

LIMITED
KANSAS RISK-BASED CORRECTIVE ACTION
FOR PETROLEUM STORAGE TANKS SITES

REPORT FORMAT

January, 2005



Kansas Department of Health and Environment

Bureau of Environmental Remediation

Storage Tank Section

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SECTION 1.0 FIELD WORK PLAN SUBMITTALS

Submit two copies of the Field Work Plan Worksheet, maps and Site Conceptual Exposure Model. The Field Work Plan Worksheet will include the projected Point of Exposure (POE). The Field Work Plan Worksheet is included in Attachment A. The Field Work Plan shall contain all requested information. Additional information should be included as needed.

SECTION 2.0 LIMITED KANSAS RISK BASED CORRECTIVE ACTION (KRBCA) REPORTS

- 2.1 Limited KRBCA Reports will be a summary of all work performed and gathered during activities conducted under the KRBCA phase and previous assessments.
- 2.2 Report will be bound and include a cover page with the following information: report title; site name; site address; KDHE project code; KDHE facility I.D. number; section, township, and range to four quarters; report date, and the name of the person who prepared the report. Cover page must be stamped and signed by a Kansas Licensed Geologist or Licensed Professional.
- 2.3 Reports will include a table of contents with the following information:
 - 1) section titles,
 - 2) titles and page numbers for tables,
 - 3) titles for figures,
 - 4) titles for each appendix.
- 2.4 Report will include a signature page to be signed by a Trained Professional with a certificate on file with KDHE verifying the completion of a Risked Based Corrective Action (RBCA) program conducted by an ASTM (American Society of Testing and Materials) certified trainer.
- 2.5 Reports will include labeled tabs for each section title and each appendix.
- 2.6 Two copies of each Limited KRBCA Final Report will be submitted to the KDHE Project Manager within 120 days after the date of the letter approving costs for additional scopes of work or after the contract between the Owner/Operator (O/O) and Vendor has been signed by all parties. One copy will be submitted to the respective O/O.

Incomplete or improperly formatted reports will be returned without review. For reports returned without review the submittal deadline will not be considered to have been met until a complete report demonstrating that the investigation goals have been met is received by KDHE.

The vendor may wait until the report has been reviewed and approved by KDHE before providing the O/O with a copy. If the Vendor provides the O/O with a copy prior to approval of the report, copies of any and all revisions and/or addenda must also be provided to the O/O. Specific sections of the Limited KRBCA Final Report will also be submitted in electronic form on a Compact Disc (CD).

- 2.7 All work will be performed in accordance with the most recent LSA RFP and Kansas Risk-Based Corrective Action (KRBCA) Manual. Both documents are available upon request or at www.kdhe.state.ks.us/tanks.

* Limited KRBCA reports will be submitted according to the KRBCA Report Format, not according to Section 4.5, Final Report, Assessment Phase, of the LSA RFP.

SECTION 3.0 FINAL REPORT FORMAT

Reports will include all information outlined below in the format and order described. Figures, tables and appendices not applicable to the site should be so noted in the Table of Contents. Do not change the item numbers designated below. Items within tables that may not be applicable, such as free product thickness, should be stated in the table to be “Not Applicable”.

Section 1.0 Site Summary

The site summary section will include the following information.

- 1.1 General Summary: Include a detailed and chronological summary of all past and recent work performed at the site.
- 1.2 Regional Geology: Review local and regional geologic and/or hydrogeologic maps, nearby site assessments and/or investigation reports and any other pertinent publications. Identify any aquifers and/or surface water bodies serving as sources of drinking water for the area. Identify and evaluate the use and/or potential use of the uppermost groundwater zone within 0.25 miles of the source of the release at the facility.
- 1.3 Land Use: Investigate and describe past, current, and potential future uses of the site. Identify potential source areas, migration pathways, and receptors. Indicate and describe all subsurface structures that are potential or current receptors of contaminated media. Determine past and current uses of adjacent properties to identify other potential sources of chemicals of concern (COC). If an off-site receptor is identified, assess the past, current and potential future land use. Future land use assumptions should be based on current use, existing zoning, and development trends of adjacent properties. Document any ordinances preventing or influencing the future installation of water wells at the site or in the surrounding area

such as groundwater protection areas. Identify the current predominant land use of the area as residential, commercial, recreational, agricultural, or undeveloped. Identify sensitive receptors, such as surface water bodies, wildlife sanctuaries, and wetlands.

- 1.4 Source History: Locate current and/or former tank systems and other potential sources such as spills or overfill incidents, both on and off-site. Investigate and summarize any previous assessment work, such as tank removal data, previous site assessments, release investigations and/or remediation activities that may have been conducted on-site and on adjacent properties. List all previous business names and property use (commercial, industrial, residential) of the facility and whether fuel was dispensed at the facility by previous owners. List all current and previous owners of the facility with current address(es). Refer to Section 7.3.2 of ASTM Practice E1527-00. Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process for guidance.

Section 2.0 Field Work Tables

Tables must be labeled with the numbers and titles provided below. Number each page of tables. Include in the table a column or row for each numbered item requested. Do not reference or include in this section, any discussion, tables, maps, photographs, drilling logs, or other documents included in this report. Abbreviations or material referenced from other publications should be explained at the bottom of the table.

Table 2.1 Summary of Work Completed

Include the following information for work completed during the KRBCA scope of work:

- 1) total number of plugged borings,
- 2) total number of monitoring wells completed,
- 3) total number of groundwater survey probes conducted,
- 4) total footage drilled,
- 5) total monitoring well footage,
- 6) total boring footage plugged,
- 7) total number of groundwater samples analyzed by laboratory,
- 8) total number of soil samples analyzed by laboratory,
- 9) total number of product samples analyzed by laboratory,
- 10) total number of waste water samples analyzed by laboratory.

Samples collected for saturated and unsaturated zone tests, properties and data included in Tables 2.7 and 2.8 should not be included in the total number of soil samples analyzed by laboratory.

Table 2.2 Water Well Information

Include the following information for all wells located within a 1/4 mile radius of the site.

- 1) the well owner's name,
- 2) the Section, Township and Range of the well location to three quarters, or to four quarters for wells sampled or located during the investigation, or used as a public water supply,
- 3) the use; select the use from those found in Section 4 of the WWC-5 form that best describes the use of the well,
- 4) the distance between the well and contaminant plume; give an approximate distance if the well location is known to only three quarters,
- 5) the location of the well relative to the contaminant plume and groundwater flow direction.

The search for this information must include at least the following: 1) a water well records search conducted through the KDHE Bureau of Water (BOW), 2) a discussion with city and/or county personnel concerning the location of public and private water supplies for the area, and 3) a ground or house-to-house reconnaissance of the area within the contaminant plume(s) and a 500 foot radius surrounding the source of contamination. PWS wells should be designated with the same numbers assigned by the city, water district, or other well owner.

Table 2.3 Soil Field Screening and Laboratory Results

Include the following results for each field sample, including those not submitted for laboratory analysis, and each laboratory sample collected from a boring. Include the same information for past soil analytical data if used to determine representative concentrations for Tier 3A and/or Tier 3B analysis.

- 1) boring and/or monitoring well ID number assigned by consultant,
- 2) the depth at which each sample was collected,
- 3) the field screening results in parts per million (ppm),
- 4) the concentration of each chemical of concern in parts per million (ppm) determined by laboratory analysis; state the petroleum product(s) identified,
- 5) the date each sample was collected,
- 6) the EPA test method and laboratory analytical sample detection limit for each analyte in each laboratory sample,
- 7) the instrument used for each field sample,
- 8) The Tier 2 Risk-Based Screening Level for each chemical of concern for both soil and soil to groundwater pathway for both residential and non residential scenarios.

Table 2.4 Groundwater Analytical Results

Present in chronological order all past and current results for each sample point. Include the following information for each groundwater and petroleum product laboratory sample:

- 1) well ID number,
- 2) the concentration for each chemical of concern and any other detected constituent, in parts per billion (ppb),

- 3) the product(s) identified, or approximate % of each product if a mixture, for any product sample(s),
- 4) the volume, in gallons, of water removed from each well during well development,
- 5) the volume, in gallons, of water purged from the well prior to sampling,
- 6) the date the well was purged,
- 7) the date each sample was collected,
- 8) the EPA test method and analytical sample detection limit for each analyte in each sample,
- 9) the Tier 2 Risk-Based Screening Level for each chemical of concern for both residential and non residential scenarios.

Bold concentrations that exceed tier 2 risk-based screening levels.

Chemicals of Concern are Total BTEX, Benzene, Toluene, Ethylbenzene, Total Xylenes, 1,2 Dichloroethane (1,2 DCA), Methyl Tertbutyl Ether (MtBE), Naphthalene, Ethylene Dibromide (EDB), TPH GRO and TPH DRO. Other chemicals detected from full VOC and/or PAH scans should also be included in the table

Table 2.5 Monitoring Well Completion Information

Include the following information for each well installed or sampled:

- 1) boring and/or monitoring ID number assigned by the consultant,
- 2) well ID number from KDHE numbered well lock,
- 3) the identification number from the KDHE well tagging Site I.D. form,
- 4) the location of the well tag,
- 5) the surveyed elevation of the well's vertical datum control point (survey pin or permanent mark on flush mount rim),
- 6) the surveyed elevation of the well casing,
- 7) the depth to groundwater below ground surface (bgs) in feet,
- 8) static groundwater elevation prior to purging (or development if wells are sampled the same day as development and the wells are not purged),
- 9) static groundwater elevation prior to sampling,
- 10) the elevation of the air/product interface,
- 11) the thickness of the separate-phase product,
- 12) the date static water level was measured.

Groundwater levels must be measured under static conditions on the same day. If free-phase petroleum product is detected, groundwater elevations must be corrected using the specific gravity determined during the product sample analysis. Explain at the bottom of the table how the measurements were corrected.

Table 2.6 Waste Handling Results

Include the following information for wastes handled:

- 1) the type of waste (soil or water) generated,
- 2) the quantity of waste generated for each type of waste,
- 3) the storage and disposal methods used for each type of waste,
- 4) results of any field analysis of wastes conducted during on-site treatment,
- 5) results of any laboratory analysis of wastes,
- 6) specific location where wastes were disposed or discharged.

Table 2.7 Unsaturated Zone Hydrologic Tests and Properties

For tables 2.7 and 2.8, identify source(s) of information for values included in the tables that were not calculated or acquired during this scope of work.

Table 2.7a Include the following information for each unsaturated zone hydrologic test conducted:

- 1) the well and/or boring ID number,
- 2) the depth at which each sample was collected, including interval,
- 3) the analysis method name and number (ASTM, EPA) for the Grain Size Analyses and/or the Permeameter tests,
- 4) the sample collection method,
- 5) the hydraulic conductivity value in centimeters per second (cm/sec),
- 6) the lithologic description of each sample.

Table 2.7b Include items 1 - 3 from Table 2.7a and the following information;

- 1) estimated porosity (cm^3/cm^3),
- 2) gravimetric water content (gm/gm) (Using ASTM Method D2216-98),
- 3) volumetric water content (cm^3/cm^3) (Using ASTM Method D2216-98),
- 4) dry bulk density (gm/cm^3) (Using ASTM Method D2937-00e1),
- 5) organic matter (% organic matter) (If ASTM Method D2974-00 is used),
- 6) total organic carbon (% organic carbon) (Walkley-Black Method/ASTM D2974-00)

Table 2.8 Saturated Zone Hydrologic Data

Include the following information for each monitoring well used for the saturated zone tests:

- 1) the monitoring well ID number (see Table 2.3),
- 2) the depth at which each sample was collected, including interval,
- 3) the analysis method name and number (ASTM, EPA) for the Grain Size Analyses and/or the Permeameter tests,
- 4) the hydraulic conductivity value in centimeters per second (cm/sec) determined for each test,
- 5) the transmissivity value in meters²/day calculated for each sample,
- 6) the storativity value,
- 7) hydraulic gradient (ft/ft) (show calculations),
- 8) known or estimated yield of uppermost aquifer within a 24 hour period. (provide source),

- 9) area specific annual rainfall in inches per year (provide source).

Table 2.9 Point of Compliance and Point of Exposure

- 1) State the location, distance from source and justification of the point of compliance well,
- 2) State the location, distance from source and justification of the point of exposure.

Section 3.0 Maps

All maps must be drawn to scale and labeled with the titles provided. Do not reference or include in this section any discussion, tables, photographs, drilling logs, or other documents included in this or any other report.

The scale for figures 3 through 5 and 7 should be approximately 1 inch = 50 feet for smaller sites and 1 inch = 100 feet for larger sites. The scale for figures 4, 5, and 7 may be adjusted to enlarge the area of the plume if the plume is small, provided that sufficient site features are shown to identify the area mapped. Maps should be 8.5" X 11" or 11" X 17" whenever possible. If warranted, the KDHE Project Manager should be contacted for approval to use a scale or figure size other than specified herein. Include a north arrow, scale, and legend on all maps. Legends should include only those items that occur at the site.

Figures 3 through 7 should include wells and borings, with ID numbers, and only those labels necessary to describe information requested for that specific map. Private and PWS wells should be designated consistently throughout the report.

Figure 1 General Site Location

A map adapted from a USGS 7.5 minute quadrangle, depicting the site location and a one mile radius of the site. Highlight or mark the location of the site. Contours and other information should be clear and legible.

Figure 2 Area Base Map

Two area base maps will be included in the report. The maps will be enlarged such that the facility is located at or near the center of the map. Figure 2.1 will depict the site and a minimum 350 foot radius around the source(s) of contamination. Figure 2.2 will depict the site and a minimum 500 foot radius around the source(s) of contamination or the complete area of the investigation, whichever is greater. Figure 2.1 will have an approximate scale of 1" = 100'. Figure 2.2 will have an approximate scale of 1" = 125'. Maps should be on 8 1/2" x 11" or 11" x 17" paper. If groundwater is less than 20 feet BGS a door to door search for basements must be made within a 500 foot radius of the source of contamination.

The following should be included on both maps: 1) all groundwater probes, soil borings, and wells. 2) property boundaries and buildings 3) identify the general use (residential, park, undeveloped, industrial, commercial) of properties in this area. 4) business names 5) locations or former locations

of all tanks, lines, buildings, roads and other fixed objects on the facility property 6) locations of all underground utility trenches within 100 feet of the contaminant plume(s). State the type and depth of each utility service. 7) basements if door to door search is required.

Figure 3 Groundwater Flow Map

Adapted from Figure 2. Label each well with the well ID, the elevation of each well (casing), static groundwater elevation, labeled equipotential contours encompassing all water measurement points, and arrow(s) indicating predominant flow paths and direction. Use all points measured for the investigation when contouring. Anomalous data points should be noted on the map. Show flow line used for calculating hydraulic gradient.

Figure 4 Soil Contamination Maps

Develop, down to laboratory non-detect (ND) levels, all soil contamination maps outlined below. Use Figure 2 as the template, and show the locations of all borings. The estimated areal extent of soil contamination above the capillary fringe must be outlined.

Use the highest soil laboratory analysis from above the capillary fringe in each boring for contouring purposes. Label sample points with depth for each sample collected for laboratory analyses from each boring. Isoconcentration lines should be labeled with the concentration in ppm. If the contaminant being mapped was detected in less than three sampling locations, submit a map showing the sample points labeled with the concentration in ppm but do not contour. If the constituent being mapped was not detected in any boring, omit map.

- 4.1 Benzene in Soils
- 4.2 Toluene in Soils
- 4.3 Ethylbenzene in Soils
- 4.4 Xylenes in Soils
- 4.5 1,2 DCA in Soils
- 4.6 Methyl Tertbutyl Ether (MtBE) in Soils
- 4.7 Naphthalene in Soils
- 4.8 Ethylene Dibromide (EDB) in Soils
- 4.9 TPH, OA-1 in Soils
- 4.10 TPH, OA-2 in Soils

Figure 5 Groundwater Isoconcentration Maps

Develop, down to non-detect (ND) levels, all Groundwater isoconcentration maps outlined below. Use Figure 2 as the template, and show all monitoring wells and sampling points, with ID numbers, sampled during the investigation. Label sample points and isoconcentration lines with the concentration in ppb. If the contaminant being mapped was detected in less than three sampling locations, submit a map showing the sample points labeled with the concentration in ppb but do not

contour. Sample points shall be labeled with concentration in ppb. If a constituent being mapped was not detected in any well, omit map.

- 5.1 Total BTEX in wells
- 5.2 Benzene in wells
- 5.3 Toluene in wells
- 5.4 Ethylbenzene in wells
- 5.5 Total Xylenes in wells
- 5.6 1,2 DCA in wells
- 5.7 MtBE in wells
- 5.8 Naphthalene in wells
- 5.9 EDB in wells
- 5.10 TPH OA-1 in wells
- 5.11 TPH OA-2 in wells

Figure 6 Groundwater Composite Historical Contamination Maps

This should be a historic combination of maps indicating snapshots of the following groundwater contaminant plumes.

- Figure 6.1 Total BTEX
- Figure 6.2 Benzene
- Figure 6.3 MtBE

If the contaminant has not been historically detected in three or more wells, that specific combination of maps may be omitted from the report. In addition, if Naphthalene or EDB is found in concentrations above Tier 2 RBSL's during any historic sampling event and has been detected in three or more wells, composite historical contamination maps will be submitted for that contaminant.

These should be, at a minimum, 3" x 4" reductions of the isoconcentration maps similar to Figure 5 maps and placed on 11" x 17" paper. Each page will include six reduced maps. Submit one page per constituent. The first map will be the initial concentrations or earliest concentrations available. The final map will be the analytical results obtained from this Limited KRBCA scope of work. The maps between the initial map and final map will be the four most recent analytical results. The sampling data and date will be clearly labeled on each reduced map.

Figure 7 Separate Phase Product Isopach Map

Develop a product isopach map, using Figure 2 as the template, any time separate phase product is detected. Each map shall include the location of all monitoring wells or sampling points. If more than one product is identified, specify the products and their approximate percent of the total product phase.

Figure 8 Wells within ¼ Mile*

The map will be enlarged such that the facility is located at or near the center of the map. The map will have a scale of approximately 1" = 300' and be on an 11" x17" page. All wells will be clearly marked and labeled as to the current use (eg: industrial, public drinking supply, monitoring). If the contaminant plume is expected to extend beyond ¼ mile from the facility, the map (scale) will be modified to include all wells potentially impacted by the release. Well descriptions may appear on an attached table. Generalized groundwater flow direction will be clearly indicated.

Figure 9 Land Use within ¼ mile*

Map will clearly indicate current land uses within a ¼ mile radius of the facility. The map will have a scale of approximately 1" = 300' and be on an 11" x17" page. The facility will be at or near the center of the map. If the contaminant plume is expected to extend a distance greater than ¼ mile, the scale of the map will be changed to include the areas potentially affected. At a minimum, the maps must include either residential or non residential. If a sensitive receptor such as a subsurface structure, school or hospital is present within this area, that structure must be indicated on the map.

* Maps must be CAD drawings or enhanced versions of the most recent aerial photographs of the specified area. Locations and names of all major streets must be included on the maps. Topographic maps will not be accepted.

Section 4.0 Drilling Logs

Include schematics for each boring drilled and each monitoring well installed during the investigation. At a minimum, the following information must be included on each log:

- 1) the boring and monitoring well ID number,
- 2) the date the drilling was conducted,
- 3) the names of the Driller and Geologist,
- 4) the drilling method/type of drill rig, soil sampling equipment, and field screening analysis equipment used,
- 5) borehole and casing diameters,
- 6) field screening results plotted at the depth measured,
- 7) a continuous soil profile will be developed with detailed lithologic descriptions using the Unified Soil Classification System (USCS). The detailed lithological descriptions must correspond to the depths measured during drilling. The profile will also include the color, texture, sorting, size and shape of grains, and any other pertinent information,
- 8) observations such as fracturing or solution cavities, organic content, staining, odor, moisture changes (dry, moist, saturated), and any other pertinent features,
- 9) a monitoring well construction diagram that accurately depicts the depth of the screen, blank casing, filter pack, bentonite seal, grout seal, well-head completion, and the surveyed elevations of the top of the casing and the permanent datum control point on the pad or flush mount rim,

- 10) for plugged borings, plugging material and interval of each material,
- 11) depth the saturated zone was encountered during drilling and elevation of static water level,
- 12) indicate where laboratory and hydrologic samples were collected, including interval.

The monitoring well construction diagram and the corresponding drilling log must be shown on the same page, and be drawn at the same vertical scale. Logs must be typed. Do not use abbreviations. Do not reference or include in this section any discussion, tables, photographs, maps, or other documents included in this or any other report.

Section 5.0 Photographs

- 6.1 All photographs shall be color print or color copies. Photographs should be taken from an appropriate distance and angle for the subject to be clearly visible and identifiable. Do not reference or include in this section any discussion, tables, drilling logs, maps, or other documents that are included in this report.
- 6.2 Each photograph shall illustrate the spatial relationships of the various components at the site.
- 6.3 Each photograph shall include a description of the scene, the direction the picture was taken from, and the date and time of the photo.
- 6.4 Include four photographs (two per page) of the entire facility from two distinctively different directions. Identify any current storage tank system components that appear in the photographs, whether or not they were a source of contamination, and any product recovery or remediation system components. Identify the location of any former tank basins and/or system components.

Section 6.0 Documentation

Include all information requested in the following format. Do not reference or include in this section any discussion, tables, photographs, maps, or other documents that are included in this report or any other report.

Appendix 1 Unsaturated Zone Hydrologic Data

Include all information and calculations to determine the unsaturated zone characteristics. If values are calculated by a computer program, include a copy of the computer output and state the program used.

Appendix 2 Saturated Zone Hydrologic Data

Include all raw data (laboratory test data, grain size distribution plots, etc.) and calculations used to determine the saturated zone hydrologic characteristics. Identify the variables and provide the

calculated or assigned values. Include all information submitted by the laboratory on sheets provided by the laboratory.

Appendix 3 Laboratory Data

Include all analytical laboratory reports and Chain of Custody documents. All lab reports must include the following QA/QC data for all samples:

- Calibration check against the true value or initial calibration every 20 samples. This should be a mid-range calibration.
- Surrogate % recovery for each soil and water sample.
- Matrix spike and duplicate for each constituent every 20 samples or each run, whichever is more frequent.
- Method blank and duplicate for each extraction.
- Trip blank for each shipping container.

Reporting limits for all samples must be the Practical Quantitation Limit (PQL) for that sample. Reporting limits set at the MCL is not acceptable. Reports for all OA-2 analyses must also include copies of the reference standard chromatographs used. Include results of free product analyses (including laboratory chromatographs) if product samples were collected.

Appendix 4 Field Notes

Field notes must be hand-written and signed by the individual who performed the work described therein. Each page must be signed as the notes are being taken. Include copies of the following:

- 1) all drilling logs, soil sampling notes, and monitoring well completion notes,
- 2) groundwater sampling notes recording, for each well sampled, the water depth and total depth; the volume, in gallons, of water removed for well development and the volume, in gallons, of water purged before sampling; the name, address, and telephone number of the well owner and the site tenant if any private wells are sampled,
- 3) the Project Geologist's notes from the slug tests,
- 4) any and all other field notes recorded during the investigation. Field notes must include the daily chronological events. This includes, time of day each boring/well was initiated, completed, sampled, static water level measured, triangulation calculations and all pertinent information relevant to the assessment. Field notes should not include a general summary of methods and procedures used during the assessment.

Appendix 5 Reports, Access Agreements, Lien Releases and Monitoring Well Information

Include copies of the following:

- 1) the RLS surveyor's report,
- 2) the KDHE BOW water well search report,
- 3) all signed access agreements,

- 4) copy of the site specific Bureau of Water waiver to install flush mount wells,
- 5) copy of the wastewater disposal waiver letter from the Bureau of Water,
- 6) all signed lien releases,
- 7) include a copy of the completed KDHE Site Identification Form for each well installed or tagged,
- 8) include a copy of the KDHE Water Well Record (form WWC-5) for each monitoring well installed,
- 9) documentation of property record search used to complete Source History in Section 1.4, Source History.

Appendix 6 Off-Site Waste Handling Documentation

Provide documentation of how wastes removed from the site were handled and/or treated, including the authorization for wastewater disposal.

Electronic Data

The following information must be supplied on a compact disc (CD) after the final report has been approved. The CD will contain the following information:

- 1) The following portions of the final report must be submitted in any word processing document.
 - Cover Page
 - Table of Contents
 - Section 1.0, Site Summary, in Section 3.0 of the Final Report Format
- 2) The data included in Tables 2.1 through 2.8 must be submitted in Excel spreadsheet or in Microsoft Access Database format.
- 3) Figures 2 through 7 will be submitted in CAD files in a DXF interchange format (preferred) or as a JPG (Joint Photographic Experts Group format). The file must be named according to one of the following conventions. Site name, last five digits of project code followed by .dxf or .jpg. Example: ABCgasstation12375.dxf

ATTACHMENT A
FIELD WORK PLAN WORKSHEET

PETROLEUM STORAGE TANK RELEASE TRUST FUND
FIELD WORKPLAN WORKSHEET

Site Name: _____ KDHE Project Code: _____

Vendor: _____ Vendor Contact: _____

Instructions: This form must be completed by providing the information requested below. Do not include any attachments with this worksheet other than those described herein.

I Site Information

Site Address: _____ Kansas _____

(Street) (City) (County)

Legal Description: _____ 1/4 _____ 1/4 _____ 1/4 _____ 1/4 Section _____ Township _____ Range _____

II Investigation Information

Check the general methodologies to be used: _____ Groundwater survey _____ Soil Borings _____ Monitoring Wells

List the requested information where indicated:

- 1) Groundwater Survey:
 Sample Extraction Equipment _____
 Sample Analysis Equipment _____

Compounds for Analysis with Detection Limits (DL)

Benzene	DL= _____ ppb	Other: _____	DL= _____ ppb
Toluene	DL= _____ ppb	_____	DL= _____ ppb
Ethylbenzene	DL= _____ ppb	_____	DL= _____ ppb
Xylenes	DL= _____ ppb	_____	DL= _____ ppb

- 2) Drilling: (list primary equipment under column "A", under column "B", list drilling equipment to be used if auger refusal is encountered)

		A	B
Drill Rig	Brand/Model	_____	_____
	Torque Rating	_____	_____
Drill String	Type (Augers, etc)	_____	_____
	O.D. / I.D.	_____	_____
Borehole Size		_____	_____
Sample Collection Equip		_____	_____
Drilling Sample Frequency		_____	_____

- 3) Field Screening Instrument
- Device (Brand / Type / Spec) _____
- Calibration Standard _____
- Calibration Frequency _____

- 4) Monitoring Well Development
- Method (bailer, pump, etc) _____
- Minimum well volume to be with drawn (Drilling Scenario "A") _____
- Minimum well volume to be with drawn (Drilling Scenario "B") _____

- 5) Hydrogeologic Testing Methods: (list methods and number of tests)
- | | | | |
|------------------|-------|-----------------|-------|
| Unsaturated Zone | _____ | Number of tests | _____ |
| | _____ | Number of tests | _____ |
| | _____ | Number of tests | _____ |
| | _____ | Number of tests | _____ |
| Saturated Zone | _____ | Number of tests | _____ |
- 6) Laboratory Analytical:
- | | | |
|---------------|--------------------------------|-------|
| Soil Samples | Collection Equipment | _____ |
| | Analytical Methods | _____ |
| Water Samples | Collection Equipment | _____ |
| | Analytical Methods | _____ |
| | Laboratory to Conduct Analysis | _____ |
- 7) Waste Handling Procedures - Briefly describe how soil and water waste will be handled, treated, or disposed of:
- Soil _____
- Water _____
- 8) Decontamination - Briefly describe decontamination equipment, methods and procedures to be employed:
- _____
- _____
- _____

III Site Maps, Photos and Site Conceptual Exposure Model

Note: All maps and photos must include a scale, north arrow and legend.

1) Attach a copy of a U.S.G.S. 7.5 minute quadrangle, scale 1:24,000, which depicts the general site location and the 1 mile radius area surrounding the site. The site must be highlighted or outlined for delineation.

- 2) Prepare and submit with this worksheet three site maps in accordance with and containing the following information:
- A One site map will be a detailed site map with a scale such that 1 inch is less than or equal to 50 feet for smaller sites and 1 inch is less than or equal to 100 feet for larger sites.
 - B The second site map will depict the site including a minimum 350' radius from the release with an approximate scale of 1" = 100'. The third site map will depict the site the site including a minimum 500' radius from the release with an approximate scale of 1" = 125'. Both maps will include the general use of surrounding properties identified; i.e., residential, industrial business (indicate what type - fast food, service stations, etc.). List owners names relative to off-site properties.
 - C Site property boundaries, buildings or other fixed objects, and street names.
 - D Tanks, lines, and pump islands, currently or formerly located at the site.
 - E General locations and depths of all utilities on and adjacent to the site from visual survey of site.
 - F If a Geoprobe Survey is requested: Proposed probe locations for at least the "Groundwater Contamination" scope of work. Include existing wells within 350' from the source. All wells should be designated in accordance with previous reports if available.
 - G If a Geoprobe Survey is not requested: Proposed boring and monitoring well locations instead of proposed geoprobe points must be indicated.
 - H Accessible easements within the specified area.
 - I Arrow depicting groundwater flow direction.
- 3) Include the most recent aerial photograph available showing the site location and the specified area; the maximum scale of the aerial photograph shall be 1 inch = 250 feet. The aerial photo must be an original print, a high quality color copy of an original print, or a blue-line. Prominent features (buildings, storage tanks, pump islands, existing wells, etc) should be denoted on the aerial photograph.
- 4) Include current photographs as stated in 4.2.1 under Section 4.0, Deliverables in the LSA RFP.
- 5) Include site conceptual exposure models for current and future on site and off site conditions as described in Section 3.6 of the KRBCA Manual and Attachment B of the Limited KRBCA Report Format.

IV Field Personnel / Health and Safety Plan

List below the consultant's personel and any subcontracting firms that will be involved in the investigation. Indicate each individual's name and position title (attach an additional sheet if necessary). If resumes documenting education, experience, and safety training certification have not been provided with the original bid package for all those listed, submit this information with this worksheet.

Name	Position Title	Name	Position Title
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Indicate whether a Health and Safety Plan has been prepared for this investigation: Yes _____ No _____

ATTACHMENT B
SITE CONCEPTUAL EXPOSURE MODELS

SITE CONCEPTUAL EXPOSURE MODEL - Current Conditions

Current On-Site		Subsurface Soils	Groundwater	
	Surficial Soil			
Receptor	Outdoor Inhalation of Vapors & Particulates, Dermal Contact and/or Accidental Ingestion	Indoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Provide Justification
Resident Child				
Resident Adult				
Commercial Worker				
Construction Worker		NA	NA	

Current Off-Site		Subsurface Soils	Groundwater	
	Surficial Soil			
Receptor	Outdoor Inhalation of Vapors & Particulates, Dermal Contact and/or Accidental Ingestion	Indoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Provide Justification
Resident Child				
Resident Adult				
Commercial Worker				
Construction Worker		NA	NA	

Place a mark in the box if the Exposure Pathway is Complete for each Receptor, and provide Justification.

Provide Justification for Incomplete Pathways.

Surficial soils = 0-1' for Resident Adult & Child, and the Commercial Worker.

Surficial soils = 0-10' for the Construction Worker.

Subsurface soils = 1' to top of the capillary fringe for the Res Adult & Child, and the Commercial Worker.

Groundwater Resource Protection Pathway is always complete.

Add footnotes if needed.

SITE CONCEPTUAL EXPOSURE MODEL - Future Conditions

Future On-Site				
	Surficial Soil	Subsurface Soils	Groundwater	
Receptor	Outdoor Inhalation of Vapors & Particulates, Dermal Contact and/or Accidental Ingestion	Indoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Provide Justification
Resident Child				
Resident Adult				
Commercial Worker				
Construction Worker		NA	NA	

Future Off-Site				
	Surficial Soil	Subsurface Soils	Groundwater	
Receptor	Outdoor Inhalation of Vapors & Particulates, Dermal Contact and/or Accidental Ingestion	Indoor Inhalation of Vapor Emissions	Indoor Inhalation of Vapor Emissions	Provide Justification
Resident Child				
Resident Adult				
Commercial Worker				
Construction Worker		NA	NA	

Place a mark in the box if the Exposure Pathway is Complete for each Receptor, and provide Justification.

Provide Justification for Incomplete Pathways.

Surficial soils = 0-1' for Resident Adult & Child, and the Commercial Worker.

Surficial soils = 0-10' for the Construction Worker.

Subsurface soils = 1' to top of the capillary fringe for the Res Adult & Child, and the Commercial Worker.

Groundwater Resource Protection Pathway is always complete.

Add footnotes if needed.

ATTACHMENT C
LIMITED KRBCA SIGNATURE SHEET

Kansas Department of Health and Environment

Storage Tank Program

Limited KRBCA

Signature Sheet

KDHE Project Code: _____

Facility Name: _____

Facility Address: _____

Facility I.D.: _____

Signature:

Date:

Signature must have certificate on file with KDHE verifying the completion of a Risked Based Corrective Action (RBCA) program conducted by an ASTM (American Society of Testing and Materials) certified trainer.