

Environmental Services Contract – Module A

Specific Task Requirement Guidance

- **Surveying**
- **General Remediation Implementation**
- **Utility Connections**
- **Soil Vapor Extraction Testing**
- **SVE/AS Remedial Startup**

The following is provided as general guidance for how standard activities should be performed. The Vendor may submit alternative procedures for pre-approval by KDHE. Alternative procedures should meet the general intent of the guidance provided below. Requirements from the Kansas Board of Technical Professions or any federal, state or local laws/codes/etc. shall take precedence over this guidance document.

Module A Specific Task Requirements

Surveying

The Vendor shall have the capability of conducting surveying in accordance with the following requirements. A Kansas Registered Land Surveyor must complete all surveying, unless approved otherwise by the KDHE Project Manager. All surveys will be conducted in accordance with Kansas Administrative Regulation K.A.R. 66-12-1.

Vertical Datum: The vertical datum for all survey work performed shall be the National Geodetic Vertical Datum 1988 Adjustment (NGVD88). All vertical control work shall commence and end at a survey monument with an elevation set per the National Geodetic Survey standards.

Standard monitoring well/direct push/borehole/surface soil sampling location surveys may be conducted for vertical elevations (reference to mean sea level elevation) of prescribed features. The top of casing (TOC) will be permanently marked and documented to show the original surveyed point. Documentation to be submitted from the survey will include, but will not be limited to: all field notes, identification of feature, ground elevation, top-of-casing (measuring point) elevation, and identification of the datum, corner, and permanent monument information used to conduct the survey. The site survey map must bear the signature and seal of the RLS. A copy of the survey field notes must be included in the survey report.

Vertical elevation surveys shall meet Standards set by the Federal Geographic Data Committee (FGDC). Proper QA/QC, such as a survey loop closure on to known permanent benchmarks, must be conducted to ensure closure accuracy is fully documented.

A site benchmark will be established. The site benchmark will be sited within the property boundaries of the facility under study. The site benchmark will be a **permanent** mark (survey bolt, cross-cut, etc.) on a **permanent** site structure, such as a building foundation or placed in a new concrete monument set to 42" below grade. Concrete pads or survey pins associated with wells or soil borings cannot be used as the site benchmark.

Accuracy Standard: Elevations for all concrete monuments shall be determined to an accuracy standard equal to third order classification as defined by the Federal Geodetic Control Committee. All field techniques and procedures shall be compatible with the equipment utilized to insure that a true third order accuracy level is achieved.

The KDHE Project Manager may request Cadastral Land Surveys. Cadastral surveys will include surveying of site boundaries, topography, site drainage features, utilities, easements, buildings (exterior dimensions at ground level), other surface features, etc. The cadastral survey will include development of a base map or plat with contours and site features, boundaries, drainage, buildings/foundations, temporary and permanent benchmarks, monuments, other surface features, etc. This base map will be required in paper and electronic form. A memorandum/report will also be required for each surveying project including the following elements: chronologic summary of office and field activities; surveyor's field notes, instrument calibration notes, etc.; datum corner and permanent monument information used to conduct the survey, field observations, and any other drawing, documentation, etc., utilized to conduct the survey.

The Vendor, or approved subcontractor, shall have the capability of performing horizontal coordinate (latitude and longitude) surveys using Global Positioning Satellite (GPS) technology. The application, methodology and equipment, and the degree of accuracy will be determined on a site-specific basis, but typically will be within +/- 3 meters.

Module A Specific Task Requirements

General Remediation Considerations

KDHE has completed the installation of remediation systems at numerous sites across Kansas. The following general considerations are provided to assist the Vendor with ensuring key details are not overlooked in the bid. This list is not all-inclusive and the Vendor is still responsible for including all cost needed to complete the scope of work.

1. **Damaged Utilities:**

- 1.1. Located or marked utilities damaged by the Vendor, or their subcontractors, during any activity over the lifetime of the contract, will be repaired by the Vendor. All repairs must be made by a qualified, bonded, licensed professional, and must be completed in a time frame agreeable to the affected party and the utility. Losses including business costs, hours of operation, equipment malfunctions, decrease in staff hours, etc. will be the responsibility of the Vendor.

2. **Documentary Photographs:**

- 2.1. Include digital photographs depicting the site before any construction activities, during construction of the remedial systems, trenching, the site after system installation and property restoration, key components of the remedial systems such as vapor extraction equipment, equipment housing or containment, soil treatment locations, etc. The photographs must provide a general perspective of activities conducted during implementation and the site appearance as it will remain during the remedial project. Each photo must be labeled and correlated to an index which contains a brief description of subject of the slide and directional orientation of the view. Digital documentary photographs will be submitted in both hard and electronic copy (e.g. CD) in the RAR.

3. **On-site waste management**

- 3.1. **Trash:** The bidder is responsible for disposal of all remediation-derived trash and waste, including C&D from pavement removal. Soil and water is excluded unless specifically identified in the bid scope of work. All trash shall be properly disposed. On-site dumpsters are not for construction use unless specifically negotiated with the owner prior to your submitting a bid.
- 3.2. **Soil:** Soil from borings, excavations, etc. shall be properly managed so as not to interfere with on-going activities. KDHE recommends the use of roll-off containers vs. drums whenever possible. All soil shall be placed on and covered with plastic if placed in a stockpile (roll off or on the ground.) Soil segregation shall be conducted in accordance with the Remedial Design. Please ensure the waste can be removed from the site in a timely manner. At times the soil may need to be removed prior to completion of the trench so plan accordingly.

4. **Surface Water Runoff:** Surface water runoff should be diverted from open trenches, including water from downspouts on nearby buildings.

5. **City Requirements**

- 5.1. Some cities have additional requirements for traffic control, backfill in city right-of-way, pavement replacement, permits, etc. Please ensure all specific city requirements are considered when providing bids. All permits and approvals shall be secured in an expeditious manner to keep the project on track.

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6. Pavement Replacement

- 6.1. Proper compaction and pavement replacement will inhibit settling and/or cracking of the replaced concrete. Unless stricter requirements are detailed in the CAP/CAWP, the pavement shall be cut back a minimum of 12-inches from the edge of trench (as determined after backfilling). Rebar shall be doweled into the existing pavement and set on staggered 24-inch centers. Rebar in the replacement concrete shall be on 12-inch centers to tie into the 24-inch staggered dowels noted above.

7. Communication/Updates

- 7.1. KDHE requests frequent updates and advance notice for certain phases of the project. Examples include trenching, pipe placement/pressure testing, system startup/testing, etc. KDHE will provide an after-hours phone number for our project manager, which will allow the Vendor to contact us if problems arise.

8. Private Utility Locates

- 8.1. Utilities on private property must be located in addition to the general One-Call utility locate. A private utility marking company must locate these utilities prior to initiating site activities. Ideally the contractor should have located all private utilities prior to the design, but the site map should not be relied on as 100% complete. Private utilities should be treated in the same manner as the One-Call utilities with respect to allowable time frame between locates.

Module A Specific Task Requirements

Utility Connections

Communications for a Remedial Unit

- 1.1. KDHE must have to following information:
 - 1.1.1. Type of service required: land line for phone; cell phone; special cable hookup, etc.
 - 1.1.2. Site name and site ISL #.
 - 1.1.3. Site address where unit is located. (City & street number.)
 - 1.1.4. Accurate description of the location of the trailer or shed on the site property.
 - 1.1.5. Location of the control panel on the trailer or shed.
 - 1.1.6. Will a jack need to be installed in the control panel?
 - 1.1.7. Name and phone number of an on-site contact person who is available during normal working hours and knows where the communications line is to be installed. (This could be the owner/operator, their on-site representative or the Vendor's installation foreman)
 - 1.1.8. Any special instructions the communications company may need to complete the installation.
- 1.2. E-mail the above information to the KDHE Project Manager.
- 1.3. Allow at least 10 working days for the installation to be completed.

Electrical for a Remedial Unit

- 2.1. Site specific bids shall include:
 - 2.1.1. Equipment, supplies, and labor costs to install and hook up the electrical system from the electrical meter to the remedial system control panel to make the remediation system(s) operational.
 - 2.1.2. Costs associated with providing the required information to the power utility, arranging for installation of the electrical service, and setting up billing as outlined below.
- 2.2. The work must be performed in accordance with the Remedial Design. Final electrical hookup requires the services of a licensed electrician.
- 2.3. The utility's charge for setting power pole(s) (if required) and electric meter will be invoiced directly to the KDHE Program by the electric utility.
- 2.4. The electrical meter will be installed as close as possible to the remedial trailer.
- 2.5. Prior to bidding, it is Vendor's responsibility to evaluate site conditions which may affect power pole location.

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- 2.6. It is Vendor's responsibility to insure that the electrical meter is connected to a power supply of the appropriate phase and voltage required to operate the remedial system.
- 2.7. The form below must be completed to the extent that the electric utility can install the appropriate power and meter at the correct location.
 - 2.7.1. Information from the completed form will be submitted to the electric utility by Vendor.
 - 2.7.2. After contacting the electric utility, Vendor will contact the KDHE Project Manager via email supplying names and phone numbers of contacts at the utility.
 - 2.7.3. KDHE will then contact electric utility to authorize the service requested by Vendor.
 - 2.7.4. All utility bills must be addressed to:

KDHE – BER
Attn: ESC Contract Administrator
1000 SW Jackson St., Ste. 410
Topeka, Ks 66612-1367

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Module A Specific Task Requirements

ESTABLISH ELECTRIC SERVICE FORM

for

Kansas Department of Health and Environment

Date:

Name of Electric Utility:

Department: Engineering Department / Billing Department

Address:

City/ZIP Code:

Contact/Phone Number:

Trust Fund Project Name:

KDHE Project Code:

Address:

City/ZIP Code:

Detailed description of where the electric service should be located:

Electrical Service Requirements

Phase:

Voltage:

On site contact for electric service:

Phone:

Date service needed:

Special instructions to facilitate electrical hook up:

Module A Specific Task Requirements

Trenching & Piping Considerations

1. Trenching and Piping

- 1.1. All trenching and piping activities must adhere to the specifications in the approved Remedial Design. Photo documentation is required for all remedial installation activities. Photos must include overall and close-ups of piping installations to ensure proper bedding (sand) materials.
- 1.2. All plumbing lines will be imbedded in sand backfill with a minimum of six (6) inches below the pipes. Sand will also be placed in two 6 inch layers above the pipes totaling a minimum of twelve (12) inches above the highest horizontal pipe. The sand backfill shall be compacted with a mechanical compactor capable of compacting the sand backfill to a minimum of 90% of the maximum standard Proctor density. The remainder of the backfill will be filled with flowable fill. All flowable fill must adhere to all applicable ASTM standards and comply with the Kansas Department of Transportation Special Provisions to the Standard Specifications, 1990 Edition, Section 800 (90P-188-R2).
- 1.3. If the system is being installed at a property that is currently in operation, the Vendor will furnish appropriate protective covering for the trench system for continued vehicular and pedestrian traffic flow to minimize impacts to the business. For these traffic areas, a minimum of 3/4 inch plate steel, or thicker where necessary due to the width of the trench, will be used to cover the trench when not being worked on during construction and completion activities. When in the process of installation, adequate barricades shall be provided. For areas not subject to traffic, the trenching should be suitably barricaded to prevent inadvertent access to the trench by pedestrians. Vendor must adhere to all OSHA regulations pertaining to trenching and protective covering.
- 1.4. Prior to filling and compaction, a piping survey will be conducted to ensure that the slope of the piping is sufficient to allow condensates to drain back into the well. The survey will consist of (at a minimum) two points of each end of each leg of the system for those runs less than 50 ft. in length. For runs greater than 50 ft., an additional survey point located equidistant between the two end points must be included. For runs greater than 100 feet in length, an additional survey point shall be located every 50 feet or equidistant as appropriate. A trenching/ piping map including a profile for piping and slope verification, will be included in the CAR.
- 1.5. All trenching information including slope measurements and pipe pressure testing values will be recorded in the field notes and provided to KDHE in the CAR.
- 1.6. All trenching, piping, compaction, pressure testing, and the resulting survey must be overseen and subsequent drawings signed, dated, and stamped by a P.E. Licensed by the State of Kansas as per KAR-66-6-1 et seq.

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- 1.7. Pressure testing of all underground AS/SVE system components include, but are not limited to, pipe, elbows, tees, etc. shall be subjected to a positive pressure test prior to the replacement of the trench final cover. Pressure testing of all SVE/AS lines will be conducted prior and post backfilling of trenches and/or excavated areas. Pipe segments shall be left exposed for pressure testing unless the installation Vendor determines partial backfilling is required for safety. At a minimum, the test will require both ends of the line segment to be sealed before pressurizing to the lesser of 20 psig or one and a half times the system design pressure using a portable air compressor or air tank. The duration of each pressure test shall be at least 10 minutes. The source of pressure should be isolated before conducting each pressure test. Pressure shall be measured every minute with a suitable pressure device calibrated to within plus or minus 10 percent of the original test pressure over the duration of the test, then the segment will be determined to have passed. Partially covered line segments failing the above pressure test protocol will need to be uncovered to expose the piping and joints for inspection prior to re-testing. Joints shall be tested by means of soap and water or an equivalent nonflammable solution in order to identify areas of leakage for repair. Final backfilling activities should not commence until all AS/SVE flow lines in the trench have passed the pressure test and the slope of each SVE line has been verified. All system testing shall be done with due regard for the safety of employees and the public.
- 1.8. All remedial piping, trenching, and new well completions must remain in good condition for the life of the project. The Vendor will be responsible for the repairing/replacing of all failed trenching/new well completions.

Module A Specific Task Requirements

Soil Vapor Extraction (SVE) Testing

The Vendor shall have the capability of performing various vadose zone tests to determine appropriate remedial methods for remediation of soil and vadose zone contamination. General specifications for standard in situ testing, Soil Vapor Extraction (SVE) testing, are provided below. The Vendor must define the need for a subcontractor for this type of work (including the name and qualifications of the subcontractor).

If specified, the Vendor will install soil vapor extraction (SVE) test well(s) and SVE observation wells, each well having a minimum inside diameter (I.D.) casing of two inches or larger. The well(s) must be completed in accordance with procedures for drilling and well installation specified in this RFP.

The SVE test will typically be conducted for a time period of *at least* eight hours.

At the start of the SVE test, every three hours thereafter, and immediately prior to termination of SVE testing, representative air samples will be collected from the air effluent for laboratory analysis.

Air samples will be collected for field analysis once every hour during the SVE test and analyzed using a photoionization detector, organic vapor analysis device (i.e. FID, PID, ECD), colorimetric tubes, or other field testing equipment approved by KDHE.

The Vendor will determine the following unsaturated zone characteristics: permeability of soils to air, vapor flow rate, radius of influence, effluent contaminant levels, and the feasibility of *in situ* soil remediation techniques at the site.

If an SVE test well or observations wells are installed, the well gravel pack and screen must be sized, and located, to insure the characteristics of the unsaturated zone are determined during the test. The SVE wells will be grouted with neat cement.

If an SVE test well or observation wells are installed, the wells shall be installed in the area determined to be the highest level of soil contamination.

The SVE test shall be conducted in such a manner that all specified unsaturated zone characteristics are fully determined

Module A Specific Task Requirements

SVE/AS Remedial System Startup

KDHE requests the use of standardized startup procedures for air sparge (AS) and/or soil vapor extraction (SVE) systems. This startup procedure ensures that each remediation line is evaluated prior to placing the system into full operation. The procedures should be used regardless of whether the equipment is new or brought in from another site.

- 1) **Pre Startup:** Prior to commencing startup, discuss with KDHE in detail the final start-up plan for the remedial system.
- 2) **Baseline:** The Project Engineer shall provide a baseline table in the Remedial Action Report (RAR) for each component of the remedial system placed into service during start-up. It will be the responsibility of the consultant's project engineer to ensure that all components of the remedial system are operating at safe conditions. The report's baseline table and text shall include:
 - a. Water Levels: Record of all water level measurements prior to system start up.
 - b. Data Analysis: The baseline testing will be the only opportunity for the project engineer to assess the air sparge portion of the system so it is imperative that a thorough analysis of data be performed prior to placing the remedial system into continual service.
- 3) **Soil Vapor Extraction:** At startup of the SVE system, each SVE well shall be isolated for purposes of recording the following baseline data:
 - a. Field effluent concentrations at individual SVE legs and from the entire system using a photoionization detector (PID).
 - b. Air flow rate at individual SVE legs and overall system flow.
 - c. Vacuum readings of individual manifold legs and wellhead readings.
 - d. Observation well vacuum readings for radius of influence (ROI) estimates.
 - e. Individual SVE well ROI's are to be determined by recording vacuum responses at all properly screened wells located within the estimated ROI determined during pilot testing or based on knowledge of the area geology. It is important that no baseline data be collected until observation well vacuum response data is indicative of equilibrium conditions. Radial distances between individual extraction and observation wells must also be recorded in the field notes. This information will be used to prepare a comprehensive SVE ROI map based on individual SVE well baseline data. At a minimum, the SVE baseline reporting section of the RAR is to include a summary of collected data in tabular form, a comprehensive SVE ROI map and a brief discussion of system adjustments (i.e. flow-balancing, flow, pressure measurements, vapor concentration readings, etc.) made to optimize contaminant removal.

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- 4) **Air Sparge:** At startup of the AS component record the following data while operating in conjunction with the SVE system:
- a. Calculate the pressure necessary to displace the water column in each air sparge well to the top of the screened interval (**the minimum theoretical injection pressure.**) This pressure calculation is only an estimation.
 - b. Line integrity and actual breakthrough pressure for each air sparge well must be determined by the following method.
 - Start the sparge system with one branch of the split air sparge manifold at design operating pressures and flow rates. Record pressures from each line at the manifold and at the wellhead with the digital manometer.
 - Isolate one line of the branch by closing the valve at the manometer. Record the line pressure at the manifold when the pressure in the line stabilizes.
 - Observe the closed line pressure over a period of 5 minutes. Record the pressure in one-minute intervals over the 5-minute test (**shut-in test**) using the digital manometer.
 - Slowly open the valve and record the pressure when measurable airflow resumes (**breakthrough pressure**).
 - With the digital manometer, measure and record pressure at the wellhead.
 - Repeat this test for each line on this branch of the manifold.
 - Switch to any other branch of the manifold and repeat the process for each line on that branch.
 - c. **AS Analysis:**
 - Note any airflow prior to breakthrough pressures for each line. This could be indicative of a line leak.
 - Compare the minimum theoretical injection pressure to the observed stable pressure from the shut-in test (shut-in pressure) on each well. A continual drop of the line pressure below the minimum theoretical injection pressure indicates that the line is leaking.
 - Compare shut-in pressure to actual breakthrough pressure. The breakthrough pressure must be equal to or greater than the theoretical pressure.
 - For each sparge line, plot pressure vs. time for each five-minute shut-in test. A pressure loss of greater than 10% during the test, for any individual line will be considered a failure and must be brought to the attention of the KDHE Project Manager for further evaluation and possible remedy.
 - Compare manifold vs. wellhead readings.
 - Dissolved oxygen (DO) measurements will be collected at all on-site monitoring wells that intersect the water table.