered throughout the Subject Site and the northern and southern adjoining properties. According to the McKinzie Construction, Inc. (McKinzie), *Brownfields Targeted Assessment Report* dated June 25, 1999, the Creek channel was redirected eastward to the present day location by the United States Corps of Engineers (USACE). This is described in the Brownfields Targeted Assessment (BTA) report as having occurred "Several years prior to operation of the landfill". It is our understanding that the former channel and floodplain were generally leveled at this time. The historic creek alignment can be seen in 1966 aerial photographs. Aerial photographs from 1972 and 1976 show the realigned Creek location present today.

Former City Landfill – 1969 through 1972

The former Landfill was operated from approximately 1969 through 1972. The extent of the former facility included land north of present day Thornton Street. Land between present day Marion Street

(south) and Thornton Street was not extensively used for landfill operations. The former east landfill boundary was the redirected Creek channel that extending north to land currently containing the City Wastewater Treatment Plant. The western former landfill boundary appears to have extended toward South 4th Street, but did not cross the railroad tracks. This land area received waste material that was placed in pits approximately 12 feet in depth (McKinzie, 1999). The pits are reported to have extended into sandy subgrade materials and groundwater was reported to have been present at a depth of approximately 13 feet below ground surface (bgs). Overlying soil cover is reported to have been placed on top of the waste.

At some point following the cessation of operations at the Landfill, the City requested assistance from the United States Environmental Protection Agency (EPA) Region 7 Superfund Division to assess the environmental condition of the former Landfill property to facilitate eventual property redevelopment. EPA conducted the aforementioned BTA in late 1998 and early 1999. KDHE was listed as a stakeholder in the Federal Brownfields program and provided assistance with the BTA. The primary objectives of the investigation included:

- To assist the City in determining the nature and extent of potential contamination;
- To assess risks presented by contamination, and to
- Assess the Site in regard to American Society of Testing and Materials (ASTM) standards for environmental site assessments.

The BTA included performance of both a Phase I and II Environmental Site Assessment (ESA). The work was completed by McKinzie under contract with EPA. The Phase II ESA consisted of sediment, onsite and perimeter surface soil, subsurface soil and groundwater sampling across the former Landfill, including in part the former City Garage operations presently enrolled in the VCPRP. Specific operational areas of the Subject Site that were assessed at this time included:

- The Maintenance Building Area;
- Two asphalt aboveground storage tank (AST) areas (west and east), and
- One former diesel AST fueling area.

Generally, low-level concentrations of regulated substances were identified in some locations of the investigation area. The final report was issued by McKinzie on June 25, 1999. These assessments were evaluated by the EPA Superfund Division with subsequent correspondence issued to the City on August 13, 1999. Only one environmental condition was specifically mentioned in the EPA correspondence. It stated that "soil sampling analytical results suggest the property may have been impacted to a limited extent by lead waste." The McKinzie BTA report also noted that the lead impact was in a "perimeter surface sample" near west-adjoining properties that included GNB Inc. (presently Tire Town) and the Great Western Manufacturing Company. The BTA report identified that GNB Inc. is a State Hazardous Waste Site property.

The report also stated that "There were no records of large quantity of hazardous substances being disposed of at the former landfill, although unconfirmed reports of disposal of calcium hydroxide and unknown solvents were noted in an EPA report." The primary determination was that although the Landfill had been previously recorded in the Comprehensive Environmental Response and Liability Information System (CERCLIS), "The EPA Superfund Program has determined that No Further Federal Action is appropriate at this property, unless new information warranting further Superfund consideration or conditions not previously known to the EPA regarding the property are discovered." The City was directed to contact the KDHE-BER for assistance with future redevelopment of the property.

Former City Garage Operations – 1972 through 1991

The Subject Site as defined for the VCPRP includes land containing former structures and garage maintenance facilities as shown on **Figure 3**. Operational dates reported by the City are to be from approximately 1972 through 1991. The facility was primarily decommissioned in 1992 with some structures remaining for an additional few years. Structures and past operations of environmental significance included:

- **Maintenance Building** – The building was constructed in 1972 and was used for vehicle repairs. It contained multiple service bays with a two story office/storage space located on the western end. A 300-gallon capacity waste oil AST was present in the northeastern portion of the building from approximately the late 1970s or early 1980's until decommissioning in 1992. The tank was used to store waste oil that fed an oil-burning heater for at least a portion of this time. The KDHE *Buried Tank Leak Assessment* dated November 11, 1992 was obtained from the Northeast District Office. The report specifies that the tank and lines were removed; a "Closed" status was assigned under KDHE Project Code U4-052-00868B.

  Regulated materials expected to have been used, generated and/or stored at the Maintenance Building are expected to include volatile organic compounds (VOCs - degreasers), waste oil, and spent vehicle fluids and fuel-range petroleum hydrocarbons.

- **Sign (Paint) Shop** – The Sign Shop was formerly located east of the Maintenance Building. It is reported by the City to have been primarily used as the base for painting operations and construction of signs. It is expected that substances containing VOCs were used; however, information specific to handling and potentially storing wastes are not available for review. It is known that a KDHE compliance inspection report from September 1991 indicated that paint/paint thinner waste had been introduced to surface soil north of the Sign Shop. This event is discussed in Section 1.1.4.

- **Equipment Storage Shed** – This structure contained equipment and non-regulated materials used for Public Works operations. According to former and current City employees, it is not expected the shed would have been used to store wastes generated from the operations.

- **Vehicle Fueling Areas** – There were formerly two generations of fuel storage tanks at the Subject Site that have been previously removed. Both were located in areas south of the Maintenance Building. The first fueling operation included either one or two 6,000-gallon capacity USTs containing gasoline; dispensing is reported to have been at the UST locations. These were located south of the southwest corner of the maintenance building (**Figure 3**). Additionally, one 3,500-gallon capacity diesel AST was located further south and east of the gasoline USTs. Due to the distance between the tanks, it is assumed that diesel fueling occurred at the AST. The aforementioned tanks are reported by the City to have been installed in 1971. The gasoline USTs were removed in approximately 1980 or 1981; however, no removal report was on file with the KDHE Northeast District Office. The diesel AST is reported to have been removed in 1991 during decommissioning. Again, no removal report could be located for the AST by KDHE district personnel.

  The second vehicle fueling area was located southeast of the first fueling area near the southern boundary of the Subject Site as presently defined. The KDHE *Tank Registration*

Renewal Form dated April 1990 specifies that three 6,000-gallon capacity gasoline USTs were present in this area; they are noted to have been installed in 1981. The City has reported the USTs were removed in 1991 prior to facility decommissioning. SCS obtained a *Buried Tank Leak Assessment* report February 25, 1991 from the Northeast District Office. The report specifies that one 6,000-gallon capacity "fuel oil no 2 UST" was removed; a Closed status was assigned under KDHE Project Code U4-052-00868A. There is no mention of other USTs, piping or dispensers being removed, although the City has reported the other facilities were also removed at this time.

Also noteworthy, correspondence from the Northeast District Office to the City issued prior to UST removal (dated December 21, 1990) provides evidence that the USTs removed in 1991 qualified for the Petroleum Storage Tank Release Trust Fund. ***Therefore, the City and SCS assumes that additional environmental assessment and/or remedial actions could be eligible for KDHE reimbursement.***

On June 29, 2020, SCS reviewed the online KDHE-BER Identified Sites List (ISL) Information for the City of Leavenworth Garage (Project Code C405273682). Specific to former fuel storage tanks, the ISL specifies that one former 4,000-gallon capacity diesel UST was present at the Subject Site. Based on information from numerous sources, SCS expects this is referring to the 3,500-gallon capacity AST installed in 1971 and removed in 1991. It should be noted that both soil and groundwater samples were collected from this area as part of the 1999 BTA; no significant petroleum hydrocarbon impact was reported. The ISL also mentions a 500-gallon waste oil tank was present and removed before 2013. SCS assumes this refers to the 300-gallon capacity AST identified in the November 1992 *Buried Tank Leak Assessment* report. No other petroleum fuel tanks are identified in the ISL.

- **Asphalt AST Areas** – The former City Garage also maintained asphalt oil storage for roadway projects. There were two areas including the southeast portion of the Subject Site (**Figure 3**) and north of the northwest boundary established for this VCPRP enrollment. These facilities are referred to in the 1999 BTA as "AST Tank Farms". The KDHE ISL cites the BTA as having identified six 10,000-gallon capacity asphalt ASTs in 1999.

  The Southeast Tank Farm included three 10,000-gallon capacity ASTs and a pump and heater house; loading occurred immediately to the north. These facilities were removed in 2013 to accommodate construction of the LAC Building. SCS reviewed select construction field reports issued by Williams, Spurgeon, Kuhl and Freshnock Architects, Inc. (WSKF Architects) for the Leavenworth Animal Control Project. A photograph included in Field Report 002 (dated June 24, 2013) shows soil excavation immediately north of the ASTs and pump/heater house. The excavation was completed per the new building plan specifications. A petroleum hydrocarbon impact was observed in this area during excavation and the affected soil was segregated and stockpiled. In Field Report 009 (August 21, 2013), it is stated that "contaminated dirt was dumped to the north of the Price Chopper lot." City Public Works personnel believe the petroleum-impacted soil was not reused onsite as it was subsequently disposed at the Gilman Road City Landfill located south of Lansing. However, offsite disposal records for this soil have not been located. No environmental sampling is discussed in the construction field reports.

  The Northwest Tank Farm was located approximately 100 feet north of the north Subject Site boundary immediately east of the tractor-trailer storage area for Tire Town. This

facility is no longer operable. Soil and groundwater samples were collected in this area during performance of the 1999 BTA; no significant detections of petroleum hydrocarbons were noted. Because of the BTA findings, additional assessment of the area is not included in this Work Plan.

No Active Property Use – 1992 Through 2013

The Subject Site was undeveloped and not used by the City following decommissioning of the Garage operations. It remained in this condition until construction of the LAC in 2013.

Current Site Use – City Animal Control Operations – 2013 to Present Day

The Subject Site currently contains LAC operations initiated in 2013 (**Figure 3**). There is presently one single-story building constructed as slab on grade supported by piers. Affiliated parking areas are located to the north and west-southwest. The north lot was constructed in 2013 and the south-southwest parking area was previously constructed by 2011. It is noteworthy that the LAC building was constructed with a 15-mil vapor barrier incorporated in the foundation design. Construction details prepared by CFS Engineers specify the vapor barrier was overlapped and sealed per manufacturer's specifications; sealing of penetrations was also noted on the plans.

South Adjoining Property

The area located immediately south of the Subject Site boundary was developed in 1990 as a Price Chopper Supermarket. The north side of the building is located approximately 60 feet south of the south boundary of the Subject Site. The area currently comprising the approximate southwest quarter of the Subject Site has been historically used as the Price Chopper northern parking area (**Figure 3**). These commercial operations are observed today generally the same as since initial development.

A geotechnical investigation was conducted by Terracon Consultants SE, Inc. in in October 1989 prior to construction of the supermarket building. Environmental sampling was not completed as part of the scope of work. Findings indicated that fill material, primarily fine-grained unconsolidated material and limestone bedrock was present. This report has been previously submitted to KDHE-BER as part of the VCPRP application.

An environmental assessment was conducted as part of a due-diligence in October and November 2019. The limited Phase II ESA was completed by Environmental Works, Inc. (Environmental Works) for Associated Wholesale Grocers. The findings of this investigation are discussed in Section 1.1.4. This report has also been previously submitted to KDHE-BER.

1.1.3 History – Adjoining Properties

The following is a summary of the general development history of properties adjoining the Subject Site:

- North – Land to the north and northeast has historically consisted of the Creek and associated flood plain. As described earlier, a portion of this area was formerly operated as the former City Landfill. The **City Wastewater Treatment Plant** is located on former Landfill property further to the north. **Great Western Manufacturing** and **Tire Town** are the commercial businesses located to the northwest; **GNB, Inc**. formerly operated in this general area.

- West – A portion of Great Western Manufacturing is also currently located west of the Subject Site. The Price Chopper parking area is located to the southwest; single family residential homes were initially located in this area. Smaller commercial businesses were also present to the southwest (fronting South 4th Street) prior to construction of the Price Chopper.

- South – The Price Chopper building is located immediately to the south. This land area was previously included the former Creek and associated flood plain. The Former City Landfill extended to the northern portion of the property for the years it was operational.

  An auto salvage yard presently containing vehicles (**Lakes Auto Salvage**) is located immediately south of the southeast portion of the Subject Site. According to information obtained from City Directory review and recent City communication with the Lake Family, the commercial property has been present at this location since 1949. The Polk's City Directory lists the business as 235 Marion Street (south side of road) in 1954. The 1958 directory lists the business as both 235 and 236 Marion Street (north side of road). This information suggests that the family residence was located to the north with the business present on both sides of the roadway.

  Additional historical information was researched to evaluate the history of operations for Lakes Auto Salvage. An aerial photograph from 1985 clearly shows that salvaged vehicle storage extended further east than presently observed. This includes the area where South 3rd Street and the east-most portion of the Price Chopper building are presently located. This is significant as it is an area of known contamination. South 3rd Street was formerly located further west than at present.

- East – The Creek and associated flood plain is located immediately east and southeast of the Subject Site. Aside from a portion used for former Landfill operations it has been undeveloped natural land.

1.1.4 Previous Environmental Assessments at and Near the Subject Site

Past environmental and geotechnical assessments have been performed at the Subject Site and adjoining properties by various parties for varying reasons. They are summarized below in chronological order. For each event summary, we provide professional opinions as to significance for the Subject Site and the planned future assessment detailed in this VI Work Plan.

Figures showing data collection locations and tables providing previous analytical data are referenced as applicable. It should be noted that the figures and tables include only data of significance to the planned assessment. Unless otherwise noted, existing environmental and geotechnical assessment reports summarized below have been previously submitted to the VCPRP with the initial application.

- South Adjoining Property: *Subsurface Exploration Report, Proposed Supermarket Site, Fourth & Marion Streets, Leavenworth, Kansas*, Terracon Environmental, Inc. dated October 26, 1989. This report was prepared for Four-B Corporation. The geotechnical investigation was performed to provide recommendations concerning the design and construction of foundations and pavements for the Price Chopper building constructed in 1990. A total of 21 borings were advanced to depths ranging between approximately 8 and 42.8 feet bgs.

Subsurface materials and bedrock were logged and geotechnical samples were collected. No environmental sampling and laboratory analysis was completed. Boring locations are considered to be non-critical information and are therefore not shown on VI work plan figures.

Significance – Subsurface materials are described as including native unconsolidated soil and bedrock, overlain by varying thickness of fill material. The native unconsolidated soil consist primarily of silty clay and clay, with subordinate lenses of silt and sand seams. Underlying bedrock is described as limestone. The overlying fill material is primarily described as clay and silty clay with construction debris included. The fill was noted as containing wood, cinders, brick, concrete and glass; gravel and trace gravel was also noted. The construction debris is expected to have originated from demolition of residential structures previously located in this area. The fill material was identified in over half the borings with thicknesses varying from approximately one foot to 16.5 feet. Groundwater was identified during drilling as ranging between approximately 11.5 to 22 feet bgs.

These findings are consistent with the site history. This area includes the former location of the Creek channel prior to redirection by USACE. Presence of fill material is not unexpected as this area was included in City Municipal Landfill operations from 1969 through 1972.

- South Adjoining Property: *Environmental Assessment – Phase II, Proposed Supermarket Site, Leavenworth, Kansas*, Terracon Environmental, Inc. dated December 26, 1989. This report was also prepared for Four-B Corporation. The Phase II ESA was performed following completion of a Phase I ESA. Per the report transmittal letter, "The primary focus of this work was to assess the subsurface conditions to help determine whether potential off-site contaminant sources may have adversely affected the area of study." The scope of work included advancing nine borings for the collection of environmental samples (**Figures 4A** and **5A**). Six of the boring locations were converted to groundwater monitoring wells (MW-1 through MW-6) for the collection of groundwater samples (**Figure 5A**). Soil samples were also collected from two of these wells (MW-3 and MW-4), as well as from three additional borings (B-1 through B-3) located along the east side of the relocated South 3rd Street (**Figure 4A**).

  A primary finding of the assessment was that total petroleum hydrocarbons (TPH) were identified in soil in Boring B-1 and Monitoring Well MW-4 located near the southern Subject Site boundary (**Figures 4A-1** and **4B**). Additionally, a higher TPH concentration was exhibited above minimum laboratory reporting limits further south within South 3rd Street (MW-4; **Figure 4A-1**); this is adjacent to Lakes Auto Salvage. Total lead concentrations in soil were reported at 20 parts per million (ppm) from the three borings. Soil analytical results are included in **Tables 1A, 1B** and **1C**.

  Analytical results for groundwater samples collected from the six monitoring wells did not exhibit regulated petroleum hydrocarbons exceeding minimum laboratory detection limits for benzene, toluene or xylenes (BTX) or for VOCs and SVOCs analyzed as a survey search. However, it should be noted that not all samples were analyzed for BTX or the VOCs/SVOCs survey search (**Tables 2A and 2B**). No TPH analysis was completed for any of the monitoring wells. Dissolved-phase arsenic, cadmium, chromium and lead concentrations were reported above minimum laboratory limits in only Monitoring Well MW-4 (**Table 2C**).

  Significance – Soil sampling conducted along the south Subject Site boundary (north of the Price Chopper building) indicates the presence of generally low-level concentrations of petroleum hydrocarbons. However, groundwater sampling suggests it is not an extensive

impact as no BTX or VOCs were reported above minimum laboratory reporting limits. It should be noted that the highest TPH concentration was present approximately 40 feet south of the Subject Site property boundary. This sample is located adjacent west of present day Lakes Auto Salvage. Metals reported in the groundwater sample from Monitoring Well MW-4 exceed their respective current KDHE Tier 2 Risk-Based Screening Levels (RBSLs) for the Residential and Non-Residential Scenario Groundwater Pathway. However, it is not known if the results are for total or dissolved metals.

- Subject Site: *Report of Testing – City Service Center*, Kansas City Testing Laboratory (KCTL) dated December 18, 1991. A KDHE compliance inspection report from September 1991 indicated that paint/paint thinner waste had been disposed by employees to the surface soil located north of the Sign Shop. To evaluate this possibility, two soil samples were collected for the City by KCTL in the area shown on **Figure 4A-1**. The samples were obtained from six composite sampling locations at depths of approximately 6 inches bgs and approximately 18 to 24 inches bgs. Samples were analyzed for Toxicity Characteristic Leaching Potential (TCLP) for RCRA metals, SVOCs and VOCs. None of these TCLP analytical results exceeded the method detection limits. Additionally, the soil samples were also analyzed for VOCs. Results indicated three compounds exceeding minimum laboratory reporting limits in the 6-inch composite sample including toluene (19,000 parts per billion [ppb]), ethylbenzene (12 ppb) and xylenes (28 ppb) as shown in **Table 1B** and **Figure 4A-1**. Although contamination was present, TCLP results indicated the material would not satisfy the definition of hazardous waste if excavated and disposed. The *Phase I Environmental Site Assessment*, *Price Chopper Property* prepared by Environmental Works (dated September 9, 2019; Page 4) specified that KDHE recommended the impacted soil be removed and properly disposed. Furthermore, approximately 60 cubic yards of contaminated soil was removed and disposed of at the Leavenworth Landfill; no post-excavation confirmation sampling is documented and it is unknown if it was completed.

  Significance – The analytical data identified VOCs present in surficial soil to a depth between surface grade and no deeper that above 18 inches bgs. Historical information indicated that soil in this area was excavated by the City. As shown on Figure 4A, the existing LAC Building overlies this sampling area. As presented later in Section 2.2, this VCI Work Plan includes advancing borings surrounding the existing building for collection of groundwater samples.

- Subject Site and North Adjoining Property: *Brownfields Targeted Assessment Report, The Leavenworth Landfill Site, Leavenworth, Kansas,* United States Environmental Protection Agency/McKinzie Construction, Inc. dated June 25, 1999. The BTA was performed by an EPA contractor at the former City Landfill property and included collection of surface soil, subsurface soil, groundwater, and sediment samples. The land area formerly operated as the former City Garage was included in the assessment. Samples collected at the Subject Site included four from surface/subsurface soil (**Figure 4A**) and two from groundwater (**Figure 5A**). Surface soil and subsurface soil samples did not exhibit detectable concentrations of TPH, VOCs or SVOCs exceeding minimum laboratory reporting limits (**Tables 1A** and **1B** and **Figure 4A-1**); RCRA metals analytical results was reported as no significant detections for the parameters tested (**Table 1C**).

  Groundwater samples were generally analyzed for the same parameters as soil samples. As shown on **Figure 5A-1,** benzene and methyl chloride were the only VOCs exceeding minimum laboratory reporting limits (Sample 100). The benzene concentration of 0.0069 mg/L slightly

exceeds the Tier 2 RBSL of 0.005 mg/L for both the Residential and Non-Residential Scenario Groundwater Pathway. Similarly, the methylene chloride concentration of 0.37 mg/L exceeds the Tier 2 RBSL of 0.005 mg/L for both the Residential and Non-Residential Scenario Groundwater Pathway (Table 2A). For TPH, SVOC and pesticide analysis, detections were limited to the pesticide compounds D,D,D-4,4' and pentachlorophenol (**Table 2B** and **Figure 5A-1**). A number of RCRA metals were exhibited exceeding minimum laboratory limits as shown in **Table 2C**. Metals exceeding Tier 2 RBSLs for the Residential and Non-Residential Scenario Groundwater Pathway included arsenic, barium, cadmium, chromium and lead (**Table 2C** and **Figure 5A-2**). However, it was not noted in the BTA report whether these results were for total metals or dissolved metals. The EPA contractor did not recommend additional evaluation of metals in their summary report.

Significance – When viewed collectively, the absence of VOCs in soil and limited number in groundwater do not suggest there was a significant petroleum hydrocarbon or VOC impact in the central and southern portions of the Subject Site. Limited pesticide compounds were present in 1999 and warrant additional evaluation. The significance of RCRA metals exceeding Tier 2 RBSLs is difficult to currently evaluate as the results may be for total metals. It should be noted that dissolved metal analytical results collected south and west of these data points in 2019 are significantly lower than the BTA results (Figure 5A-2 and Table 2C). The more recent results are discussed later in this section.

- Subject Site and East Adjoining Property: *Preliminary Geotechnical Engineering Services Report for the Proposed Animal Control Facility, Marion Street, Just East of 4th Street, Leavenworth, Kansas*, Professional Service Industries, Inc. March 21, 2012. This report was prepared for the City to assist in structural design for the LAC building. A total of three borings were advanced to depths ranging between approximately 38.5 and 40.5 feet bgs. Subsurface materials and bedrock were logged and geotechnical samples were collected. No environmental sampling and laboratory analysis was completed. Boring locations are considered to be non-critical information and are therefore not shown on VI work plan figures.

  Significance – Similar to that for the south adjoining property, subsurface materials consisted of native unconsolidated soil and bedrock, overlain by varying thickness of fill material. The native unconsolidated soil consist primarily of silty clay and clay, with subordinate lenses of silt and sand seams. Underlying bedrock is described as limestone. The overlying fill material is primarily described as clay with construction debris including rock, brick and asphalt; the material is present from demolition of residential homes previously located in the area. The fill material was encountered to approximately 6 feet bgs across the study area. Groundwater was identified during drilling as ranging between approximately 10 to 11 feet bgs.

In addition to those studies discussed above, a due-diligence environmental assessment was performed by Environmental Works in 2019 for the south adjoining property. Work was completed for Associated Wholesale Grocers (AWG) of Kansas City, Kansas. A Phase I ESA was completed in September 2019 and a follow-up Limited Phase II ESA was completed in November 2019. These reports were not submitted as part of the City VCPRP application as they had been previously submitted to KDHE by AWG. The Phase I ESA identified the Subject Site as a Recognized Environmental Condition, which warranted performance of the limited Phase II ESA. The data and key findings are discussed below.

- South Adjoining Property: *Limited Phase II Environmental Site Assessment, Price Chopper Property, 2107 South 4th Street, Leavenworth, Kansas*, Environmental Works, Inc. dated November 6, 2019. The limited Phase II Environmental Site Assessment was performed exclusively at the Price Chopper property. Analytical data for soil and groundwater was primarily collected west and south of the western half of the Subject Site. Additionally, three soil gas samples were collected to evaluate subsurface vapor conditions in proximity to the Price Chopper Building; these are located south of the Subject Site.

  Soil sampling identified petroleum hydrocarbons (mid-range and high-range hydrocarbons) in soil near the south and southwest boundaries of the Subject Site (Figure 4A-1). None of these results exceeded Tier 2 RBSLs for the TPH fractions (Table 1A). No BTEX or other VOCs were reported exceeding minimum laboratory reporting limits (Table 1B). An area exhibiting elevated total lead concentrations is identified east of the Price Chopper building; however, the condition is not present further west of the building. Only one detectable PCB compound (Arochlor 1254) was identified and is located in the South 3rd Street area between the Price Chopper building and Lakes Auto Salvage (Boring SB-5; Table 1B and Figure 4A-1).

  Groundwater sampling also identified petroleum hydrocarbons (mid-range and high-range hydrocarbons) near the south and southwest boundaries of the Subject Site (Figure 5A-1). The highest TPH-MRH and TPH-HRH concentrations were noted south of the Subject Site along South 3rd Street and exceeded the Tier 2 RBSL for TPH-MRH and TPH-HRH (Table 2B). However, aside from one generally low p-isopropyltoluene concentration from the sample collected from Monitoring Well MW-5 (0.0016 mg/L), no other VOCs exceeded minimum laboratory reporting limits (Table 2A). Additionally, the only detectable SVOC reported was 2,6-dinitrotoluene (0.0182 mg/L) from the sample collected from Monitoring Well MW-7 (Table 2B); the result exceeds the Tier 2 RBSLs for the Residential and Non-Residential Scenario Groundwater Pathway (0.000557 and 0.00187 mg/L, respectively). The only RCRA dissolved metal concentrations above minimum laboratory reporting limits were arsenic and barium (Table 2C and Figure 5A-2). The arsenic concentrations in samples collected from Monitoring Wells MW-1 and MW-2 (0.015 mg/L) slightly exceeded the Tier 2 RBSLs for the Residential Scenario Groundwater Pathway (0.01 mg/L). The barium concentrations were significantly below the Tier 2 RBSL for the Residential Scenario Groundwater Pathway (2.0 mg/L).

  Soil gas samples were collected north, northwest and northeast of the Price Chopper building (Figure 6A). Analytical results indicated a number of common VOCs exceeding minimum laboratory reporting limits (Table 3 and Figure 6A-1). The concentrations were evaluated by Environmental Works using the EPA VISL Calculator. No VOCs identified in the soil gas samples exceeded the EPA VISL Commercial Target Concentrations for Exterior Soil Gas. Only chloroform was identified above these threshold concentrations for Residential use.

  Significance – Soil and groundwater sampling results have identified TPH-MRH and TPH-HRH in the area immediately north and east of the Price Chopper building. This area is immediately south of the Subject Site where two generations of fueling areas were formerly located. This area was also used for vehicle storage in the past by Lakes Auto Salvage, which is presently limited to the area east of South 3rd Street. Comparatively lower TPH-MRH

and TPH-HRH concentrations are also present further west of the Subject Site below the main parking lot.

There were other isolated detections of regulated substances in soil and groundwater located south of the Subject Site. This includes PCB soil detections in one boring located at the northeast corner of the Price Chopper building near both the Subject Site and the auto salvage yard. The two elevated total lead concentrations in soil were also present in this boring and further south along South 3rd Street. Also of note for groundwater, one 2,6-dinitrotoluene concentration of 0.0182 mg/L was identified in the sample collected from the southern portion of South 3rd Street (in proximity to Marion Street). One common use of this compound is as an explosive for vehicle air bags.

The only RCRA metal in groundwater samples exceeding Tier 2 RBSLs for the Residential and Non-Residential Scenario Groundwater Pathway was arsenic in the area west of the Subject Site. Conversely, sample results for areas nearer former garage operations that handled or stored regulated substances are below their applicable Tier 2 RBSLs. These dissolved metal results are significantly lower than those reported in the BTA performed in 1999. This comparative evaluation provides some analytical evidence that earlier results were for total metals rather than dissolved metals.

1.2 DATA NEEDS & OBJECTIVES

Based on the findings of past assessments at and near the Subject Site, the potential regulated contaminants of concern (COC) could include total petroleum hydrocarbons, VOCs, SVOCs, RCRA metals, organochlorine pesticides, and PCBs. As discussed in Section 1.1.4 and shown in Figures and Tables, the currently identified COCs are present in portions of the Subject Site, rather than pervasively present across its entirety. Therefore, the data needs vary by COC and is the basis of the Phase II ESA design. The types of data needed to achieve the VCI objectives include surface soil, subsurface soil, groundwater, and indoor air samples.

Once the assessment is completed, results of laboratory analyses will be compared to:

- The KDHE - BER typically applies the *Risk Based Standards for Kansas, RSK Manual – 5th Version* dated October 2010 (including subsequent updates). The initial screening process is a Tier 1 evaluation which is a comparison of a naturally occurring contaminant to the background concentration of that contaminant in the affected medium, using methods approved by KDHE-BER. Tier 2 is a comparison of the concentration of a contaminant to the risk-based cleanup values in the KDHE Tier 2 Risk-Based Summary Table (RSK Manual; Appendix A). If a Tier 3 evaluation is warranted, this process includes collecting necessary site-specific data under direction of KDHE-BER to replace default values in the Tier 2 equations.

This site-specific VCI work plan presents our detailed approach for surface/subsurface soil, groundwater, and indoor air sampling to be completed during planned Phase II ESA activities. It includes the selected points of sampling and the intended numbers, volumes, and types of samples to be collected. The VCI work plan will address these issues generically and in detail for the Subject Site.

1.3 WORK PLAN APPROACH

The technical approach for developing the Phase II ESA design was to utilize data from previous investigations to identify COC data gaps so that a more thorough assessment of potential Subject Site source areas would be completed. Existing environmental data has identified:

Subject Site

- ***Generally low-level concentrations of petroleum hydrocarbons and total lead in soil and limited VOCs and SVOCs in groundwater near the southern property boundary.*** None of the soil concentrations exceeded current RSK Manual Tier 2 RBSLs for both Residential and Non-Residential uses. ***For groundwater, only benzene and methylene chloride in one location exceeded both the Residential and Nonresidential Tier 2 RBSLs.*** Additionally, two SVOCs in groundwater were identified in this area, including pentachlorophenol and D,D,D-4,4'; the pentachlorophenol exceeded Residential and Non-Residential Tier 2 RBSLs.

- ***Toluene, ethylbenzene and xylenes were formerly identified in surface soil samples exceeding minimum laboratory reporting limits north of the former Sign Shop (Figure 4B).*** This LAC building is currently present in this area. Soil was excavated by the City prior to the building being constructed. No previous groundwater data exists for this general area.

- ***Other limited COC were reported by analytical laboratories in groundwater.*** This includes D,D,D-4,4' (SVOC) north of the northeast corner of the former Maintenance Garage building. Elevated RCRA metals were also identified in this area and at the southern property boundary; however, it should be noted that it is not known if these results are for total or dissolved metals.

Adjoining Properties

Existing environmental data from properties immediately adjoining the Subject Site have identified:

- ***TPH-MRH, TPH-HRH and RCRA metals have been identified in soil at the Price Chopper supermarket (south and west adjoining property).*** The TPH concentrations do not exceed current RSK Manual Tier 2 RBSLs for both Residential and Non-Residential uses. One total lead result in soil (432 mg/kg) exceeds the Residential Tier 2 RBSL, but is below the value for Non-Residential use. Remaining metals are considered to be within expected background concentrations. Additionally, PCBs were identified in soil at two depths in one boring located approximately 40 feet south of the Subject Site.

- ***Organic COCs in groundwater at the Price Chopper in proximity to the Subject Site include TPH-MRH, TPH-HRH, p-isopropyltoluene (VOC) and 2,6-dinitrotoluene (SVOC).*** Three of five analytical data points for TPH-MRH exceed Residential Tier 2 RBSLs but not the Non-Residential use value. One TPH-HRH concentration exceeds both the Residential and Non-Residential Tier 2 RBSLs (south of the Subject Site below South 3rd Street). The 2,6-dinitrotoluene identified further to the south exceeds both the Residential and Non-Residential Tier 2 RBSLs. No Tier 2 RBTL has been established for p-isopropyltoluene. A common industrial use for 2,6-dinitoluene is in explosives, and is not expected to have been used at the Subject Site.

Dissolved-phase arsenic and barium was also reported above minimum laboratory detection limits. The two arsenic concentrations of 0.015 mg/L exceeding minimum laboratory reporting limits slightly exceed the Residential/Non-Residential use Tier 2 RBSL of 0.01 mg/L. Barium concentrations are all below the Residential/Non-Residential use Tier 2 RBSL of 2 mg/L. It should be noted these concentrations are significantly lower than those reported in the 1999 BTA.

- *Although a number of VOCs were exhibited in the three soil gas samples, no VOCs identified exceeded the EPA VISL Commercial Target Concentrations for Exterior Soil Gas.* Only chloroform was identified above these threshold concentrations for Residential use.

Known Locations of Identified COC

When viewed collectively, COCs in soil and groundwater are generally present in the southern portion of the Subject Site and the north-most and northwest-most portions of the Price Chopper property. The offsite areas impacted by regulated substances include:

- The offsite area immediately west of the Subject Site is located approximately 250 feet from the former onsite gasoline UST facilities operated from approximately 1971 through 1980/1981. However, it is significant that no detectable gasoline-range (TPH-LRH) concentrations were identified during the previous assessments. Petroleum hydrocarbons exceeding minimum laboratory reporting limits have only included diesel- (MRH) and oil-range compounds (HRH).

- The area immediately north of the Price Chopper building is located in proximity to the former Subject Site gasoline fueling area (operated from 1981 to 1991) and the diesel fueling area (operated from 1971 to 1991). Again, detectable petroleum hydrocarbon concentrations identified to date have been diesel and oil-range compounds.

- The highest offsite petroleum hydrocarbon concentrations have been identified east of the Price Chopper building near and within the present day South 3rd Street. This area was formerly used for salvage automobile storage prior to construction of the relocated roadway; auto salvage operations remain immediately to the east. It is noteworthy this area also exhibits the highest total lead concentrations in soil, as well as the PCBs in soil and 2,6-dinitrotoluene in groundwater.

Work Plan Approach – General Assessment Strategy

We plan to collect additional environmental data to achieve the VCI objectives as introduced below and described in greater detail in Section 2.2 (Sample Strategy). The planned design includes soil sampling in former operational garage areas considered to have a higher potential for a COC release(s) to the subsurface. Groundwater sampling is also planned to further evaluate potential source areas and the lateral extent of COC(s) in groundwater. Additionally, collection of air samples from the LAC building is planned to evaluate the condition of indoor air quality specific to the potential COCs. The specific objectives include:

- **Site-Wide Assessment:** The overall objective is to obtain additional information to fill site-wide "data gaps" from previous investigations not specifically intended to assess the Subject Site and former operations as presently defined.

- **Potential COC Source Areas:** Assess the potential for petroleum hydrocarbons being present in soil and/or groundwater in the area of the two former onsite UST fueling areas not specifically assessed as part of the 1999 EPA BTA. We also plan to assess the former east AST asphalt tank/heater building area. Additionally, groundwater sampling will be conducted north, east and west of the area surrounding the former Sign Shop where VOC-impacted soil was previously identified.

- **Lateral Assessment of COCs in Groundwater:** Additional groundwater samples will be collected to enhance the current assessment of COCs at the Subject Site. The planned data set will include the source area sampling locations described above and two additional located near the southwest property boundary. As the data collected in 2019 at the Price Chopper property used currently required field procedures and analytical methods, no additional groundwater sampling is planned for this adjoining property.

  Specific to RCRA metals, dissolved metals analysis will be performed for samples from five locations across the Subject Site. This data will be compared to the existing 1989 Terracon, 1999 BTA and 2019 Price Chopper results to provide site-wide assessment.

  We also plan to install 1-inch diameter PVC piezometers at each of the groundwater sampling locations. A top of casing elevation survey will be completed so that a groundwater gradient calculation can be made. The fluid-level monitoring will be a one-time event with the piezometers removed following measurement of static groundwater conditions.

- **Evaluation of Indoor Air Quality:** We plan to collect two indoor air samples to evaluate indoor air quality in the LAC building. Indoor sampling has been selected rather than subsurface soil gas sampling as a 15-mil vapor barrier was installed during building construction. The results will be compared to the Residential Indoor Air Tier 2 RBSLs.

2.0 VCI TASKS

2.1 PROPOSED FIELD INVESTIGATION

A total of eight direct-push technology borings are planned to be advanced at the Subject Site (**Figure 7**). Groundwater samples will be collected from each boring with soil samples collected from three of the borings. Temporary piezometers will be installed at each boring to facilitate collection of groundwater samples and also to be used to collect fluid-level monitoring data. Additionally, two indoor and one ambient air samples are to be collected. Activities will be performed in accordance with the Quality Assurance Project Plan (QAPP), provided in **Appendix A** and site-specific Health and Safety Plan provided in **Appendix B**. Photographs will be taken of each boring and air sampling location.

The following field tasks will be completed as part of the VCI:

Task 1 – Utility Clearance: Obtain utility clearance using the Kansas One-Call System. SCS will mobilize field personnel to the Subject Site and note if utilities have been cleared at planned boring locations.

Task 2 – Soil Sampling: Surface and subsurface soil samples will be collected from three borings in areas where gasoline UST and the eastern asphalt ASTs were formerly present (**Figure 7**). Soil contained within Macrocore acetate sample liners will be logged in accordance with the Unified Soil Classification System (USCS). Two representative soil samples will be collected at each boring. Surficial soil samples will be collected from an interval between current surface grade and approximately two feet bgs. Subsurface samples will be collected from depth intervals that indicate high Photoionization Detector (PID) and/or visual and olfactory observations of potential impact. If no such observations are present, the subsurface samples will be collected immediately above the capillary fringe. All soil samples will be submitted to a State of Kansas accredited laboratory and analyzed for:

- Full scan VOCs using EPA Method 8260B;
- TPH-LRH, TPH-MRH and TPH-HRH using EPA Modified Method 8015;
- RCRA Metals using EPA Methods 6010/7471, and
- Organochlorine pesticides using EPA Method 8141.

In addition to the above analysis, the three soil samples exhibiting the highest TPH-MRH/TPH-HRH concentrations will be analyzed for SVOCs using EPA Method 8270C. The soil samples from Borings PB-1 through PB-3 will be analyzed for PCBs using EPA Method 8082.

Task 3 – Piezometer Installation, Groundwater Sampling and Elevation Surveying: One-inch PVC temporary piezometers will be placed in each of the eight direct-push technology boreholes to allow for groundwater accumulation and sampling and casing elevation surveying (**Figure 7**). The top of piezometer casings will be surveyed and static groundwater level measurements collected prior to collecting groundwater samples. Once the tasks are completed, the piezometers will be removed and boreholes backfilled with bentonite. All groundwater samples will be submitted to a State of Kansas accredited laboratory and analyzed for:

- Full scan VOCs using EPA Method 8260B;
- TPH-LRH, TPH-MRH and TPH-HRH using EPA Modified Method 8015, and
- SVOCs using EPA Method 8270C.

In addition to the above analysis, groundwater samples from five borings (PB-1, PB-3, PB-5, PB-6 and PB-8) will be analyzed for dissolved RCRA Metals using EPA Methods 6010/7471, and three samples will be analyzed for organochlorine pesticides (Borings PB-1 through PB-3).

Task 4 – Indoor Air Sampling: Two indoor air samples will be collected to evaluate indoor air quality inside the LAC building. The samples will be collected from the northern and southwest portions of the structure (Figure 7). An ambient air sample will also be collected outside west of the building. The air samples will be analyzed for VOCs using EPA Method TO-15.

Task 5 – Quality Assurance (QA)/Quality Control (QC) Sampling: Quality Assurance (QA)/Quality Control (QC) samples will be collected including trip blanks, field duplicates for soil, groundwater and indoor air sampling and field blanks for soil and groundwater sampling activities. An equipment blank will be collected during the soil sampling activities as non-disposable equipment will be used. The QA/QC samples will also be submitted to a laboratory for analyses shown for Tasks 2 and 3.

Task 6 – Submission of Samples to Analytical Laboratory: All soil, groundwater and QA/QC samples collected during the field investigation will be labeled and placed in appropriate sample containers and immediately placed in a cooler containing ice to maintain an approximate temperature of 4 degrees Celsius (C). As indoor air samples will be collected in SUMA canisters, they will be transported separately from the coolers. The samples will be transported to Pace National Laboratory for Testing and Innovation (Pace) located in Mt. Juliet, Tennessee. All samples will be handled and analyzed according to the site-specific QAPP and analytical laboratory's QA/QC Plan.

The total number of samples and laboratory analysis for the planned Phase II ESA is summarized in the table below:

Sample Summary Table – Phase II ESA

Soil Laboratory Analyses								
Analyte Class	VOCs	TPH-LRH	TPH-MRH	TPH-HRH	SVOCs	RCRA Metals	Pesticides	PCBs
No. of Samples	8	8	8	8	4	8	8	6
Groundwater Laboratory Analyses								
Analyte Class	VOCs	TPH-LRH	TPH-MRH	TPH-HRH	SVOCs	RCRA Metals	Pesticides	PCBs
No. of Samples	8	8	8	8	8	5	3	
Indoor Air Laboratory Analyses								
Analyte Class	VOCs	TPH-LRH	TPH-MRH	TPH-HRH	SVOCs	RCRA Metals	Pesticides	PCBs
Trip Blank	3							

Sample Summary Table – Phase II ESA

Quality Assurance / Quality Control Analyses								
Analyte Class	VOCs	TPH-LRH	TPH-MRH	TPH-HRH	SVOCs	RCRA Metals	Pesticides	PCBs
Trip Blank	2							
Soil Field Duplicate	1	1	1	1	1	1	1	1
Soil Field Blank	1	1	1	1	1	1	1	1
Soil Equipment Blank (non-disposable equipment used)	1	1	1	1	1	1	1	1
Groundwater Field Duplicate	1	1	1	1	1	1	1	
Groundwater Field Blank	1	1	1	1	1	1	1	
Groundwater Equipment Blank (disposable equipment used)								
Indoor Air Field Duplicate	1							

Task 7 – Borehole Abandonment: Upon completion of sample collection, the direct-push technology borings will be abandoned according to KDHE requirements.

2.1.1 Source Area(s) Characterization

As described previously, potential source area characterization will include the former gasoline fueling areas and the former eastern asphalt AST storage area. Both soil and groundwater samples will be collected as part of the potential source area investigation. Additionally, indoor air quality at the LAC building will be characterized by collection of air samples to be analyzed for VOCs.

2.1.2 Extent of Contamination in Soil

Soil samples will be collected from three of the eight planned borings (PB-1 through PB-3) sited at potential source areas. Each boring will be continuously sampled from the ground surface to approximately five feet into the saturated zone. Based on the assumed depth to groundwater, the

anticipated maximum total depth of core sample collection is expected to be 20 feet bgs. Cores will be logged for lithology and visual and olfactory indications of contamination, and discrete soil samples will be collected at from within the soil cores. These discrete samples will be field-screened for headspace VOCs using a PID. Two soil samples from each boring will be selected for laboratory analysis. Samples will include one from surficial soil at each location with the second sample from each boring selected based on field VOC screening and visual and olfactory observations of potential contamination. The groundwater sample will provide a third (deeper) sample to further assess potential contamination at each location. As it is not known if contamination will be encountered at the three borings locations, the need for lateral assessment will be evaluated during the field investigation. Additional borings specifically for collection of additional soil samples will be advanced if warranted.

2.1.3 Extent of Contamination in Groundwater

Groundwater samples will be collected from all eight planned borings. As VOC and SVOCs previously identified are lighter than water, groundwater samples will be collected from the upper five feet of the saturated zone. Onsite lateral assessment of COCs potentially present in groundwater will be accomplished with the planned boring locations. Existing offsite analytical data collected from the Price Chopper will be relied upon to further evaluate the presence of COCs to the west and south. Previous data obtained during the 1999 BTA will be utilized to further evaluate the onsite and offsite extent of COCs to the north, east and northeast.

2.1.4 Vadose Zone Physical Characteristics

As there is previously obtained geotechnical data collected at and near the Subject Site, additional collection of data to evaluate characteristics of unconsolidated vadose zone materials is not planned at this time. It should be noted that significant lateral and vertical heterogeneity is expected as the Subject Site is located above the former Creek channel. It is also expected that buried construction debris fill material and/or landfill waste will be present in areas of the subsurface.

2.1.5 Aquifer Characteristics

As described immediately above, previously obtained geotechnical information will be referenced to evaluate aquifer characteristics and the influence of fate and transport of COC, if present. However, collection of additional geotechnical samples may occur in the future to provide actual transmissivity, hydraulic conductivity, storativity and specific yield information.

2.1.6 Investigative Derived Wastes

Wastes generated from planned investigation activities will include soil cores, decontamination wash/rinse water, purge water from groundwater sampling and general solid waste including disposable sampling materials and personal protective equipment (PPE). Planned waste handling includes:

- Soil core material not used for sample collection will be returned to the borehole from which it was generated.
- Decontamination water and sampling purge water generated from direct-push boring activities will be disposed of at the surface in each immediate sampling area. The estimated volume is less than five gallons per location.

- Solid waste, such as disposable sampling equipment, will be removed from the Site and disposed of as general solid waste.

2.1.7 Regulatory Involvement

All direct-push borings are located on City property; no municipal permits or other pre-assessment regulatory approvals are required. The City will grant access to the LAC building for collection of air samples. SCS will adhere to KDHE pre- and post-drilling reporting requirements.

2.1.8 Permitting

As no permanent groundwater wells are planned, no permits will be obtained prior to drilling. Additionally, no Kansas Geological Surveys WWC-5 Forms will be completed following drilling.

2.2 SAMPLE STRATEGY

2.2.1 Sampling Objectives

The overall sampling objective is to collect soil, groundwater, and indoor air samples that are representative of site conditions. Eight direct-push technology borings are planned for the collection of soil and groundwater samples. Additionally, two air samples are to be collected from inside the LAC building to evaluate current indoor air quality. The Subject Site assessment will rely on previous investigation analytical data and collection of additional data. The detailed VCI assessment objectives include:

- Site-Wide Objective: The high-level assessment objective is to obtain additional information to fill site-wide "data gaps" from previous investigations not specifically intended to assess the Subject Site and former operations as presently defined.

- Potential Source Areas: Assess the potential for petroleum hydrocarbons being present in soil and/or groundwater in the area of the two former onsite UST fueling areas not specifically assessed as part of the 1999 EPA BTA. Previous soil and groundwater data obtained in the area of the former 3,500-gallon capacity diesel AST at this time will be relied upon without additional sampling. Likewise, no additional sampling will be completed in the area of the former interior waste oil AST due to the KDHE closure determination.

  Additionally, we intend to evaluate the condition of soil and groundwater in the area of the former east AST asphalt tank/heater building area. Surface soil that had noted visual impacts has been previously removed by the City during construction of the LAC building in 2013.

  Groundwater sampling will be conducted north, east and west of the area surrounding the former Sign Shop where VOC-impacted soil was previously identified. Soil sampling is not feasible in the former source area as it is below the current LAC building footprint.

  In addition to TPH, VOC and SVOC analysis for soil and groundwater samples, organochlorine pesticide analysis will also be performed for select samples across the Subject Site. The SVOC analysis will include 2,6-Dinitotoleune and D,D,D-4,4'. Additionally, three soil samples collected in the vicinity of South 3rd Street will be analyzed for PCBs.

- **Lateral Assessment of COCs in Groundwater:** Additional groundwater samples will be collected to enhance the current assessment of COCs at the Subject Site. The planned data set will include the source area sampling locations described above and two additional located near the southwest property boundary. As the data collected in 2019 at the Price Chopper property used currently required field procedures and analytical methods, no additional groundwater sampling is planned for this adjoining property. It is also our understanding that groundwater sampling data (SVOCs) to be obtained by the BER Site Assessment Section (2,6-Dinitrotoleune Assessment) in this area will be made available for use by the City and SCS.

  Specific to RCRA metals, dissolved metals analysis is planned for samples from five locations across the Subject Site. This data will be compared to the existing 1989 Terracon, 1999 BTA and 2019 Price Chopper results to provide site-wide assessment.

  We also plan to install 1-inch diameter PVC piezometers at each of the groundwater sampling locations. A top of casing elevation survey will be completed immediately following construction so that a groundwater gradient calculation can be made. The fluid-level monitoring will be a one-time event with the piezometers removed following measurement of static groundwater conditions.

- **Evaluation of Indoor Air Quality:** We plan to collect two indoor air samples to evaluate indoor air quality in the LAC building. Indoor sampling has been selected as a 15-mil vapor barrier was installed during building construction. The results will be compared to the Residential Indoor Air Tier 2 RBSLs.

2.2.2 Sampling Locations and Frequency

Soil Borings

Soil samples will be collected from three of the eight borings located in suspect source areas. The locations of the soil borings are shown on **Figure 7**. Direct-push technology boreholes will be continuously sampled and soil cores will be analyzed, photographed and lithology described. Two soil samples are to be collected from each boring using procedures and selection criteria described in Section 2.2.3. All soil samples will be submitted to a State of Kansas accredited laboratory and analyzed for:

- Full scan VOCs using EPA Method 8260B;
- TPH-LRH, TPH-MRH and TPH-HRH using EPA Modified Method 8015;
- RCRA Metals using EPA Methods 6010/7471, and
- Organochlorine pesticides using EPA Method 8141.

In addition to the above analysis, the three soil samples exhibiting the highest TPH-MRH/TPH-HRH concentrations will be analyzed for SVOCs using EPA Method 8270C. The soil samples from Borings PB-1 through PB-3 will be analyzed for PCBs using EPA Method 8082.

Groundwater Borings

Groundwater samples will be collected from all eight borings located in suspect source areas and across the Subject Site (**Figure 7**). An attempt will be made to collect samples using a mill slot

sampling tool. One-inch PVC temporary piezometers will be placed in each of the eight direct-push technology boreholes and surveyed so that static groundwater level measurements can be obtained and a groundwater gradient calculated. The piezometers will also be utilized to collect the groundwater samples in the case of low flow conditions encountered during boring advancement. Planned field procedures are described in Section 2.2.3. All groundwater samples will be submitted to a State of Kansas accredited laboratory and analyzed for:

- Full scan VOCs using EPA Method 8260B;
- TPH-LRH, TPH-MRH and TPH-HRH using EPA Modified Method 8015, and
- SVOCs using EPA Method 8270C.

In addition to the above analysis, groundwater samples from five borings (PB-1, PB-3, PB-5, PB-6 and PB-8) will be analyzed for dissolved RCRA Metals using EPA Methods 6010/7471, and three samples will be analyzed for organochlorine pesticides (Borings PB-1 through PB-3).

Indoor Air Sampling

Two indoor air samples will be collected to evaluate indoor air quality inside the LAC building. The samples will be collected from the northern and southwest portions of the structure. An ambient air sample will also be collected outside west of the building. The air samples will be analyzed for VOCs using EPA Method TO-15. Planned field procedures are described in the following section.

2.2.3 Sampling Equipment and Procedures

Soil Sampling

Soil borings will utilize Geoprobe® (or equivalent) direct-push equipment to advance 4- or 5-feet long Geoprobe® MacroCore Samplers (or equivalent) fitted with new, disposable acetate liners from the ground surface through successive sampling intervals to a depth approximately five feet below the top of the saturated zone. Based on the depth to groundwater during prior investigations (approximately 10 to 15 feet bgs), the anticipated total depth of the soil borings is expected to be 20 feet bgs. Soil samples will be collected as described below.

Each soil core will be logged for percent recovery, lithology, moisture, and visual/olfactory indications of contamination. Discrete soil samples will be collected from each of the recovered cores (0 to 4 feet, 4 to 8 feet, or 0 to 5 feet, 5 to 10 feet, etc.). Soil samples will not be collected from the saturated zone so that logging can be completed; however, soil samples will not be collected for laboratory analysis. Geoprobe® sampling equipment will be cleaned prior to re-use in each new boring using a high pressure wash and/or by hand-cleaning using an Alconox® or equivalent detergent solution, and a potable water rinse.

Soil samples will be containerized for offsite laboratory analysis, and a separate container will be utilized to perform field screening for VOCs using a PID (Thermo Environmental Model 580B Organic Vapor Meter (OVM) and/or Ion PhoCheck+ PID, equipped with 10.6 eV lamps, or equivalent). Headspace VOC analysis will be conducted as follows:

- A plastic zip-seal baggie will be filled approximately half-full of the soil sample and sealed.
- The soil within the baggies will be allowed a headspace development time of 15 minutes at an ambient air temperature of about 20°C (68°F). During the headspace development period,

the sample will be shaken for at least 30 seconds; 15 seconds at the beginning and 15 seconds near the end of the development period.

- After the development period, the bag will be punctured with the PID intake probe. The PID probe will be inserted to a point in the bag headspace approximately ½ the headspace depth. Care will be taken to avoid uptake of soil particles or water droplets.
- The highest PID reading obtained within 10 seconds after probe insertion will be recorded. Readings below ambient air readings will be recorded as "non-detect" (ND).

As discussed above, one duplicate soil sample will be collected. The duplicate and original samples will be submitted to an offsite KDHE-certified laboratory for analysis as specified in Section 2.1.

Groundwater Sampling

Geoprobe® (or equivalent) direct-push equipment will be used to advance a retractable screened rod (Geoprobe Screen Point 15 Groundwater Sampler – SP-15) fitted with a stainless steel expendable tapered drive point. The sampler will be advanced approximately five feet into the saturated zone. Groundwater is anticipated to be encountered between approximately 10 and 15 feet bgs. Representative groundwater samples will be collected from directly below the assumed static groundwater level immediately following drive rod advancement into the saturated zone. At the targeted sampling interval, an expendable drive point is released from the drive rods, a stainless steel inner screen is held in position and the rods and sampler sheath are retracted exposing the 100 cm, 0.1 mm milled slot inner screen to groundwater. The sample port is purged at a rate as close to the natural recharge rate as possible using a peristaltic pump or tubing check valve assembly threaded into the lower end of polyethylene (PE) tubing. The tubing is slowly lowered to the bottom of the boring. For low-flow sampling, the upper end of the tubing is then connected to flexible silicon tubing which is run through a peristaltic pump. The pump draws a vacuum at the upper end of the tubing drawing groundwater from the lowered tubing end.

In the event that groundwater conditions are encountered that prevent Geoprobe SP-15 use, samples will be collected following installation of 1-inch diameter piezometers. The piezometers will be constructed of approximately 10 feet of PVC well screen manually placed across the static groundwater level. This temporary PVC piezometer will consist of new threaded flush joint PVC 3/4-inch ID pipe. The PVC will conform to the requirements of ASTM-D 1785 Schedule 40 pipe and the National Sanitation Foundation potable water grade requirements. The screen will be non-contaminating, factory constructed, slotted (Schedule 40). The slot size will be 0.010. Screen and riser sections will be joined by threaded, flush joint couplings to form water tight unions. The bottom of the screen will be threaded to a self-tamping drive cone. Samples will be collected using disposable bailers lowered through the piezometer casing.

Once a sufficient volume of groundwater has accumulated in the tubing or bailer, the water will be transferred into the appropriate containers as required by the EPA test methods. If feasible, at least three saturated borehole volumes will be purged prior to sampling. However, groundwater will be sampled without purging or development if low flow conditions are encountered. In this case, sample containers will be filled in the order of volatile organics and petroleum hydrocarbons first, pesticides, semi-volatile organics and then metals.

As discussed above, one duplicate groundwater sample will be collected. The duplicate and original samples will be submitted to an offsite KDHE-certified laboratory for analysis as specified in Section 2.1.

Indoor Air Sampling

Two indoor air samples and one outside ambient sample will be collected using one-liter Summa canisters. We plan to collect the two indoor air samples from the southwest and northeast portions of the building to provide representative data coverage as shown on **Figure 7**.

Both the indoor and ambient air samples will be collected with 1-Liter SUMMA brand canisters equipped with a valve, vacuum gauge, particulate filter, and flow regulator. The flow regulator will be set by the laboratory to sample at a constant flow rate over a 4-hour sample interval. The canisters will be individually certified and shipped with a brass cap over the sampling port. The brass cap will be removed at the start of the sampling period and replaced at the end of the sampling period. The following sample information is recorded for each Summa canister on an Air Sample Summary Log:

- Sample Number;
- Sample Location;
- Summa Canister Serial Number;
- Regulator Serial Number;
- Pressure;
- Start Time;
- End Time, and
- Total Elapsed Time.

The following meteorological parameters will be recorded at the start and end of the sampling event:

- Indoor Temperature;
- Outdoor Temperature;
- Approximate Wind Speed and Direction, and
- Precipitation conditions.

The Summa canisters will be submitted to an analytical laboratory for VOC analysis using EPA Method TO-15.

2.2.4 Sampling Handling and Analysis

Proposed analytical methods, holding time and sample container requirements for soil, groundwater and indoor air samples are presented in the following table.

Summary Table - Analytical Methods and Sample Storage

Sample Media	Parameter and Analytical Method	Container/Storage	Preservation	Holding Time
Soil	Full VOCs Method 8260B	Kansas TerraCore Kit[1] / cool to 4 degrees Celsius	See Footnote[1]	14 days
	LRH Kansas Modified 8015	Kansas TerraCore Kit[1] / cool to 4 degrees Celsius	See Footnote[1]	28 days
	MRH/HRH Kansas Modified 8015	4-ounce amber soil jar	None	14 days for extraction

Summary Table - Analytical Methods and Sample Storage				
Sample Media	Parameter and Analytical Method	Container/Storage	Preservation	Holding Time
Soil (Continued)	RCRA Metals Method 6010	1 2-ounce soil jar	None	180 days
	Mercury Method 7470			28 days
	Organochlorine Pesticides Method 8081	8-ounce glass jar	None	14 days
	SVOCs Method 8270C	8-ounce soil jar	None	14 days
	PCBs-Aroclors Method 8082	8-ounce soil jar	None	1 year (if frozen)
Groundwater	Full VOCs/LRH Method 8260B/Kansas Modified 8015	4 – 40 ml glass vials / cool to 4 degrees Celsius	HCL	14 days
	MRH/HRH Kansas Modified 8015	2 – 40 ml glass amber vials / cool to 4 degrees Celsius	HCL	14 days for extraction
	RCRA Metals (including Total Chromium) Method 6010	1 – 250 ml plastic	HNO3	180 days
	Mercury Method 7471			28 days
	SVOCs Method 8270C	1-liter amber glass / cool to 6 degrees Celsius	$Na_2S_2O_3$	40 days
	Organochlorine Pesticides Method 8081	1-liter amber glass / cool to 6 degrees Celsius	$Na_2S_2O_3$	7 days
Air	VOCs Method TO-15	Summa Canister	None	72 hours

[1] Kansas TerraCore Kit includes – TerraCore sampler, one 40 ml VOA vial preserved with 15 mL of Methanol (for LRH), two 40 ml VOAs preserved with 5 mLs of Sodium BiSulfate, one 2 oz soil jar for percent solids and one 2 oz soil jar for lab PID screening.

Soil Samples

All soil samples will be placed in laboratory provided containers appropriate for each required test. A laboratory-prepared trip blank will be present in each sample cooler containing samples for VOCs analysis. The containers will be labeled with the boring number, sample depth, and date and time of sample collection, packaged to minimize the risk of breakage during transportation, and placed on ice in a cooler. Coolers containing samples will be transported via overnight courier to the analytical laboratory. A completed chain-of-custody will accompany the samples to the laboratory.

Groundwater Samples

All groundwater samples will be placed in laboratory-provided, containers appropriate for each required test. The containers will be labeled with the boring number, sample depth, and date and

time of sample collection, packaged to minimize the risk of breakage during transportation, and placed on ice in a cooler. A laboratory-prepared trip blank will be present in each sample cooler containing samples for VOCs analysis. The sample coolers will be transported via overnight courier to the laboratory. A completed chain-of-custody will accompany the samples to the laboratory. The samples designated for dissolved-metals analysis will either be filtered in the field or by the analytical laboratory.

Air Samples

The Summa canisters will be shipped to the laboratory via ground courier in the same manner they were received from the laboratory. No ice is required during transportation. A completed chain-of-custody will accompany the samples to the laboratory.

QA/QC Samples

All QA/QC samples, including soil and groundwater duplicates, and equipment and field blanks will also be placed in laboratory-provided, containers appropriate for each required test. The containers will be labeled with the boring number, sample depth, and date and time of sample collection, packaged to minimize the risk of breakage during transportation, and placed on ice in a cooler. The trip blanks will accompany the soil and groundwater samples for VOCs analysis. The sample coolers will be transported via overnight courier to the laboratory. A completed chain-of-custody will accompany the samples to the laboratory.

2.3 VADOSE ZONE CONTAMINANT MODELING

Vadose zone contaminant modeling will not be performed at this time. This task may be completed, if warranted, once COC presence and distribution has been more thoroughly evaluated by the planned field assessment.

2.4 GROUNDWATER FLOW & CONTAMINANT TRANSPORT MODELING

Groundwater flow and contaminant transport modeling will not be performed at this time. This task may be completed, if warranted, once COC presence and distribution has been more thoroughly evaluated by the planned field assessment.

2.5 IDENTIFY POTENTIAL RECEPTORS

At this time, potential human receptors for currently identified COCs are expected to include:

Current Potential Receptors

- **Onsite Commercial Workers** – LAC Building (Indoor Inhalation to VOCs)
- **Onsite Construction Workers** – This assumes subsurface construction work is planned for the near future. Construction workers could be potentially exposed to contaminants by dermal contact with soils or by inhalation of vapors in trenches.
- **Onsite Residents** – There are currently no residents at the Subject Site.

- **Offsite Commercial Workers** – Price Chopper supermarket property. The most likely exposure would be through the indoor Inhalation pathway for VOCs; however, this possibility is considered unlikely as subsurface soil gas data collected by EWI in 2019 did not exhibit results exceeding EPA VISL Calculator threshold concentrations.

- **Offsite Construction Workers** – This assumes subsurface construction work will be performed in the future. Construction workers could be potentially exposed to contaminants by dermal contact with soils or by inhalation of vapors in trenches.

- **Offsite Residents** – There are currently no potential residential receptors at immediately adjoining properties. Based on current zoning, future residential use near the Subject Site in the future is not expected.

Future Potential Receptors

As described in Section 2.6, current land zoning at and in the area of the Subject Site is non-residential. It is expected this zoning will continue in the foreseeable future. Therefore, the potential future receptors are presently identified as:

- **Onsite Commercial Workers** – LAC Building (Indoor Inhalation to VOCs).

- **Onsite Construction Workers** – This assumes subsurface construction work is planned for the future.

- **Onsite Residents** – It is not expected that the Subject Site will be used as residential property in the future.

- **Offsite Commercial Workers** – Price Chopper supermarket Property. The most likely exposure would be through the indoor Inhalation pathway for VOCs; however, this possibility is considered unlikely as subsurface soil gas data collected by EWI in 2019 did not exhibit results exceeding EPA VISL Calculator threshold concentrations. Additional commercial receptors in proximity of the Subject Site may exist if they are constructed in the future.

- **Offsite Construction Workers** – This assumes subsurface construction work is planned for the near future. The areas where exposure is most likely to occur is in the northern and eastern portions of the property.

- **Offsite Residents** – There are currently no potential residential receptors at immediately adjoining properties. Based on zoning, future residential use at properties adjoining the Subject Site in the future is not currently expected.

Residential Properties in Proximity to Subject Site

The City Public Works Department completed a search of current residential addresses within 1,000 feet of the Subject Site. Information was obtained by searching the City GIS Database. The database is updated on a weekly basis. Residential properties nearest the boundaries of the Property are listed below. Properties within 750 feet of the nearest Subject Site property boundary are shown in **bold**.

Marion Street

- 106 Marion Street – Erickson Residence – Approximately 1,000 feet to the southeast;
- 107 Marion Street – Cochran Residence – Approximately 950 feet to the southeast;
- 108 Marion Street – Raney Residence – Approximately 870 feet to the east-southeast;
- 110 Marion Street – Davis Residence – Approximately 840 feet to the east-southeast;
- 111 Marion Street – Chinn Residence – Approximately 930 feet to the southeast;
- **112 Marion Street – Schaub Residence – Approximately 700 feet to the east-southeast;**
- 115 Marion Street – Aquino Residence – Approximately 760 feet to the southeast;
- **119 Marion Street – Herman Residence – Approximately 670 feet to the southeast;**
- 409 Marion Street – Wrigley Residence – Approximately 820 feet to the southwest;
- 410 Marion Street – Jupiter Residence – Approximately 820 feet to the southwest;
- 411 Marion Street – Runyon Residence – Approximately 875 feet to the southwest, and
- 414 Marion Street – Xhang Residence – Approximately 830 feet 820 feet to the southwest.

South 4th Street

- **1904 South 4th Street – Eaglehaw Residence – Approximately 600 feet to the northwest;**
- **1922 South 4th Street – Vossmer Residence – Approximately 525 feet to the northwest, and**
- **1924 South 4th Street – Rodgers Residence – Approximately 545 feet to the northwest.**

South 2nd Street

- **2113 South 2nd Street – Goodman Residence – Approximately 450 feet to the east;**
- **2215 South 2nd Street – Gould Residence – Approximately 600 feet to the southeast;**
- **2219 South 2nd Street – Gould Residence – Approximately 570 feet to the southeast;**
- **2223 South 2nd Street – Roberts Residence – Approximately 550 feet to the southeast, and**
- **2321 South 2nd Street – Einhellig Residence – Approximately 550 feet to the southeast.**

Rees Street

- 413 Rees Street – Darlene Residence – Approximately 800 feet to the northwest;
- 417 Rees Street – Snedegar Residence – Approximately 880 feet to the northwest;
- 421 Rees Street – Dobbs Residence – Approximately 900 feet to the northwest;
- 425 Rees Street – Gragg Residence – Approximately 940 feet to the northwest, and
- 429 Rees Street – Gavilan Residence – Approximately 980 feet to the northwest.

Rose Street

- 1914 Rose Street – Albee Residence – Approximately 880 feet to the northwest;
- **1921 Rose Street – Nolan Residence – Approximately 660 feet to the northwest;**
- **2001 Rose Street – Greenhamy Residence – Approximately 615 feet to the west;**
- **2005 Rose Street – Lewis Residence – Approximately 620 feet to the west, and**
- **2013 Rose Street – Echelon Residence – Approximately 630 feet to the west.**

Thornton Street

- **422 Thornton Street – Echelon Residence – Approximately 735 feet to the west, and**
- 425 Thornton Street – Ceda Residence – Approximately 800 feet to the west.

Water Wells

A water well survey was conducted to locate all public and private water supply wells within a 1-mile radius of the site. The subject site area is serviced by City of Leavenworth Waterworks, which uses

treated surface water from the Missouri River alluvial aquifer for the municipal water supply (http://www.lvnwater.com/20wqr.pdf). Based on information obtained from the Kansas Geological Survey (KGS) Water Well Record (WWC5) database (https://maps.kgs.ku.edu/wwc5/index.html?t=wwc5), multiple monitoring/observation wells are located within 1 mile from the Subject Site. However, there do not appear to be any public water supply (PWS) wells or private/domestic wells located within 1 mile from the Subject Site. A well location map obtained from the KGS WWC5 well database is included in **Attachment C**.

Based on review of the United States Geological Survey (USGS) topographic map; the USGS National Map Advanced Viewer (https://viewer.nationalmap.gov/advanced-viewer/), which denotes state and federal parks, wilderness and wildlife areas, public lands, and significant natural features; and the Unites States Fish and Wildlife Service (USFWS) National Wetlands Inventory mapper (https://www.fws.gov/wetlands/data/mapper.html), there are no known nearby sensitive receptors, such as state parks or wetlands within a 500-foot radius of the subject site. The noted maps did identify a surface water feature, Five Mile Creek, located approximately 250 feet southeast or 300 feet east of the Subject Site. Five Mile Creek flows north and east approximately ½-mile before draining into the Missouri River. Based on additional review of the Leavenworth County GIS Web Map noted above, the Federal Emergency Management Administration (FEMA) Flood Hazard Overlay indicates the Subject Site is located outside of the Five Mile Creek floodway, although 0.2% Annual Chance Flood Hazard areas do appear to touch on the northeast and southeast corners of the approximate Subject Site boundary. There are no other known surface water bodies within ¼-mile of the subject site. A copy of the USGS National Map and USFWS Wetlands Map are included in **Attachment C**.

An informal United States Fish and Wildlife Survey (USFWS) Information for Planning and Consultation (IPaC) query was performed for threatened and/or endangered species near the Subject Site on July 22, 2020 (https://ecos.fws.gov/ipac/). Results of the IPaC query indicated four species for potential consideration, as discussed below.

- **Northern long-eared bat (*Myotis septentrionalis*)** Threatened: Northern long-eared bats spend winter hibernating in caves and mines, most often in small crevices or cracks, with only the nose and ears visible. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. The IPaC query indicates no critical habitat has been designated for this species.

- **Pallid Sturgeon (*Scaphirhynchus albus*)** Endangered: Pallid sturgeons evolved and adapted to living close to the bottom of large, silty rivers with natural a hydrograph. Their preferred habitat has a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars. The pallid sturgeon is scarce in most Missouri River reaches. The IPaC query indicates no critical habitat has been designated for this species.

- **Mead's Milkweed *(Asclepias meadii)*** Threatened: Mead's milkweed requires moderately wet (mesic) to moderately dry (dry mesic) upland tallgrass prairie or glade/barren habitat characterized by vegetation adapted for drought and fire. It persists in stable late-successional prairie. The IPaC query indicates no critical habitat has been designated for this species.

- **Western Prairie Fringed Orchid *(Platanthera praeclara)*** Threatened: Occur most often in mesic to wet unplowed tallgrass prairies and meadows but have been found in old fields and

roadside ditches. The IPaC query indicates no critical habitat has been designated for this species.

Based on the current and historical development of the Subject Site and surrounding parcels (commercial/industrially developed since approximately the late 1960s), we conclude that contamination from the Subject Site is not likely to adversely affect the species identified in the IPaC query. A copy of the informal (non-consultation) USFWS IPaC query included in **Attachment C**.

2.6 LAND USE DETERMINATION

Based on review of City of Leavenworth Zoning, obtained from City of Leavenworth GIS (http://gis.firstcity.org/), the Subject Site and adjoining properties to the north, east, and southeast of the site are zoned industrial (I-2), while adjoining properties to the west and southwest are zoned general business (GBD). The nearest residential zoning (R1-6) is located approximately 600 feet to the west/northwest of the Subject Site, on the west side of South 4th Street, as well as multi-family zoning (R-MF) located approximately 600 feet to the southeast of the Subject Site, on the east side of South 2nd Street. A parcel map identifying property lines, address points, and owner names within approximately 500 feet of the Subject Site was also obtained from the Leavenworth County GIS Web Map (https://leavenworthgis.integritygis.com/H5/Index.html?viewer=leavenworth). A copy of the zoning map and parcel map are included in **Attachment C**.

3.0 SCHEDULE

Following approval of this work plan, we estimate the primary components of the VCI to proceed in general accordance with this schedule:

- Pre-drilling preparation including utility clearance, scheduling field activities and assembling required materials, equipment and supplies will be completed within two weeks of work plan approval.
- Field sampling activities will be completed in one week with a single mobilization.
- Laboratory analyses are to be completed with a "standard" turn-around time of five to 10 working days.
- The VCI report is expected to be submitted to the VCPRP Project Manager within one month of receipt of laboratory analysis results.

4.0 REFERENCES

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5.0 TABLES

Table 1A - Applicable Soil Analytical Results - Previous Assessments
TCLP and TPH Analysis - Varying Methods

Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Boring/Sample ID	Date Sampled	Sample Depth (feet bgs)	Laboratory Analytical Results (milligrams per kilogram) and Test Methods							
			TCLP - VOCs	TCLP - SVOCs	TPH	TPH	TPH - (all fractions)	TPH-LRH	TPH-MRH	TPH-HRH
			Not Identified	Not Identified	OA-1	OA-2	Not Identified	KS LRH	KS MRH	KS HRH
Terracon - 1989										
B-1	*11/24/89*	*2*	*NA*	*NA*	*NA*	*NA*	*ND*[1]	*NA*	*NA*	*NA*
B-2	*11/24/89*	*2*	*NA*	*NA*	*NA*	*NA*	*ND*[1]	*NA*	*NA*	*NA*
B-3	*11/24/89*	*2*	*NA*	*NA*	*NA*	*NA*	*ND*[1]	*NA*	*NA*	*NA*
MW-3	*11/24/89*	*2*	*NA*	*NA*	*NA*	*NA*	***140***	*NA*	*NA*	*NA*
MW-4	*11/24/89*	*2*	*NA*	*NA*	*NA*	*NA*	***260***	*NA*	*NA*	*NA*
Kansas City Testing Laboratory - 1991										
6" Composite	*10/31/91*	*0.5*	*ND*[2]	*ND*[2]	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
18-24" Composite	*10/31/91*	*1.5-2*	*ND*[2]	*ND*[2]	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
EPA BTA - 1999										
003	*12/02/98*	*12-16*	*NA*	*NA*	*ND*[3]	*ND*[3]	*NA*	*NA*	*NA*	*NA*
023	*12/02/98*	*0-4*	*NA*	*NA*	*ND*[3]	*ND*[3]	*NA*	*NA*	*NA*	*NA*
024	*12/02/98*	*0-4*	*NA*	*NA*	*ND*[3]	*ND*[3]	*NA*	*NA*	*NA*	*NA*
025	*12/02/98*	*4-8*	*NA*	*NA*	*ND*[3]	*ND*[3]	*NA*	*NA*	*NA*	*NA*
Environmental Works - 2019										
SB-1	*10/10/19*	*26-27*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	*ND*	***30.4***
SB-2	*10/10/19*	*22-23*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	*ND*	***21.8***
SB-3	*10/10/19*	*18-19*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	*ND*	***34.2***
SB-4	*10/10/19*	*11.5-12.5*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	***16.7***	***88.8***
SB-5	*10/10/19*	*4-5* *8-10*	*NA* *NA*	*NA* *NA*	*NA* *NA*	*NA* *NA*	*NA* *NA*	*NA* *ND*	*NA* ***29.5***	*NA* ***327***
SB-6	*10/10/19*	*4-6*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	***12.7***	***92.5***
SB-7	*10/10/19*	*24-25*	*NA*	*NA*	*NA*	*NA*	*NA*	*ND*	*ND*	***43.4***
KDHE Tier 2 Risk-based Screening Levels										
Residential Scenario, Soil Pathway			*NE*	*NE*	*NE*	*NE*	*NE*	*550*	*250*	*6,000*
Residential Scenario, Soil to			*NE*	*NE*	*NE*	*NE*	*NE*	*50*	*50*	*6,000*
Non-Residential Scenario, Soil Pathway			*NE*	*NE*	*NE*	*NE*	*NE*	*950*	*350*	*27,500*
Non-Residential Scenario, Soil to			*NE*	*NE*	*NE*	*NE*	*NE*	*150*	*150*	*13,000*

Notes:

bgs = below ground surface
NA = not analyzed
ND = not detected above laboratory reporting limit
NE = not established
[1] = Less than 50 mg/kg
[2] = Less than varying minimum laboratory detection limits
[3] = Identified in BTA report as "no significant detections for the parameters tested"

TCLP = toxic characteristic leaching procedure
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
TPH = total petroleum hydrocarbons

LRH = low range hydrocarbons
MRH = mid range hydrocarbons
HRH = high range hydrocarbons
KS = Kansas
Detected concentratrions shown in bold

Table 1B - Applicable Soil Analytical Results - Previous Assessments
VOCs, SVOCs and PCBs Analysis

Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Boring/Sample ID	Date Sampled	Sample Depth (feet bgs)	Laboratory Analytical Results (milligrams per kilogram) and Test Method											
			Benzene	Toluene	Ethylbenzene	Total Xylenes	p-Isopropyltoluene	2,6-Dinitrotoluene	D,D,D-4,4'	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(a) anthracene	Benzo(k) fluoranthene	PCBs
			8260	8260	8260	8260	8260	8270C	8270C	8270C	8270C	8270C	8270C	8082
Kansas City Testing Laboratory - 1991														
6" Composite	*10/31/91*	*0.5*	*ND [1,2]*	***19*** *[1]*	***0.012*** *[1]*	***0.028*** *[1]*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
18-24" Composite	*10/31/91*	*1.5-2*	*ND [1,2]*	*ND [1,2]*	*ND [1,2]*	*ND [1,2]*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
EPA BTA - 1999														
003	*12/02/98*	*12-16*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*NA*
023	*12/02/98*	*0-4*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*NA*
024	*12/02/98*	*0-4*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*NA*
025	*12/02/98*	*4-8*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*ND [3]*	*NA*
Environmental Works - 2019														
SB-1	*10/10/19*	*26-27*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
SB-2	*10/10/19*	*22-23*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
SB-3	*10/10/19*	*18-19*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND*
SB-4	*10/10/19*	*11.5-12.5*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND*
SB-5	*10/10/19*	*4-5*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	***0.71*** *[4]*
		8-10	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	***0.10*** *[4]*
SB-6	*10/10/19*	*4-6*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND*
SB-7	*10/10/19*	*24-25*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*NA*	*NA*	*ND [2]*	*ND [2]*	*ND [2]*	*ND [2]*	*ND*
KDHE Tier 2 Risk-based Screening Levels														
Residential Scenario, Soil Pathway			*15.9*	*4,320*	*82*	*936*	*NE*	*5.31*	*NE*	*1.09*	*10.9*	*10.9*	*109*	*50 [5]*
Residential Scenario, Soil to Groundwater Protection Pathway			*0.168*	*51.2*	*65.6*	*809*	*NE*	*0.0677*	*NE*	*23.5*	*19.2*	*7.89*	*190*	*50 [5]*
Non-Residential Scenario, Soil Pathway			*28.2*	*29,800*	*145*	*1,410*	*NE*	*16.4*	*NE*	*3.38*	*33.8*	*33.8*	*338*	*50 [5]*
Non-Residential Scenario, Soil to Groundwater Protection Pathway			*0.168*	*51.2*	*65.6*	*809*	*NE*	*0.227*	*NE*	*23.5*	*64.4*	*26.5*	*638*	*50 [5]*

Notes:
bgs = below ground surface
ND = not detected above laboratory reporting limit
NA = not analyzed
NE = not established
VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
PCBs = polychlorinated biphenyls
D,D,D-4,4' = dichlorodiphenyldichloroethane
Detected laboratory concentrations are shown in bold
[1] = EPA Method 8240
[2] = Less than minimum laboratory detection limits
[3] = Identified in BTA report as "no significant detections for the parameters tested"
[4] = Detected compound was Aroclor 1254

Table 1C - Applicable Soil Analytical Results - Previous Assessments
RCRA Metals and TCLP Metals Analysis

Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Boring/Sample ID	Date Sampled	Sample Depth (feet bgs)	Laboratory Analytical Results (milligrams per kilogram) and Test Methods								
			Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	TCLP
			6010	6010	6010	6010	6010	7471	6010	6010	NA
Terracon - 1989											
B-1	11/24/89	2	NA	NA	NA	NA	**20** [1]	NA	NA	NA	NA
B-2	11/24/89	2	NA	NA	NA	NA	**20** [1]	NA	NA	NA	NA
B-3	11/24/89	2	NA	NA	NA	NA	**20** [1]	NA	NA	NA	NA
MW-3	11/24/89	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	11/24/89	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kansas City Testing Laboratory - 1991											
6" Composite	10/31/91	0.5	NA	NA	NA	NA	NA	NA	NA	NA	ND [2]
18-24" Composite	10/31/91	1.5-2	NA	NA	NA	NA	NA	NA	NA	NA	ND [2]
EPA BTA - 1999											
003	12/02/98	12-16	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	NA
023	12/02/98	0-4	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	NA
024	12/02/98	0-4	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	NA
025	12/02/98	4-8	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	Not Reported [3]	NA
Environmental Works - 2019											
SB-1	10/10/19	26-27	**4.0**	**200**	ND	**21.6**	**12.2**	ND	ND	ND	NA
SB-2	10/10/19	22-23	**3.0**	**183**	ND	**20.0**	**11.1**	ND	ND	ND	NA
SB-3	10/10/19	18-19	**8.2**	**156**	ND	**20.7**	**27.2**	ND	ND	ND	NA
SB-4	10/10/19	11.5-12.5	**8.1**	**242**	**0.52**	**19.4**	**23.4**	ND	ND	ND	NA
SB-5	10/10/19	4-5 8-10	**14.0** **4.0**	**244** **156**	**0.51** ND	**27.2** **19.5**	**432** **25.9**	**0.064** ND	ND ND	ND ND	NA NA
SB-6	10/10/19	4-6	**8.0**	**228**	**1.1**	**16.6**	**118**	**0.057**	ND	ND	NA
SB-7	10/10/19	24-25	**3.6**	**243**	ND	**26.3**	**14.0**	ND	ND	ND	NA
KDHE Tier 2 Risk-based Screening Levels											
Residential Scenario, Soil Pathway			18.9	15,300	39	33.6	400	2	391	391	NA
Residential Scenario, Soil to			NE	NE	NE	NE	NE	NE	NE	NE	NE
Non-Residential Scenario, Soil Pathway			63.2	277,000	965	111	1,000	20	10,200	10,200	NA
Non-Residential Scenario, Soil to			NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

bgs = below ground surface
NA = not analyzed
ND = not detected above laboratory reporting limit
NE = not established
RCRA = Resource Concervation and Recovery Act
TCLP = toxic characteristic leaching procedure

Detected laboratory concentrations are shown in bold
Concentrations above Residential Tier 2 Risk-based Screening Levels highlighted in yellow

[1] = Noted in report as "detected at concentrations of 20 ppm in each of the three samples"
[2] = Less than minimum laboratory detection limits
[3] = Identified in BTA report as "no significant detections for the parameters tested"

Table 2A - Applicable Groundwater Analytical Results - Previous Assessments
VOC Analysis

Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Probe/ Well ID	Date Sampled	Laboratory Analytical Results (milligrams per liter) and Test Methods						
		Benzene	Toluene	Ethylbenzene	Total Xylenes	VOCs Survey Search	Methylene Chloride	p- Isopropyltoluene
		8260	8260	8260	8260	8260	8260	8260
Terracon - 1989								
MW-1	*11/24/89*	*ND*	*ND*	*NA*	*ND*	*NA*	*NA*	*NA*
MW-2	*11/24/89*	*ND*	*ND*	*NA*	*ND*	*NA*	*NA*	*NA*
MW-3	*11/24/89*	*ND*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*
MW-4	*11/24/89*	*ND*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*
MW-5	*11/24/89*	*ND*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*
MW-6	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND*	*ND*	*ND*
EPA BTA - 1999								
100	*12/02/98*	***0.0069***	*ND*	*ND*	*ND*	*NA*	***0.37***	*ND*
105	*12/02/98*	*ND*	*ND*	*ND*	*ND*	*NA*	*ND*	*ND*
Environmental Works - 2019								
MW-1	*10/10/19*	*ND*	*ND*	*ND*	*ND*	*NA*	*ND*	*ND*
MW-2	*10/10/19*	*ND*	*ND*	*ND*	*ND*	*NA*	*ND*	*ND*
MW-3	*10/10/19*	*ND*	*ND*	*ND*	*ND*	*NA*	*ND*	*ND*
MW-5	*10/10/19*	*ND*	*ND*	*ND*	*ND*	*NA*	*ND*	***0.0016***
MW-7	*10/10/19*	*ND*	*ND*	*ND*	*ND*	*NA*	*ND*	*ND*
KDHE Tier 2 Risk-based Screening Levels								
Residential Scenario, Groundwater Pathway		*0.005*	*1*	*0.7*	*10*	*NE*	*0.005*	*NE*
Non-Residential Scenario, Groundwater Pathway		*0.005*	*1*	*0.7*	*10*	*NE*	*0.005*	*NE*

Notes:
All results in milligrams per liter (mg/L)
Detected laboratory concentrations are shown in bold
VOCs = volatile organic compounds
Concentrations above Tier 2 Risk-based Screening Levels are highlighted in green
ND = not detected above laboratory reporting limit
NA = not analyzed
NE = not established

Table 2B - Applicable Groundwater Analytical Results - Previous Assessments
TPH, SVOC and Pesticides Analysis

Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Probe/ Well ID	Date Sampled	Laboratory Analytical Results (milligrams per liter) and Test Methods						
		TPH-LRH	TPH-MRH	TPH-HRH	SVOCs Survey Search	Pentachlorophenol	2,6-Dinitrotoluene	D,D,D-4,4'
		KS LRH	KS MRH	KS HRH	Not Identified	8270	8270	8270C
Terracon - 1989								
MW-1	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND* [1]	*ND* [1]	*NA*
MW-2	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND* [1]	*ND* [1]	*NA*
MW-3	*11/24/89*	*NA*	*NA*	*NA*	*ND* [1]	*ND* [1]	*ND* [1]	*NA*
MW-4	*11/24/89*	*NA*	*NA*	*NA*	*ND* [1]	*ND* [1]	*ND* [1]	*NA*
MW-5	*11/24/89*	*NA*	*NA*	*NA*	*ND* [1]	*ND* [1]	*ND* [1]	*NA*
MW-6	*11/24/89*	*NA*	*NA*	*NA*	*ND* [1]	*ND* [1]	*ND* [1]	*NA*
EPA BTA - 1999								
100	*12/02/98*	*NA*	*NA*	*NA*	*NA*	***0.0011***	*ND* [2]	***0.003***
105	*12/02/98*	*NA*	*NA*	*NA*	*NA*	*ND*	*ND* [2]	***0.0039***
Environmental Works - 2019								
MW-1	*10/10/19*	*ND*	***0.15***	***0.95***	*NA*	*ND*	*ND*	*NA*
MW-2	*10/10/19*	*ND*	***0.13***	***0.77***	*NA*	*ND*	*ND*	*NA*
MW-3	*10/10/19*	*ND*	***0.14***	***0.80***	*NA*	*ND*	*ND*	*NA*
MW-5	*10/10/19*	*ND*	***0.33***	***3.1***	*NA*	*ND*	*ND*	*NA*
MW-7	*10/10/19*	*ND*	***0.16***	***0.78***	*NA*	*ND*	***0.0182***	*NA*
KDHE Tier 2 Risk-based Screening Levels								
Residential Scenario, Groundwater Pathway		*0.35*	*0.15*	*1*	*NE*	*0.001*	*0.000557*	*NE*
Non-Residential Scenario, Groundwater Pathway		*0.95*	*0.4*	*2.5*	*NE*	*0.001*	*0.00187*	*NE*

Notes:

All results in milligrams per liter (mg/L)
Detected laboratory concentrations are shown in bold
TPH = total petroleum hydrocarbons
SVOCs = semi-volatile organic compounds
LRH = low range hydrocarbons
MRH = mid range hydrocarbons
HRH = high range hydrocarbons
KS = Kansas
D,D,D-4,4' = dichlorodiphenyldichloroethane
ND = not detected above laboratory reporting limit
NA = not applicable
NE = not established

Concentrations above Tier 2 Risk-based Screening Levels (residential scenario) are highlighted in yellow
Concentrations above Tier 2 Risk-based Screening Levels (non-residential scenario) are highlighted in green

[1] = Assumed to be below the minimum laboratory reporting limits for the SVOC Survey Search
[2] = Assumed to be below the minimum laboratory reporting limits for the SVOC method used in 1999

Table 2C - Applicable Groundwater Analytical Results - Previous Assessments
RCRA Metals Analysis

Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Probe/ Well ID	Date Sampled	Laboratory Analytical Results (milligrams per liter) and Test Methods							
		Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
		6010	6010	6010	6010	6010	7471	6010	6010
Terracon - 1989									
MW-1	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND*	*NA*	*NA*	*NA*
MW-2	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND*	*NA*	*NA*	*NA*
MW-3	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND*	*NA*	*NA*	*NA*
MW-4	*11/24/89*	***0.06***	*NA*	***0.07***	***0.17***	***3.0***	*ND*	*ND*	*ND*
MW-5	*11/24/89*	*NA*	*NA*	*NA*	*NA*	*ND*	*NA*	*NA*	*NA*
MW-6	*11/24/89*	*ND*	*NA*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
EPA BTA - 1999									
100	*12/02/98*	***0.187***	***8.38***	***0.237***	***0.272***	***4.89***	***0.0048***	*NA*	*NA*
105	*12/02/98*	***0.0281***	***0.153***	*ND*	***0.006***	***0.453***	***0.000344***	*NA*	*NA*
Environmental Works - 2019									
MW-1	*10/10/19*	***0.015***	***0.22***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-2	*10/10/19*	***0.015***	***0.19***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-3	*10/10/19*	*ND*	***0.13***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-5	*10/10/19*	*ND*	***0.40***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
MW-7	*10/10/19*	*ND*	***0.035***	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
KDHE Tier 2 Risk-based Screening Levels									
Residential Scenario, Groundwater Pathway		*0.01*	*2*	*0.005*	*0.1*	*0.015*	*0.002*	*0.05*	*0.0779*
Non-Residential Scenario, Groundwater Pathway		*0.01*	*2*	*0.005*	*0.1*	*0.015*	*0.002*	*0.05*	*0.508*

Notes:
All results in milligrams per liter (mg/L)
Detected laboratory concentrations are shown in bold
RCRA = Resource Concervation and Recovery Act
Concentrations above Tier 2 Risk-based Screening Levels (non-residential scenario) are highlighted in green
ND = not detected above laboratory reporting limit
NA = not applicable

Table 3 - Previous Soil Vapor Analytical Results
VOCs Analysis

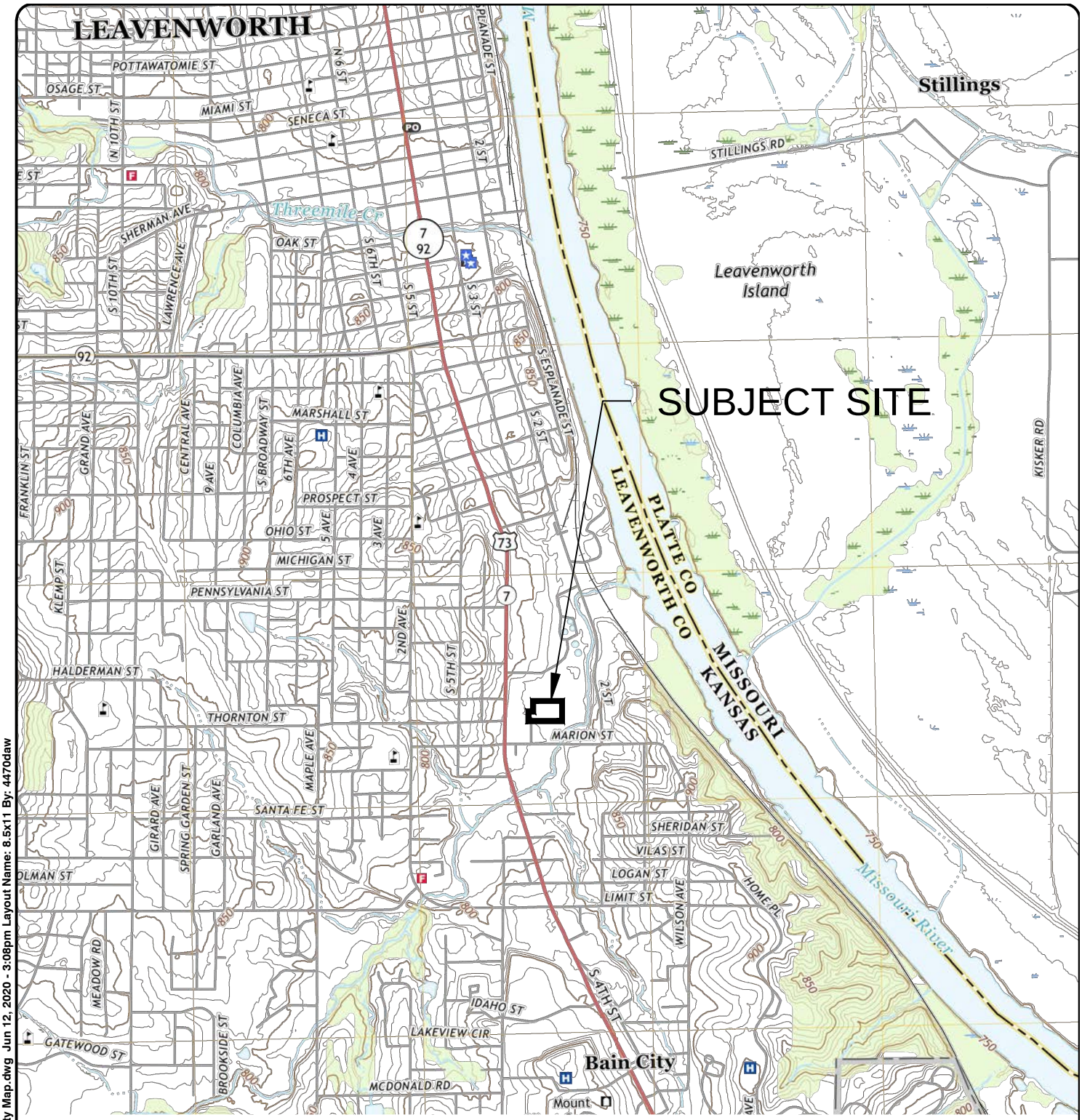
Former City Garage Operations
2109 South 3rd Street
Leavenworth, Kansas

SCS Engineers Project Number 27220109.00
KDHE Project Code: C4-052-73682

Sample ID	Date Sampled	Laboratory Analytical Results (micrograms per cubic meter) and Test Method																												
		Acetone	Benzene	Bromodichloromethane	Carbon Disulfide	Chloroform	Chloromethane	Cyclohexane	Ethyl Acetate	Ethylbenzene	4-Ethyltoluene	Freon 11	Freon 114	Freon 12	Heptane	Hexane	Isopropyl alcohol	MEK	Methylene chloride	Naphthalene	Styrene	PCE	Toluene	TCE	1,1,1-Trichloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2,2,4-Trimethylpentane	m&p-Xylene	o-Xylene
		TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15	TO-15
Environmental Works - 2019																														
SVW-1	*10/11/19*	***53***	***7.2***	***2.5***	***32***	***49***	*ND*	***11***	*ND*	***7.2***	***1.5***	***3.3***	***68***	***6.8***	***23***	***16***	***5.0***	***11J***	***0.80***	***0.89***	***1.2***	***0.68J***	***14***	*ND*	*ND*	***3.8***	***2.7***	***1.9***	***6.5***	***2.6***
SVW-2	*10/11/19*	***43***	***12***	***0.80J***	***15***	***36***	***0.76***	***19***	***1.0***	***3.2***	*ND*	***1.5***	*ND*	***2.5***	***11J***	***19***	***4.0***	***8.8J***	***0.59***	***1.3***	*ND*	*ND*	***12***	***1.3***	*ND*	***1.9***	***0.93***	***3.6***	***5.0***	***1.7***
SVW-3	*10/11/19*	***20***	***3.2***	***3.7***	***7.5J***	***120***	*ND*	***11***	***0.76J***	***1.5***	*ND*	***2.6***	*ND*	***2.7***	***11***	***8.5J***	***4.2***	***5.7***	***0.42J***	***1.0***	*ND*	***0.95J***	***5.2***	*ND*	***12***	***2.5***	***1.2***	***4.3***	***3.9***	***1.4***
EPA VISL																														
Target Exterior Soil Gas - Residential		*1.1E+06*	*120*	*25*	*2.4E+04*	*4.1E+01*	*3.1E+03*	*2.1E+05*	*2.4E+03*	*374*	*NE*	*NE*	*NE*	*3.5E+03*	*1.4E+04*	*2.4E+04*	*7.0E+03*	*1.7E+05*	*2.1E+04*	*28*	*3.5E+04*	*1.4E+03*	*1.7E+05*	*7.0E+01*	*1.7E+05*	*2.1E+03*	*2.1E+03*	*NE*	*7.0E+03*	*3.5E+03*
Target Exterior Soil Gas - Commercial		*4.5E+06*	*524*	*110*	*1.0E+05*	*1.8E+02*	*1.3E+04*	*8.8E+05*	*1.0E+04*	*1,640*	*NE*	*NE*	*NE*	*1.5E+04*	*5.8E+04*	*1.0E+05*	*2.9E+04*	*7.3E+05*	*8.8E+04*	*120*	*1.5E+05*	*5.8E+03*	*7.3E+05*	*2.9E+02*	*7.3E+05*	*8.8E+03*	*8.8E+03*	*NE*	*2.9E+04*	*1.5E+04*

Notes:
VOCs = volatile organic compounds
MEK = Methyl Ethyl Ketone
PCE = Tetrachloroethylene
TCE = Trichloroethylen
J = analyte detected below quantitation limit
ND = not detected above laboratory reporting limit
EPA VISL = U.S. Environmental Protection Agency Vapor Intrusion Screening Level
NE = not established
Detected laboratory concentrations are shown in bold
Samples collected by Environmental Works, Inc. in October 2019
Concentrations above EPA VISL Target Exterior Soil Gas concentrations for residential land use are highlighted in yellow

6.0 FIGURES



LEAVENWORTH QUADRANGLE
KANSAS-MISSOURI
2018 7.5-MINUTE SERIES

2000 0 2000 4000

SCALE FEET

T:\27220109.00\Data and Calculations\DWG\Figure 1 - Vicinity Map.dwg Jun 12, 2020 - 3:08pm Layout Name: 8.5x11 By: 4470daw

SCS ENGINEERS
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Overland Park, Kansas 66210
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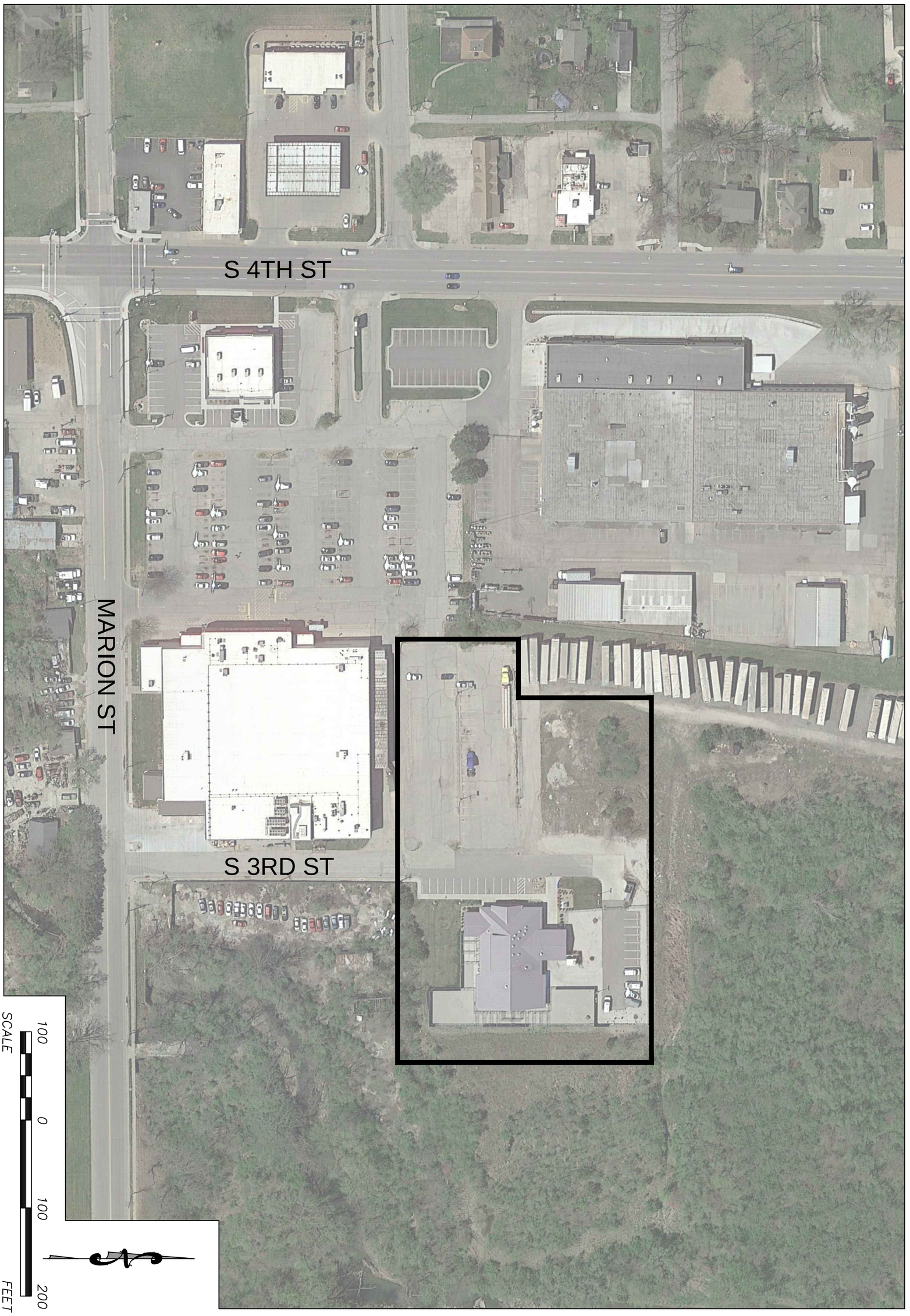
FIGURE 1 - VICINITY MAP

FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

CHK. BY: DND	DWN. BY: DAW	DSN. BY: DND	PROJ. NO. 27220109.00
PROJ. MGR: DND	DATE: 6/11/20	CADD FILE: FIGURE 1 – VICINITY MAP.DWG	DRAWING NO. 1

T:\27220109.00\Data and Calculations\DWG\Figure 2 and 3 - Former Location of Former City Garage Operations v0.02.dwg Jun 18, 2020 - 4:23pm Layout Name: 2 By: 4470daw



DRAWING NO. 2

DATE: 6/18/20

CADD FILE: T:\27220109.00\Data and Calculations\DWG\Figure 2 and 3 - Former Location of Former City Garage Operations v0.02.dwg

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW BY:
27220109.00	DAW	DND
DSN. BY: DND	CHK. BY: DND	PROJ. MGR DND

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SHEET TITLE
FIGURE 2 - SITE PROPERTY BOUNDARY

PROJECT TITLE
CITY OF LEAVENWORTH

REV.	DATE		CK. BY
1	-		-
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3	-		-
4	-		-
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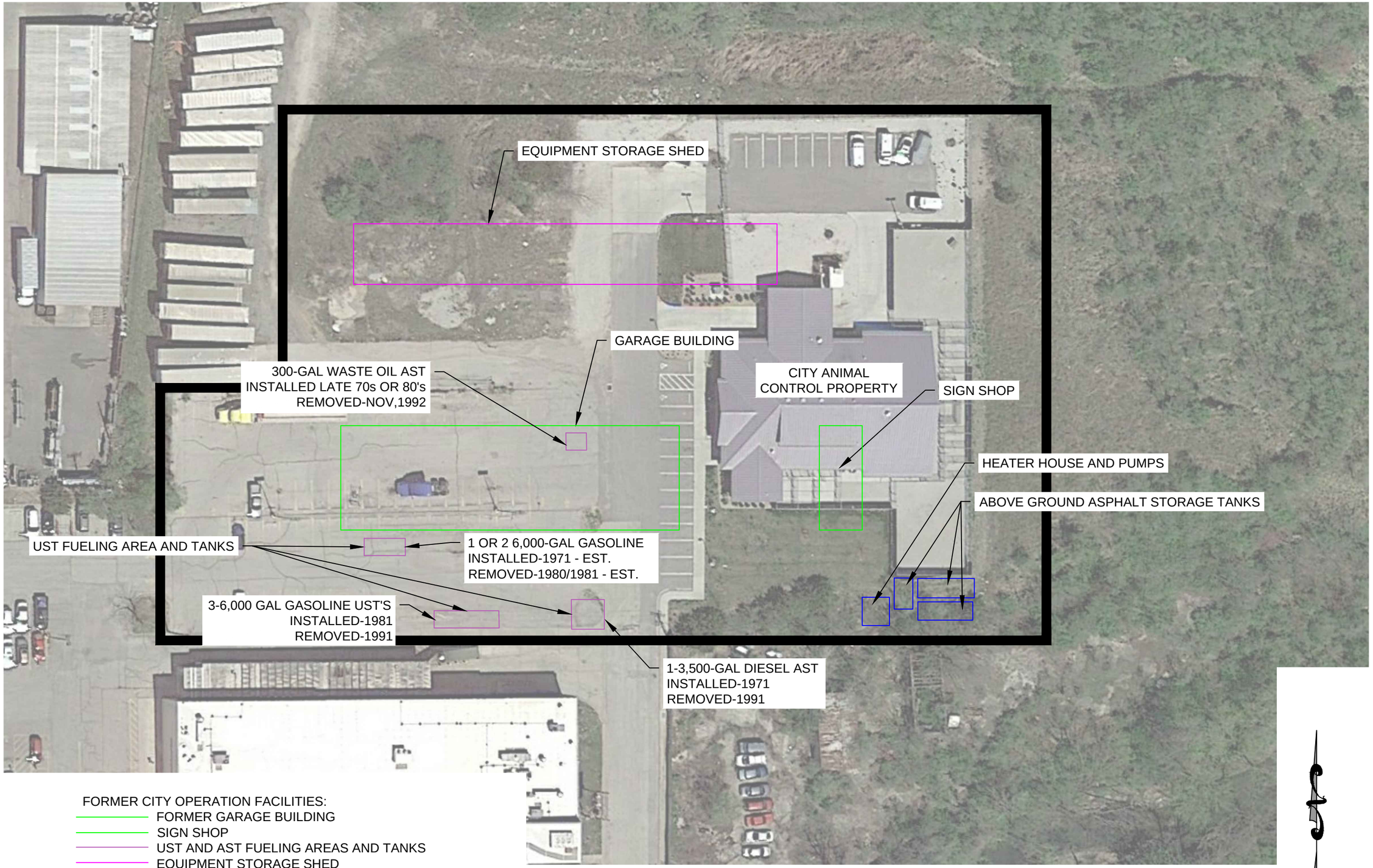
6	-		-



FORMER CITY OPERATION FACILITIES:

- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

100 0 100 200

SCALE FEET

REV.	DATE	CK. BY
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6	–	–

SHEET TITLE
FIGURE 3 - FORMER LOCATION OF CITY GARAGE OPERATIONS

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH: (913) 681-0030 FAX: (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	DSN. BY:	C/A RVW BY:	PROJ. MGR.
27220109.00	DAW	DND	DND	DND	DND

CADD FILE:
FIGURE 2 AND 3 – FORMER LOCATION OF FORMER CITY GARAGE OPERATIONS V0.02.DWG

DATE: 7/16/20

DRAWING NO.
3

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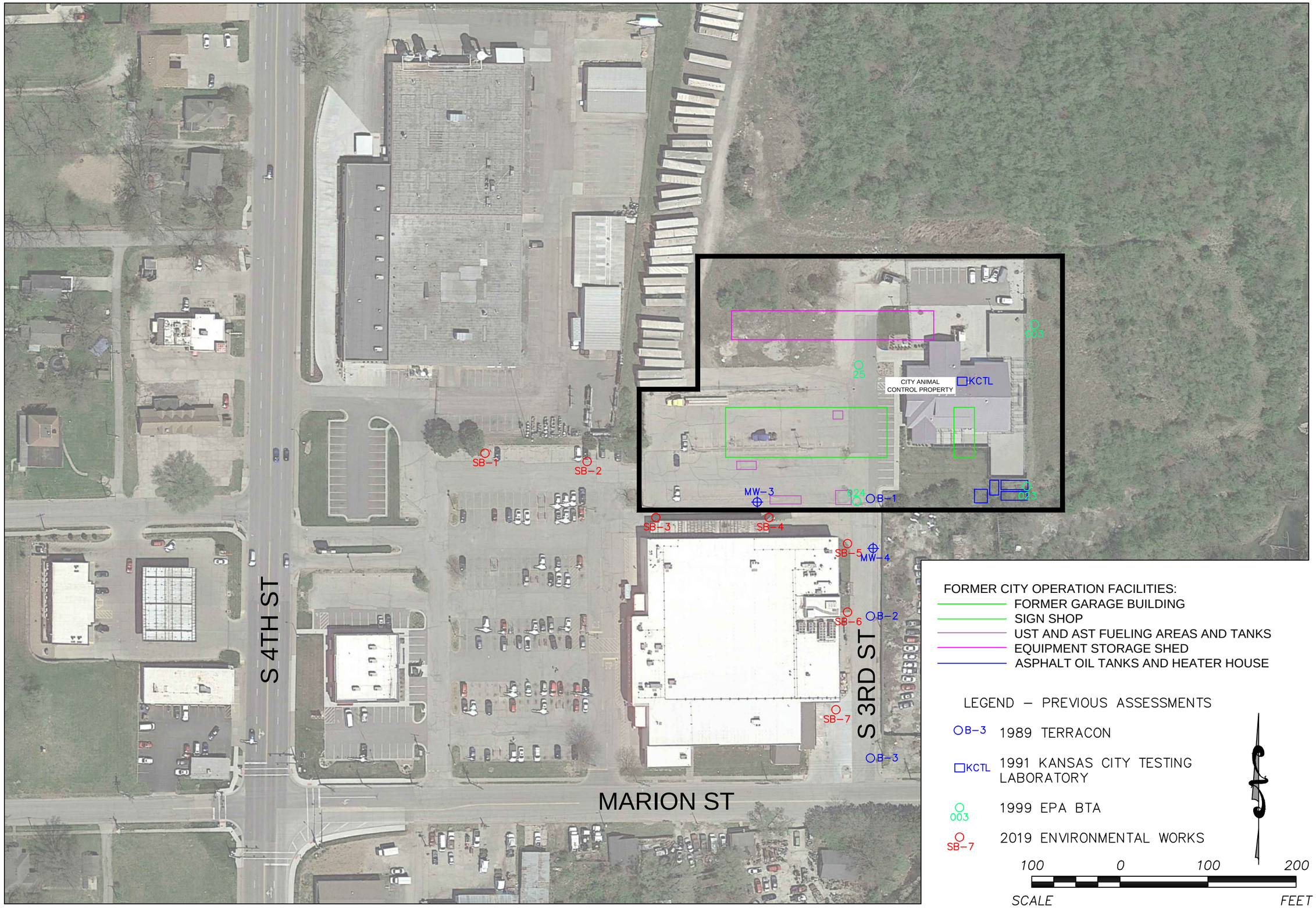

FORMER CITY OPERATION FACILITIES:
- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND – PREVIOUS ASSESSMENTS

B–3 1989 TERRACON

KCTL 1991 KANSAS CITY TESTING LABORATORY

003 1999 EPA BTA

SB–7 2019 ENVIRONMENTAL WORKS

100 0 100 200

SCALE FEET

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SHEET TITLE
FIGURE 4A - PRIOR ASSESSMENT LOCATIONS - SOIL

PROJECT TITLE
CITY OF LEAVENWORTH

REV.	DATE	CK. BY
1	–	–
2	–	–
3	–	–
4	–	–
5	–	–
6	–	–

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27220109.00
DSN. BY: DND
DWN. BY: DAW
CHK. BY: DND
QA/QC BY: DND
PROJ. MGR: DND

CADD FILE:
FIGURE 4 – PRIOR ASSESMENT LOCATIONS – SOIL.DWG

DATE:
7/16/20

DRAWING NO.
4A

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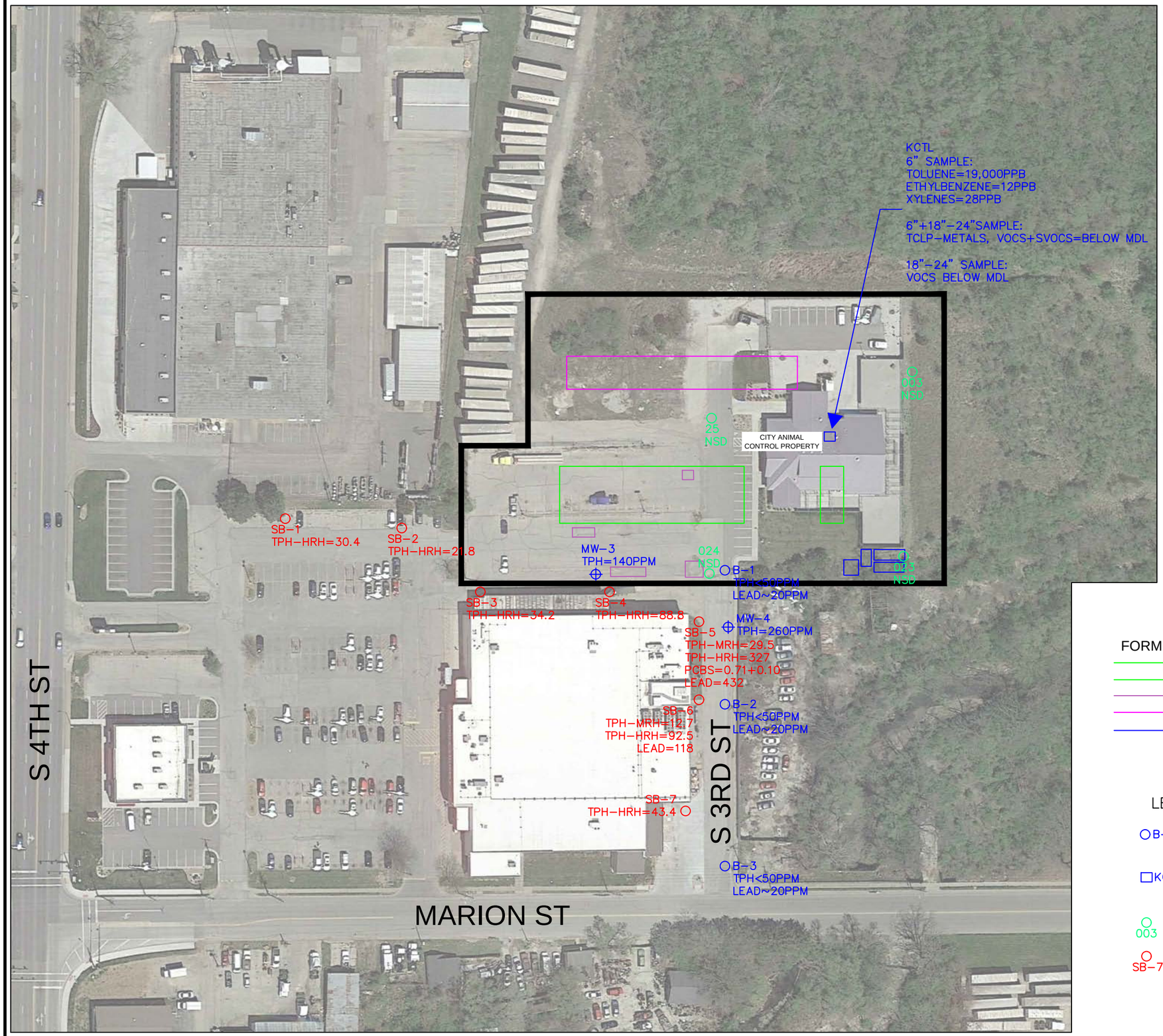

NOTES:

- NSD=NO SIGNIFICANT DETECTIONS, ANALYSIS INCLUDED METALS, VOLATILES, SEMI-VOLATILES, PESTICIDES AND MERCURY.
- PPM=PARTS PER MILLION
- PPB=PARTS PER BILLION
- MDL=BELOW METHOD DETECTION LIMIT
- VOCs=VOLATILE ORGANIC COMPOUNDS
- PCBs=POLYCHLORINATED BIPHENYL
- SVOC'S=SEMI-VOLATILE ORGANIC COMPOUNDS

ALL 2019 ENVIRONMENTAL WORKS LOCATIONS REPORTED IN MILOGRAMS PER KILOGRAMS.

RESULTS SHOWN EXCEED MINIMUM LABORATORY DETECTION LIMITS, HOWEVER, KCTL RESULTS SHOWN BELOW MDL'S TO COMMUNICATE ANALYSIS PERFORMED.

FORMER CITY OPERATION FACILITIES:
- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND – PREVIOUS ASSESSMENTS

B-3 1989 TERRACON

KCTL 1991 KANSAS CITY TESTING LABORATORY

003 1999 EPA BTA

SB-7 2019 ENVIRONMENTAL WORKS

100 0 100 200

SCALE FEET

REV.	DATE	CK. BY
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3	-	-
4	-	-
5	-	-
6	-	-

SHEET TITLE
FIGURE 4A1 - SOIL RESULTS FOR TPH, VOCS, SVOCS, PCBS AND METALS

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

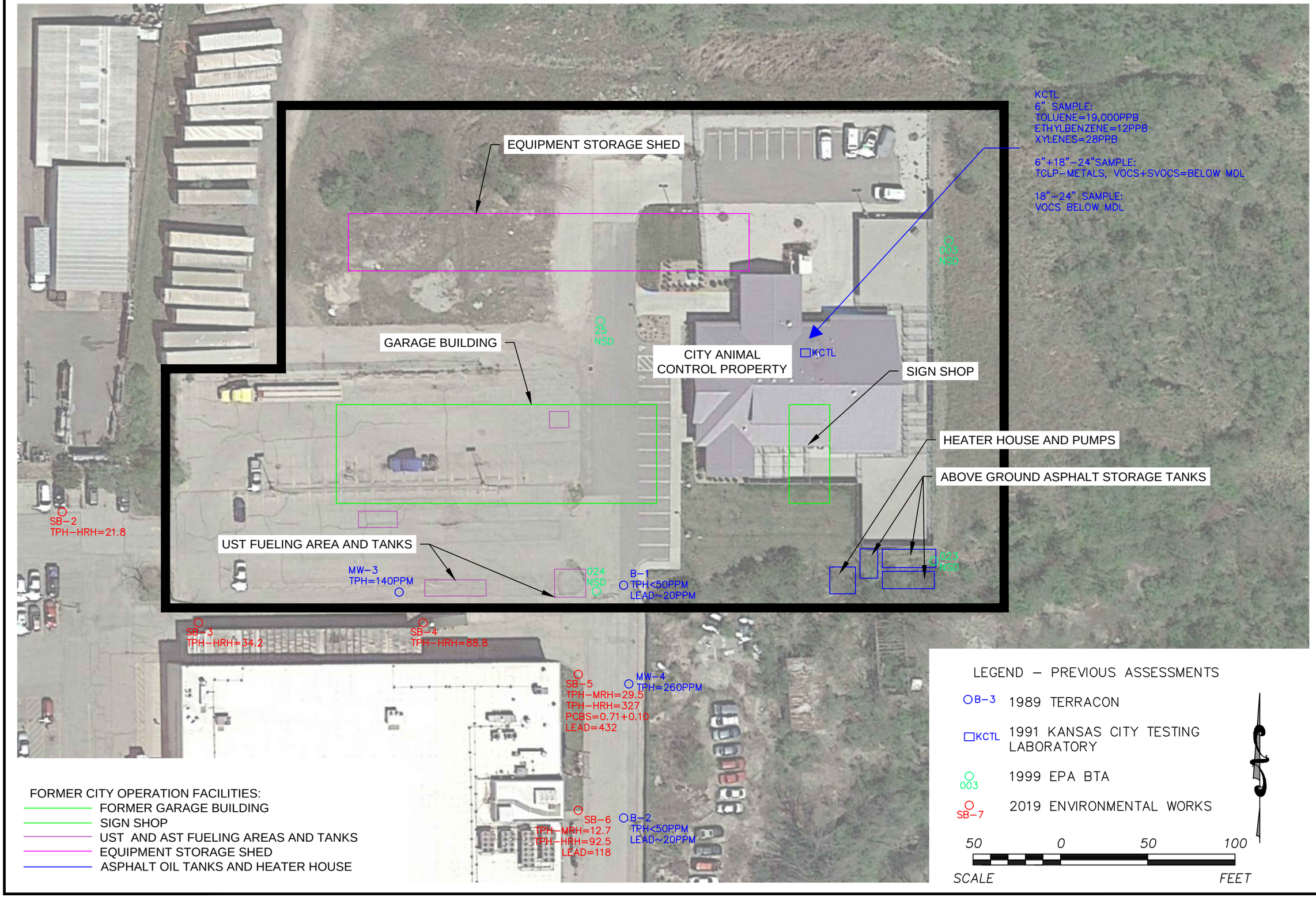
SCS ENGINEERS
8575 W. 110th St. Ste. 100
Overland Park, Kansas 66210
PH: (913) 681-0030 FAX: (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A R/W BY:
27220109.00	DAW	DND
DSN. BY:	CHK. BY:	PROJ. MGR
DND	DND	DND

CADD FILE:
FIGURE 4A-1 - RESULTS FOR TPH, VOCS, SVOCS, PCBS AND METALS.DWG

DATE:
7/16/20

DRAWING NO.
4A-1



REV.	DATE	CK. BY
1	-	-
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5	-	-
6	-	-

SHEET TITLE
FIGURE 4B - SITE DETAIL AND PRIOR ASSESSMENT LOCATIONS - SOIL

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH: (913) 681-0030 FAX: (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	QA/QC BY:	PROJ. MGR.
27220109.00	DAW	DND	DND	DND

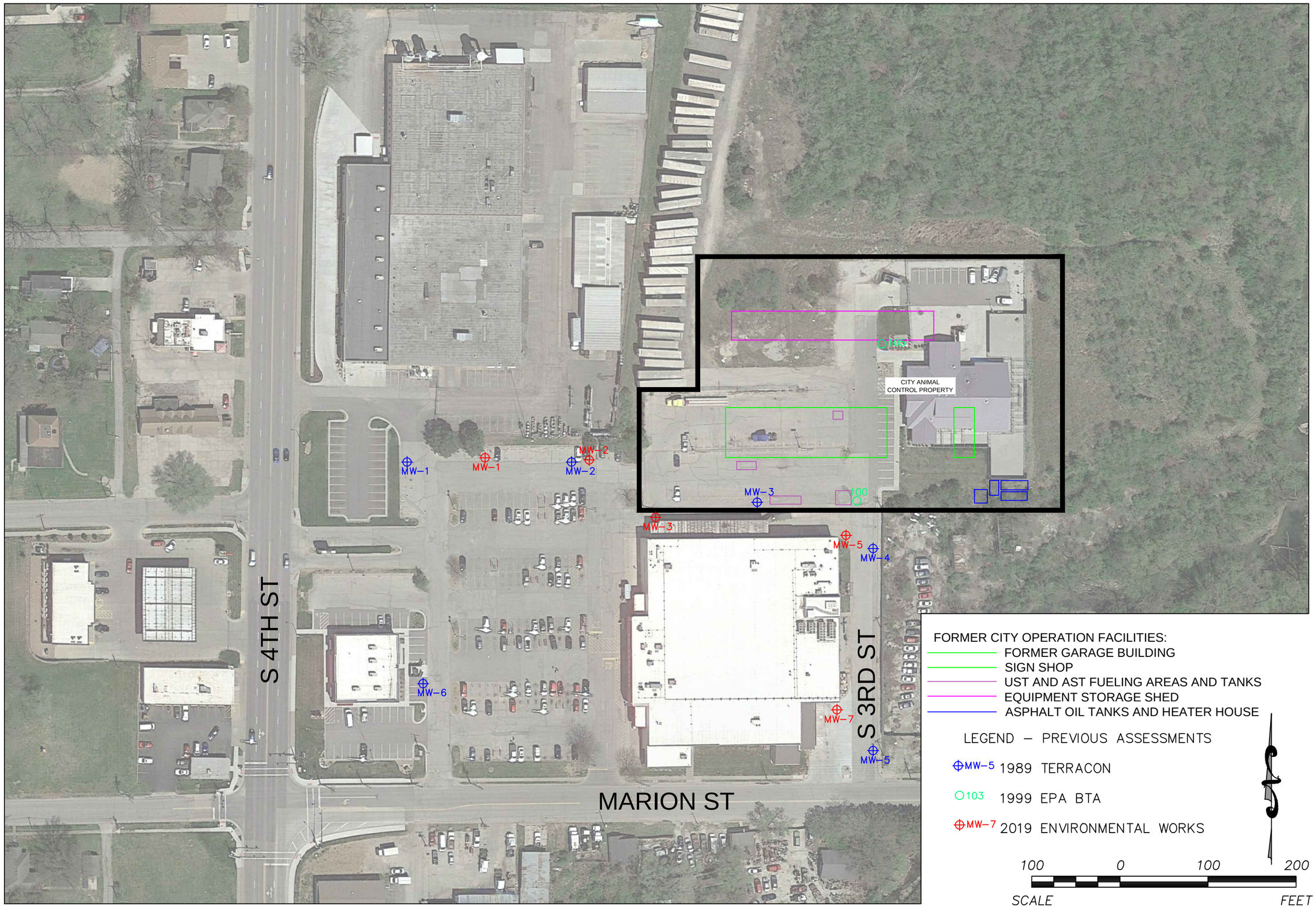
DSN. BY: DND

CADD FILE:
FIGURE_4B - PRIOR ASSESMENT LOCATIONS - SOIL.DWG

DATE: 7/16/20

DRAWING NO.
4B

T:\27220109.00\Data and Calculations\DWG\Figure 4B - Prior Assesment Locations - Soil.dwg Aug 03, 2020 - 9:00am Layout Name: B By: 4470daw



REV.	DATE	CK. BY
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3	–	–
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5	–	–
6	–	–

SHEET TITLE
FIGURE 5A - PRIOR ASSESSMENT LOCATIONS - GROUNDWATER

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27220109.00
DSN. BY: DND
DWN. BY: DAW
CHK. BY: DND
QA/A RVW BY: DND
PROJ. MGR: DND

CADD FILE:
FIGURE 5 – PRIOR ASSESMENT LOCATIONS – GROUNDWATER.DWG

DATE:
7/16/20

DRAWING NO.
5A

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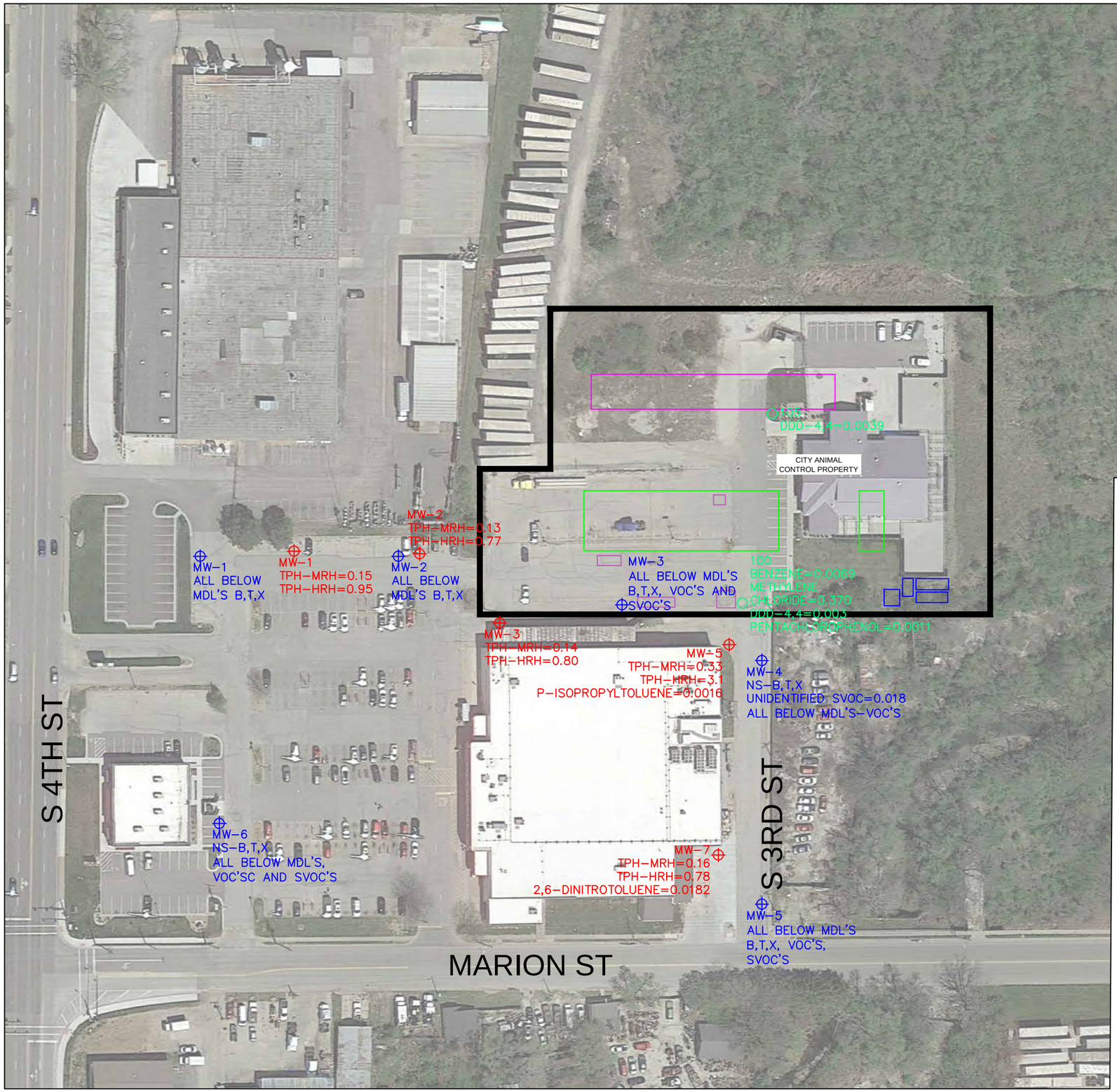


NOTES:

- TPH-MRH=TOTAL PETROLEUM HYDROCARBONS-MID RANGE HYDROCARBONS
- TPH-HRH=TOTAL PETROLEUM HYDROCARBONS-HIGH RANGE HYDROCARBONS
- VOC'S=VOLATILE ORGANIC COMPOUNDS
- SVOC'S=SEMI-VOLATILE ORGANIC COMPOUNDS

RESULTS SHOWN EXCEED MINIMUM LABORATORY DETECTION LIMITS (MDL). HOWEVER, TERRACON RESULTS BELOW MDL SHOWN TO COMMUNICATE ANALYSIS PERFORMED.

ALL LOCATIONS REPORTED IN MILLIGRAMS PER LITER

B=BENZENE
T=TOLUENE
X=XYLENES

FORMER CITY OPERATION FACILITIES:
- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND - PREVIOUS ASSESSMENTS

MW-5 1989 TERRACON

103 1999 EPA BTA

MW-7 2019 ENVIRONMENTAL WORKS

100 0 100 200
SCALE FEET

REV.	DATE	CK. BY
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-

SHEET TITLE
FIGURE 5A1 - GROUNDWATER RESULTS FOR VOC'S, TPH'S & SVOC'S

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX: (913) 681-0012

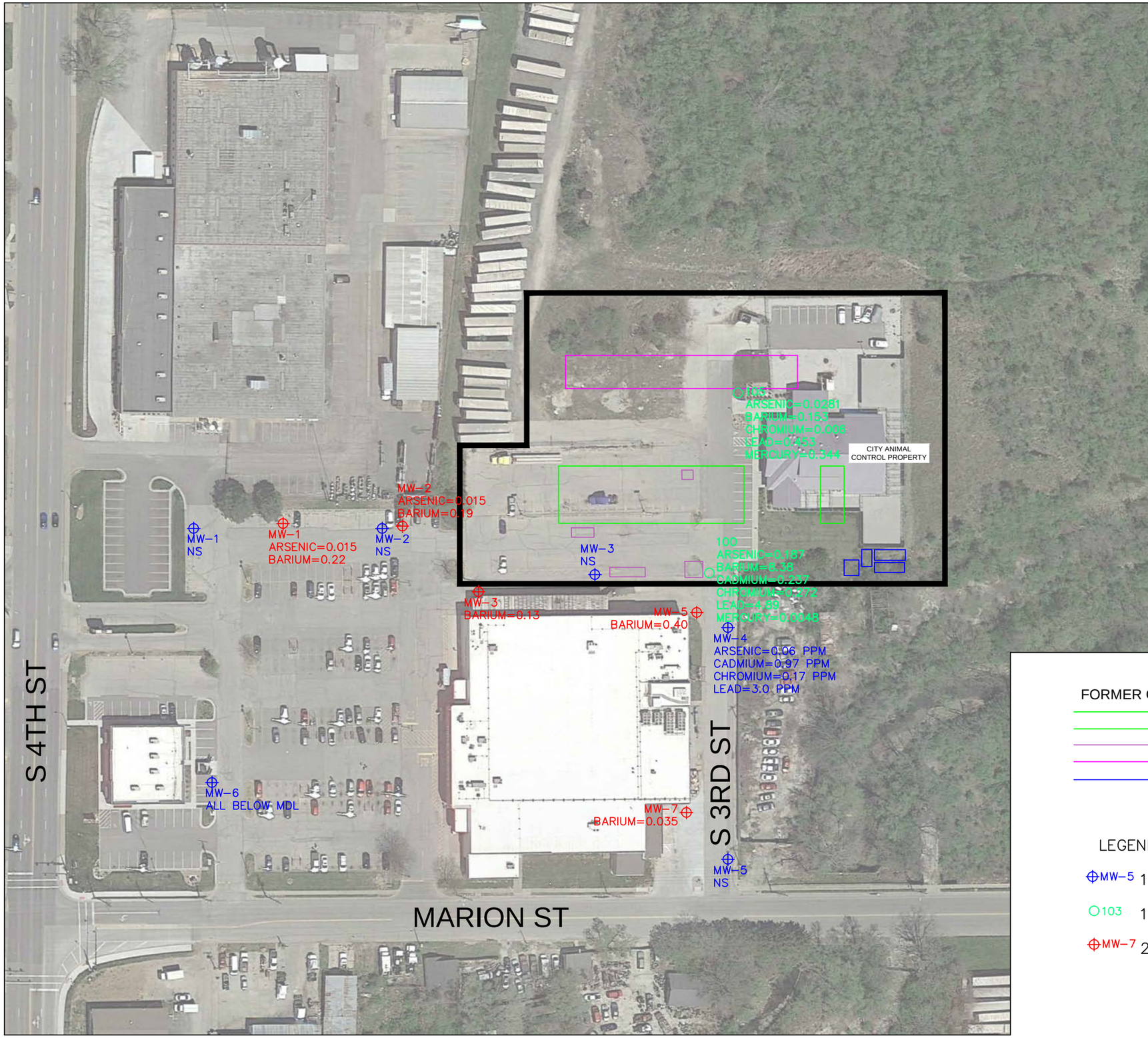
PROJ. NO.	DWN. BY:	G/A R/W BY:
27220109.00	DAW	DND
TASK NO.	**CHK. BY:**	**PROJ. MGR**
DND	DND	DND

CADD FILE:
FIGURE 5A-1 - RESULTS FOR VOC'S, TPH'S, SVOCS.DWG

DATE:
7/16/20

DRAWING NO.
5A-1

T:\27220109.00\Data and Calculations\DWG\Figure 5A-1 - Results for VOC's, TPH's, SVOCs.dwg Jul 16, 2020 - 11:00am Layout Name: A By: 4470daw



NOTES:

- NS = NOT SAMPLED
- PPM = PARTS PER MILLION
- MDL = METHOD DETECTION LIMIT

ALL 2019 ENVIRONMENTAL WORKS LOCATIONS REPORTED IN MILLIGRAMS PER LITER

RESULTS SHOWN EXCEED MINIMUM LABORATORY DETECTION LIMITS

FORMER CITY OPERATION FACILITIES:

- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND – PREVIOUS ASSESSMENTS

- MW-5 1989 TERRACON
- 103 1999 EPA BTA
- MW-7 2019 ENVIRONMENTAL WORKS

100 0 100 200

SCALE FEET

REV.	DATE	CK. BY
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5	-	-
6	-	-

SHEET TITLE
FIGURE 5A2 - GROUNDWATER RESULTS - RCRA 8 METALS

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	C/A RVW BY:
27220109.00	DAW	DND
DSN. BY:	CHK. BY:	PROJ. MGR.
DND	DND	DND

CADD FILE:
FIGURE 5A-2 – RESULTS-RCRA 8 METALS.DWG

DATE:
7/16/20

DRAWING NO.
5A-2

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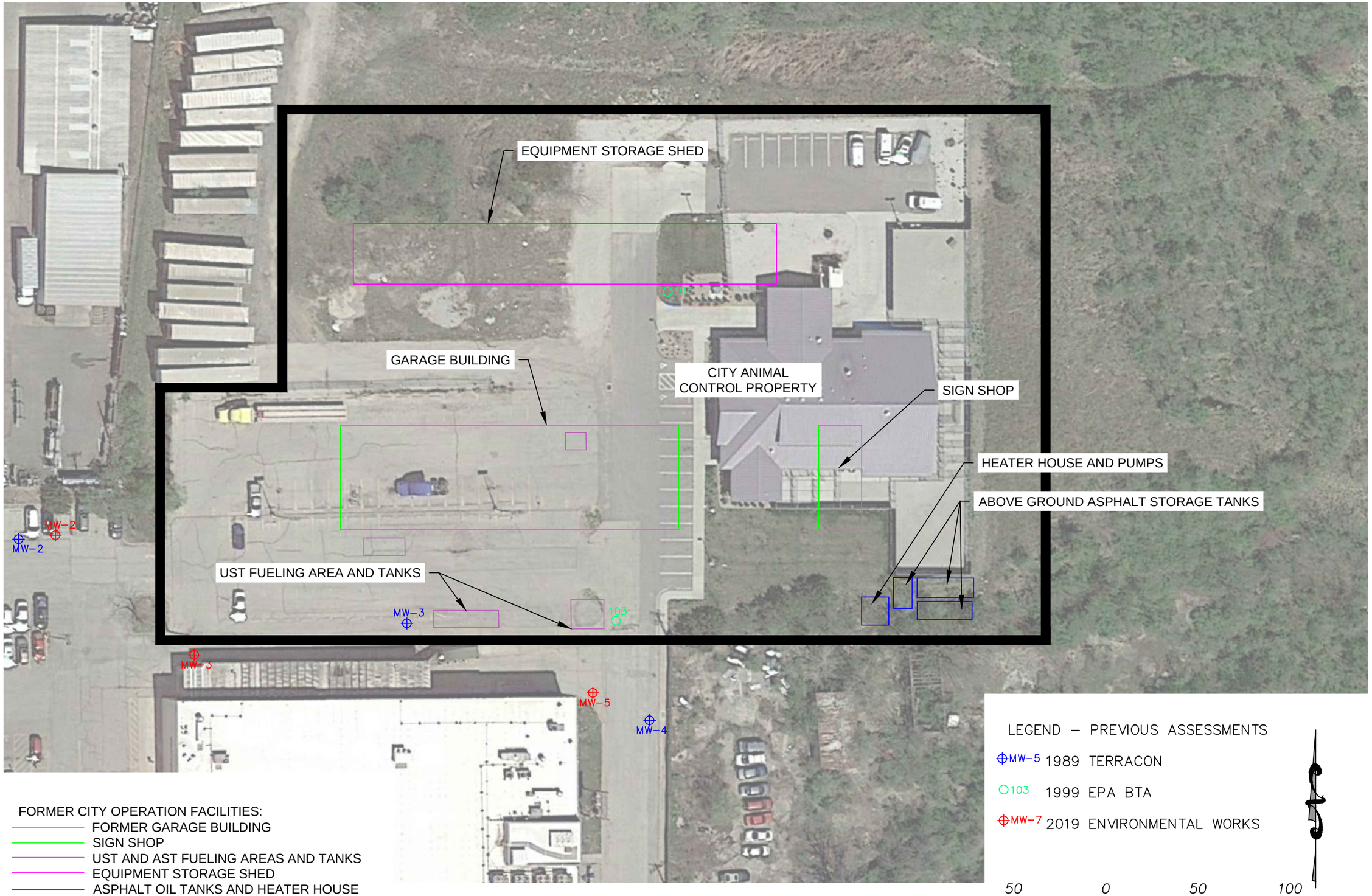

T:\2722010900\Data and Calculations\DWG\Figure 5B - Prior Assesment Locations - Groundwater.dwg Jul 16, 2020 - 1:18pm Layout Name: B By: 4470daw

REV.	DATE	CK. BY
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SHEET TITLE
FIGURE 5B - SITE DETAIL AND PRIOR ASSESSMENT LOCATIONS - GROUNDWATER

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

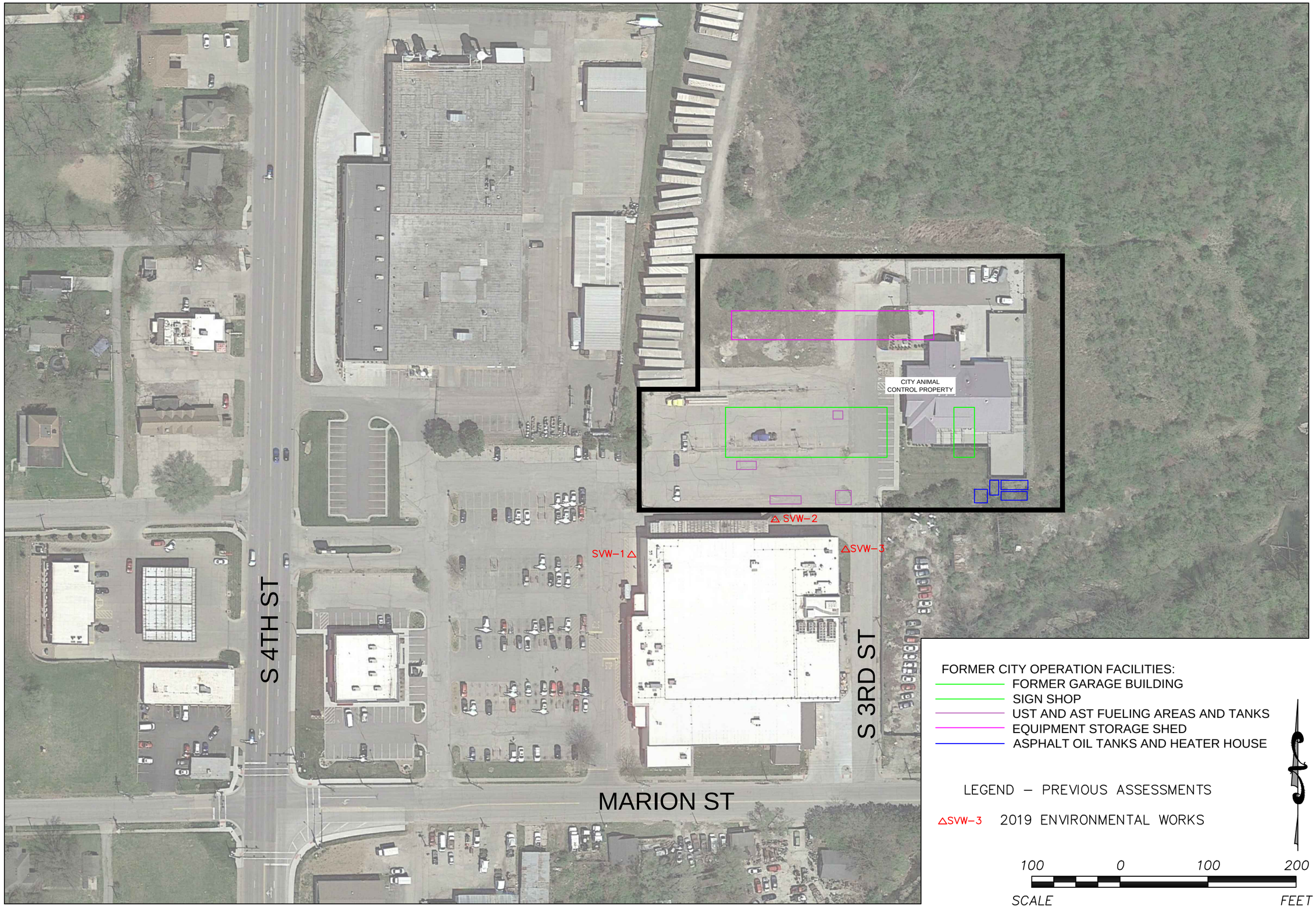
SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	DSN. BY:	C/A RVW BY:	PROJ. MGR.
27220109.00	DAW	DND	DND	DND	DND

CADD FILE:
FIGURE 5B – PRIOR ASSESMENT LOCATIONS – GROUNDWATER.DWG

DATE:
7/16/20

DRAWING NO.
5B



FORMER CITY OPERATION FACILITIES:
- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND – PREVIOUS ASSESSMENTS

△SVW-3 2019 ENVIRONMENTAL WORKS

100 0 100 200

SCALE FEET

SHEET TITLE
FIGURE 6A - PRIOR ASSESSMENT LOCATIONS - SOIL GAS

PROJECT TITLE
CITY OF LEAVENWORTH

REV.	DATE	CK. BY
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CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

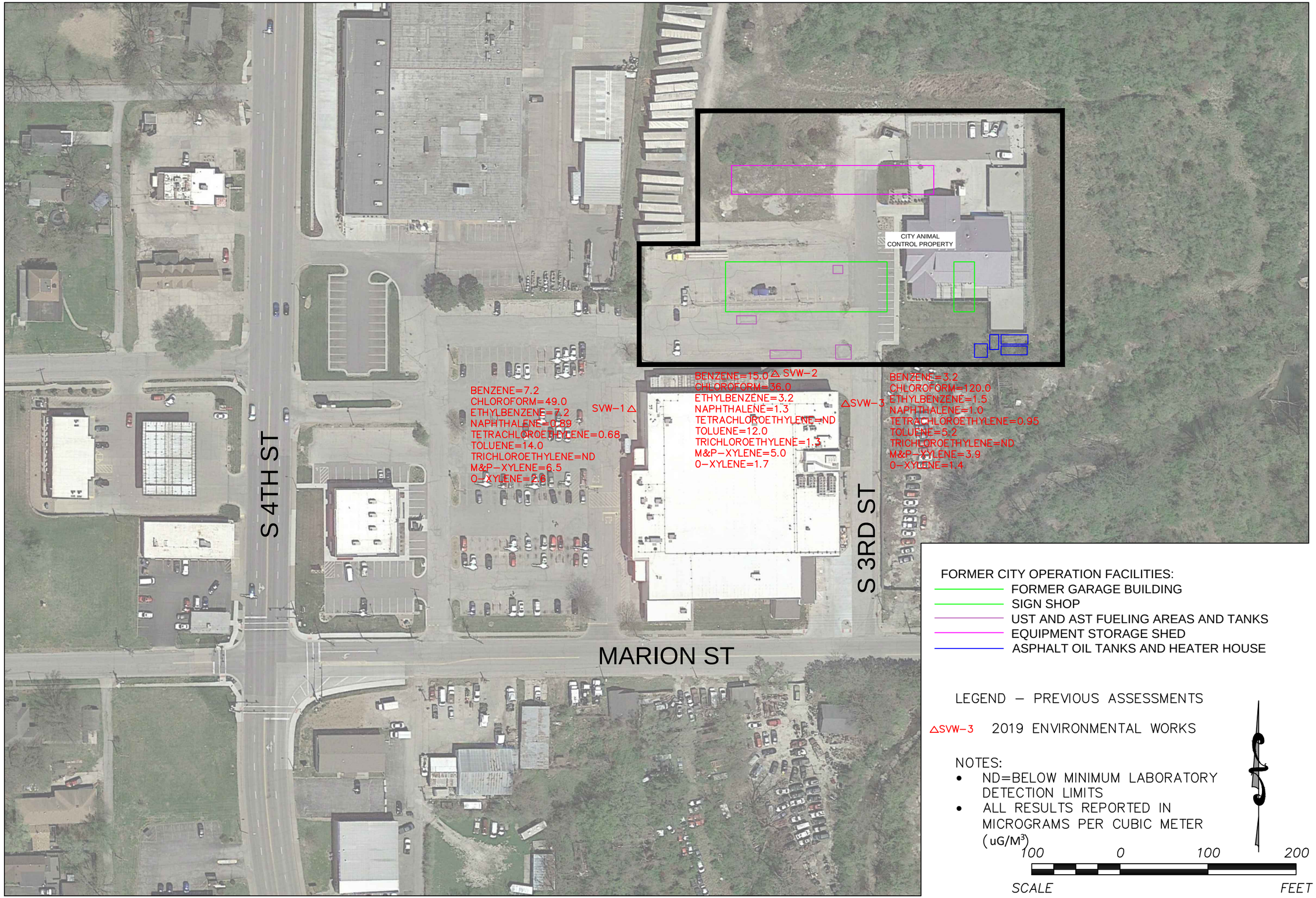
SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27220109.00 | DSN. BY: DND | DRW. BY: DAW | CHK. BY: DND | Q/A REW BY: DND | PROJ. MGR: DND

CADD FILE:
FIGURE 6 – PRIOR ASSESMENT LOCATIONS – SOIL GASDWG

DATE:
7/16/20

DRAWING NO.
6A



FORMER CITY OPERATION FACILITIES:

- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND – PREVIOUS ASSESSMENTS

△SVW-3 2019 ENVIRONMENTAL WORKS

NOTES:

- ND=BELOW MINIMUM LABORATORY DETECTION LIMITS
- ALL RESULTS REPORTED IN MICROGRAMS PER CUBIC METER (uG/M^3)

100 0 100 200

SCALE FEET

REV.	DATE	CK. BY
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4	-	-
5	-	-
6	-	-

SHEET TITLE
FIGURE 6A1 - SOIL GAS RESULTS FOR SELECT VOC'S

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27220109.00 | DWN. BY: DAW | Q/A REW BY: DND
DSN. BY: DND | CHK. BY: DND | PROJ. MGR: DND

CADD FILE:
FIGURE 6A-1 – RESULTS FOR SELECT VOCS.DWG

DATE: 7/16/20

DRAWING NO.
6A-1

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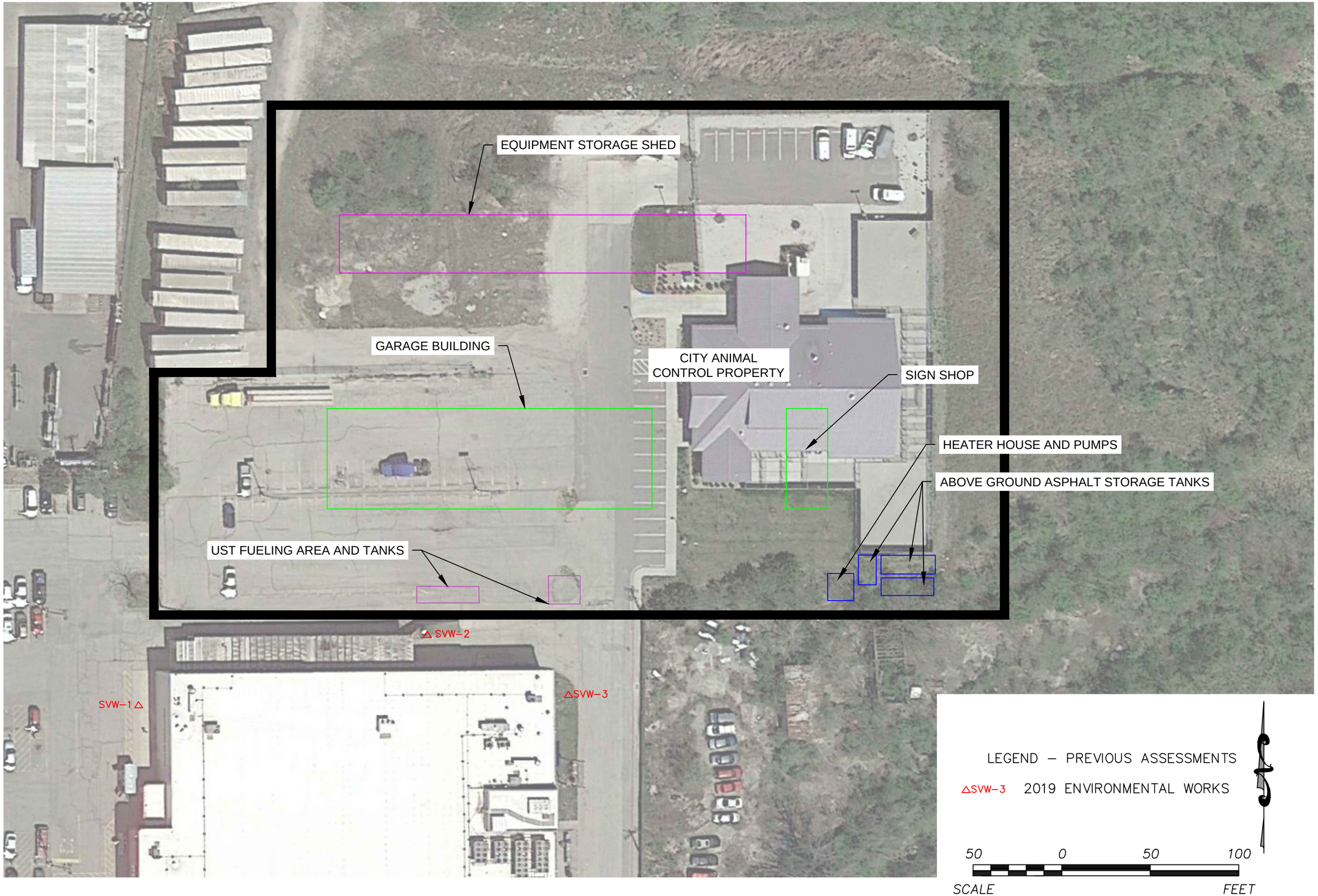

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SHEET TITLE
FIGURE 6B - SITE DETAIL AND PRIOR ASSESSMENT LOCATIONS - SOIL GAS

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH: (913) 681-0030 FAX: (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	DSN. BY:
27220109.00	DAW	DND	DND

Q/A RVW BY:	PROJ. MGR.
DND	DND

CADD FILE:
FIGURE 6B – PRIOR ASSESMENT LOCATIONS – SOIL GAS.DWG

DATE:
6/25/20

DRAWING NO.
6B

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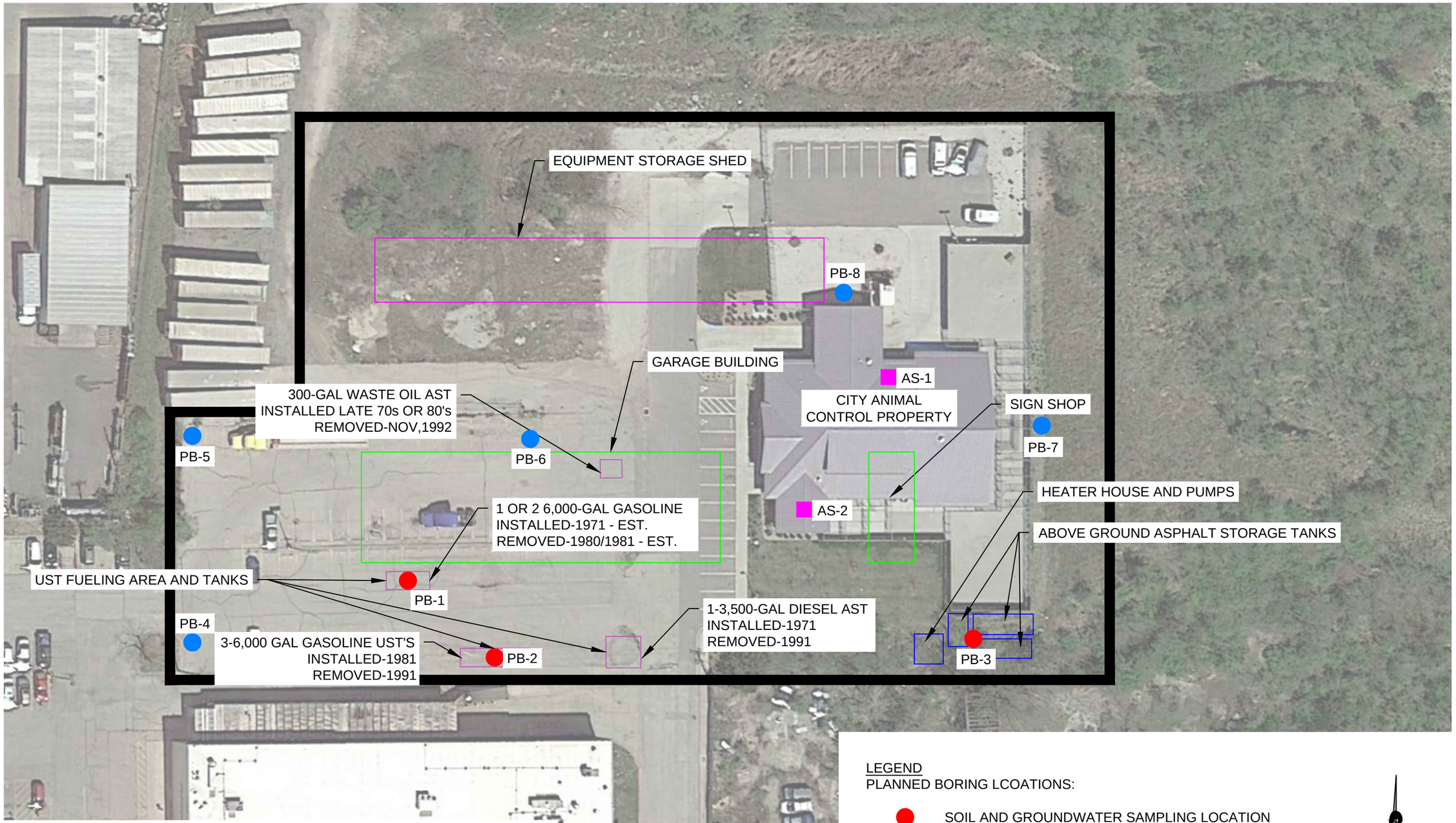

FORMER CITY OPERATION FACILITIES:
- FORMER GARAGE BUILDING
- SIGN SHOP
- UST AND AST FUELING AREAS AND TANKS
- EQUIPMENT STORAGE SHED
- ASPHALT OIL TANKS AND HEATER HOUSE

LEGEND
PLANNED BORING LCOATIONS:

PB-1 — SOIL AND GROUNDWATER SAMPLING LOCATION

PB-4 — GROUNDWATER SAMPLING LOCATION

AS-1 — INDOOR AIR SAMPLING LOCATION

100 0 100 200
SCALE FEET

REV.	DATE	CK. BY
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SHEET TITLE
FIGURE 7 - PROPOSED PHASE II ENVIRONMENTAL SITE ASSESSMENT

PROJECT TITLE
CITY OF LEAVENWORTH

CLIENT
FORMER CITY OF LEAVENWORTH GARAGE
2109 S. 3RD STREET
LEAVENWORTH, KANSAS 66048
KDHE PROJECT CODE C4-052-73682

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. MGR.	DWN. BY:	CHK. BY:	QA/A RVW BY:	PROJ. MGR
27220109.00	DAW	DND	DND	DND
DSN. BY: DND				

CADD FILE:
FIGURE 7 – PROPOSED PHASE II ENVIRONMENTAL SITE ASSESSMENT.DWG

DATE:
8/3/20

DRAWING NO.
7

ATTACHMENT A

Quality Assurance / Quality Control Plan

VOLUNTARY CLEANUP INVESTIGATION QUALITY ASSURANCE PROJECT PLAN

Phase II Environmental Site Assessment

Former City Garage Operations
City of Leavenworth, Kansas
2109 South 3rd Street
Leavenworth, Kansas 66048

Project Code: C4-052-73682

Kansas Department of Health and Environment
Bureau of Environmental Remediation
Voluntary Cleanup and Property Redevelopment Program
1000 SW Jackson, Suite 410
Topeka, Kansas 66612

SCS ENGINEERS

Project Number 27220109.00
August 4, 2020

8575 W. 110th St.
Overland Park, KS 66210
913-681-0030

Table of Contents

Section Page

1.0 QAPP INTRODUCTION

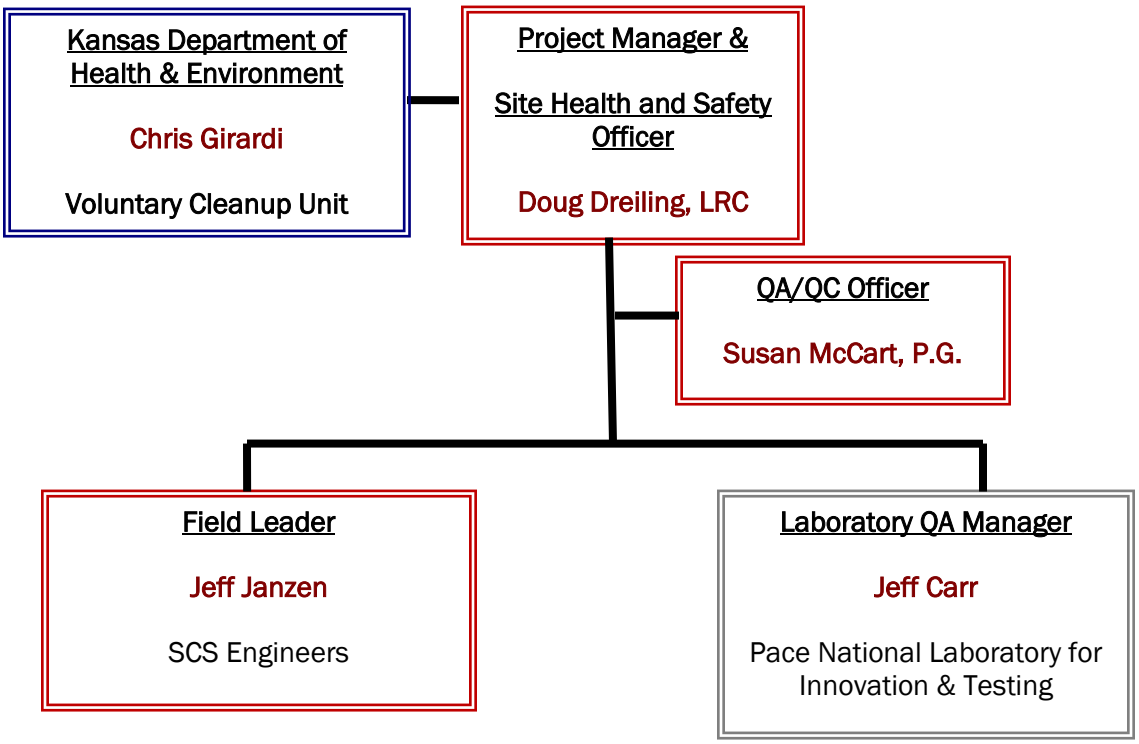
SCS has prepared this Site-Specific Quality Assurance Project Plan (QAPP) to be utilized for the planned Phase II Environmental Site Assessment (ESA) at the City of Leavenworth, Kansas Former City Garage Operations (Subject Site). The Subject Site has an assigned address of 2109 South 3rd Street in Leavenworth, Kansas. The Subject Site has been enrolled in the Voluntary Cleanup and Property Redevelopment Program (VCPRP) with the affiliated KDHE Project ID #C4-052-73682 provided in KDHE correspondence dated February 24, 2020.

This Site-Specific QAPP has been developed to meet the general content requirements of EPA *QA/R-5 "EPA Requirements for Quality Assurance Project Plans"* Publication Number EPA/240/B-01/003 dated March 2001. The QAPP is a formal document describing in detail the necessary Quality Assurance/Quality Control (QA/QC) and other technical activities implemented to ensure that the results of the site work performed and integrity of the data acquired will satisfy the required performance criteria.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

2.1 KEY PROJECT ORGANIZATION AND RESPONSIBILITY

A project organization chart is provided below; the individuals participating in the project and their specific roles and responsibilities are summarized on the following page.



Chris Girardi; Voluntary Cleanup Unit Project Manager (VPM), KDHE-BER – Mr. Girardi is responsible for reviewing and providing work plan authorization to proceed with the planned Phase II ESA. He is also responsible for reviewing the subsequent site assessment documentation.

Doug Dreiling, LRC; Project Manager (PM) and Site Safety & Health Officer (SSHO), SCS Engineers – Mr. Dreiling is responsible for development, approval, and maintaining this Site-Specific QAPP. He will oversee all project activity for the proposed project site and is responsible for developing deliverables in compliance with the appropriate standards prior to submittal to the VCPRP. Mr. Dreiling is the SCS decision-maker for the project and primary user of the data to evaluate whether further action is required at the Site. He will also coordinate the project activities with specific responsibilities including:

1. Overall responsibility of the investigation.
2. Support the Field Health & Safety Officer during the field investigation.
3. Coordinating field and environmental laboratory (Laboratory) activities.
4. Conducting project activities in accordance with this Site-Specific QAPP.
5. Coordination with the VCC regarding the project status and preparing final reports to the VCPRP.
6. Making project decisions with the authority to commit the necessary contractor resources to conduct the project.
7. Responsible for instituting corrective actions for problems encountered in the field sampling activities.
8. Communicate corrective actions to the field personnel to remedy problems encountered in the field and coordinate with the Laboratory Quality Assurance Managers to correct any corresponding problems encountered in the laboratory analysis.
9. Complete documentation detailing any corrective actions and provide them to the SCS QA/QC Manager.

Susan McCart, P.E., P.G; QA/QC Manager, SCS Engineers – The SCS QA/QC Manager will remain independent of the groups responsible for data generation and will provide QA/QC technical assistance to the SCS Project Manager. The QA/QC Manager will oversee the quality of all work products under this contract. He will also review audit results and review all implemented corrective actions. Primary responsibilities include the following:

1. Assure that the entire project team, including subcontractors, inspectors, and other investigators working on this project have appropriate and current Kansas Certifications and Licenses and/or other applicable certifications and/or licenses.
2. Review all analytical laboratory qualifications to verify appropriate accreditation.
3. Complete an Internal Technical Surveillance Audit of fieldwork during the limited Phase II ESA. Observe compliance with the Site-Specific QAPP and the United States Occupational

Safety and Health Administration (OSHA) regulations and recognized safety precautions. The Project Manager will be notified immediately of any serious QA/QC problems.

4. Ensure that the appropriate number of QA/QC samples are collected and analyzed according to the Site-Specific QAPP QA/QC plan. Provide comments on QA/QC sample results, and corrective action, if necessary.

5. Document compliance with all standards and document any necessary corrective actions.

Jeff Janzen; Field Team Leader (FTL) and Field Site Safety & Health Officer (FSSHO), SCS Engineers – Mr. Janzen is responsible for implementing all field operations. As the FTLeader, his responsibilities include, but are not limited to the following:

1. Distribute the approved Site-Specific QAPP to the members of the field sampling team.

2. Conduct the field activities per the approved QAPP and supervise the field sampling team. This may be extended to include the regeneration of data by repeating field procedures if the procedure is of suspect quality.

3. Implement and document corrective actions in the field.

4. Is responsible for ensuring the Field Health and Safety Plan (HASP) procedures are implemented in the field. He is also responsible for communicating variations from the HASp to the PM/SSHO.

Mr. Jeff Carr; Quality Assurance Manager; Pace National Laboratory for Testing & Innovation (Pace National) – Environmental Laboratory – Mr. Carr is responsible for coordinating the analysis of the samples and Laboratory validation of the data. He will coordinate the receipt of the samples at the Laboratory, select the analytical team, ensure internal Laboratory audits are conducted per the Laboratory's Quality Assurance Manual/Laboratory Custody Procedures, and distribute the applicable sections of the QAPP and subsequent revisions to members of the analytical team. He is responsible for instituting corrective actions for problems encountered in the chemical analyses and will also report Laboratory problems affecting the project data to the Project Manager and QA/QC Officer. Corrective actions for chemical analyses will be detailed in a QA report that will be provided to the Project Manager via electronic mail.

2.2 DATA USERS

The City of Leavenworth, VCPRP and SCS will use the data generated during this project.

3.0 PROBLEM DEFINITION AND BACKGROUND

This Site-Specific QAPP has been prepared to comply with the EPA Quality System (QS) and is intended to integrate all technical and quality aspects of a project including planning, implementation, and assessment. This QAPP document summarizes how QA/QC is applied for proposed environmental data operations to assure that the results obtained are of the type and quality needed and expected. This Site-Specific QAPP is integrated in the overall EPA Data Quality Objectives (DQO) Process.

4.0 PROJECT/TASK DESCRIPTIONS

A limited Phase II ESA will be performed to assess the condition of surface water and underlying soil/sediment at the Site. The general assessment approach is described in Section 2.0 of the Voluntary Cleanup Investigation (VCI) Work Plan; the soil, groundwater and indoor air sampling objectives are presented in Section 2.2.

5.0 DQO FOR MEASUREMENT OF DATA

The DQO will meet the requirements of applicable KDHE regulations and guidance documents. The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, Laboratory analysis, and reporting that will provide results that are required by the specified oversight agency. Specific procedures for chain-of-custody, Laboratory analysis, reporting of data, internal QC, and corrective action are described in other sections of this Site-Specific QAPP. The purpose of this section is to address the specific objectives for accuracy, precision, completeness, representativeness, and comparability.

5.1 ANALYTICAL DQO

Analytical DQOs are qualitative and quantitative statements that specify the quality of the data required to identify the presence or absence of contaminants and support decisions concerning the Site and are based on the end uses of the data to be collected. As such, different data uses may require different levels of data quality. The EPA has defined two analytical levels that address various data uses and the QA/QC effort and methods required to achieve the desired level of quality. These levels include:

- Screening (DQO Level I): Screening data is described as "data generated by rapid, less precise methods of analysis with less rigorous sample preparation". Sample preparation steps may be restricted to simple procedures such as dilution with a solvent, instead of elaborate extraction/digestion and cleanup. Screening data provides analyte identification and quantification, although the quantification may be relatively imprecise. At least 10% of the screening data are confirmed using analytical methods and QA/QC procedures and criteria associated with definitive data. Screening data without associated confirmation data are not considered to be data of known quality. It should be noted that the Site-Specific QAPP will describe the screening data required to meet the DQOs; and

- Definitive (DQO Level II): Definitive data is described as "generated using rigorous analytical methods, such as approved EPA reference methods". Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce tangible raw data (e.g., chromatograms, spectra, digital values) in the form of paper printouts or computer-generated electronic files. All data generated at Level II is legally defensible. Data may be generated at the site or at an off-site location, as long as the QA/QC requirements are satisfied. For the data to be definitive, either analytical or total measurement error must be determined. Level II protocols all have built-in QA/QC including external QA in the form of trip blanks and duplicate samples. Level II analytical methods and protocols for this project are identified in the following:

Test Methods For Evaluating Solid Waste, Physical/Chemical Methods, SW-846 (3rd, 4th and online editions);

Guideline Establishing Test Procedures for the Analysis of Pollutants, 40 Code of Federal Regulations (CFR), Chapter 1, Part 136, Methods of Chemical Analysis of Water and Wastes;

EPA 600/4-79/020 *Methods for the Determination of Organic Compounds in Drinking Water*; EPA 600/4-88/039 *Standard Methods for the Examination of Water and Wastewater* (18th, 19th, and 20th Editions);

In addition to the Federal protocols and method guidance documents noted above, the Site data will be evaluated to relevant State of Kansas regulatory thresholds by comparing actual sample concentrations to:

- The KDHE - BER typically applies the *Risk Based Standards for Kansas, RSK Manual – 5th Version* dated October 2010 (including subsequent updates). The initial screening process is a Tier 1 evaluation which is a comparison of a naturally occurring contaminant to the background concentration of that contaminant in the affected medium, using methods approved by KDHE-BER. Tier 2 is a comparison of the concentration of a contaminant to the risk-based cleanup values in the KDHE Tier 2 Risk-Based Summary Table (RSK Manual; Appendix A). If a Tier 3 evaluation is warranted, this process includes collecting necessary site-specific data to replace default values in the Tier 2 equations.

Level II data is used for site characterization, confirmation of Level I field data, risk assessments, establishing cleanup objectives, and environmental monitoring to demonstrate attainment of cleanup objectives or compliance with applicable standards. Level II data must provide sufficient documentation to allow qualified personnel to review, evaluate, and validate data quality in accordance with acknowledged standards and protocols. Documentation is not limited to but will include review of sampling procedures documentation (e.g., field logs, boring logs, decontamination procedures, Laboratory chain-of-custody) and analytical Laboratory reports (e.g., holding time, field and Laboratory QA/QC documentation, sample data sheets, data qualifiers).

During the field investigation activities, all soil, groundwater and air samples for chemical analysis will be sent to Pace National, a State of Kansas certified laboratory. All samples will be analyzed by the designated SW-846/40 CFR/EPA 600 standard methods guidelines and the laboratory will adhere to the QC requirements of the corresponding guideline. The data package will be presented in a laboratory report format and will include all the associated forms, utilizing default or internally-generated SW-846/40 CFR/EPA 600 control limits.

5.2 PRECISION, ACCURACY, COMPLETENESS, AND SENSITIVITY OF LABORATORY ANALYSIS

The fundamental QA objective with respect to precision, accuracy, completeness, and sensitivity of Laboratory analytical data is to achieve the QA acceptance criteria of the analytical protocols. Specific precision and accuracy QC requirements and/or limits for SW-846/40 CFR/EPA 600 methodologies are documented within each associated methodology. Qualifiers used to denote deviations from established control limits are based upon SW-846 functional guidelines.

Practical Quantitation Limits (PQLs) may vary depending on moisture content, matrix, sample collection anomalies (e.g., the collection of less than ideal sample volumes), and instrument sensitivity. The Project Manager will be in communication regarding significant deviations from PQLs.

There are SOPs utilized by the Laboratory for analyses performed. These include method-specific requirements for accuracy, precision, and sensitivity of the analyses performed according to SW-846 or alternate methods as specified.

Laboratory results will be assessed for compliance with required precision, accuracy, completeness, and sensitivity with specific routine calculations as follows:

5.2.1 Precision

Precision will be assessed on the basis of reproducibility by multiple reading of a single sample. Precision of Laboratory analysis will be assessed by comparing the analytical results between matrix spike/matrix spike duplicate (MS/MSD) and Laboratory duplicate analyses. The Relative Percent Difference (RPD) will be calculated for each pair of duplicate analyses using the Equation 10-1.

$$RPD = \frac{|(S-D)|}{[(S+D)/2]} \times 100 \qquad \text{(Equation 10-1)}$$

Where: S = First sample value (original or MS value)

D = Second sample value (duplicate or MSD value)

5.2.2 Accuracy

Accuracy of Laboratory results will be assessed for compliance with the established QC using the analytical results of method blanks, reagent/preparation blank, MS/MSD samples, and field blanks. The percent recovery (% REC) of MS samples will be calculated using Equation 10-2.

$$\%\ REC = \frac{A - B}{C} \times 100 \qquad \text{(Equation 10-2)}$$

Where:

A = Analyte concentration determined experimentally from the spiked sample;

B = Background level determined by a separate analysis of the unspiked sample, and;

C = Amount of the spike added.

5.2.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is expected that the Laboratory will provide data meeting QC acceptance criteria for 95 percent or more for all samples tested using the specified analytical methods. Following

completion of the analytical testing, the percent completeness will be calculated by using the following equations:

The data completeness of Laboratory analyses results will be assessed for compliance with the amount of data required for decision-making. Data completeness will be calculated using Equation 10.3.

$$\textit{Completeness (\%)} = \frac{\textit{(Number of valid data)}}{\textit{(Number of Sample Collected for Each Parameter Analyzed)}} \times 100$$

(Equation 10.3)

5.2.4 Sensitivity

The achievement of method detection limits depends on instrumental sensitivity and matrix effects. Therefore it is important to monitor the instrumental sensitivity to ensure the data quality through constant instrument performance. The instrumental sensitivity will be monitored through the analysis of method blank, calibration check sample, and Laboratory control samples, etc.

5.3 REPRESENTATIVENESS AND COMPARABILITY

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter that is dependent upon the proper design of the sampling program and proper Laboratory protocol. The sampling network, for the activities at the Site, will be designed to provide data representative of site conditions. During development of this sampling network, consideration will be given to existing analytical data, past activities conducted at the Site, physical setting and processes. Representativeness will be satisfied by insuring that the field assessment approach is followed, proper sampling technique are used, proper analytical procedures are followed and holding times of the samples are not exceeded in the Laboratory. Representativeness will be assessed by the analysis of field duplicate samples.

Comparability expresses the confidence with which one data set can be compared with another. The extent to which existing and planned analytical data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data, as documented in this Site-specific QAPP, are expected to provide comparable data. These new analytical data, however, may not be directly comparable to existing data because of difference in procedures and QA objectives.

6.0 NECESSARY TRAINING AND CERTIFICATIONS

6.1 FIELD PERSONNEL

All field personnel involved in field operations, including drilling subcontractor(s), geologists and sampling personnel will have completed OSHA *Hazardous Waste Operations and Emergency Response* (HAZWOPER) - Training per 29 CFR 1910.120. In addition, field personnel will be current

with required annual HAZWOPER refresher training. The Field Safety and Health Officer (SSHO; i.e. - supervisors) will also have eight hours of Supervisor training. All appropriate licenses, registrations, and current training certificates will be provided to the Project Manager prior to initiation of fieldwork and will be maintained in SCS project files.

7.0 DOCUMENTS AND RECORDS

7.1 QAPP REVISIONS

If a revision to this QAPP is needed, the revision will be approved by all personnel listed in the Distribution List. Any revisions to this QAPP will be documented as *revised* with corresponding revision number (e.g.-*Revision #1*). It is the responsibility of the Project Manager for distribution of the revised version to each person on the distribution list.

7.2 PRE-ASSESSMENT DOCUMENTATION

This Site-Specific QAPP, the FSP, and a HASP will serve as the pre-assessment documentation prior to commencement of fieldwork. Documents include the following:

- SOPs for field activities will be included in the FSP portion of this document (Section 4.0);
- Site-specific QA/QC procedures for field sampling and Laboratory analyses will be specified by SCS in the FSP so that all project personnel are in agreement with data collection requirements for field operations;
- Specific forms for chain-of-custody, daily field log, field equipment checklist, boring log/piezometer installation sheets and field calibration information are included as Attachment E; and
- The HASP for field activities is presented as **Attachment B** of the VCI Work Plan.

7.3 ASSESSMENT DOCUMENTATION

Upon receiving the environmental samples and chain-of-custody documentation, the Laboratory will provide a pdf version of the chain-of-custody and Laboratory login information for consistency with the internal work order that documented the sampling work and analyses to be conducted during the field event. The Laboratory will provide both electronic and paper copies of the analytical results generally within ten working days of sample receipt. The Laboratory will provide a final narrative report which will include, at minimum, analytical results sheets, QA/QC data relative to sample results, any problems encountered and their solutions, data qualifiers, and a discussion of the quality of the reported analytical data.

Environmental assessment documents will be prepared as specified below:

- Phase II ESA: SCS will summarize the information collected from the Phase II ESA sampling into a summary site assessment report in accordance with VCPRP requirements. This includes a site history, physical and environmental setting, synopsis of all sampling activities, deviations from this scope of work, detailed compilation and discussion of analytical results with summary

tables and findings regarding the presence or absence of contaminants for concern (COC) at the Site. At a minimum, report figures will include a site location map, site layout and boring location map, and representative boring logs (lithology diagrams). Additional figures may be included if necessary to effectively present subsurface data for decision-making purposes. Report appendices will include analytical results, field logbook, and photographic documentation.

All project documents will be created in Microsoft Word format to be converted to Portable Document Format (.pdf). SCS will provide both hard copy and electronic files of the final reports.

7.4 FILING SYSTEM

At the start of the project a unique project number will be created by SCS. The project number will be referenced on all documents and correspondence. All original project documents and correspondence pertaining to a project will be filed by date and project number, filed electronically and in a bound correspondence file for that specific project.

8.0 SAMPLING PROCESS DESIGN

The site sampling strategy design is detailed in the FSP portion of this document.

9.0 SAMPLING METHODS

Specific sampling procedures and protocols is described in Section 2.2.3 of the VCI Work Plan.

10.0 PRESERVATION, HOLDING TIME AND SAMPLE CONTAINERS

Sample containers, preservation methods, and holding times vary depending on analyses requested. Preservation, holding times, and types of containers required by Pace National Laboratory are shown in Section 2.2.4 of the VCI Work Plan.

11.0 SAMPLE CUSTODY

Sample custody, or chain-of-custody protocols involves specific procedures during sample collection, field (screening) analyses, and Laboratory analysis.

11.1 FIELD CHAIN-OF-CUSTODY PROCEDURES

The sample packaging and shipment procedures summarized below will insure that the samples transported off site will arrive at the Laboratory with the chain-of-custody intact.

11.1.1 Field Procedures

- The field sampler is responsible for the care and custody of the samples until they are transferred or properly dispatched. As few people as possible should handle the samples;

- All containers will be tagged with sample numbers and locations. Each sample is identified by affixing a pressure sensitive gummed label and Laboratory number on the container(s). The sample collection technique (grab or composite), source of sample, preservative used, the collector(s) signature, date and time of collection, and analyses required will be identified in indelible ink and the label will be covered with clear waterproof tape; and

- Sample tags are to be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample tag because a ballpoint pen would not function in freezing weather.

11.1.2 Field Logbooks/Documentation

A field logbook will provide the means of recording data collecting activities. As such, entries will be described in as much detail as possible so that persons going to the site could re-construct a particular situation without reliance on memory.

Field logbooks will be bound, field survey books or notebooks of water-resistant paper. Logbooks will be assigned to field personnel. Each logbook will be identified by the project-specific document number.

The title page of each logbook will contain the following:

- Person to whom the logbook is assigned;
- Logbook number;
- Project name;
- Project start date; and
- End date.

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection being used, and the signature of the person making the entry will be entered. The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Measurements made and samples collected will be recorded. All entries will be made legibly and in indelible ink and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark and initialed and dated. Whenever a sample is collected, or a measurement is made, a detailed description of the location of the station and distance measurements shall be recorded. The number of the photographs taken of the station, if any, will also be noted. All equipment used to make measurements will be identified, along with the date of calibration.

The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume and number of containers. Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive an entirely separate sample identification number, will be noted under sample description.

11.1.3 Transfer of Custody and Shipment Procedures

a) Limited Phase II ESA sediment/soil and surface water samples will be accompanied to the Laboratory by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to the permanent Laboratory, or to/from a secure storage area.

b) Samples will be properly packaged for shipment and dispatched to the appropriate Laboratory for analysis, with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be locked and secured with strapping tape and EPA custody seals for shipment to the Laboratory. The preferred procedure includes use of a custody seal attached to the front right and back left of the cooler. The custody seals are covered with clear plastic tape. The cooler is strapped shut with strapping tape in at least two locations.

c) All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and the pink and yellow copies will be retained by the sampler for returning to the sampling office.

11.2 LABORATORY CUSTODY PROCEDURES

If any departures from standard conditions or abnormalities are noted by the Laboratory, the Project Manager is immediately notified so that a decision can be made to proceed with sample analysis or to submit another sample. Abnormalities or departures from standard conditions include, but are not limited to:

- Sample containers with obvious signs of damage, leaking, or tampering such as damaged custody seals;
- Chain-of-custody having incomplete information, or not submitted with the sample;
- Information included on the chain-of-custody does not agree with that identified on the sample container labels;
- Sample exceeds regulatory or method holding time;
- Sample not preserved to the method or regulatory-required pH;
- Sample submitted in a container that does not meet method or regulatory criteria; and
- Sample temperature exceeds or falls below the thermal preservation regulatory or method requirement by more than 2 degrees Celsius (C).

A sample that is not appropriate for the type of analyses requested does not conform to the method or regulatory requirements, or where the test is not fully specified requires:

- Documentation of correspondence and/or records of conversations pertaining to the final disposition of the sample;

- Complete documentation concerning any decision to proceed with the analysis of the sample including the nonconforming condition on the chain of custody and the Laboratory's Sample Receipt and Review form; and

- Documentation that the analysis is qualified appropriately on the final report.

11.2.1 Sample Storage

All newly-received water or soil samples will be stored in a designated refrigerator or freezer. The temperature of the refrigerators and freezers are maintained at 1 to 4 degrees C and –10 to –20 degrees C, respectively. The temperature of each refrigeration or freezer unit is either recorded continuously or recorded daily from in-place thermometers or thermocouples.

12.0 ANALYTICAL PROCEDURES

The soil, groundwater and soil gas and QA samples collected during field sampling activities at this project site will be analyzed by the Laboratory.

12.1 LABORATORY CHEMICAL ANALYSIS

All sample analyses performed under this contract will use the methods published by EPA in SW-846, inclusive of Update III or most recently promulgated methods (40 CFR/EPA 600). The methods provided in 40 CFR, Part 136 and in EPA 600/4-79/020 are utilized in support of the National Pollutant Discharge Elimination System and Safe Drinking Water Act Regulations.

SOPs have been prepared by the Laboratory for all methods used for analysis of samples for this project. Each of these SOPs is based on an analytical method and updates published by the EPA. Separate SOPs are generated for sample preparation and sample analysis. An overall SOP was developed which establishes procedures for determining the actual and required detection limits. Each SOP specifies:

- Procedures for sample preparation (for sample preparation SOPs only);
- Instrument start-up and performance check;
- Initial and continuing calibration check requirements;
- Specific methods for each sample matrix type; and
- Required analyses and QC acceptance limits for method blanks, trip blanks (as appropriate), field blanks, MS/MSD, and Laboratory control samples (EPA or National Bureau of Standards reference samples or Laboratory prepared blank/spikes).

Deviations from the SOPs are not allowed without the approval of the Project Manager.

Soil/sediment results will be reported in milligram per kilogram (mg/kg) and liquid results in microgram per liter (µg/L) or milligram per liter (mg/L). The results will be reported to the RDL values that are generally a multiple of the method or instrument detection limits. Laboratories establish Instrument Detection Limits (IDLs), Method Detection Limits (MDLs), and PQLs, or RDLs. The IDLs establish the overall sensitivity of an analytical system and establish the minimal amount of material that can be detected by the analytical system, independent of method preparatory procedures. The MDLs are statistically generated values, based upon the evaluation of replicate samples, which determine standard deviation and variance of the data set and produce limits that incorporate the actual method-specified preparatory conditions. RDLs or PQLs (the terms are used interchangeably) are the limits used by the Laboratory for standard sample analysis reporting. The RDLs are generally a multiple of the MDLs that have been rounded to standardize sample reporting. The greater the

multiplier used for the calculation of the RDL, the greater the degree of confidence associated with the actual reporting limit. Reporting limits are based on method detection limits and may vary with moisture content, matrix and instrument performance. In addition, soil/sediment samples will be reported on a dry weight basis. Reporting limits will also be adjusted for sample specific moisture content and matrix interference.

13.0 QUALITY CONTROL CHECKS

13.1 EXTERNAL QUALITY ASSURANCE

The types of field QC samples available, and their intended purpose, include:

- Field Blank - monitors for contamination due to sampling technique;
- Equipment Blank or Rinsate - monitors for contamination remaining after equipment cleaning;
- Field Duplicates - monitors the precision of the overall sampling and analysis procedures;
- Split Samples - monitors accuracy, and
- Trip Blank – ensure that cross contamination does not occur during shipment/storage.

Field blanks are utilized to detect contamination that may be introduced to the samples in the field from atmospheric contamination. These are prepared at the each project site by filling sample bottles for the appropriate analysis with reagent grade water (usually Laboratory deionized water). Equipment blanks are utilized to ensure that sampling devises have been effectively cleaned. They are also used to evaluate sources of contamination that may also be found in a trip blank. A minimum of one equipment blank and one field blank per sampling period is collected and analyzed for the constituents of interest.

Duplicate samples will be analyzed to assess the quality of the data resulting from the field sampling program. Duplicate samples are analyzed to check for sampling and analytical reproducibility. Soil/sediment samples are prepared from investigative samples and require no substantial extra volume for extractable organics. To monitor sampling technique, one sampling location per day is duplicated. The variability between the client sample and its duplicate sample is charted, and sampling technique is evaluated for precision and accuracy. The general level of the QC effort for duplicate samples will be one field duplicate for every 20 or fewer investigative samples.

Split samples measure variability between analysts, methods, and laboratories and are taken as subsamples from a single sample. True split samples are difficult to collect for soils, sediment, and sludge under field conditions. If the split sample is blended and split between two containers, split samples are a measure of how thoroughly the sample was blended before being split, and does not actually indicate an effect on the rest of the samples at the site. Therefore, as the overall objective is accuracy, this is not attained. However, the environmental laboratory periodically participates in split samples (Laboratory replicate) with outside laboratories to confirm analytical results. This may be performed on a project specific basis and will be at the discretion of the Project Manager.

Trip blanks are purchased by the laboratory and are pre-filled with laboratory grade deionized water preserved with hydrochloric acid. The containers are tested by both the manufacturer and the Laboratory to verify that each trip blank lot number has been specifically cleaned using procedures specified by the EPA to limit the concentration of specified organic compounds. Trip blanks are utilized to ensure the following:

- To ensure that contaminant-free sample bottles are used;
- Reagent grade rinse water used at the sampling site is contaminant-free, and
- Handling procedures used to transfer the samples for the sampling site to the Laboratory do not alter the quality of the samples.

13.2 INTERNAL QC

The Laboratory performs QC checks at levels that assure valid, verifiable data. Internal QC checks will, at a minimum, conform to the QC required for specific methods such as the QC requirements in the methods found in SW-846.

The types of Laboratory QC samples available, and their intended purpose, include:

- Blind Check Standards - related to intra- and inter-Laboratory studies;
- Blind Duplicate - monitors Laboratory precision;
- Interference Check Sample (ICS) – a series of two solutions, used in Inductively Coupled Plasma (ICP) and Inductively Coupled Plasma mass Spectrometry (ICPMS) analysis, to verify that inter-element interferences are compensated for correctly;
- Internal Standards – analytes not expected to occur naturally in field samples are spiked to provide a consistent basis for comparison with target analytes; used in internal calibration models;
- Laboratory Control Sample (LCS) - monitors for Laboratory accuracy;
- Laboratory Control Sample Duplicate - monitors for Laboratory accuracy and precision;
- Laboratory Replicate (RP) - monitors Laboratory precision;
- Matrix Spike (MS) - monitors accuracy and sample matrix effects;
- Matrix Spike Duplicate (MSD) - monitors precision, accuracy, and sample matrix effects;
- Method Blank (MB) - monitors Laboratory contamination;
- Reagent or Solvent Blank - monitors for solvent interferences and false positives;
- Retention Time Windows – important tool in peak identification and quantitation in field samples, and

- Surrogate Spike - monitors Laboratory accuracy.

The chemical reference standard materials used for preparing the LCS, MS, MSD, and surrogate spikes must originate from standards of certified or verified identity, purity, and traceability. NIST traceable standard materials are preferred, but materials from EPA or commercial sources may be used. If a material's certification or verification is not available, characterization of the material is required before it can be used.

13.3 LABORATORY QC EVALUATION CRITERIA

The control limits for each method are included in the relevant appendices for the Laboratory's Quality Assurance Manual. These include LC/LCSD/MS/MSD and surrogates. QC limits are also found in the appropriate Laboratory's SOP. Control limits are established by utilizing historical limits, but in some cases, are restricted to method defined criteria depending on the method and matrix. Deviations from the methods cited in the Laboratory Quality Assurance Manual are not allowed without the approval of the Project Manager.

The cited standard QC criteria are applied to evaluate whether corrective action such as reanalysis is necessary. However, failure of these criteria does not automatically mean reanalysis is required. For example, if a set of water samples analyzed for lead show no detectable traces of lead, yet the method blank is greater than the detection limit, reanalysis may not be necessary since the random positive interference seen in the method blank has not affected the sample data. In this case, a random Laboratory contamination would be suspected and the proper corrective action would be to evaluate the Laboratory glassware, utensils, and reagents for the source of contamination.

If a set of analyses are rejected due to failed QC samples, the cause of the failure must be investigated before reanalysis is done. The questions "what happened," "who noticed it," "when did it happen," and "why did it happen" are pertinent. A key factor in every investigation of a QC failure is to take appropriate action not only to correct the identified problem but also to prevent the occurrence of future incidents of the same type. This investigation should consider:

- data interpretation or mathematical errors;
- improperly prepared spiking solutions or mixes;
- improper spiking technique or sample preparation;
- QC sample contamination from glassware, utensils, Laboratory environment, reagents, solvents, instrumentation, equipment, etc.;
- aging or contaminated columns;
- aging or contaminated Standard Reference Materials, reagents, or solvents;
- improperly functioning or tuned equipment;
- analyst level of training and experience, and
- sample matrix effects (for MS, MSD, RP, and sample surrogate spikes).

It is the analyst's responsibility to closely monitor the QC data from their analysis and to seek advice from their supervisor, Project Manager, or the Laboratory QA Manager when the applicable QC criteria are not met. Each criterion failure will be documented and evaluated on a case-by-case basis. Reanalysis (including re-preparation, if applicable) will be initiated if the sample data are suspect. Inability to adhere to the limits shown in the Laboratory Quality Assurance Manual must be brought to the immediate attention of Project Manager.

14.0 INSTRUMENT / EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

The individual users of field equipment are responsible for the maintenance (in accordance with manufacturer's procedural manuals and/or SOPs) of the equipment while being used in field operations. The user should ensure the equipment is checked for proper operation and is current with calibration requirements (if needed) prior to leaving for the field. The user should record any malfunctions encountered while in the field in the logbook associated with the equipment. The user should make sure the malfunctions are communicated to the Field Manager upon return of the equipment to storage so that the appropriate action can be initiated to repair or replace the item of equipment.

The Laboratory will perform testing, inspection, and maintenance procedures and protocols for Laboratory instruments/equipment as described in the Quality Assurance Manual.

15.0 INSTRUMENT / EQUIPMENT CALIBRATION AND FREQUENCY

When required by the manufacturer's specifications, instruments/equipment (e.g. – photoionization detectors, dissolved oxygen meters, pH meters, PID, temperature gauge) will be calibrated at a minimum frequency of once per day prior to the first sample analyzed each day. A calibration standard gas or solution will be employed which is similar to the compounds of concern expected at the site or required by the instrumentation. In addition, periodic calibration verifications (e.g., every 2 hours or every ten samples) employing the standard gas must be conducted. The time, date, and calibration procedure must be clearly documented in the field notebook and the calibration log. If at any time the field instrument readings appear erratic or inconsistent with field observations, then the unit must be re-calibrated. If calibration is difficult to achieve, then the procedure manuals will be consulted for troubleshooting purposes.

16.0 NON-DIRECT MEASUREMENTS

Data sources required for the limited Phase II Site-Specific QAPP, FSP and report preparation (e.g. – general geology information) which are obtained from non-measurement sources will include (but are not limited to) the following:

- Environmental database reports;
- Kansas Geological Survey;
- Google Maps;
- United States Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey; and
- U.S. Geological Survey.

Data utilized from the above listed sources will be scrutinized according to its intended purpose, the validity of the data, and the level of detail required for the respective use. For instance, the environmental database reports will be examined to gain knowledge on environmentally impaired properties in the vicinity of the project. As the environmental database reports are derived from local, state, and Federal sources and are continually updated, the user is provided all available update information for validation purposes.

Any transmittal of generated electronic data includes two exact copies produced at the same time with one remaining with the Project Manager as a record. The electronic files are considered the original and SCS is not responsible for any electronic files that are not exactly as delivered or which are sealed and signed by the Project Manager. Copies may be made and retained for the use of the project by others; however, such documents are not intended or suitable for reuse by others on extension of the specific project or on any other project SCS is not responsible for.

17.0 DATA MANAGEMENT

The Site-Specific QAPP will meet the criteria established in *Guidance on choosing a Sampling Design for Environmental Data Collection* (EPA/240/R-02/005 December 2005). Reports required by the Site-Specific QAPP must include field logs, sample management and tracking procedures and document control and control and inventory procedures for both Laboratory data and field measurements to ensure that the data collected during the investigation are of adequate quality and quantity to support the findings of the investigation and remedial reports. For each measurement, the data reduction scheme planned for collected data, including all equations used to calculate the concentration or value of the measured parameter should be described. The principal criteria employed to validate the integrity of the data collected should be validated at the appropriate level of Laboratory QC to ascertain whether it is appropriate for its intended use. All task management and QC implemented shall be documented within the appropriate report appendix.

Data shall include at a minimum, but not limited to, the following: dates of sample collection, receipt, extraction and analysis, compounds analyzed, results, units and detection limits, and all method QC including results of surrogates, spikes, blanks, duplicates, etc. Any sample that should fail the method or Laboratory QC for any reason shall be reanalyzed. If the sample has to be diluted for any reason, both the original value and the diluted value shall be reported. All Laboratory protocol involving data reduction validation, reporting, preventive and corrective action, and document control and internal policy is included in the Laboratory's Quality Assurance Manual.

Laboratory data reports will be kept in a project file maintained and secured according to the SCS filing scheme. The Project Manager will be responsible for ensuring the project file is maintained appropriately. A hard copy of the Site-Specific QAPP and other relevant documents will also be kept in the project file. No data or documentation will be stored solely on electronic media.

18.0 ASSESSMENTS AND RESPONSE ACTIONS

18.1 READINESS REVIEWS, PEER REVIEW, AND INTERNAL TECHNICAL SURVEILLANCE AUDITS

18.1.1 Readiness Reviews

The QA/QC Manager will conduct a Readiness Review with designated personnel prior to fieldwork identifying and clarifying the DQO's as outlined in the Site-Specific QAPP. Additionally, an internal field equipment Readiness Review will be implemented primarily with the inclusion of a checklist in the Site-Specific QAPP for required supplies and equipment, including items required for health and safety of field personnel.

18.1.2 Peer Review

Reviewers are chosen who have technical expertise comparable to the project's performers but who are independent of the project. The peer review will occur prior to Phase II ESA document submission to check for technical adequacy, competent performance, proper documentation, satisfaction of established technical requirements, and satisfaction of established QC requirements.

18.1.3 Internal Technical Surveillance Audits

The QA/QC Manager will also conduct at least one Internal Technical Surveillance Audit (Phase II ESA Site audit) to verify each team's compliance with the Site-Specific QAPP, ASTM E1903-11 *Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process*, and applicable State of Kansas regulatory standards. Items noted during the audit will include the following:

- Copies of Site-Specific QAPP on site;
- Sample locations cleared by utilities;
- Samples being collected in accordance with Site-Specific QAPP and the VCI Work Plan;
- Numbers and locations of samples conform to the Site-Specific QAPP and the VCI Work Plan;
- Samples labeled properly;
- Equipment decontamination in accordance with the VCI Work Plan;
- Field instrumentation being operated and calibrated in accordance with Site-Specific QAPP and VCI Work Plan;
- Samples being preserved and containerized in accordance with Site-Specific QAPP and VCI Work Plan;
- QC samples in accordance with Site-Specific QAPP and VCI Work Plan;
- Chain-of-custody procedures and documents in order;
- Field logs are complete, accurate, up-to-date, and in conformance with good recordkeeping procedures; and
- Modification to the Site-Specific QAPP are being communicated, approved, and documented appropriately.

Corrective action resulting from field audits will be implemented immediately if data may be adversely affected due to unapproved or improper field procedures (the VCI Work Plan will describe in detail standard operating procedures). The QA/QC Officer will identify deficiencies and notify the Project Manager regarding the corrective action implemented. The corrective action will be implemented and documented in the field log. Additionally, the QA/QC Officer will audit the performance of any subcontractors completing tasks as described in the VCI Work Plan. A brief letter report will be prepared and submitted to the Project Manager summarizing the field audit information.

18.2 SAMPLE COLLECTION/FIELD MEASUREMENTS

Field data will be assessed by the Project Manager. The Project Manager will also review the field results for compliance with the established QC criteria that are specified in the Site-Specific QAPP.

Accuracy of the field measurements will be assessed using daily instrument calibration, calibration check, and analysis of blanks, if applicable. The QA/QC Officer will audit the fieldwork and will have the authority to stop work if serious violations of the Site-Specific QAPP are not corrected. The Laboratory analyses and QA/QC samples will be reviewed and corrective action taken if necessary.

Key project personnel will be responsible for reporting all suspected technical or QC non-conformances or suspected deficiencies of any activity or issued document by reporting the situation to the Project Manager. The Project Manager will be responsible for assessing the suspected problem and making a decision based on the potential for the situation or condition to impact the quality of the data. If it is determined that the situation warrants a reportable nonconformance requiring corrective action, then a nonconformance report will be initiated by the Project Manager.

The Project Manager will be responsible for ensuring that corrective action for non-conformances are initiated by:

- Evaluating all reported non-conformances;
- Controlling additional work on non-conforming items;
- Determining disposition or action to be taken;
- Maintaining a log of non-conformances;
- Reviewing non-conformance reports and corrective actions taken, and
- Ensuring non-conformance reports are included in the final site documentation in project files.

If appropriate, the Field Project Manager will ensure that no additional work that is dependent on the non-conforming activity is performed until the corrective actions are completed.

Corrective action for field measurements may include:

- Repeat the measurement to check the error;
- Check for all proper adjustments for ambient conditions such as temperature;
- Check the batteries;
- Re-Calibration;
- Check the calibration;
- Replace the instrument or measurement devices, and
- Stop work (if necessary).

The Project Manager is responsible for all Site activities. In this role, the Project Manager at times is required to vary the site programs to accommodate Site-specific needs. When it becomes necessary to modify a program, the responsible person notifies the Project Manager of the anticipated change and implements the necessary changes. The Project Manager and QA/QC Manager must approve the change, in writing or verbal communication, prior to field implementation, if feasible. If unacceptable, the action taken during the period of deviation will be evaluated in order to determine the significance of any departure from established program practices and action taken.

The Project Manager is responsible for the controlling, tracking, and implementation of the identified changes. Reports on all changes will be distributed to all affected parties.

18.3 LABORATORY ANALYSES

Corrective actions are required whenever an out-of-control event or potential out-of-control event is noted. The investigative action taken is somewhat dependent on the analysis and the event. Laboratory personnel are alerted that corrective actions may be necessary if:

- QC data are outside the warning or acceptable windows for precision and accuracy;
- Blanks contain target analyses above acceptable levels;
- Undesirable trends are detected in spike recoveries or RPD between duplicates;
- There are unusual or unaccounted changes in detection limits;
- Deficiencies are detected by the QC Department during internal or external audits or from the results of performance evaluation samples, or
- Inquiries concerning data quality are received.

Corrective action procedures are often handled at the bench level by the analyst, who reviews the preparation or extraction procedure for possible errors, checks the instrument calibration, spike and calibration mixes and instrument sensitivity and related instrument/method specific parameters. If the problem persists or cannot be identified, the matter is referred to the Laboratory Supervisor, Laboratory Project Manager and/or Laboratory QA Officer for further investigation. Once the problem is resolved, full documentation of the corrective action procedure is filed with the QA department.

Corrective action is necessary whenever uncontrolled deviations from the QA system occur. QS deviation can be detected in a number of ways, some of which include routine QC activities, data review/verification (at all levels), performance samples, audits or other internal or external evaluations. The effect of identified variations from the QS range from minor to a significant quality impact and, as such, the corrective action will be based on the projected quality consequences of the identified concern.

Deviations that occur before the actual analysis of samples, such as tuning verification or calibration, are corrected by the analyst at the bench level. Corrective action would depend upon the method requirements or client needs. Responses to statistical out-of-control situations are immediate. Since only published method ranges are used for acceptance criteria, any "out-of-control" situation is quickly identified and corrected. The Laboratory QA Officer has the final responsibility for the review and verification of the entire data package. Any and all irregularities are documented in the case narrative.

Regardless of the source or the projected impact of the QS deviations, the following systematic approach is recommended in developing a suitable corrective action.

- Define the problem;
- Establish the root cause of the problem;
- Determine course of action to resolve the problem and eliminate the root cause;
- Assign responsibility for implementing the corrective action; and
- Verify that the corrective action has solved the problem and eliminated the cause.

The emphasis of the corrective action process is to prevent the problem from reoccurring.

18.4 DOCUMENTATION OF CORRECTIVE ACTIONS

Corrective actions may be required for two classes of problems: analytical/equipment problems and noncompliance problems.

For noncompliance problems, a formal corrective action program will be determined and implemented at the time the problem is identified. The person(s) who identifies the problem is responsible for notifying the appropriate party within his/her organization (reference Key Personnel in Section 6.1). Problems or anomalies concerning Laboratory data are to be directed to the Project Manager. Communication regarding Laboratory noncompliance issues must be maintained by the Laboratory QA Officer. Non-compliance related issues for problems or concerns not directly related to the generation of analytical data should be directed to the Project Manager. It is the final responsibility of the Project Manager (or designated alternate), to promptly notify the KDHE/BER BC of all non-compliance issues. Implementation of corrective action will be confirmed in writing through the same channels.

Any non-conformance with the established QC procedures in the Site-Specific QAPP will be identified and corrected in accordance with the Site-Specific QAPP. Corrective actions will be implemented and documented in the field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels.

19.0 DATA VERIFICATION, VALIDATION AND USABILITY

The degree of validation of the data depends entirely on the quality of data specified in the Site-Specific QAPP. As a minimum, valid data should be supported with evidence that: (1) all field, Laboratory, and other procedures used to collect the data are documented so the work can be reproduced by others skilled in the field; (2) all methods and equipment were working properly when the data was collected; and (3) the methods were capable of producing the values reported and that the precision and accuracy or bias of the data are acceptable for the intended use of the data.

A validation report will be completed to document the results of data validation for both the field data and analytical Laboratory data. The field data validation report will be separate from the analytical Laboratory data report. A brief summary of this validation report and the usability of the data will be included in the text of the site assessment report with the validation reports included in the Appendix.

19.1 FIELD DATA EVALUATION

Overall, the content and format of the field data evaluation report will depend on the project objectives as specified in the Site-Specific QAPP. The report should provide the data user with an overall picture of the quality of the field data and how well it supports the project needs described in the Site-Specific QAPP. The QA/QC Manager will evaluate, at a minimum, the following criteria:

- Field equipment calibration information;
- Verification/confidence in field equipment measurements;
- Auditing sample identification numbers, sample location, depth of sample, sample matrix, and duplicate sample information;
- Auditing of sample handling and preservation procedures; and

- Summarization of any field data relevant to making project decisions according to the Site-Specific QAPP (i.e. - deviations from the Site-Specific QAPP).

19.2 ANALYTICAL LABORATORY DATA EVALUATION

The Laboratory will complete internal validation procedures according to their SOPs. The QA/QC Manager will complete a separate data validation report for each sample group/batch. It should be noted that each sample group/batch will have its own Laboratory narrative summarizing the analytical information. Information included at the beginning of the validation report should include:

- Project name;
- Name and date of approved Site-Specific QAPP;
- Laboratory name;
- Laboratory project identification;
- Sample matrix;
- Sample start and end dates;
- Parameters included (e.g., volatile organic compounds using EPA Method 8260);
- Date validated, and
- Name of validator.

The data validation will include an assessment of data using the precision, accuracy, representativeness, sensitivity, comparability, and completeness parameters. The measurement performance criteria will depend on the stated DQOs stated in the Site-Specific QAPP.

19.2.1 Summary of Technical Acceptability and Usability

The QA/QC Manager will review, document, and discuss the following:

- Table or list identifying number of samples, sample field identification, and the associated Laboratory identification number;
- List Laboratory methods analyzed by comparing to the chain-of-custody.
- Indicate if chain-of-custody is complete and accurate;
- Laboratory narrative;
- Data result sheets;
- Review units appropriate for the associated sample matrix/matrices and method of analyses;
- Describe and note any qualified data; include a description of the data qualification flags attached to reported organic analyte concentrations (e.g., U – the analyte was not detected above the PQL; J – estimated concentration; UJ – estimated reporting limit [for non-detect results);
- Identify and explain any exceptions (i.e., rejected data); and
- Describe if the Laboratory case narrative notes any nonconformance issues with the analytical data.

19.2.2 Summary of Precision and Representativeness

The QA/QC Manager will review and discuss the following:

- Calculate the RPD between the samples and their respective field duplicate (indicating field and Laboratory precision). The acceptable data validation QC limit is 0 – 50% for soil and 0 – 30% for water unless further specified in the Site-Specific QAPP; and
- Calculate the RPD between MS/MSD for the analytical Laboratory precision parameter; refer to the Laboratory's specified limits.

19.2.3 Summary of Accuracy

The QA/QC Manager will review and discuss the following:

- Sample analysis within method specified or technical holding times;
- Percent recovery of the Laboratory control samples relative to the Laboratory QC limits as established by the method SOP; and
- Percent recovery of the MS/MSD relative to the Laboratory QC limits as established by the method SOP.

19.2.4 Summary of Sensitivity

The QA/QC Manager will review and discuss the following:

- Laboratory method blank samples prepared equal to at least 5% of the total number of samples, or analyzed as required by the Laboratory method;
- Review the number of equipment, trip, or field blanks collected per the Site-Specific QAPP requirements;
- Review equipment blank, trip blank, and field blank results for contamination and discuss relationship to sample data; and
- Detection limits (i.e. – MDL, PQL) should be in accordance with the project requirements. The soil and groundwater result PQL's will be compared to the applicable Kansas regulatory concentrations to verify that the PQL's are below the regulatory thresholds. If the PQL's fall above the regulatory thresholds, the Laboratory will be contacted to resolve the issue. If there is no resolve, the analyte will be flagged and discussed in both the data validation report and the site assessment report.

19.2.5 Summary of Comparability

The QA/QC Manager will ensure that the data has consistently followed standard field and Laboratory procedures and used standard measurement units during reporting. If valid, the reported analytical data will be compared to the applicable Kansas regulatory soil and groundwater guidelines.

19.2.6 Summary of Completeness

Valid data are obtained when samples are collected and analyzed in accordance with QC procedures outlined above, and when none of the QC criteria that affect data usability are exceeded. Once data validation is complete, percent completeness can be calculated. If the Laboratory data deliverable package is incomplete, data validation cannot be completed, or data problems are encountered, the Laboratory will be contacted to provide the missing documentation or to provide additional QC data. The Phase II ESA report will include a discussion of the usability of the data collected and whether it

can be applied to the overall findings. At least 95% of the data must be valid to effectively evaluate the Site.

ATTACHMENT B

Site-Specific Health & Safety Plan

Site-Specific Health and Safety Plan

Phase II Environmental Site Assessment

Former City Garage Operations Project

Leavenworth, Kansas

27220109.00

Rev. 1.0 – August 4, 2020

REQUIRED APPROVAL			
SCS Engineers OSHC:	Jason Franks	Date	8/4/20
SCS Engineers PM & Supervisor:	Doug Dreiling	Date:	8/4/20

Project No.:	27220109.00
Project Name:	Former City Garage Operations ESA
Site Address:	Leavenworth, Kansas
Client Contact:	Ms. Deanna Ross

EMERGENCY TELEPHONE NUMBERS	
Fire:	911 or (913) 682-3346 (Fire Department)
Police:	911 or (913) 758-6738 (Police Department)
Hospital	(913) 680-6000; Saint John Hospital
Ambulance:	911
The directions and information on the nearest hospital are found on Pages 3 and 4.	

ACKNOWLEDGEMENT PAGE

"I have read the attached Health and Safety Plan for the Former City Garage Operations Environmental Site Assessment dated August 4, 2020. I have discussed any questions and/or concerns that I have regarding the contents of this document with the designated SCS Engineers project safety representative, and I understand its requirements."

Name	Signature	Company	Date

Table of Contents

1 INTRODUCTION

At SCS Engineers, protection of human health and the environment is paramount. This Site-Specific Health and Safety Plan (SSHSP) provides information to identify hazards that may be present and/or introduced by the project's activities onto SCS Engineers job sites, and details needed precautions that employees should follow to protect themselves. Tasks performed onsite or during projects should be analyzed to determine if physical or chemical hazards requiring safeguards or additional Personal Protective Equipment (PPE) exist. This plan will be modified as necessary if any new hazards are identified during the project that require that additional safeguards be put in place.

PROJECT ORGANIZATION

Director:	Susan McCart	(913) 634-0156
Primary Health and Safety Representative:	Jason Franks	(913) 302-3238
Onsite Health and Safety Representative:	Whit Martin	(913) 775-0440
Project Manager:	Doug Dreiling	(913) 710-0259
Client Representative:	Mr. Deanna Ross	(785) 296-5519

SCOPE OF WORK

The Environmental Site Assessment (ESA) will involve obtaining soil/sediment samples and groundwater samples to aid in the understanding of contaminants from potential onsite sources. The work will entail direct-push technology, soil sampling, obtaining groundwater level measurements, groundwater sampling, and surveying. The scope of work will include:

- Advancing direct-push technology borings;
- Collecting soil samples;
- Setting temporary piezometers;
- Surveying the temporary piezometers;
- Obtaining groundwater level measurements to establish groundwater gradient;
- Collecting groundwater samples; and
- Collecting indoor air quality samples from within the Leavenworth Animal Control building.

KNOWN ENVIRONMENTAL CONDITIONS

Based on our review of previous environmental assessments completed at the Former City Garage Operations property (the Site), SCS provides the following summary discussing identified contaminants of concern (COC) and potential source areas at and near the Site:

Property – 2109 South 3rd Street, Leavenworth, Kansas: Based on the findings of past assessments at and near the Site, the potential regulated COCs could include total petroleum hydrocarbons (TPH) low-range hydrocarbons (LRH), mid-range hydrocarbons (MRH) and high-range hydrocarbons (HRH), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) metals, pesticides and polychlorinated biphenyls (PCBs). Currently identified COCs are present in portions of the Site rather than pervasively present across its entirety.

2 EMERGENCY RESPONSE AND MEDICAL TREATMENT PROCEDURES

EMERGENCY CONTACT AND NOTIFICATION INFORMATION

Location of Nearest Hospital

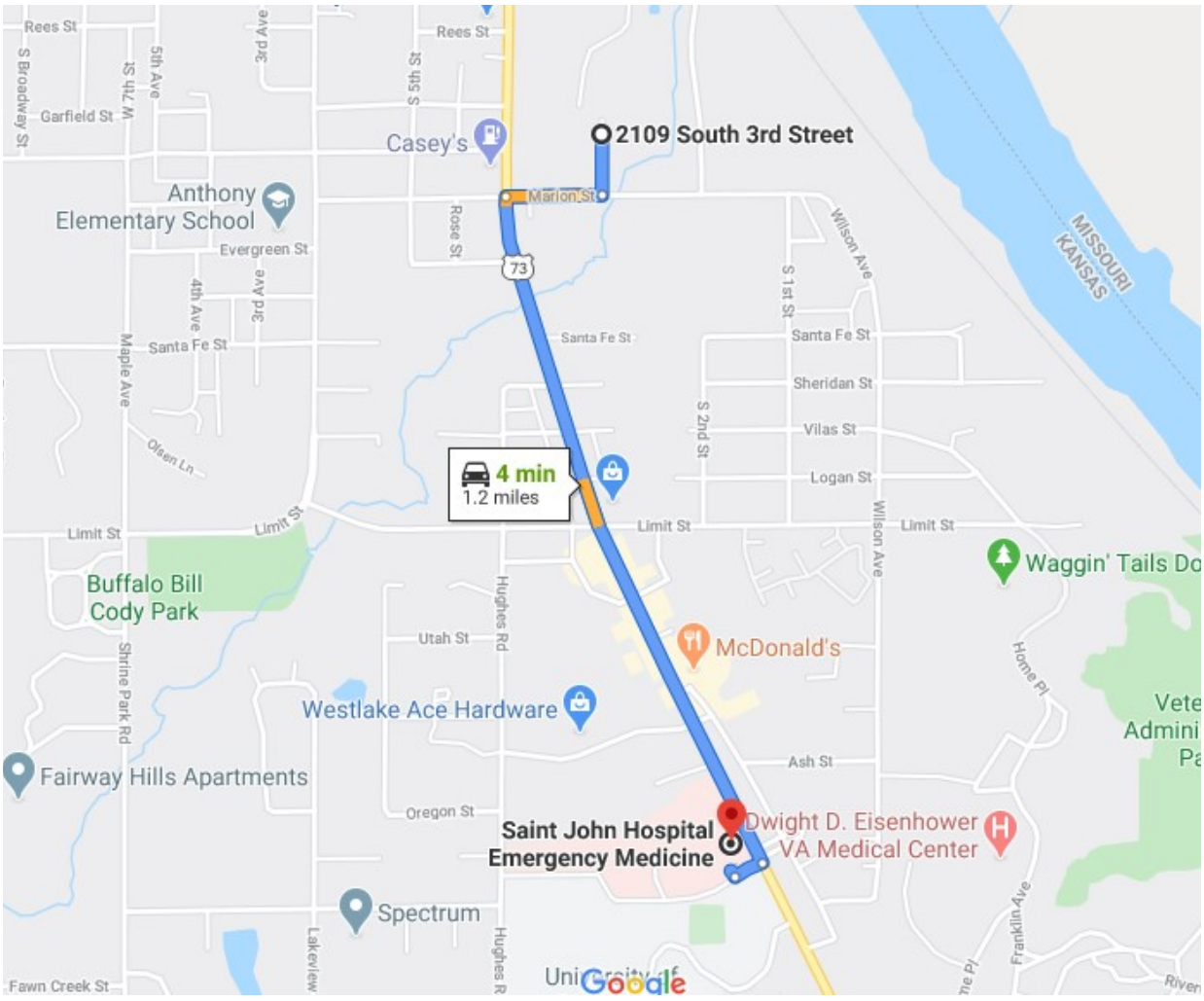


Figure 1. Saint John Hospital

Nearest Hospital Address:

Saint John Hospital
3500 South 4th Street
Leavenworth, Kansas
(913) 680-6000

Directions to Nearest Hospital

2109 S 3rd St
Leavenworth, KS 66048

1. Head south on S 3rd St toward Marion St
423 ft
2. Turn right onto Marion St
0.1 mi
3. Turn left onto S 4th St
1.0 mi
4. Turn right
217 ft
5. Turn right
Destination will be on the right
52 ft

Saint John Hospital Emergency Medicine
3550 S 4th St, Leavenworth, KS 66048

ACCIDENT OR INCIDENT REPORTING SYSTEM

In the event of an emergency at the Site, project personnel should call 911 for emergency assistance. After the immediate emergency situation has been addressed by emergency personnel, SCS project personnel should call the SCS Engineers Project Manager, SCS Occupational Health and Safety Council (OHSC), and the Client Representative and inform them of the situation. The Project Manager should evaluate the nature of the emergency and direct project personnel actions from that point.

NOTIFICATION PROCEDURES FOR INCIDENTS (CLIENT, LOCAL, STATE, OR FEDERAL)

Site personnel should contact their supervisor and the OHSC immediately when an accident or injury occurs, and provide any needed information so that additional notifications can be determined and completed as needed.

METHODS TO SUMMON EMERGENCY RESPONSE TEAM

Emergency services can be summoned through 911, as this service is active in the area.

RESCUE AND MEDICAL TREATMENT REQUIREMENTS

Stop work authority should be exercised when an injury or accident occurs. The appropriate emergency agency should be contacted and first aid administered, if possible. Additionally, contact the SCS Engineers OHSC (Jason Franks at 913 302-3238) as soon as possible. If the injury is not life-threatening and does not require emergency response, contact WorkCare at (888) 449-7787. First aid kits and fire extinguishers are available in each SCS work truck.

SITE EMERGENCIES

The use of large, heavy and loud operating equipment onsite may interfere with effective communication at the Site. Communicate the emergency to fellow workers using five or more rapid blasts of a vehicle horn, using hand signals (“Thumbs up” – I’m OK, or “Thumbs Down” – Need Assistance), verbal warnings (if possible), mobile phones, etc. Summon the local fire/rescue for help using 911. Emergency response and emergency first aid equipment are in each SCS Engineers work vehicle. In the event of a Site evacuation type of emergency, a pre-designated exit route and off site gathering place will be discussed prior to initiating any work onsite.

FIRST AID PROCEDURES

Inhalation:	Remove victim to fresh air; administer rescue breathing and/or CPR, if necessary.
Skin Absorption:	Remove contaminated clothing and wash thoroughly.
Ingestion:	Get medical attention immediately. DO NOT induce vomiting unless told to do so by physician.
Eyes:	Flush with water thoroughly for at least 15 minutes.

3 SITE DESCRIPTION

LOCATION DESCRIPTION

This project area includes one land parcel along South 4th Street and Marion Street in Leavenworth, Kansas. The Site is generally located east of South 4th Street and north of Marion Street, with South 3rd Street entering the south-center portion of the Site.

4 GENERAL FIELD SAFETY PROCEDURES

General Standard Operating Procedures (SOPs) and additional SCS Engineers Health and Safety procedures and requirements are included in the current SCS Injury Illness Protection Program (IIPP) and on the SCS intranet. These documents are considered a part of this plan.

APPLICABLE STANDARD OPERATING PROCEDURES (SOPS) AND PROGRAMS

	SOP Number and Name		SOP Number and Name
X	01 - General Code of Safe Work Practices	X	25 - Avoidance and Prevention of Heat and Cold Stress, and Other Weather-Related Hazards
X	04 - JTSA and PPE Assessment Procedures		26 - All-Terrain Vehicles and Watercraft
X	05 - Work Permits		27 - OSHA and Other Regulatory Inspections
X	06 - Forklift and Heavy Machinery Operations		
	07 - Compressed Air and Compressed Gas Cylinders		**Appendix Letter and Program Name**
X	08 - Drilling and Well Installation Procedures	X	B - Hazard Communication
	09 - Electrical Safety	X	C - HAZWOPER
	10 - Fall Protection	X	D - Exposure Assessment
X	11 - Fire Extinguishers	X	E - PPE Other Than Respiratory Protection
X	12 - Hand and Power Tools	X	F - Respiratory Protection
	13 - Working Safely with Ladders	X	G - Motor Vehicle and Fleet Safety
	14 - Landfill Leachate and Condensate Safe Procedures	X	H - Hearing Conservation
	15 - Lockout and Tagout		I - Bloodborne Pathogens
	17 - Materials Use and Handling		J - Excavation and Construction Earthwork Program
	18 - Polyethylene (PE) Pipe Work Safe Procedures		K - Confined Space Entry
X	19 - Site Sanitation Procedures		L - Ergonomics Program
	20 - Safe Work Practices for Scaffolds	X	M – Medical Surveillance Program
X	21 - Safe Procedures for Biological Hazards (Snakes, Insects, Vegetation, Bacteria)		N – Return to Work Program
	22 - Safe Procedures for Working with Sites That Contain Hydrogen Sulfide	X	O – Contractor Safety Management
X	24 - Avoidance of Slips, Trips, and Falls		

JOB TASK SAFETY ANALYSIS (JTSA) AND PPE ASSESSMENT

JTSAs for activities performed at the Site have been completed as indicated below. A completed JTSA is required for all work tasks performed at the Site. **JTSAs are designed to identify steps which involve potential hazards to employees and should be reviewed and understood (and signed providing evidence of understanding) before performing any task at the Site. If additional steps or hazards are present, the JTSA should be revised (and the revision signed by all affected staff) to indicate that all items have been appropriately addressed and are understood before proceeding with the task.**

Unless identified in an attached Job Task Safety Analysis (JTSA) form, all project tasks are anticipated to only require **Level D** PPE, as defined by the Occupational Safety and Health Administration (OSHA). Prior to working in a Level C or B environment, each employee is required to be medically qualified (by an approved SCS Engineers medical provider) and properly fit-tested for the needed respiratory protection defined in this plan. The projects designated will ensure that this is completed per SCS Engineers policy, with assistance, as needed, from the SCS Corporate Health and Safety Director (CHSD). IN ADDITION, ANY EMPLOYEE WORKING AT A SITE AS DEFINED IN 29 CFR 1910.120 (or applicable state OSHA standard) OR REQUIRED BY CONTRACT SHALL BE TRAINED IN ACCORDANCE WITH 29 CFR 1910.120(e) (24-hour or 40-hour HAZWOPER, as appropriate). Each employee will only perform tasks that they have been properly trained to perform. A copy of each employee's training record is available through the SCS Engineers OSHC.

X	JTSA ES-08- Soil Sampling with Geoprobe and Hand Auger	X	JTSA SCS CNT – 01A Vehicle Operations
X	JTSA SCS CNT-02A Sample Collection - Groundwater-Surface Water	X	JTSA SCS CNT-07 Indoor Air Sampling via Summa-Tedlar Bag

SAFE OBSERVATIONS

The SCS Engineers SAFE Observation Checklist will be used by field and project personnel. The goal is to make at least one (1) documented observation per quarter during Site activities. The appropriate SCS Engineers SAFE Observation Checklist is included in Appendix A.

OTHER INSPECTION PROCEDURES

Periodic Site inspections may be made by the CHSD, SCS Engineers OHSC, Project Supervisor, Project Manager, and Regional Compliance Auditor or Safety Specialist. There is also the potential for the client or regulatory agencies to visit and inspect the Site. SCS Engineers personnel are to perform tasks in compliance with all contractual, regulatory, and company requirements at all times.

SITE CONTROL

Client Responsibility

Our clients are responsible for providing SCS Engineers employees with safe access to job sites, which includes sites that are free of threats from transients or other aggressive people or dogs. If an SCS Engineers employee encounters an aggressive person or dog, they should withdraw from the Site and contact the Site Representative and their SCS Engineers supervisor. The Site Owner is responsible for removing the threats, and SCS Engineers employees should not take any affirmative action of their own.

Description of Exclusion Zone

An exclusion zone will be established around the active work area (minimum 10 foot radius from work) for all tasks. Caution banner and/or traffic cones shall be used to delineate the exclusion zone during any drill rig/soil probe operations, unless the safety and health of non-project personnel can be assured.

All personnel must have received required training as specified in Section 11.0. All personnel must be wearing the level of PPE as specified in Section 6.0 prior to entering the exclusion zone or decontamination zone.

All activities which may cause indirect ingestion of contaminants (including, but not limited to, eating, drinking, or use of tobacco) will not be allowed inside of the exclusion zone.

PPE/SAFETY EQUIPMENT

Various types of PPE are required depending on substances handled, existing conditions, and particular work activities. PPE includes a variety of specialty uniforms, hard hats, goggles, face shields, aprons, boots, gloves, safety vests, hearing protection, and respirators, all designed to protect against a variety of hazards. Selection of PPE will be based on the hazard assessment prepared for a specific site or work effort, and will be the responsibility of the Field Health and Safety Supervisor and Project Manager.

Level D PPE includes:

- Nitrile gloves, alone or under work gloves, when there is a potential for contact with contaminated soil or liquid;
- Boots, leather or chemical resistant, steel toe and shank;
- Safety glasses with side shields;
- Hard hat (during drill rig/soil probe operations, when overhead hazards are present or as required by Facility);
- Hearing protection
- Respirator (as needed)

HOUSEKEEPING REQUIREMENTS

There are no facilities available at the worksite; however, there are multiple facilities within driving distance of the work site.

5 SITE HAZARDS

CHEMICAL AND PHYSICAL AGENT HAZARDS

The following chemical and physical hazards should be considered before performing any task or work at the Site. The analysis will depend on a thorough understanding of the Site's physical characteristics and the task(s) being performed.

Chemical Hazards

The following chemical and physical hazards should be considered before performing any task or work at the Site. The analysis will depend on a thorough understanding of the Site's physical characteristics and the task(s) being performed.

ARSENIC

Permissible Exposure Limit

0.01 mg/m^3 OSHA PEL

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Inorganic arsenic compounds are mainly used to preserve wood. Arsenic is known to be a human carcinogen. Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso. Skin contact with inorganic arsenic may cause redness and swelling.

LEAD

Permissible Exposure Limit

0.05 mg/m^3 OSHA PEL

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing. Lead is reasonably anticipated to be a human carcinogen. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles.

SVOCs

Permissible Exposure Limit

5 ppm OSHA PEL

10 ppm OSHA STEL

SVOCs are the primary products of the incomplete combustion of organic materials. SVOCs are principle constituents of soot, automobile and diesel exhaust, creosote (coal tar), tobacco smoke, asphalt, and similar mixtures. Benzo(a)pyrene is the best-studied of the SVOCs and, as far as is known, the most toxic. It is a carcinogen. Its chemical and physical properties are similar to those of other commonly found SVOCs.

BENZENE

Permissible Exposure Limit
1 ppm OSHA PEL
5 ppm OSHA 10 min Ceiling
0.5 ppm OSHA Action Level

Benzene is a central nervous system depressant and an eye and skin irritant. Poisoning may cause hemorrhages and immunosuppression. A relationship has been discovered between benzene exposure and leukemia. Benzene is regulated as an occupational carcinogen. Acute exposure may cause dizziness, excitation, weakness, headache, giddiness, breathlessness and chest constriction.

PCE

Permissible Exposure Limit
100 ppm OSHA PEL
300 ppm OSHA STEL

PCE is a central nervous system depressant and inhaling its vapors (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. After repeated or extended skin contact, PCE may dissolve fats from the skin, resulting in severe skin irritation in work environments where people have been exposed to high concentrations.

TCE

Permissible Exposure Limit
10 ppm OSHA PEL
25 ppm OSHA STEL

TCE produces central nervous system depression resulting in general anesthesia. At low concentrations it is relatively non-irritating to the respiratory tract. The symptoms of acute non-medical exposure are similar to those of alcohol intoxication, beginning with headache,

dizziness, and confusion and progressing with increasing exposure to unconsciousness. Respiratory and circulatory depression can result in death.

TOLUENE

Permissible Exposure Limit
100 ppm OSHA PEL
150 ppm OSHA STEL

Toluene is an eye, skin and mucous membrane irritant and a central nervous system depressant. Poisoning may affect the liver and kidneys. Prolonged exposure may affect the heart and blood. The ingestion of alcoholic beverages may enhance the toxic effects of toluene. Symptoms of exposure include respiratory tract irritation, headache, dizziness and eye irritation.

ETHYL BENZENE

Permissible Exposure Limit
100 ppm OSHA PEL
125 ppm OSHA STEL

Ethyl benzene is a skin, eye and mucous membrane irritant. It is moderately toxic by ingestion and slightly toxic by skin absorption. Ethyl benzene is a central nervous system depressant. Poisoning may affect the liver. Symptoms of exposure may include a sense of chest constriction and nervous disorders. Skin contact may result in first and second degree burns. The odor can be detected at 140 ppm and irritation occurs at 200 ppm.

XYLENE

Permissible Exposure Limit
100 ppm OSHA PEL
150 ppm OSHA STEL

Xylene is a mild eye and mucous membrane irritant, primary skin irritant and a central nervous system depressant. Ingestion causes severe gastrointestinal upset and creates an aspiration hazard. Chronic inhalation results in symptoms resembling acute poisoning.

GASOLINE

Permissible Exposure Limit
300 ppm OSHA PEL
500 ppm OSHA STEL

Gasoline is irritating to the skin, eyes and mucous membranes. Dermatitis may result from prolonged contact with the liquid. Gasoline acts as a central nervous system depressant. Exposure may cause staggering gait, slurred speech and mental confusion. Gasoline exposure may affect the liver, kidneys and spleen. Absorption of alkyl lead antiknock compounds

contained in many gasolines poses an additional health concern, especially where there is prolonged skin contact.

DIESEL FUEL (No. 2-D)

Permissible Exposure Limit
400 ppm OSHA PEL (As petroleum distillates/naphtha)

Diesel fuel is a skin and mucous membrane irritant and a central nervous system depressant. Poisoning may affect the liver and kidneys. Skin contact may result in drying and cracking of the skin.

FUEL OIL (No. 6)

Permissible Exposure Limit
400 ppm OSHA PEL (as petroleum distillates/naphtha)

Fuel oil No. 6, or "Bunker Fuel", may be irritating to the eyes and skin. Poisoning may affect the liver, kidneys and digestive system. This substance is likely to contain polynuclear aromatic hydrocarbons (PNA's) some of which are considered carcinogenic. PNA's present a skin contact hazard.

PCB

Permissible Exposure Limit

0.5 ppm OSHA PEL

PCB is a colorless, odorless, and nonflammable liquid. PCB is a very stable compound that can bioconcentrate in living organisms once introduced into the environment. It has been classified as a probable human carcinogen and dermal exposure to PCB can result in skin conditions such as acne or rashes and changes in blood and urine that indicate liver damage.

Physical Hazards

Physical hazards are inherently present during project field activities. Common physical hazards include mechanical hazards; noise exposure associated with mechanical equipment use; slip-trip-fall hazards associated with the field environment; hazards associated with weather conditions; musculoskeletal injury resulting from lifting tasks; explosion or electrical hazards from underground pipes or lines that may be encountered during drilling/probing activities; and biological hazards. The physical hazards anticipated at the Site and the methods for preventing injury due to these hazards are described below.

Heavy Equipment: The drill rig and support vehicles will be present onsite. Loud noise and limited visibility can increase the threat of being run over or crushed by these vehicles. Wear high-visibility vests (recommend Class III) and coordinate with vehicle operators when working in the vicinity of these pieces of equipment. When working in areas where heavy equipment and machines are utilized, equipment operators must be notified. These vehicles should not be

operated within 50 feet of a person on foot. The use of a second person (as a spotter) should be done when working around heavy equipment. Only trained personnel should operate heavy equipment.

Only equipment that is in safe working order will be used. To maintain this policy, all equipment brought onto the Site will be inspected for structural integrity, smooth operational performance, and proper functioning of all critical safety devices in accordance with the manufacturer's specifications. A qualified equipment operator will perform this inspection. Equipment not conforming to the operational and safety requirements during this inspection will not be put into service until all necessary repairs are made to the satisfaction of the inspection group. Only qualified operators with the equipment will be permitted to operate equipment.

Steep and Uneven Terrain: Treacherous footing on slopes (i.e., sandy soil/clay), heavy equipment, or snakes and other animals that could be present on slopes or in bushes all present hazards at disposal sites. Walking, driving, or operating heavy equipment on steep hills or uneven terrain can be dangerous. These areas should be avoided whenever possible. When it is necessary to walk or drive in such locations, great care should be taken. Move slowly and be aware of loose materials or holes that could be present. Sharp items or spilled materials may also exist there and should be avoided. When traversing steep terrain, drive straight up or down slopes to reduce the possibility of roll over. Holes, pits, and ditches may be present. Falling or driving into these hazards can be avoided by becoming familiar with the Site. Tall grass or vegetation can hide these features.

Do not drive on areas with which you are not familiar. Discuss access routes and hazards with site personnel. A good rule of thumb for driving is: "When in doubt—get out."

Slip-Trip-Fall Hazards and General Housekeeping: Slip-trip-fall hazards are common at most sites due to muddy, slippery or unstable surfaces and/or equipment on the ground. While it is difficult to eliminate all slip-trip-fall hazards, implementing safe work practices, utilizing proper foot wear, and keeping the work area free from obstructions will minimize risk of injury.

Suitable storage locations should be provided for all tools, materials and supplies so that these items can be conveniently and safely handled without hitting or falling on personnel or a visitor. Pipe, drill rods, casing, augers, tools and similar equipment should be stacked in an orderly fashion on racks or sills to prevent spreading, rolling, or sliding. Work areas should be kept free of materials, debris, obstructions and substances such as ice, grease or oil that could cause a surface to become slick or otherwise hazardous.

Electrical: Electrical hazards fall into two categories. The first category includes underground or overhead electrical power lines that may be encountered. The location of all electrical power lines should be determined before any digging or excavation is performed. The presence of overhead electrical power lines should be determined so that contact with tall equipment (loaders, track hoes, etc.) can be prevented. Contracted locater services and/or physical protective measures (barriers or line covers) should be used as needed.

The second category of electrical hazard includes working on energized (powered) equipment or systems. Projects that may involve exposure to any form of hazardous energy, including

electrical energy, must be performed in compliance with requirements described in **SOP 9** (Electrical Safety) of the SCS Health and Safety Program Manual. Special care should be taken while working in wet areas where electrical power is present. Activities occurring in proximity with electrical power require that extreme caution be exercised to avoid accidental contact with pipes, ladders, tools, or body parts.

Lifting Hazards: Field operations often require the performance of laborious tasks. All employees must implement proper lifting procedures, such as keeping the load close to the body and using leg muscles instead of back muscles to perform lifting tasks. Additionally, employees shall not attempt to lift large, heavy or awkwardly shaped objects without assistance.

Underground Utilities: The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during drilling, soil probe, excavation, or other subsurface activities shall be determined prior to beginning work at the Site. Kansas One-Call System, 1-800-DIG-RITE (344-7483), 811, or www.kansasonecall.com, may need to be contacted as well. Should Call One-Call services be necessary, they should be contacted no more than 10 days or less than 48 hours prior to commencement of subsurface activities, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of the actual Site activities.

When probing or drilling within 20 feet of a potentially sensitive underground installation (i.e., high pressure gas lines, fiber optics, etc.) the appropriate utility company should be contacted. The presence of a utility company representative may be required during probing or drilling. Project personnel shall determine the exact location of the underground installation prior to probing/drilling within 5 feet of a marked underground installation, through use of hand tools and line locating equipment. If the underground installations cannot be located, the appropriate utility company shall be contacted to locate the underground installation.

If an underground utility installation is damaged, the appropriate utility company shall be notified immediately.

Electrical Hazards: Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified/licensed electrician must perform installation. General electrical safety requirements include:

- Electrical wiring and equipment must be a type listed by UL, Factory Mutual Engineering Corporation ("FM"), or other recognized testing or listing agency;
- Installations must comply with the National Electrical Safety Code ("NESC"), or the National Electrical Code ("NEC");
- A multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle must ground portable and semi-portable tools and equipment;
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM;
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them;

- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching;
- Circuits must be protected from overload;
- Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage;
- Plugs and receptacles must be kept out of water unless approved for submersible construction;
- Ground fault circuit interrupters ("GFCI") shall be provided for all electrical cord sets, portable electric hand tools, and any equipment connected by cord and plug;
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment;
- Extension cords or cables must not be fastened with staples, hung from nails, or suspended by bare wire;
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician; and
- Generators will be equipped with spark suppressers and other fire or explosion proof means.

Lightning and Other Severe Weather Events: The danger of lightning strike is increased when work occurs on the elevated surface of a landfill. Lightning can strike miles ahead of a storm when no rain is present. All operations should be stopped immediately when lightning is visible or thunder is audible. All personnel should seek shelter off the elevated surface of the landfill and remain inside a building (primary) or vehicle (secondary) until the danger passes. Do not take shelter near tall objects such as power lines, trees, antennas, or the flare stack. Work can resume when the lightning is no longer visible and the thunder cannot be heard.

Heat-Related Injuries: Elevated body temperatures can cause serious injury or death. Working outdoors or in the sun increases the chance of heat-related injuries. This hazard is especially critical when PPE (such as coveralls or rain gear) is worn, since heat from the body becomes trapped inside clothing. Personnel should drink plenty of liquids and take breaks as needed. The following describes the various **Heat Disorders and Health Effects**:

- **Heat Stroke:** This disorder occurs when the body's system of temperature regulation (e.g., sweating and evaporation) fails and body temperature rises to critical levels. The condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a serious hazard, however. Primary signs and symptoms are confusion, irrational behavior, loss of consciousness, convulsions, a lack of sweating (usually), hot, dry skin, and an abnormally high body temperature. If a worker shows signs of possible heat stroke, call 911 to obtain **immediate** medical assistance. The worker should be placed in a shady area, and his or her outer clothing should be removed. The worker's skin should also be wetted and air movement around the body increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible--by mouth only if the worker is conscious. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment. Regardless of the worker's protests, **no** employee

suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

- **Heat Exhaustion:** The signs and symptoms of heat exhaustion include clammy skin, headache, nausea, vertigo, weakness, thirst, and giddiness. Fortunately, heat exhaustion responds readily to prompt treatment. This condition, however, should not be dismissed lightly, for several reasons. One is that fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended. The victim could also be injured when he or she faints. While the signs and symptoms associated with heat exhaustion are similar to those of heat stroke, the notable difference (with heat exhaustion) is clammy skin. Workers suffering from heat exhaustion should be removed from hot environments and given fluid replacement, by mouth only if the workers are conscious. They should also be encouraged to get adequate rest.

- **Heat Rashes:** The most common problem occurring in hot work environments is heat rash. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, the papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and papules may become infected if they are not treated. In most cases, heat rash will disappear when the affected individual returns to a cool environment.

- **Heat Fatigue:** One factor that predisposes individuals to heat fatigue is the lack of acclimatization. Use of a program of acclimatization and training for work in hot environments are advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, high-concentration, or high-vigilance activities. The sole treatment available for heat fatigue is to remove heat stress and increase fluid replacement before a more serious heat-related condition develops.

Cold-Related Injuries: In winter weather conditions, there is a potential for injury from cold, including dehydration, frostbite, heavy shivering, excessive fatigue, drowsiness, irritability, and euphoria. If workers show these symptoms, work should cease and affected personnel rest in heated buildings or vehicles.

Dust Hazards: High winds, soil investigation activities, and certain drilling methods (i.e., air rotary drilling) can result in airborne hazards. If intrusive activities generate visible dust, a water mist should be applied to the area to reduce dust generation. Be aware of dust hazards; if activities create dust or it is windy and metal contaminants are suspected, avoid breathing dust/particulates and avoid getting dirt on body/clothes. Stand upwind, use dust control in work area, and/or use dust cartridges on respirators as conditions warrant to avoid exposure. If dust is generated during operations, report to SCS Engineers project manager.

Biological Hazards

Rodents, poisonous insects, snakes, other animals and/or plants are a natural part of any ecosystem. They are sometimes difficult to eliminate or avoid on some rural and remote sites. Employees should be aware of the potential for encountering these types of animals and plants.

Where possible, nesting places should be removed or access to them should be limited. If several infestations occur, remedies should be discussed with a supervisor and the client (see **SCS IIPP, SOP-21**, for precautions and treatment for biological hazards). The following could be encountered in performance of the operation, maintenance, and monitoring functions of a project:

Rabid Animals: Some mammals may carry rabies, and rabid animals tend to approach people instead of avoiding them. Beware of nocturnal (night dwelling) animals (such as raccoons or opossums) active during the day.

Dogs: Realize that dogs encountered in the wild tend not to be "man's best friend," even if they look like "Lassie." Two or more dogs together constitute a pack (with a tendency toward fierce behavior), and can pose significant threat. Roaming animals, particularly large dogs that instinctively hunt by sight (such as collies or shepherds), are cause for concern. Some breeds (cocker spaniels and English Springer spaniels) are notorious for erratic fits of violent behavior. Other dogs are bred as guard dogs or fighting dogs (Dobermans, Rottweilers, Boxers, and Bulldogs). Dogs that are unconfined are more likely to contract rabies. Beware of dogs that foam at the mouth or show their teeth. Upon encountering such a dog, do not make any sudden moves. Do not make direct eye contact with the dog. Back slowly away from the animal, and never turn your back on unknown dogs.

Lyme Disease: A tick-borne bacteria that causes a range of debilitating symptoms (i.e., flu-like discomfort, joint pain, fatigue, headache, lack of concentration, facial paralysis). The most outstanding symptom of the disease is a bulls-eye rash from the tick bite. Personnel should avoid areas known to harbor ticks, and use insect repellant containing DEET to limit the possibility of being bitten.

Africanized Honey Bees: This species of bee is aggressive and unpredictable. It responds quickly and stings in large numbers; senses threats from people or animals 50 feet or more from the nest; senses vibrations from power equipment 100 feet or more from the nest; swarms frequently to establish new nests; pursues an enemy 3 miles or more; and nests in small cavities and sheltered areas. Avoid areas known to contain bees.

Snakes: Rattlesnakes, vipers, and coral snakes are poisonous. Not all rattlesnakes give audible warning before they strike. Extra caution should be taken if tools or other materials are dropped in highly vegetated areas, around rocks, into stockpiles of pipe or other objects, or when walking through highly vegetated areas where visibility (of the ground) is limited. The most active times for rattlesnakes are morning, late afternoon, and early evening; however, encounters could happen at any time of the day. Walking loudly, shuffling feet, or making noise while working is recommended. Boots that reach mid-calf or snake guards are recommended, and all personnel should have leather work gloves.

6 PERSONNEL INSTRUCTION TRAINING

All SCS Engineers site personnel who may be exposed to potential contaminants through inhalation, ingestion or skin contact must have completed a minimum of 40 hours of hazardous waste activity instruction and a minimum of three days supervised field instruction. Site

personnel must also have completed eight hours of refresher training each year following the initial 40 hours of instruction. All site personnel must meet these training requirements in addition to the site-specific training requirements prior to working onsite.

SITE SPECIFIC TRAINING

All site personnel shall be instructed in basic hazard awareness by the Onsite Health and Safety Representative prior to work on the Site. **Project-specific Daily Tailgate Safety Meetings will be conducted and documented**. This training will be augmented by crew briefings as required. Training will include:

- History of the Site (as appropriate)
- Chemical hazards
- Physical hazards
- Requirements for personal protection equipment, its effectiveness and its limitations.
- Emergency procedures.
- Decontamination procedures.
- Personal hygiene and care.
- General health and safety practices.

Information concerning the health and safety hazards of the contaminants at the Site shall be maintained by the Onsite Health and Safety Representative, and shall be available to the employees for examination. The Onsite Health and Safety Representative shall verify that training concerning the fitting, use, care, and limitations of respirators and other PPE has been provided to all employees, as appropriate.

PROJECT HAZARD COMMUNICATION

The chemicals listed in the table below may be present or used on this project. This table will act as the project chemical inventory list. A safety data sheet ("SDS") for each of these chemicals can be obtained by contacting the SCS OHSC. The Onsite Health and Safety Representative shall review the signs and symptoms of exposure with project personnel prior to work at the Site. The Onsite Health and Safety Representative shall verify that the chemicals are properly labeled with the chemical name and hazard warning.

Chemical Name	Signs & Symptoms of Exposure	MSDS Available
AutoCal Solution	Irritant - inhalation, skin, eye.	Yes
Bentonite / Super Gel-X	Shortness of breath and reduced pulmonary function with prolonged exposure. May cause delayed pulmonary disease.	Yes
Concrete Mix	Eyes, upper respiratory system, skin irritant.	Yes
Conductivity Standard Solution < 90 mS	Eye irritant, possible skin irritant.	Yes
Isobutylene in Air (Calibration Gas)	Asphyxiant.	Yes

Isopropyl Rubbing Alcohol 70% USP	Eye, skin, respiratory tract irritant, headaches, dizziness may cause dermatitis,	Yes
Level Two Calibrating Solution	Irritant - inhalation, skin, eye.	Yes
Liquinox / Alconox	May cause eye irritation. Irritation with prolonged skin contact, headache and nausea.	Yes
Muriatic Acid / Hydrochloric Acid	Corrosive, cough, choking, inflammation of the respiratory tract. Eye contact can cause severe burns and damage.	Yes
pH Buffers (4, 7,10)	Possible skin and eye irritation.	Yes
Portland Cement	Upper respiratory irritant, cough, wheezing, shortness of breath, dermatitis.	Yes
Sand	Irritant - inhalation, skin, eye.	Yes

7 MEDICAL SURVEILLANCE REQUIREMENTS

All SCS site personnel (SCS Engineers employees) working under the project tasks listed herein must have had a complete physical examination conducted by a licensed M.D. or D.O. within the last year. The examination must have met the requirements of 29 CFR 1910.120.

8 RECORDKEEPING REQUIREMENTS

Prior to project startup, the Onsite Health and Safety Representative shall verify with the Project Manager and/or SCS Engineers OHSC that all site personnel have met the training requirements under Section 6 and that all SCS Engineers employees have met the medical surveillance requirements under Section 7.

9 APPENDICES

Please refer to the SCS intranet for referenced General Standard Operating Procedures (SOPs) and Programs. The SCS SAFE Form, Auto Accident Report Form, Incident Report Form, and the above referenced Job Task Safety Analysis (JTSA) & PPE Assessments are attached.

APPENDICIES

SAFE Observation Form for Environmental Services/Engineering/Solid Waste Staff Field Activities

I. General Information:		
Date	**Project Number/Name**	**Office/Profit Center**
Location of Observations	**Observed By**	Check if Self-Observation ☐

For the following sections, provide clear, concise, and complete responses. Each observation should answer the following questions: Who, What, When, Where, Why, How.

II. General Description of Observed Activity(ies) or Work Conducted (as identified under Specific Project Tasks on Page 2):

III. Describe <u>SAFE</u> Behavior(s)/Procedure(s) Observed (as identified on Page 2):

IV. Describe <u>AT-RISK</u> Behavior(s)/Procedure(s)/Condition(s) Observed (as identified on Page 2):

V. Describe Immediate Corrective Action(s) Taken or Note Estimated Completion Date(s):

☐ Corrected on the spot:

☐ Corrective action(s) to be completed (include estimated completion date[s]):

SCS Engineering/Environmental Services/Solid Waste – Project Tasks and Critical Behaviors(s) (revised 3/26/12)

▶Specific Project Tasks – Check ONLY those that are applicable to this evaluation:

- ☐ Site assessments and inspections
- ☐ Manual sampling – soil, soil vapor, groundwater, surface water, leachate, air, etc
- ☐ Excavations, borings, sampling, and well construction – soil, soil vapor, groundwater, LFG, etc
- ☐ Asbestos, lead-based paint, mold, etc inspections, sampling, & abatement
- ☐ Underground storage tanks
- ☐ Landfill investigations and waste sorts
- ☐ Confined space
- ☐ Construction Quality Assurance (CQA)
- ☐ Geotechnical sampling and measurements
- ☐ Soil Vapor Extraction (SVE) systems installation, operation, & maintenance
- ☐ Compressed gas cylinders – proper transport, use, and storage
- ☐ All-terrain vehicles, utility vehicles, and watercraft
- ☐ Other (List):_____

▶Critical Behaviors – Check ONLY those applicable behavior(s) actually observed during this evaluation:

1. Driving

Yes	No	
☐	☐	Inspects vehicle before leaving
☐	☐	Drives in safe manner (seat belts, following distances, alertness, traffic and pedestrians, lane changes, mirrors, etc)
☐	☐	Pulls over to use cell phone for calls or texts and avoids other distractions (eating, reading, GPS, etc)

2. Safety Preparation

- ☐ ☐ Reviews HASP, JTSAs, & hospital route
- ☐ ☐ Evaluates capability to safely complete tasks, obtains assistance as necessary
- ☐ ☐ Attends site safety briefings & tailgate meetings
- ☐ ☐ Establishes and reviews hand signals
- ☐ ☐ Wears hardhat, safety boots, and safety vest
- ☐ ☐ Wears other PPE appropriate for site conditions (safety glasses, earplugs, etc)
- ☐ ☐ Is an Exposure Assessment necessary?

3. Site Conditions

- ☐ ☐ Prepares for weather conditions (hot, cold, wet, storms, snow, etc)
- ☐ ☐ Drinks plenty of liquids and takes adequate breaks
- ☐ ☐ Watches for hazardous wildlife (snakes, bees, spiders, scorpions, insects, bears, etc)
- ☐ ☐ Checks for hazardous vegetation (poison ivy, oak, sumac, etc)
- ☐ ☐ Checks for slip, trip, & fall hazards and watches footing
- ☐ ☐ Uses care walking or driving in areas where the ground surface is obscured by vegetation
- ☐ ☐ Uses air monitoring devices to check levels of suspected contaminants or combustible vapors
- ☐ ☐ Assesses site security for potential hazards (hostile people, dogs, crime, etc), works in pairs, gets police checks, etc
- ☐ ☐ Is aware of and prepares for regional health hazards (ticks, mosquitoes, rodent droppings, etc)
- ☐ ☐ In traffic areas, sets up necessary traffic controls; faces traffic; wears appropriate reflective vest; uses vehicle signals, strobe, and/or reflective triangles

4. Ergonomics

- ☐ ☐ Uses equipment appropriate for the tasks and uses ergonomic tools
- ☐ ☐ Takes frequent breaks and performs stretches to relieve stress from repetitive motion
- ☐ ☐ Stops repetitive motion or physical activities if pain is experienced to prevent injury
- ☐ ☐ Uses proper lifting techniques & gets help where appropriate
- ☐ ☐ Carries equipment without straining, uses a cart for heavy equipment, and/or obtains assistance

5. Site Investigation/Remediation/Oversight/CQA

- ☐ ☐ Public and private subsurface utilities are located and work areas checked for overhead obstructions
- ☐ ☐ Checks for vehicle and equipment traffic
- ☐ ☐ Sets up and maintains exclusion zones as appropriate
- ☐ ☐ Makes eye contact with operators of heavy equipment before approaching, stays out of the swing radius of excavators and other heavy machinery, stays back from operating drilling equipment
- ☐ ☐ Works uphill or cross-grade, never downhill, and upwind from heavy equipment
- ☐ ☐ Stays out of trenches >5 ft deep unless there is proper sloping, shoring, or shielding, egress is available, and a Competent Person is in charge
- ☐ ☐ Stays away from edges of excavations and borings, makes sure spoils and equipment are 2+ feet away from edge
- ☐ ☐ Backfills or properly secures borings, excavations, etc if not in use or if left open overnight (fencing, covers, etc)
- ☐ ☐ Follows safe ladder procedures
- ☐ ☐ Uses fall protection harness tied to a secure spot where there are fall hazards (borings, excavations, etc); uses covers/grates over borehole openings or excavations
- ☐ ☐ Has been trained to perform in special site conditions (confined space, landfills, asbestos, etc.) if required. List below:

_____

_____

2019 VEHICLE ACCIDENT REPORTING FORM

First Steps	While Still at the Scene
▪ Remain calm. ▪ Move to a safe location. ▪ Do not move someone if they are injured, unless absolutely necessary. ▪ Do not attempt to render First Aid unless willing and trained to do so. ▪ Call Police (9-1-1) ▪ Call Supervisor/Project Manager. ▪ Call Work Care (888) 449-7787 if the accident was severe or you are injured.	▪ Complete as much information as possible on this report. ▪ Take pictures with your phone of the accident, the damage, the surrounding area, etc. ▪ When the police arrive, cooperate and tell them what you know.

DESCRIBE ACCIDENT

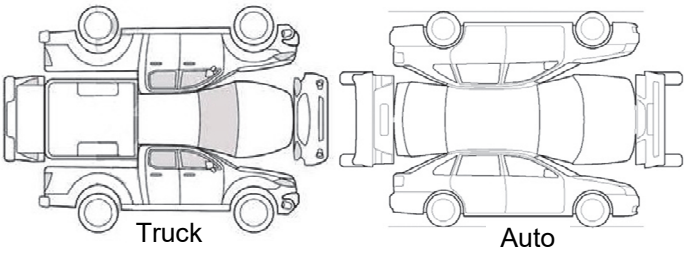
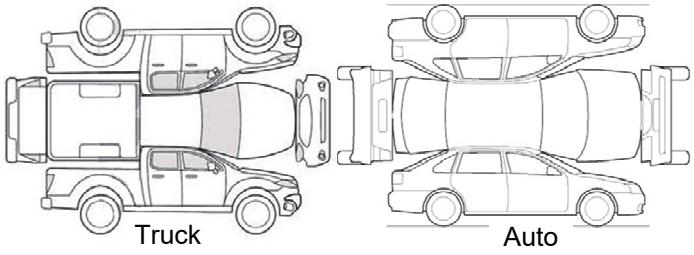
Date/Time (AM/PM)	
Weather/Road Conditions	
Location of Accident	
Accident Details	

PROVIDE INSURANCE INFORMATION AS INDICATED BELOW:

Company *auto insurance covers* ***company*** *owned or leased vehicles or rental cars used on* ***company*** *business.*
If you are in an accident in your ***personal*** *vehicle while on company business, your* ***personal*** *insurance is primary.*

When driving **your own personal vehicle…**	…provide only **your personal auto insurance information.** When driving on company business, also complete this Vehicle Accident Reporting form and turn into your OSM so we have a record of the incident.
When driving a **company vehicle** (owned or leased) or a **rental car on company business…**	… provide the **company's insurance information** (SCS Auto ID cards are in all company vehicles) **Zurich American Insurance Company Policy #BAP 0112780-04** Phone: 1 (800) 987-3373 Effective 4/1/2019 thru 4/1/2020 Insured: Stearns, Conrad and Schmidt Consulting Engineers, Inc.

DAMAGE DIAGRAM (Take pictures with your cell phone.)

YOUR Vehicle: ☐SCS Vehicle ☐Rental Car ☐Personal Vehicle	***OTHER*** Vehicle (if more than one vehicle use additional forms)
 Towing Company Name & Phone No.	 Towing Company Name & Phone No.

OBTAIN INFORMATION ABOUT *OTHER* DRIVER/VEHICLE

If more than one vehicle use additional forms. OK to use cell phone to take pictures of DL, Registration & Insurance Card.

Name	
Driver License # /State/Expiration	
Address/City/State/ZIP	
Phone	( )
Vehicle Make/Model/Year	
Vehicle Color	
Vehicle License Plate Number/State	
Insurance Company Name	
Insurance Policy Number/Exp. Date	
Insurance Company Phone Number	( )

OBTAIN INFORMATION ABOUT PASSENGERS/INJURIES

YOUR Vehicle Number of Passengers:	***OTHER*** Vehicle Number of Passengers:
Passenger #1 Name:	Passenger #1 Name:
Injuries:	Injuries:
Passenger #2 Name:	Passenger #2 Name:
Injuries:	Injuries:
Passenger #3 Name:	Passenger #3 Name:
Injuries:	Injuries:

OBTAIN WITNESS INFORMATION

Name:		Name:	
Address:		Address:	
Home Phone:	( )	Home Phone:	( )
Work Phone:	( )	Work Phone:	( )

OBTAIN POLICE INFORMATION

Officer Name/Badge #	
Department:	
Phone Number:	( )
Report/Citation Number:	

SKETCH ACCIDENT SCENE

ADDITIONAL NOTES/COMMENTS

IMPORTANT: Report all accidents to your Supervisor/Project Manager. Email this completed form to your OSM. You will be contacted by the insurance company to give a statement, **so keep a copy of this paperwork handy** to aid in your recollection.

Form Revised 4/01/2019

Exhibit 1. SCS Incident Report

For Human Resources Department Use Only

Name:	**Office:**	**Date of incident:**	**Incident Time:**
☐Near Miss ☐Injury ☐Illness ☐Other		**Location:**	
Report Type: ☐Preliminary ☐Final		**Work Care Called:** ☐Yes ☐No	
Injury or Illness			
Occupation of injured:		Name of Injured:	
Was person performing normal duties:		Length of service in this job:	
Hours on shift prior to accident:		Object/equipment/substance inflicting harm:	
Body Part Affected :	☐Head ☐Neck ☐Trunk ☐Arm ☐Hand ☐Finger ☐Leg ☐Ankle ☐Foot ☐Eye ☐ Back ☐Chest ☐ Multiple ☐Others:(Define)_____ Specific details:		
Nature of Injury / Disease :	☐Fracture of Spine ☐Other Fracture ☐Dislocation ☐Sprain / Strain ☐Amputation ☐Laceration ☐Bruising ☐Abrasion ☐ Burn ☐ Puncture Wound ☐ Poisoning / Toxic Effect ☐ Internal Injuries ☐Other:_____		
Signs & Symptoms & Treatment:			
Injury Care & Status : ☐Work Care Consultation ☐Site First Aid ☐Clinic First Aid ☐Doctor ☐Hospital ☐Full Duty ☐Light Duty ☐Lost Time Additional Details:			
Description of Near Miss or Incident:			
Task performing:			
Exact step or part of job being done:			
Witnesses :			
Damaged equipment or property: ☐No ☐Yes (provide details)			
Was first aid initiated: ☐No ☐Yes (provide details)			

Type of Contact:
- ☐ Struck against
- ☐ Struck by
- ☐ Caught in
- ☐ Caught on
- ☐ Slip
- ☐ Fall on same level
- ☐ Fall to below
- ☐ Overexertion
- ☐ Other (Please explain)

[Type explanation here]

Contact with:
- ☐ Electricity
- ☐ Heat
- ☐ Cold
- ☐ Radiation
- ☐ Corrosives
- ☐ Noise
- ☐ Toxic or noxious substance
- ☐ Other (Please explain)

[Type explanation here]

Immediate causes (What actions & conditions caused the event? Check all applicable below and explain here):

Unsafe Action
- ☐ Operating equipment without authority
- ☐ Failure to warn
- ☐ Failure to secure
- ☐ Operating at improper speed
- ☐ Making safety devices inoperable
- ☐ Removing safety devices
- ☐ Using defective equipment
- ☐ Using equipment improperly
- ☐ Improper PPE
- ☐ Improper PPE use
- ☐ Improper loading
- ☐ Improper placement
- ☐ Improper lifting
- ☐ Improper position for task
- ☐ Servicing equipment in operation
- ☐ Horseplay
- ☐ Under influence of alcohol or drugs
- ☐ Working in dangerous situation
- ☐ Non-adherence to rules/standards
- ☐ Other (Please explain below):

[Type explanation here]

Unsafe Condition
- ☐ Inadequate guards or barriers
- ☐ Inadequate or improper protective equipment
- ☐ Defective tools equipment or materials
- ☐ Congested or restricted action
- ☐ Inadequate warning system
- ☐ Fire and explosion hazard
- ☐ Poor housekeeping disorder
- ☐ Hazardous environmental conditions (gas, dust etc.)
- ☐ Noise exposures
- ☐ High or low temperature exposures
- ☐ Inadequate or excess illumination
- ☐ Inadequate ventilation
- ☐ Defective PPE
- ☐ Inadequate equipment
- ☐ Other (Please explain below):

[Type explanation here]

Basic Causes (What personal factors or fundamental job factors caused the event)

Personal factors	**Job Factors**
☐ **Capability** ☐ **Knowledge** ☐ **Skill** ☐ **Stress** ☐ **Motivation**	☐ Engineering ☐ Maintenance ☐ Tools & equipment ☐ Work standards ☐ Wear & Tear ☐ Abuse or misuse

Action to Prevent Reoccurrence	**By Whom**	**When**	**Status**

Employee's Comments:

Employee's Name: Signature: Date:

Supervisor's Comments:

Supervisor's Name: Signature: Date:

Health and Safety (H&S) Representative's Comments:

H&S Representative's Name: Signature: Date:

Potential Hazard Risk	Probability of Occurrence
☐ Minor ☐ Serious ☐ Imminent	☐ Seldom ☐ Occasional ☐ Frequent

Signature of Lead Investigator: **Date:**

Signature of Reviewer: **Date:**

Job Task Safety Analysis and PPE Assessment Form: SCS CNT – 01A Vehicle Operations

Task Type (Check all that apply) ☐ **FS-OM&M/Construction** ☐ **Construction** ☐ **Energy** ☒ **Engineering**	**Task Description (include estimate of task duration in hours/day):** Vehicle Operations; as needed up to 11 hours per day (Cars and trucks < 10,000 lbs GVW)	**Location or Project:** Former City Garage Operations Project **Date:** 7/31/20 **Project/Revision #:** 27220109.00	
Analysis Team Member	**Position Title**	**Acknowledged by**	**Position Title**
Jason Franks	Central OHSC		
Doug Dreiling	Project Manager		
Special Training/Certification Required (In Addition to IIPP and Site Specific Health & Safety Plan)	Valid Drivers License *Note – This JTSA does not address the requirements for the operation of DOT regulated vehicles in excess of 10,000 pounds Gross Vehicle Weight (GVW). If the total weight of the vehicle and trailer exceed 10,000 lbs. additional requirements are necessary.*		
Applicable SAFE Checklist(s): Specify type and category number	Safe Observation Form/Vehicle Inspection Form/Employee Suggestion		

This form is certification that the hazard assessment has been performed for the workplace as required under 29 CFR 1910.132. This document is to be used as guidance for the task described and should be modified on an as necessary basis to address site, operational and/or environmental changes.

Job Task Safety Analysis and PPE Assessment Form: SCS CNT – 01A Vehicle Operations

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
1. Perform Vehicle Safety Inspection	Do not pinch fingers/hands in hood Do not smoke near flammable liquids Use caution/watch for traffic	Do not have keys in ignition while checking under hood	Head: None Body: None Foot: None Hand: None Respiratory: None Hearing: None
2. Ensure all equipment & materials are properly secured	Watch for slip, trip and fall hazards Do not contact sharp corners/ items Do not crush hands/ feet under or between moving items	Watch for unstable equipment/ items	Head: None Body: None Foot: non slip/as needed Hand: as needed for sharp items Eyes: safety glasses as needed Respiratory: as needed Hearing: None
3. Adjust seat, mirrors, and fasten seat belt	Do not pinch hands or skin in seat belt	Perform these actions before starting and moving vehicle	Head: None Body: None Foot: None Hand: None Eyes: None Respiratory: None Hearing: None
4. Activate “hand-free” & (cell phone) and GPS devices	Set volume at appropriate level so that driver will not be startled	Perform these actions before starting and moving vehicle	Head: None Body: None Foot: None Hand: None Eyes: None Respiratory: None Hearing: None

Job Task Safety Analysis and PPE Assessment Form: SCS CNT – 01A Vehicle Operations

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
5. Start vehicle	Ensure hood is closed and that no foreign objects are in engine compartment Keep others away from outside of vehicle	Ensure personnel are clear of vehicle and exhaust when starting	Head: None Body: None Foot: None Hand: None Eyes: None Respiratory: None Hearing: None
6. Drive/ operate vehicle	Follow speed limit, road signs and traffic laws. Use directional signals when changing lanes or turning. Be courteous to other drivers. If driving off-road, pay attention to tilt angles and terrain conditions. Drive straight up and down slopes to reduce chances of roll-over. Avoid mud and water. If lost, pull into safe area to ask directions or revise route.	Check blind spots When in doubt get out and look to ensure safe passage is possible Increase following distance as needed for load and road and weather conditions	Head: None Body: Seat Belt Foot: None Hand: None Eyes: None Respiratory: None Hearing: None
7. Stop and park vehicle	Do not park in road or in a manner that blocks other needed access points/ areas (set park brake) Turn off lights and lock all compartments as needed	Park in safe, well lighted and designated area	Head: None Body: None Foot: None Hand: None Eyes: None Respiratory: None Hearing: None

Job Task Safety Analysis and PPE Assessment Form: SCS CNT – 01A Vehicle Operations

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
8. Properly, store valuables (computer, GPS, GEM etc.)	Use proper lifting techniques	Do not carry too much at one time Do not leave items in plain view	Head: None Body: None Foot: None Hand: None Eyes: None Respiratory: None Hearing: None
End of JTSA Form SCS CNT – 01A			

[1] See SCS Injury Illness and Prevention Plan *Table SOP 4-1* for examples of Environmental Hazards.
[2] See SCS Injury Illness and Prevention Plan Table SOP 4-2 for examples of Personal Hazards.

Job Task Safety Analysis and PPE Assessment Form: SCS CNT-02A Sample Collection – Manual Sample Groundwater/Surface Water

Task Type (Check all that apply) ☐ **FS-OM&M/Construction** ☐ **Construction** ☐ **Energy** ☒ **Engineering**	**Task Description (include estimate of task duration in hours/day):** Groundwater/Surface Water sampling for analytical testing during remedial action; as needed up to 12 hours/day	**Location or Project:** Former City Garage Operations Project **Date:** 7/31/20 **Project/Revision #:** 27220109.00	
Analysis Team Member	**Position Title**	**Acknowledged by**	**Position Title**
Jason Franks	Central OHSC		
Doug Dreiling	Project Manager		
Special Training/Certification Required (In Addition to IIPP and Site Specific Health & Safety Plan)	40 Hour HAZWOPER/Safety Data Sheets		
Applicable SAFE Checklist(s): Specify type and category number	Safe Observation Form		

This form is certification that the hazard assessment has been performed for the workplace as required under 29 CFR 1910.132. This document is to be used as guidance for the task described and should be modified on an as necessary basis to address site, operational and/or environmental changes.

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
1. Review & Sign SSHSP/JTSA	None	None	None
2. Unpack lab equipment, check inventory, and review laboratory instructions.	Sample bottles may contain acid preservative. Any free liquid encountered in a cooler should be considered to be an acid.	Check for leaking containers. Ensure you have everything you need to complete the task.	Head: None Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
3. Calibrate field sampling equipment.	Compressed Gas Cylinder / Explosive / Flammable / Splash hazard	Ensure equipment is clean and probes, meters and instruments are calibrated per manufacturer's instructions.	Head: None Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
4. Travel to monitoring well or surface sample location.	Snakes, spiders, ticks slip/trip hazards Animals	Use snake guards for high grass areas. Only use non-synthetic bug repellants (NO DEET). Use spike overlays for snow or icing conditions, use boots that are slip resistant and provide good ankle support.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
5. Assess and open (unlock) the well or probe.	Snakes, spiders, ticks, bees, hornets, wasps; slip/trip hazards; landfill gas, H2S, and pressure. Leachate sumps may be under pressure and will often have LFG and H2S hazards.	Avoid spider webs and avoid sticking hands into dark / blind spaces. Look for honey combs and insect nests. Use care in opening leachate sumps, ensure 4 gas personal monitor is used if opening leachate sump.	Head – Hard hat Body – High visibility vest or shirt Foot- Steel-toe ANSI boots Hand - Chemical resistant gloves Eyes – Safety glasses Hearing protection – None Atmospheric monitoring – 4 gas personal monitor (if necessary).
6. Measure the depth to water level.	Splash hazard, overextension, electrical Hazards	Decontaminate liquid level probe before and after use. LO/TO pump (if leachate sump application). Hold liquid level equipment close to body, not at arms length.	Head – Hard hat Body – High vis vest/shirt Foot- Steel-toe ANSI boots Hand - Chem resist gloves Eyes – Safety glasses Hearing protection - None
7. Purge the well	Splash hazards; overextension hazards	Ensure pump or bailer is clean before each use. Keep arms close to body when lifting	Head: Hardhat Body: Hi-vis shirt/vest Foot: ANSI/ASTM-approved Hand: Nitrile gloves Respiratory: None Hearing: As-needed Eye/Face: Safety glasses

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
8. Label Containers and Collect groundwater samples	Getting struck by heavy equipment Overextension Hand cuts by sharp edges Airborne Contaminants Impacted water Preservatives in sample containers/Splash Hazard	Keep personnel away from heavy equipment when possible. Avoid getting hit by drill rod or drilling machine, allow machine to stop before collecting sample. Use proper sampling techniques. Keep arms close to body when lifting. Take care not to spill preservative. Seal sample containers immediately and store properly. Fill out sample log.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: As Required Hearing: Ear plugs Eye/face: Safety glasses
9. Securely reseal, cover, lock well / probe covers.	Be careful not to get fingers pinched.	Ensure cover is secured.	Head – Hard hat Body: High vis vest or shirt Foot- Steel-toe ANSI boots Hand: As needed. Eye/face: Safety glasses Hearing: As Needed
10. Access sample area near water body.	Slip/trip hazards; snakes, biological hazards; drowning	Find an area with firm ground and minimal slip hazards. Wear personal flotation device	Head: Hard hat Body: safety vest and personal flotation device. Hand: Nitrile gloves Foot: ANSI boots or rubber ANSI boots, waders Eye/Face: Safety glasses Hearing: As Needed

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
11. Label Containers and Collect surface water samples	Getting struck by heavy equipment Overextension Hand cuts by sharp edges Impacted water Preservatives in sample containers/Splash Hazard Slip/trip hazards; snakes, biological hazards; drowning	Keep personnel away from heavy equipment when possible. Use proper sampling techniques. Arms close to body when lifting. Take care not to spill preservative. Seal sample containers immediately and store properly. Use extension rod/dippers to collect samples, avoid getting to close to the bank or into the water.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: As Required Hearing: Ear plugs Eye/face: Safety glasses
12. Prepare samples to be shipped to lab.	Take care in handling samples/Proper Lifting of packed samples	Follow proper guidelines for shipping samples.	Head: None Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
End of JTSA Form SCS CNT – 02A			

[1] See SCS Injury Illness and Prevention Plan *Table SOP 4-1* for examples of Environmental Hazards.
[2] See SCS Injury Illness and Prevention Plan Table SOP 4-2 for examples of Personal Hazards.

Job Task Safety Analysis and PPE Assessment Form: SCS CNT-07 Indoor Air Sampling via Summa-Tedlar Bag

Task Type (Check all that apply) ☐ **FS-OM&M/Construction** ☐ **Construction** ☐ **Energy** ☒ **Engineering**	**Task Description (include estimate of task duration in hours/day):** Indoor Air Sample Collection in a Summa or Tedlar Bag up to 12 hour per day	**Location or Project:** Former City Garage Operations Project **Date:** 7/31/20 **Project/Revision #:** 27220109.00	
Analysis Team Member	**Position Title**	**Acknowledged by**	**Position Title**
Jason Franks	Central OHSC		
Doug Dreiling	Project Manager		
Special Training/Certification Required (In Addition to IIPP and Site Specific Health & Safety Plan)	40 Hour HAZWOPER/SCS Dangerous Goods Shipping		
Applicable SAFE Checklist(s): Specify type and category number	Safe Observation Form		

This form is certification that the hazard assessment has been performed for the workplace as required under 29 CFR 1910.132. This document is to be used as guidance for the task described and should be modified on an as necessary basis to address site, operational and/or environmental changes.

Job Task Safety Analysis and PPE Assessment Form: SCS CNT-07 Indoor Air Sampling via Summa-Tedlar Bag

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
1. Review & Sign SSHSP/JTSA	None	None	None
2. Read and familiarize self with instructions from laboratory supplying sample canisters and Tedlar bags	None	• Take care in unpacking and inventorying materials from lab	Head: None Body: None Foot: None Hand: None Respiratory: None Hearing: As-needed Eye/Face: None
3. Calibrate field sampling equipment.	• Compressed Gas Cylinder • Explosive • Flammable	• Ensure equipment is clean and probes, meters, and instruments are calibrated per manufacturer's instructions.	Head: Hardhat Body: Hi-vis shirt or vest Foot: ANSI/ASTM-approved Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses
4. Travel to soil sampling location.	• Snakes, spiders, ticks • slip/trip hazards • Animals	• Use snake guards for high grass areas. • Only use non-synthetic bug repellants (NO DEET). • Use spike overlays for snow or icing conditions, use boots that are slip resistant and provide good ankle support.	Head: Hardhat Body: Hi-vis shirt or vest Foot: ANSI/ASTM-approved Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
5. Ensure area that samples are to be taken is well ventilated	• Slip/trip/fall hazards • Biological hazards • Sharp corners • High temperature or high pressure piping	• Observe surroundings and walking surfaces • Be aware of all exits and possible escape routes	Head: Hardhat Body: Hi-vis shirt or vest Foot: ANSI/ASTM-approved Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses
6. Affix sample train to summa or tedlar bag, ensure valves are closed, purge sample train accordingly	• Flammable gas • H2S/Landfill Gas • High pressure • High temperature	• Avoid breathing in landfill gas • Check gauge pressure • Perform continuous air monitoring with 4-gas meter	Head: Hardhat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses
7. Fill canister or bag per standard procedures	• Flammable gas • H2S/Landfill Gas • High pressure • High temperature	• Avoid breathing in landfill gas • Check gauge pressure • Do not overfill • Perform continuous air monitoring with 4-gas meter	Head: Hardhat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses
8. Close all valves and remove sample train, seal probe hole with bentonite plug	• Flammable gas • H2S/Landfill Gas • High pressure • High temperature • Heavy Lifting	• Do not breath landfill gas when backfilling probe location • Proper lifting techniques	Head: Hardhat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses

Job Task Safety Analysis and PPE Assessment Form: SCS CNT-07 Indoor Air Sampling via Summa-Tedlar Bag

Job Task Step	Potential Environmental and Personal Hazards[1,2]	Critical Actions	PPE Required
9. Exit area in a safe manner	• Slip/trip/fall hazards • Biological hazards • Sharp corners/items • High pressure • High temperature/Heat Stress	• Observe surroundings and walking surfaces	Head: Hardhat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses
10. Label Summas/Bags and Prepare samples to be shipped to lab.	• Take care in handling samples • Heavy/Bulky Packages	• Follow proper guidelines for shipping samples. • Keep arms close to body when lifting.	Head: Hardhat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Leather gloves Respiratory: None/4 Gas Hearing: Ear plugs Eye/face: Safety glasses
End of JTSA Form SCS CNT – 07A			

[1] See SCS Injury Illness and Prevention Plan *Table SOP 4-1* for examples of Environmental Hazards.
[2] See SCS Injury Illness and Prevention Plan Table SOP 4-2 for examples of Personal Hazards.

Job Task Safety Analysis and PPE Assessment Form: FORM- 08

Job Task Safety Analysis Form			
Task Type: Engineering Services	**Task Description** Soil Sample Collection with Geoprobe and/or hand auger	**Location or Project:** Former City Garage Operations Project	
		Date: 7/31/20	
		Project/Revision #: 27220109.00	
Analysis Team Member	**Position Title**	**Reviewed by**	**Position Title**
Jason Franks	Central OHSC		
Doug Dreiling	Project Manager		
Special Training Required:	None		
Applicable SAFE Checklist(s):	ES SAFE Observation Report		

Job Task Step	Potential Environmental and Personal Hazards[1]	Critical Actions	PPE Required
1. Review & Sign SSHSP/JTSA	None	None	None
2. Unpack lab equipment, check inventory, review laboratory instructions.	Sample bottles may contain acid preservative. Any free liquid encountered in a cooler should be considered to be an acid.	Check for leaking containers. Ensure you have everything you need to complete the task.	Head: None Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
3. Calibrate field sampling equipment.	Splash hazard	Ensure equipment is clean and probes, meters and instruments are calibrated per manufacture's instructions.	Head: None Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
4. Travel to soil sampling location.	Snakes, spiders, ticks; slip/trip hazards; animals	Use snake guards for high grass areas. Only use non-synthetic bug repellants (NO DEET). Use spike overlays for snow or icing conditions, use boots that are slip resistant and provide good ankle support.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses

Job Task Step	Potential Environmental and Personal Hazards[1]	Critical Actions	PPE Required
5. Observe Geoprobe activities	Getting struck by heavy equipment, steep slopes/ uneven terrain, flying particles and debris/falling objects, slip/trip fall hazards; overhead hazards; high noise; dust	Keep personnel away from heavy equipment when possible. Use of pre-determined hand signals to communicate with ground crew. Watch for uneven surfaces/ trip hazards Use boots that are slip resistant and provide good ankle support Approach excavations from down slope direction	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: None Respiratory: None Hearing: Earplugs Eye/face: Safety glasses
6. Hand auger at soil sample locations	Overextension, repetitive motion; heat stress; airborne contaminants	Keep arms close to body when hand auguring Take breaks and drink at least 4 cups of water per hour Perform air monitoring to determine if any airborne levels are present.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Leather gloves Respiratory: None, APR available Hearing: None Eye/face: Safety glasses
7. Collect soil samples	Getting struck by heavy equipment, overextension	Keep personnel away from heavy equipment when possible. Keep arms close to body when lifting. Seal sample containers immediately and store properly. Fill out sample log.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: Ear plugs Eye/face: Safety glasses

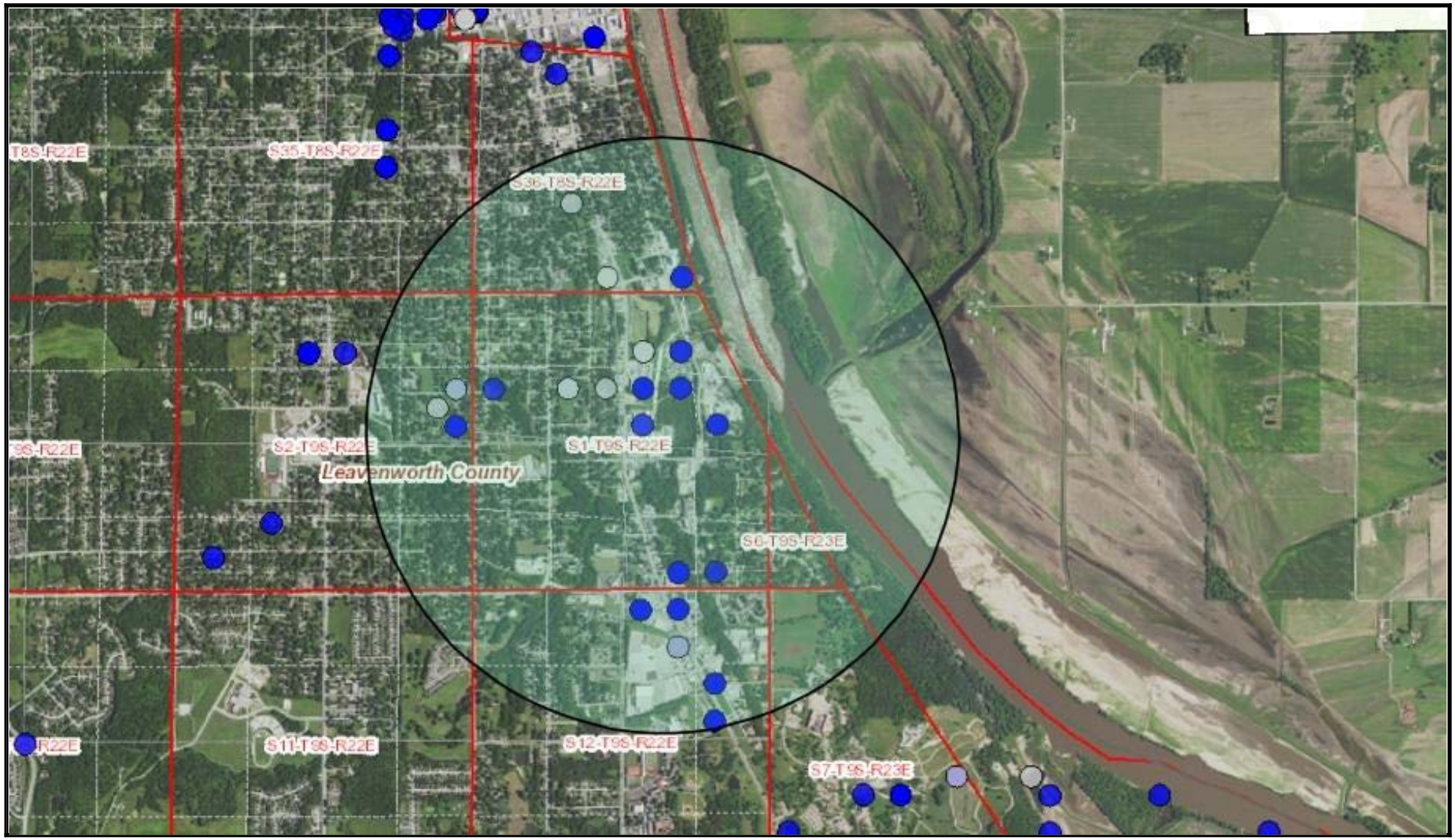
Job Task Step	Potential Environmental and Personal Hazards[1]	Critical Actions	PPE Required
8. Label containers and collect samples.	Splash hazard, overextension.	Seal sample containers immediately and store properly. Fill out sample log.	Head: Hard hat Body: Hi-vis shirt or vest Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
9. Prepare samples to be shipped to lab.	Take care in handling samples.	Follow proper guidelines for shipping samples.	Head: None Foot: Steel-toe boots Hand: Nitrile gloves Respiratory: None Hearing: None Eye/face: Safety glasses
End of JTSA Form ES-08			

1. See SCS Injury Illness and Prevention Plan Table SOP 4-1 for examples of Environmental Hazards.
2 See SCS Injury Illness and Prevention Plan Table SOP 4-2 for examples of Personal Hazards.

ATTACHMENT C

Potential Receptor Information

1-mile radius



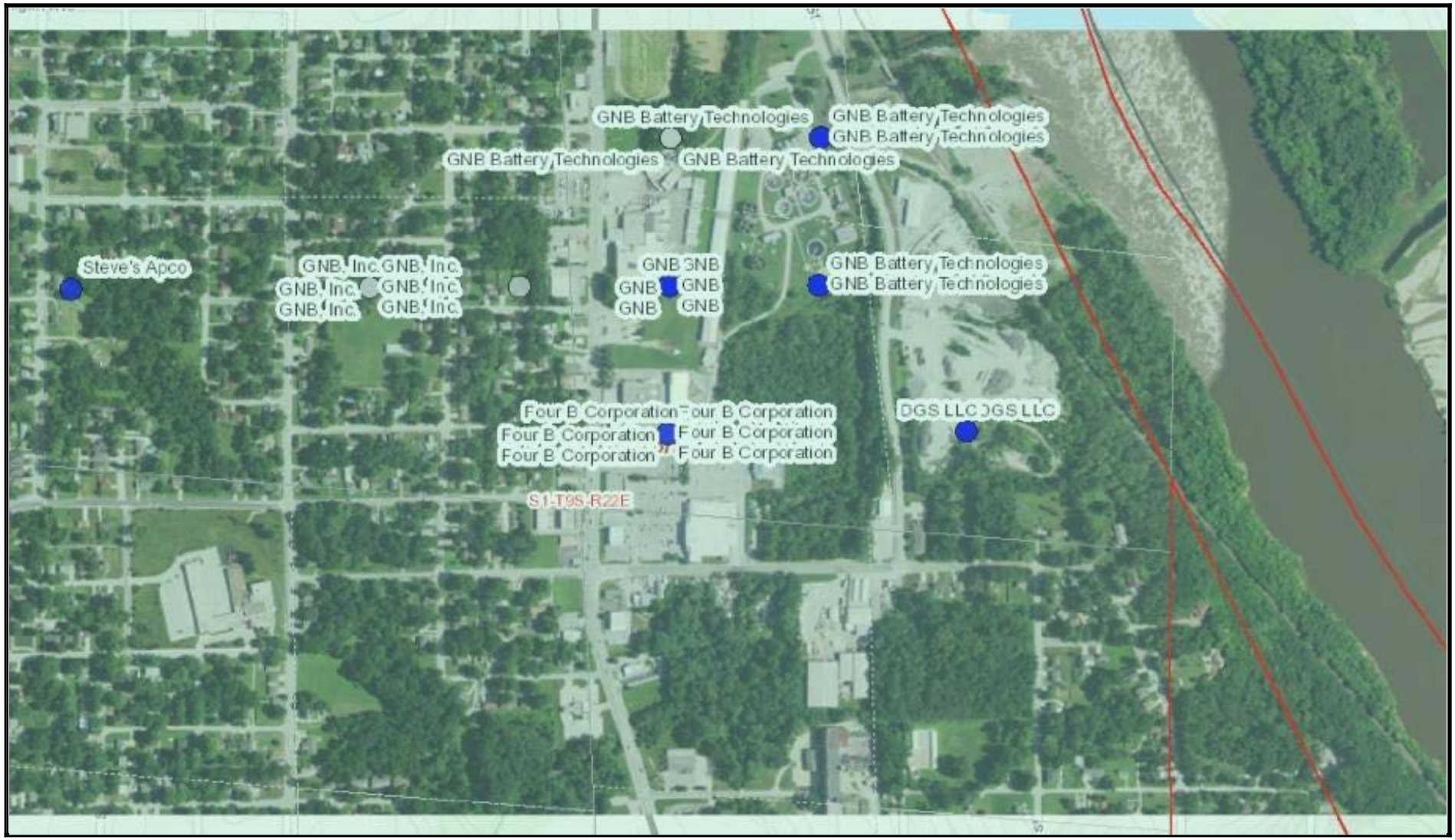
WWC5 Water Wells

- Constructed
- Reconstructed
- Plugged

7/22/2020

https://maps.kgs.ku.edu/wwc5

1-mile radius



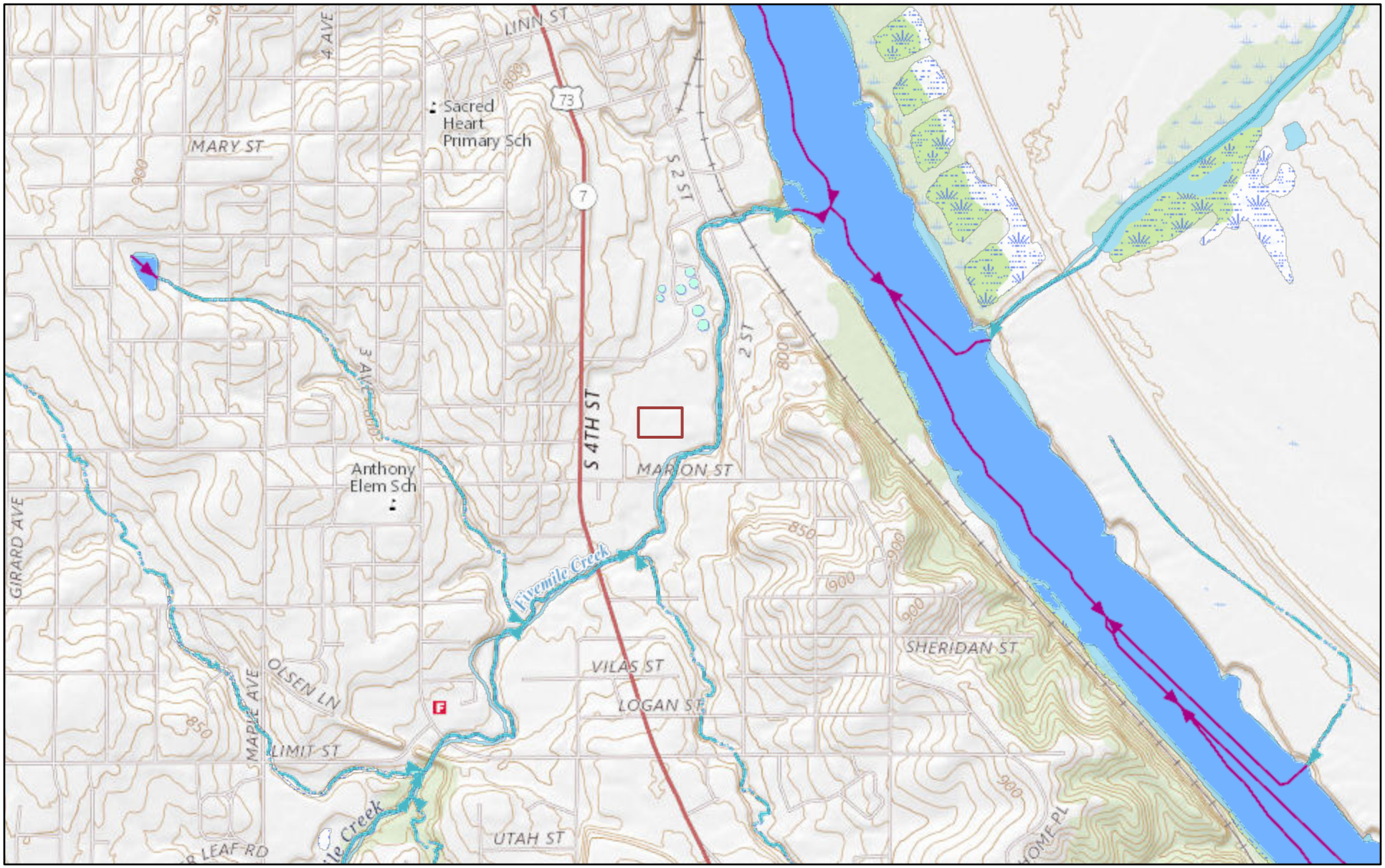
WWC5 Water Wells

- Constructed
- Reconstructed
- Plugged

7/22/2020

https://maps.kgs.ku.edu/wwc5

The National Map Advanced Viewer



7/22/2020, 11:04:08 AM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

U.S. Fish and Wildlife Service, USGS TNM – National Hydrography Dataset.

USGS

Override 1

Waterbody - Large Scale

Estuary

Ice Mass

LakePond

Playa

Reservoir

SwampMarsh

Area - Large Scale

Area of Complex Channels

Area to be Submerged

BayInlet

Bridge

CanalDitch

DamWeir

Flume

Foreshore

USGS The National Map: Orthoimagery | Garrity, C.P., Soller, D.R. | USGS National Map 3D Elevation Program (3DEP) | USGS TNM - 3D Elevation Program (3DEP). Data Refreshed Weekly. | USGS The National Map: 3D Elevation Program. Data Refreshed July,

The National Map Advanced Viewer

7/22/2020, 10:57:52 AM

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Override 1

Waterbody - Large Scale

Estuary

Ice Mass

LakePond

Playa

Reservoir

SwampMarsh

Area - Large Scale

Area of Complex Channels

Area to be Submerged

BayInlet

Bridge

CanalDitch

DamWeir

Flume

Foreshore

USGS The National Map: Orthoimagery and US Topo. Data refreshed

USGS

USGS The National Map: Orthoimagery | Garrity, C.P., Soller, D.R. | USGS National Map 3D Elevation Program (3DEP) | USGS TNM - 3D Elevation Program (3DEP). Data Refreshed Weekly. | USGS The National Map: 3D Elevation Program. Data Refreshed July,

U.S. Fish and Wildlife Service
National Wetlands Inventory

2109 S. 3rd Street_Wetlands

July 22, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Leavenworth County, Kansas

Local office

Kansas Ecological Services Field Office

(785) 539-3474
(785) 539-8567

2609 Anderson Avenue
Manhattan, KS 66502-2801

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Pallid Sturgeon Scaphirhynchus albus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7162	Endangered

Flowering Plants

NAME	STATUS
Mead's Milkweed Asclepias meadii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8204	Threatened
Western Prairie Fringed Orchid Platanthera praeclara No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

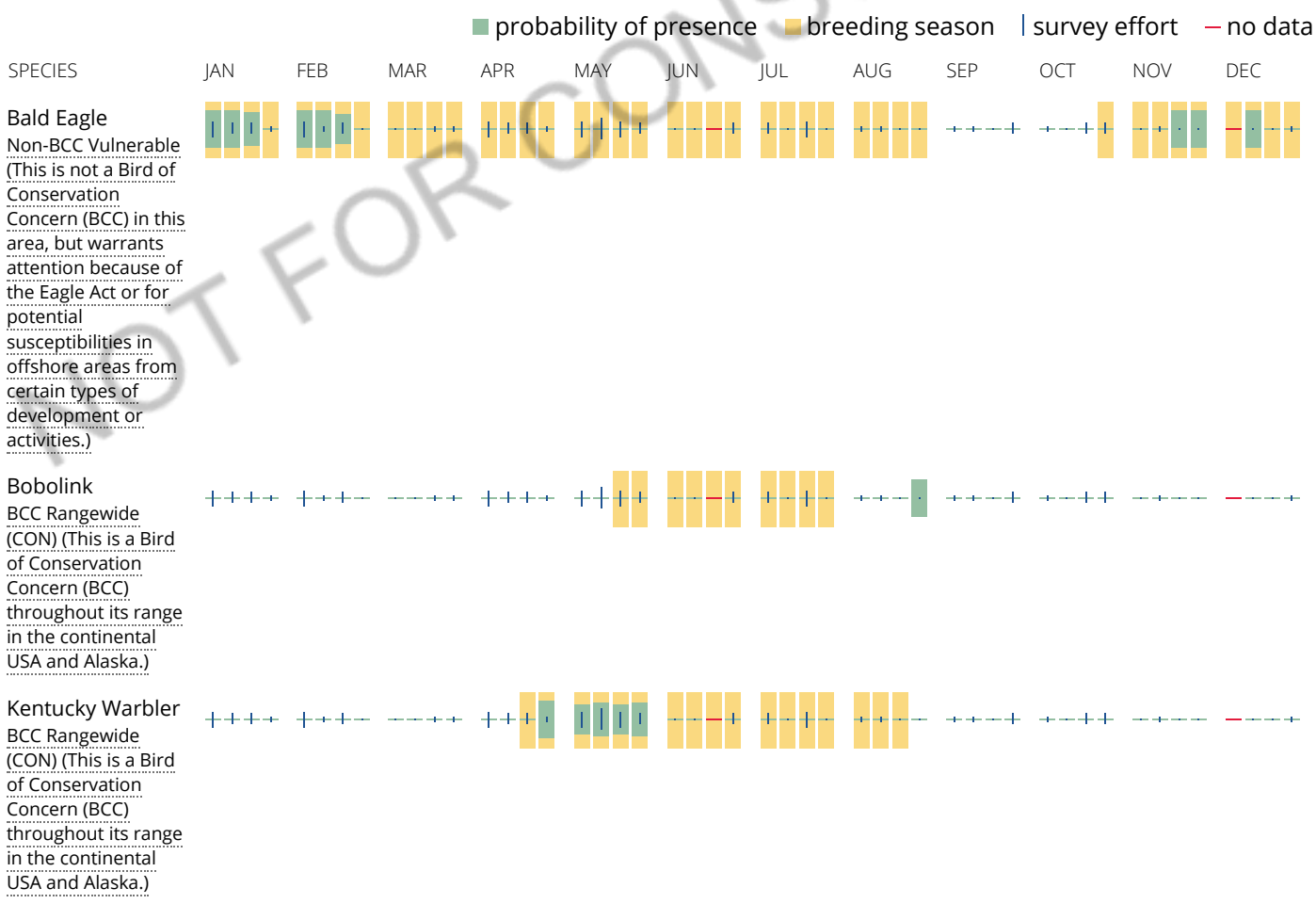
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

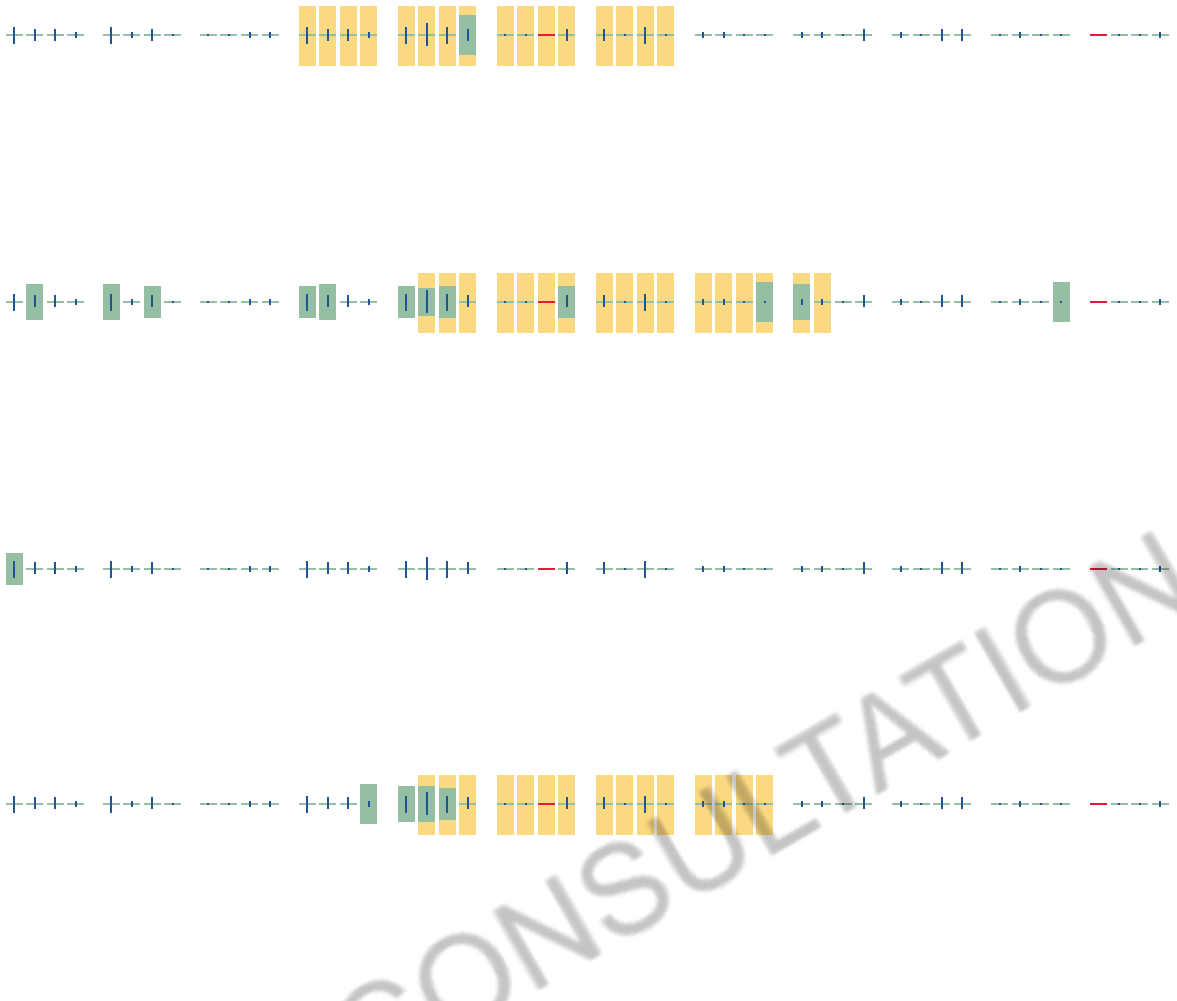
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

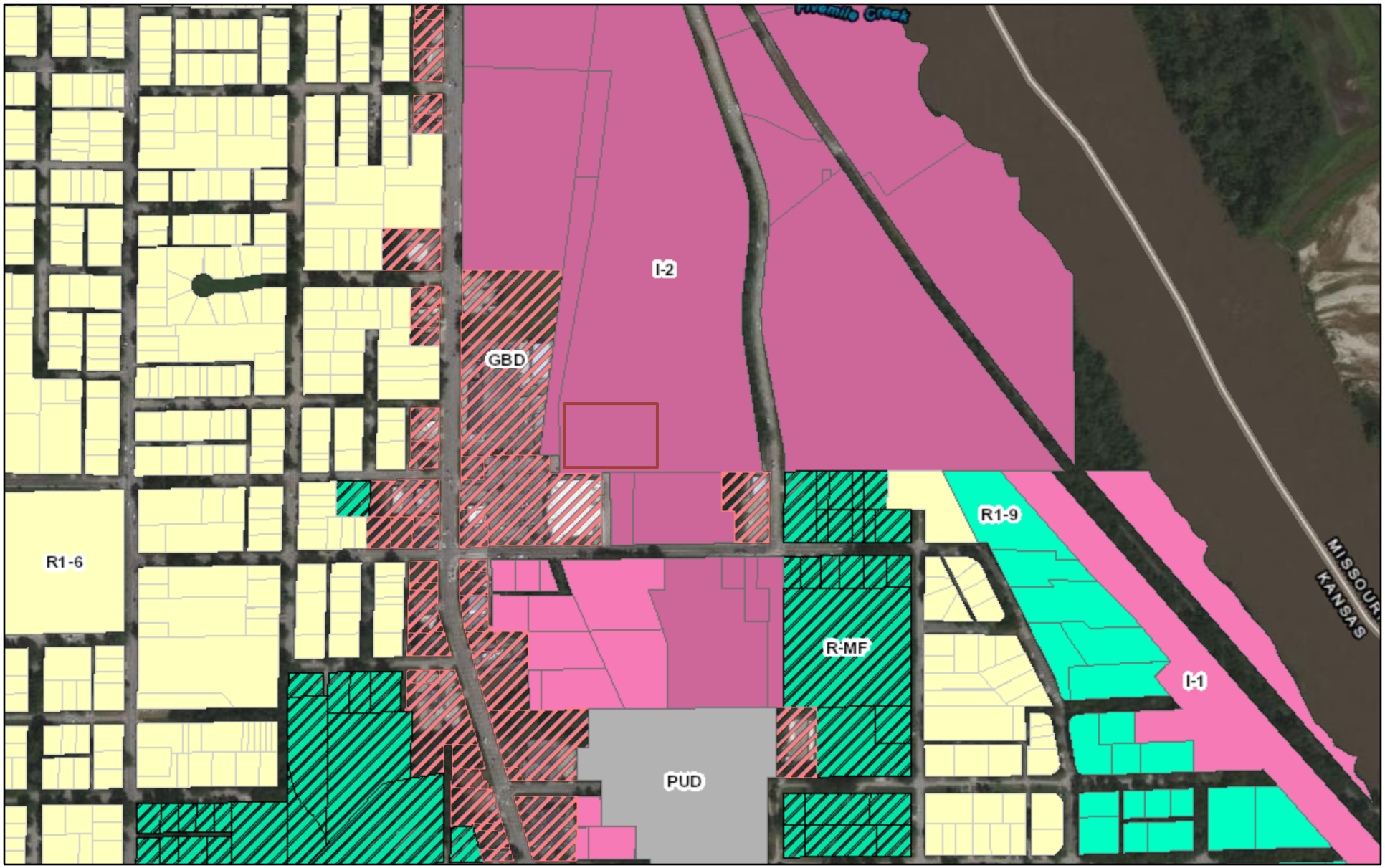
Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

ArcGIS Web Map



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Override 1
GBD
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PUD
R1-25
R4-16
Zoning_CURRENT
I-1
NBD
R-MF
R1-6
Unzoned
CBD
I-2
OBD
R-MX
R1-9

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE,

Web AppBuilder for ArcGIS

USDA FSA | Esri, HERE, Garmin, iPC |