

PETROLEUM STORAGE TANK RELEASE TRUST FUND

REMEDIAL DESIGN PLAN

REQUEST FOR PROPOSAL

REVISION 10, 05/12



**Kansas Department of Health and Environment
Bureau of Environmental Remediation
Storage Tank Section
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367**

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SECTION 1.0 PROPOSAL PROCESS INFORMATION

1.1 PURPOSE - On behalf of the Owner/Operator (O/O), the Kansas Department of Health and Environment (KDHE) is soliciting bids from qualified Vendors to develop a Remedial Design Report/Remedial Design Plan (RDR/RDP) to mitigate contaminants identified in previous site investigations.

1.2 OBJECTIVES

1.2.1 To provide information necessary for the preparation of competitive proposals by qualified Vendors.

1.2.2 To provide for a fair and objective evaluation of proposals.

1.2.3 To result in a contract between the O/O and Vendor to provide the services as described in Sections 3.0 and 4.0 of this Request for Proposal (RFP).

1.3 DEFINITIONS

1.3.1 Corrective Action means all action necessary to contain, collect, control, identify, analyze, clean up, treat, disperse, remove, or dispose of soils and groundwater contaminated by a release of petroleum products from a storage tank.

1.3.2 Field Geologist

This position works under the direct supervision of Vendor's designated "Project Geologist". Minimum qualifications for this position are:

- 1) A Bachelor of Science degree in Geology from an accredited four year college or a related degree with a minimum of 30 semester hours of geologic course work.
- 2) Has overseen drilling activities and has described and recorded the subsurface lithology during the drilling of at least 21 boreholes.
- 3) Has performed a minimum of 3 successful soil vapor extraction/air sparge tests of at least 8 hour duration per test.
- 4) OSHA 40-Hour Hazardous Material training and annual 8-Hour Refreshers.
- 5) Knowledge of EPA/KDHE sampling protocol.

1.3.3 Vendor

This is any person (individual, partnership, association or corporation) who is seeking or is chosen to enter into a procurement contract with the O/O.

1.3.4 KDHE Project Manager

This position is the KDHE staff geologist/environmental scientist designated to be the lead technical interface with Vendor.

1.3.5 Owner/Operator

This term describes the person or corporation that entered into the Underground Fund Consent Agreement with the KDHE. This party will contract with the successful Vendor to accomplish the remedial action.

1.3.6 Project Geologist

This position is the designated supervisor of Vendor's "Field Geologist(s)". Minimum qualifications for the Project Geologist are:

- 1) Having the minimum qualifications for a Field Geologist.
- 2) Currently a Licensed Geologist in the State of Kansas.
- 3) OSHA 40-Hour Hazardous Material training and annual 8-Hour Refreshers.
- 4) Knowledge of EPA/KDHE sampling protocol.

The Project Geologist is responsible for the preparation and certification of all geological information in reports and on maps.

1.3.7 Project Engineer

This position is the person designated by Vendor to develop the RDR and RDP. The minimum qualifications for this position are:

- 1) Currently a Licensed Professional Engineer in the State of Kansas.
- 2) Has successfully designed a minimum of five remedial systems that are similar to the type(s) specified in this RFP.
- 3) The five designs have been implemented and they are or have been successful in remediating the contamination.
- 4) OSHA 40-Hour Hazardous Material training and annual 8-Hour Refreshers
- 5) Knowledge of EPA/KDHE sampling protocol.

1.3.8 Technician

Vendor representative qualified to perform certain on-site activities as specified in the RDP RFP. Minimum qualifications are:

- 1) OSHA 40-Hour Hazardous Material training and annual 8-Hour Refreshers.
- 2) Knowledge of EPA/KDHE sampling protocol.
- 3) Experience in collecting groundwater samples for laboratory analysis from at least 30 monitoring wells.

1.4 INQUIRIES

1.4.1 All written inquiries concerning this RFP must be submitted to:

Petroleum Storage Tank Release Trust Fund
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367
Attn: KDHE Project Manager Fax: (785) 296-6190

1.4.2 All inquiries must be received no later than one week prior to the bid deadline.

1.4.3 Answers to all written questions requiring clarification to this RFP will be distributed to all participating prospective Vendors.

1.4.4 In all cases, no verbal communication will override written communications and only written communications are binding.

1.5 REVISIONS TO THE RFP- In the event it becomes necessary to revise any part of this RFP, revisions will be provided in writing to all Vendors.

1.6 SUBCONTRACTORS- If Vendor intends to subcontract any part of the work to be performed under this RFP, Vendor must include in its proposal a complete list of potential subcontractors and a description of the work which will be subcontracted. Vendor is responsible for assuring the subcontractors possess all licenses and certifications for the services they will provide.

1.7 SUBMISSION OF PROPOSAL- Vendor's sealed proposal must be received by the Petroleum Storage Tank Release Trust Fund no later than 3:00 p.m. on the date specified in the PROJECT BID PROPOSAL SHEET. Proposals should be addressed to:

Petroleum Storage Tank Release Trust Fund
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367
Attn: Storage Tank Section

The proposal must include costs for all tasks necessary to complete the specified scope of work in accordance with all requirements outlined in the RFP.

1.7.1 The outside of the envelope should be marked “**SEALED BID**” in bold lettering. The bid number(s) of the enclosed bid(s) must be displayed on the outside of the envelope. All bids sent in the same envelope must have the same bid deadline. Failure to properly mark the outside of the envelope may result in the bid(s) being disqualified.

1.7.2 Late proposals will not be opened. A letter notifying Vendor, and documentation that the proposal was received after the deadline, will be mailed to Vendor. The proposal will be stored in KDHE files for a period of one year beyond the closing date for the bid.

1.7.3 KDHE and/or the O/O will not pay for any information herein requested, nor are they liable for any costs incurred by Vendor to prepare or submit a proposal.

1.7.4 Proposals must be in duplicate and include the following completed documents in the order listed below:

- 1) Exhibit 2 Project Bid Summary Sheet (multiple site bids only).
- 2) Bid Proposal Cover Sheet with Vendor Information.
- 3) Exhibit 2 Project Bid Proposal Sheet(s). Vendor’s name must appear at the top of each sheet in the designated place.
- 4) List of all proposed subcontractors, major equipment suppliers, and analytical laboratories.

For multiple site bids, keep the Bid Proposal Cover Sheet and Exhibit 2 Project Bid Proposal Sheet(s) together for each site.

Proposals must be neat and legible. Proposals that are not properly submitted and/or are not complete will be disqualified.

- 1.8 WITHDRAWAL OF BIDS-** A Vendor may withdraw a bid at any time prior to the scheduled closing time for receipt of proposals.
- 1.9 PROPOSAL OBLIGATIONS-** The contents of the proposal and any clarification thereto submitted by the successful Vendor shall become part of the contractual obligation and will be incorporated by reference into the ensuing contract.
- 1.10 TERM OF PROPOSAL-** All proposals shall be firm for a period of ninety (90) days after the proposal due date to allow time for evaluation of all proposals and to make an award.
- 1.11 DISPOSITION OF PROPOSALS-** All proposals become the property of the State of Kansas upon receipt and will not be returned to Vendor. The State of Kansas shall have the right to use or adapt all ideas contained in any proposal received in response to this RFP. Selection or rejection of the proposal will not affect this right.
- 1.12 NOTIFICATION OF APPROVED COSTS-** After evaluation of the proposals, Vendors who submitted proposals will be notified in writing of the approved costs for the project.
- 1.13 EVALUATION CRITERIA-** Proposals will be evaluated on: (1) Vendors total cost as submitted on Project Bid Proposal Sheets, (2) experience, (3) expertise, and (4) past performance on KDHE Trust Fund sites. The final determination of approved costs for the project will be in the best interest of the O/O and KDHE.
- 1.14 CONFLICT OR AMBIGUITIES-** Vendors shall notify KDHE immediately if conflicts or ambiguities are found in the Request for Proposal. Failure to do so prior to the specified closing date may result in these items being resolved in a manner deemed to be in the State's best interest as judged by the KDHE Underground Storage Tank Staff.
- 1.15 PRE-CONTRACT SUBMITTALS-** Prior to signing a contract, in order to be eligible for reimbursement, Vendor is required to submit each item requested in the order and format provided below. Certain items (*) will remain on file with KDHE and, once submitted, re-submittal will be necessary only when changes are made. Vendor must specifically state each item omitted from the submittal package and include an explanation. Submit two copies of the Project Bid Proposal Sheets (Exhibit 2), with Project Information Sheets attached.
 - 1.15.1** A cover letter from Vendor itemizing submitted documentation.

- 1.15.2** Completed Project Bid Proposal Sheets.
- 1.15.3** Copy of Insurance Certificate (specimen copy).
- 1.15.4** Standard Operating Procedures for the following technical procedures:
 - 1.15.4.1** Drilling and decontamination procedures*
 - 1.15.4.2** Procedures for field analysis of samples*
 - 1.15.4.3** Laboratory sample collection and handling methods*
 - 1.15.4.4** Well development procedures*
 - 1.15.4.5** Waste handling and disposal methods*
 - 1.15.4.6** Unsaturated zone test methods description*
 - 1.15.4.7** All other technical procedures described herein or proposed by Vendor
- 1.15.5** Resumes with documentation and OSHA safety training certification of personnel proposed for the project (see Section 1.3 for detailed requirements).
- 1.15.6** Complete list of equipment*
- 1.15.7** Drill Rig Specifications*
- 1.15.8** Quality Assurance and Quality Control (QA/QC) plan*
- 1.15.9** Field safety plan
- 1.15.10** Workers Compensation Log & Summary of Occupational Injuries & Illness (OSHA form G300A)
- 1.15.11** Completed W-9
- 1.15.12** List of all sub-contractors with a description of their duties and, if applicable, copies of their OSHA safety training certificates. If the sub-contractor is to serve as Vendor's Project Geologist or Project Engineer, a copy of their resume is to be submitted to KDHE indicating their qualifications as outlined in Section 1.3.9.

SECTION 2.0 CONTRACT INFORMATION

2.1 PURPOSE- This section will outline the type of contract contemplated and will set forth contract clauses that need to be contained in any resultant contract.

2.2 CONTRACT DOCUMENT

2.2.1 The Contract between the O/O and Vendor shall consist of, at a minimum, the following:

- 1) This RFP and any amendments thereto,
- 2) Vendor's proposal submitted in response to the RFP, and
- 3) The Owner/Operator Standard Contract (see ATTACHMENT A) or equivalent.

2.2.2 For the purpose of contract uniformity, the Owner/Operator Standard Contract (ATTACHMENT A) in this RFP should be used.

2.2.3 In the event of any inconsistency or contradiction between this RFP and Vendor's proposal and/or contract form, the provisions of this RFP are controlling.

The O/O and Vendor are to enter into the contract within 14 days following the approval of the costs. A copy of the Owner/Operator Standard Contract or equivalent must be forwarded to KDHE as soon as it is signed by both parties.

2.3 RESPONSIBILITIES

2.3.1 The O/O is responsible for assuring that all work is conducted in accordance with KDHE specifications described in SECTION 3, 4 and 5.

2.3.2 The O/O and Vendor selected to perform this scope of work are responsible for maintaining the initial project costs approved by KDHE. Any change to the value of this contract will be in accordance with Vendor's proposed unit pricing and must be approved in writing by KDHE prior to Vendor commencing work.

2.3.3 The O/O and Vendor are responsible for securing and complying with any and all federal, State of Kansas or local permits and regulations regarding the Scope of Work defined in this RFP.

2.4 ERRORS IN PREPARATION- Vendor is responsible for any mathematical error or incorrect extension of any calculations in Vendor's price quotes. In case of discrepancies, Vendor unit cost will be multiplied by the units provided and the resultant unit price will be used in the evaluation. If there is an error in the proposal, it will be disqualified if there is a five percent or less difference between it and the next lowest qualified proposal. If the percent difference is greater than five percent, the corrected amount will be considered Vendor's submission and subject to approval.

- 2.5 CONTRACT AMENDMENTS-** Modification, amendment or any extension to a contract resulting from this RFP must be in writing. The O/O must receive prior written approval from KDHE for the changes. KDHE reserves the right to deny any modifications, amendments, or extensions.
- 2.6 COMPLIANCE WITH LAW-** Vendor agrees to comply with all applicable federal, state, and local laws, rules regulations and ordinances; and all provisions required thereby to be included herein, are hereby incorporated by reference. Vendor agrees to indemnify and hold the O/O and KDHE harmless from any loss, damage, or liability resulting from the violation on the part of Vendor of such laws, rules, regulations, or ordinances.
- 2.7 SEVERABILITY-** The invalidity in whole or part of any provision of the contract shall not void or affect the validity of any other provision.
- 2.8 ASSIGNMENT, TRANSFER, CONVEYANCE, SUBCONTRACT, AND DISPOSAL-** Vendor shall not assign, transfer, convey, subcontract, or dispose of any contract resulting from this RFP, or its rights, title, interest, or power to execute such assignments to any other person, company, corporation, or entity without the written consent of the O/O and KDHE.
- 2.9 INSURANCE-** Vendor shall maintain, at its expense during the term of the contract, the following insurance covering the services to be performed under this contract:
- 2.9.1** Workmen's compensation-statutory.
 - 2.9.2** Employers liability insurance in the minimum amount of \$500,000.00 per occurrence with a \$1,000,000.00 aggregate.
 - 2.9.3** Comprehensive general liability insurance of \$1,000,000.00 per occurrence with a \$1,000,000.00 aggregate.
 - 2.9.4** Vehicle liability (property damage and bodily injury combined) \$500,000.00 per occurrence.
 - 2.9.5** Professional liability insurance of \$1,000,000.00 per occurrence with a \$1,000,000.00 aggregate.
 - 2.9.6** The successful Vendor will provide the O/O, within twenty (20) working days of the contract signing, a certificate of insurance (Accord Form 25-S) naming the O/O as the certificate holder. The cancellation clause of the Accord Form will read as follows:

"Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 10 days written notice to the certificated holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or

representatives."

A copy of this document must be provided to KDHE within the same 20 working day time period.

- 2.10 INDEMNIFICATION-** Neither the O/O or KDHE shall be liable for any damage or compensation payable at law in respect or in consequence of any accident or injury to any worker or other person in the employment of Vendor or any subcontractor, save and except an accident or injury resulting from a willful negligent act or default of the O/O or KDHE.

Vendor shall indemnify and keep indemnified the O/O and KDHE against all such damages and compensation, save and except as aforesaid, and against all claim proceedings, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

- 2.11 LIEN RELEASE-** Provide a lien release, or written statement of no liens placed, from all Subcontractors and Equipment Vendors as an attachment to the Remedial Design Plan.

- 2.12 COMMUNICATION AND NOTICES-** Any written notice to Vendor shall be deemed sufficient when deposited in the United States mail, postage prepaid, and addressed to Vendor at its address listed on the signature page of the contract or at such address as Vendor may have requested in writing or which is hand carried and presented to an authorized employee of Vendor at its address as listed on the signature page of the contract.

- 2.13 AUDIT TRAIL-** Vendor shall retain documentation of all expenditures incurred in performing the activities required by the contract for purposes of maintaining an audit trail and shall produce such documentation to KDHE and/or O/O upon written request.

2.14 TERMINATION

- 2.14.1** Termination for cause - The O/O or Vendor may terminate the contract resulting from this RFP at any time when either party fails to carry out its obligations under the provisions of this RFP or to make substantial progress under the terms specified in the RFP and the resulting proposal and contract.

- 2.14.2** The O/O shall provide Vendor with written notice of conditions adversely affecting performance. If after such notice Vendor fails to remedy the conditions contained in the notice within ten (10) days the O/O may issue Vendor an order to stop work immediately and exercise their right to terminate the contract.

- 2.14.3** Vendor shall provide the O/O with written notice of conditions adversely affecting performance. If after such notice the O/O fails to remedy the conditions contained in the notice within ten (10) days Vendor may exercise their right to terminate the contract.

2.14.4 The O/O shall be obligated only for the services performed in accordance with the RFP specifications prior to the date of termination notice.

2.15 WAIVER- In the event of breach of contract or any provision thereof, the failure of the O/O to exercise any of its rights or remedies under this contract shall not be construed as a waiver of any such provision of the contract breached or as an acquiescence in the breach. The remedies herein reserved shall be cumulative and additional to any other remedies at law.

SECTION 3.0 **STATEMENT OF WORK**

3.1 GENERAL INFORMATION - The following information is provided to assist the O/O in obtaining proposals for the scope of work necessary to accomplish the goals outlined herein.

3.1.1 All modifications to the proposal must be approved in writing by KDHE prior to the initiation of work.

3.1.2 KDHE reserves the right to reject any modifications to proposals.

3.1.3 This contract will be discontinued or modified if KDHE determines the level of contamination or the ranking of the site does not warrant further cleanup, or if the scope of work, as defined by KDHE, changes significantly.

3.1.4 Definitions for items included on the Project Bid Proposal Sheets and other work specific terms can be found in SECTION 6.0.

3.1.5 Vendor is responsible for ensuring that work performed under this contract complies with all applicable standard operating procedures (SOPs) as included in the most recent version of the KDHE-Division of Environment Quality Management Plan (QMP) or directed by the KDHE Project Manager if it is determined by the KDHE that more rigorous operating procedures are warranted. The most recent version of the KDHE-Division of Environment QMP can be obtained from KDHE or from the KDHE website:

<http://www.kdheks.gov/environment>

3.1.6 Vendor is expected to act in a professional and respectful manner to any local and agency authorities, utility companies, and the public.

3.2 SITE SPECIFIC INFORMATION

3.2.1 Review the Site Specific Information (SSI) for each site in EXHIBIT 1. Conduct the work described therein following the requirements outlined in this document.

3.2.2 Develop and complete an RDR and RDP in accordance with all requirements

outlined in this document.

3.3 RDR EXPECTATIONS

- 3.3.1** It is the responsibility of Vendor to identify all potential source areas.
- 3.3.2** The RDR will include data collected from all investigatory and remedial work and will recommend remedial technology based upon this data. The RDR will present feasible, cost-effective technologies to aggressively address source area(s) of contamination.
- 3.3.3** The RDR will include, at a minimum, pilot test results, analytical data, cross sections, isoconcentration maps, and proposed remedial technologies with adequate documentation of remedial effectiveness and cost effectiveness. **Past experience with similar systems is not considered adequate justification for implementing a proposed remedial technology.**
- 3.3.4** All data collected during this phase of work will be evaluated by the Project Geologist, and/or Project Engineer.
- 3.3.5** The Project Geologist and Project Engineer must seal, sign and date the RDR as specified in KAR-66-6-1 et seq.

3.4 RDP EXPECTATIONS

- 3.4.1** Upon KDHE approval of the RDR, develop an RDP. The RDP must provide sufficient details such that prospective Vendors can develop a bid for implementing the remedial plan.

The RDP will include complete plans and specifications for the entire remedial system. The plans and specifications will include, at a minimum, a site plan, process and instrument diagrams, construction details including piping and trenching, electrical schematics, and all other plans and specifications that are necessary to properly construct and implement the remedial system in accordance with the RDP and in accordance with National Recognized Testing Laboratory (NRTL) and National Electric Code (NEC) Class I Division II electrical requirements.

- 3.4.2** The RDP will be developed by the Project Engineer. The Project Engineer must seal, sign, and date the RDP plans and specifications as specified in KAR-66-6-1 et seq.

3.5 PROPERTY ACCESS

- 3.5.1** Vendor is responsible for obtaining access from facility managers, lessee, and tenant, and/or current property owner, all on-site, and off-site property owners. Contact will be verbal and in writing. Written permission will be obtained from the owner of each property that will be accessed. A copy of the access agreement,

signed by both the O/O of the facility, as well as the owner of the property must be available to KDHE upon request. Copies of all property access agreement(s) must be included in the RDR.

- 3.5.2** Vendor must contact the Owner/Operator and tenant (if different) and off-site property owners, if involved in the investigation, prior to mobilizing for any field activity.
- 3.5.3** Vendor should utilize city and utility easements for off-site work, whenever possible. Written permission to perform work in city and utility easements must be obtained prior to equipment mobilization. In such cases, Vendor must obtain written permission from both the property owner and the entity granting the easement.
- 3.5.4** If authorization for property access is denied, immediately contact the KDHE Project Manager by telephone.
- 3.5.5** A compensation amount may be payable to off-site owners (see ATTACHMENT B for payment schedule). This amount will be eligible for reimbursement from the Trust Fund.
- 3.5.6** Vendor must submit a map verifying O/O (and tenant if different) approval of the location of the remedial trenching and equipment. This map will include the exact location of trenching and equipment enclosure and must be signed and dated by the O/O and/or tenant and Project Engineer and should be included in the RDP.

3.6 DRILLING EQUIPMENT AND METHODS

- 3.6.1** It is the responsibility of Vendor to evaluate the site-specific geology and other relevant information and determine the drilling method(s) necessary to meet the requirements of the contract at this site.

If changing the drilling method is necessary, Vendor will submit in writing to the KDHE Project Manager a description of the proposed change a minimum of one week prior to mobilizing. The request must be submitted under separate letter from Vendor. KDHE will review the information and provide Vendor with a written response authorizing or denying the proposed change. **All costs associated with the change will be the responsibility of Vendor.**

In some cases, wells must be completed by rotary or pier rig auger drilling methods. The prospective Vendor must factor into the bid all costs related to well completion and disposal of drilling fluids and drill cutting wastes, etc. All mobilization costs related to performing multiple drilling methods for the installation of the wells must be included.

- 3.6.2** Vendor must receive written approval of the Field Workplan Worksheet from the

KDHE Project Manager before drilling activities can begin. Subsequent changes must be approved by the KDHE Project Manager.

- 3.6.3** All wells will be drilled and constructed by a KDHE-licensed water well contractor. The wells will be constructed as per the approved Field Workplan Worksheet. (Attachments C, D and E).
- 3.6.4** A Field Geologist will be on-site and oversee all drilling activities. The Field Geologist will evaluate and record the description of the sediments, to include soil texture, grain size and shape, sorting, color, odor, staining, relative moisture (i.e. dry, moist, wet). Include field screening for contaminant distribution and other pertinent information related to the geology of the site and contamination detected during drilling activities.
- 3.6.5** Vendor will be responsible, at their costs, for replacing wells that Vendor constructed incorrectly, inadequately developed, and or improperly located.
- 3.6.6** The selected drilling methods and equipment must be capable of completing the wells to the depth required without causing the migration or dilution of contamination.
- 3.6.7** The minimum borehole diameter of any well constructed must be eight (8) inches, or four (4) inches larger than the outside diameter of the casing, whichever is larger.
- 3.6.8** For hollow stem auger drilling, the drill rig capacity must follow:

If Static Water Level (SWL) < 40 ft., a minimum of 3,000 ft-lbs torque is required.
If SWL $40 \geq 70$ ft., a minimum of 5,500 ft-lbs of torque is required.
If SWL $70 \geq 100$ ft., a minimum of 7,000 ft-lbs of torque is required.
If SWL > 100 ft., a minimum of 10,000 ft-lbs of torque is required.
- 3.6.9** All air sparge wells will be drilled by rotary drilling or hollow stem auger method unless otherwise approved by the KDHE Project Manager. The top of the screened interval shall be a minimum of five feet below the seasonal low static water table and a minimum of five feet below the depth of soil contamination. After the gravel pack is set in place, a two-foot bentonite seal using coated time-release bentonite pellets shall be placed above the gravel pack. The pellets shall be poured into the annulus between the drill stem or auger and the riser at a slow rate to ensure bridging does not take place. A tape measure with a weight on it will be used to ensure proper placement of the pellets.
- 3.6.10** Bentonite drilling mud will NOT be allowed for any remedial well. Native mud is the preferred fluid of rotary drilling however; polymer drilling materials will be acceptable providing they are both biodegradable and non-polluting. Vendor must

describe within the Field Workplan Worksheet the type of drilling fluid and the well development procedures that will be used.

3.7 DIRECT PUSH SOIL SAMPLING AND ELECTRIC CONDUCTIVITY LOGGING

- 3.7.1** Prior to drilling and installation of any wells, a direct push site assessment will be conducted. The assessment will utilize both direct push continuous core sampling and direct push electric conductivity logging. Locations for the direct push survey will be selected to both investigate potential source areas and give an overall geologic assessment of the site. The continuous core direct push survey will be conducted first. Continuous samples must be collected using a closed-piston, closed-tube or similar sampling method. Each core will be described, sampled, and logged by Field Geologist. All sampling methods and boring logs shall be performed in accordance with the latest ASTM Standards. Each lithologic/soil stratigraphic unit will be fully described on the boring log and include at a minimum: soil texture, grain size and shape, sorting, color, odor, staining, relative moisture (i.e. dry, moist, wet), field screen readings for volatile organic contaminants, and other pertinent information. A composite sample from each continuous sample sleeve will be field screened; however, changes in sediments/texture within the samples will be field screened discretely. A separate mobilization for the direct push survey is provided so that all logging will be completed and submitted to the KDHE Project Manager prior to mobilization of the drill rig.
- 3.7.2** This work may include continuous soil sampling and electric conductivity (EC) logging. Continuous samples must be collected using a closed-piston, closed-tube or similar sampling method. An electric conductivity (EC) log will be generated to verify sedimentary descriptions prior to selecting well location, screen depths, and intervals, and to identify depositional units that could pose a problem for the successful operation of the selected remedial technologies. A discrete sample will be taken to confirm the composition of any fine-grained sediment indicated by the EC probe in the saturated zone. The conductivity log will then be compared to the lithologic description generated from the continuous sampling. Any suspected anomaly between the logs must be brought to the attention of the KDHE Project Manager. Information regarding the direct push electric logging is located in Attachment F.

3.8 WELLS AND GROUNDWATER SAMPLING REQUIREMENTS

- 3.8.1** All drilling/sampling information will be recorded in the field notes.
- 3.8.2** The Project Geologist must seal, sign and date the RDR verifying that all drilling and sampling procedures were followed as specified in this RFP.
- 3.8.3** All SVE pilot test wells will be completed as four-inch wells unless otherwise approved by the KDHE Project Manager.

- 3.8.4** All wells must be securely covered until completed. Vendor will be responsible for replacing wells damaged prior to completion.
- 3.8.5** For wells with the top of the screened interval completed above the water table, the screen seal will be a two-foot layer of hydrated bentonite (granular, chips, or pellets). The seal will be hydrated with at least one gallon of water for every six (6) inches and completed in six- (6) inch lifts. For wells with the top of the screened interval completed below the water table, the screen seal will be a two-foot layer of coated bentonite above the gravel pack. In either case the pellets shall be poured into the annulus between the auger and the riser at a slow rate to ensure bridging will not take place. A weighted tape measure will be used to ensure proper placement of the pellets.
- 3.8.6** Wells where the screen seal is less than or equal to 40 feet bgs will be grouted with hydrated bentonite as described above, or with a flowable bentonite or cement bentonite grout via tremie.
- 3.8.7** All wells deeper than 40 feet bgs will be grouted by a flowable bentonite grout or cement bentonite. All grouting will be completed by pumping grout through a tremie pipe with a diameter smaller than the well casing and from the screen seal up. Hydrated bentonite (granular, chips or pellets) are NOT considered grout in wells deeper than 40 ft bgs.
- 3.8.8** It is the responsibility of Vendor to ensure that the weight and consistency of the grout is appropriate for the type of well to be installed and the depositional material in which the well is set. Deep wells must be designed and constructed so that heat distortion and grout pressure will not compromise the integrity of the well. Deeper wells must be grouted in lifts.
- 3.8.9** Any changes to this design must be approved by the KDHE Project Manager in writing, once justification has been supplied to cause a variance from the original design. Flush-mounted wells require a variance from the KDHE Bureau of Water.
- 3.8.10** All monitoring well completions less than 75 feet total depth shall be constructed using a minimum of two (2) inch inside diameter (I.D.) casing and screen unless otherwise specified in the site-specific information. Monitoring well completions at a depth of 75 feet or deeper shall be constructed using a minimum of four (4) inch I.D. casing and screen.
- 3.8.11** Although an estimated or approximate depth to groundwater has been provided, Vendor will be fully responsible for determining the actual depth to groundwater and completing the well(s) to the appropriate depth and targeted zone according to their intended purpose. It is the responsibility of the Field Geologist to complete

and screen all wells properly. Any questions concerning well completion must be brought to the attention of the KDHE Project Manager prior to well installation. Vendor will replace wells at Vendor's expense if wells are not properly located, screened, constructed or completed.

- 3.8.12** Vendor is responsible for proper development of all wells. All wells that intersect groundwater must be properly developed no sooner than 24 hours after installation and no later than 7 days after installation. Development of the well may be accomplished by the Mechanical Surging (Bailer or Surge Block) Method, or the Surge-Pumping Method. Wells that are completed in fine sand and silt sediments should be developed by a compatible method so that fine-grained materials will not accumulate into the filter pack. Well development must include documentation that a minimum of 5-10 well volumes and all silts, clays, or sediment created during the drilling process inside the casing have been removed. Failure of Vendor to properly develop any well will result in the denial of any or all costs of well installation.
- 3.8.13** All monitoring wells must be properly developed and purged prior to sampling according to the most recent Bureau of Environmental Remediation Standard Operating Procedure (BER SOP). If wells are not sampled within 24 hours following development, three casing volumes must be purged prior to sampling. Groundwater must be allowed to return to static conditions before sampling.
- 3.8.14** On newly completed SVE and AS wells, Vendor must wait a minimum of 72 hours prior to pilot testing activities.
- 3.8.15** In low-yield wells, Vendor must allow the groundwater to return to static conditions before taking a groundwater sample for analysis. If static conditions are not attained or if three well volumes of water cannot be purged before groundwater samples are taken, Vendor must document the reasons and include them as part of the field notes and on Table 3 of the RDR.
- 3.8.16** No more than two weeks prior to pilot testing, measure static water levels, and collect representative groundwater samples from all monitoring wells and water wells; e.g., public, private, etc., located within a 500-foot radius of the groundwater contaminant plume. Groundwater samples will be collected within the same sampling event.
- 3.8.17** Groundwater samples will not be collected for laboratory analysis if separate phase hydrocarbons, including sheen, are present in the well. Vendor shall document the thickness of the separate phase layer, color, odor, viscosity, and indicate the type of product suspected.
- 3.8.18** All well completion information will be recorded in the field notes and provided to KDHE.

- 3.8.19** All well abandonments and soil borings not completed as wells must follow KAR 28-30-7(d), included in ATTACHMENT G.
- 3.8.20** Digital photographs of all newly installed and abandoned wells must be submitted in the RDR. Photographs should include the horizon for orientation purposes.
- 3.8.21** Contact information for owners of all domestic wells sampled during remedial activities must be provided to KDHE Project Manager. A contact form is provided in Attachment H. A new form must be submitted to KDHE Project Manager each time the contact information changes.
- 3.9 PILOT TESTING-** Field Geologist or Project Engineer will be on site to perform all pilot testing activities.
- 3.9.1 Soil Vapor Extraction Pilot Test**
- 3.9.1.1** Test wells shall be installed in the area(s) determined to have the highest concentration of soil contamination.
- 3.9.1.2** The SVE test shall be conducted in such a manner that all unsaturated zone characteristics are fully determined.
- 3.9.1.3** Install soil vapor extraction (SVE) and observation test wells with a minimum inside casing diameter (ID) of four inches. The screen slot size and gravel pack will be sized appropriately for site conditions. The well screen interval will be installed in zones of interest, for both SVE and air sparge tests. The well(s) must be installed in accordance with the requirements outlined in Sections 3.6 and 3.8.
- 3.9.1.4** The SVE test should be conducted for a period of eight hours or as deemed necessary by Design Engineer and/or KDHE Project Manager. Where possible, several extraction wells and air flow rates / vacuum combinations should be utilized during the test. KDHE Project Manager must be notified for tests conducted less than eight hours. The reimbursement will be pro-rated to the line item for the actual length of the test.
- 3.9.15** Use the Soil Vapor Extraction Pilot Test Results table found in Attachment I to record the pilot test data.
- 3.9.1.6** The SVE test must be conducted as a step test for each well tested. The step test will progress from lower to higher applied vacuum pressures. Proposed step test parameters will be provided on the RDP Field Workplan Worksheet.
- 3.9.1.7** Determine the following unsaturated zone characteristics: air flow rate, zone of remediation (horizontal and vertical pressure gradients), effluent

contaminant levels, and the feasibility of in situ soil remediation techniques at the site. Field personnel must obtain an extracted soil gas sample upstream of the dilution valve to measure O₂ concentrations to determine if short circuiting has occurred.

3.9.1.8 Flow measurements must be taken using an in-line flow meter, pitot tube or other KDHE-approved flow measuring device. This measurement should be taken in-line, upstream of any dilution valve, vacuum relief valve, sample port, etc. Blower performance curves are not acceptable for basis of design and should be used only for comparison with field readings. All flow measurements must be reported in standard cubic feet per minute (scfm).

3.9.1.9 The dilution air flow rate will be measured and reported in the field notes and tables.

3.9.1.10 Vendor must ensure the vacuum gauges are calibrated to atmospheric conditions prior to the start of pilot testing. A background magnehelic must be open to the atmosphere to measure any changes in barometric pressure during the pilot test. Any ambient barometric pressure changes during the pilot test must be reported in the field notes and tables.

3.9.1.11 At the start of the SVE test and every two hours thereafter, (start, 2 hrs., 4 hrs., 6 hrs., 8 hrs.), or as approved by KDHE Project Manager, field personnel must collect a soil gas sample. The sample will be collected upstream of the dilution valve. Soil gas samples must be analyzed by a KDHE-approved laboratory for the constituents outlined in the Project Bid Proposal Sheet (EXHIBIT 2).

3.9.1.12 Air samples will be collected for field analysis once every hour during the SVE test and analyzed using a photoionization detector, flame ionization detector, colorimetric tubes, or other field testing equipment approved by KDHE for hydrocarbon analysis.

3.9.1.13 All samples designated for laboratory analysis will immediately, upon collection, be sealed in a laboratory approved sample container, and will be properly preserved and transported to the laboratory.

3.9.1.14 All laboratory analysis will be performed by a laboratory approved by KDHE for the specific analysis and laboratory method. **Maximum holding time for air samples is 72 hours.**

3.9.2 Air Sparge Pilot Test

3.9.2.1 Install air sparge (AS) pilot test well(s) with an inside diameter (I.D.) casing of a minimum of two inches. Air sparge injection well(s) will be equipped with a maximum screen length of 36 inches. The well must be completed in accordance with the requirements outlined in Section 3.6 with the exception that the top of the screened interval shall be a minimum of five feet below the seasonal

low static water table and a minimum of five feet below the depth of soil contamination.

3.9.2.2 Appropriately screened wells, located near the AS injection well, will be utilized to measure soil gas VOC concentration levels, pressure in the vadose zone, fluctuations in depth to groundwater and dissolved oxygen in groundwater. Air samples from each vadose observation well will be measured at least every hour for VOC concentrations using photoionization detector, flame ionization detector, colorimetric tubes, or other field testing equipment approved by KDHE.

3.9.2.3 Well screens will be installed in zones of interest for AS observation wells. Install AS observation wells within the expected radius of influence of the sparging point. To confirm that injected air is recoverable, one AS observation well will be constructed identically to the AS test well.

3.9.2.4 Use the Air Sparge Pilot Test Results table found in Attachment J to record the pilot test data.

3.9.2.5 Air flow rates must be reported in scfm. Injection pressures and observation well pressures must be reported in pounds per square inch (psi).

3.9.2.6 All receptors (e.g., existing monitoring wells, streams, ponds, utility trenches, storm sewers, basements, etc.) on or near the site will be monitored for indications of sparging effects (air bubbles, fumes, localized mounding above the sparging point).

3.9.2.7 The AS test shall be conducted for a total period of 8 hours, and shall run concurrently with SVE test or as approved by the KDHE Project Manager.

3.9.2.8 Determine the feasibility of AS by recording and evaluating the following test parameters: air-entry pressure, air-flow rate, radius of influence and vapor concentrations.

3.9.2.9 AS test wells and/or observation wells will be installed within the source area to characterize the aquifer.

3.9.2.10 AS injection well gravel pack and screen must be sized and placed appropriately to facilitate a valid test. The AS injection well gravel pack will be sealed with a minimum of two feet of coated bentonite pellets. The AS injection well will be grouted with neat cement or other grout approved by the KDHE Project Manager. All grout will be placed by the tremie method.

3.9.2.11 The AS injection test well shall be installed within the anticipated radius of influence of the SVE extraction well(s).

3.9.2.12 Air samples will be collected for field analysis once every hour during the AS test from each AS observation well and analyzed using a

photoionization detector, flame ionization detector, colorimetric tubes, or other field testing equipment approved by KDHE for hydrocarbon analysis.

3.10 FIELD AND LABORATORY SOIL SAMPLE COLLECTION AND ANALYSIS

- 3.10.1** Discrete soil samples will be collected every five feet for the first fifty feet of drilling and every ten feet thereafter using split spoon, Shelby tube, or continuous samplers. No composite samples will be allowed. All soil samples will be collected in this manner. If alternate drilling methods are approved, collection of discrete drilling samples for field screening will be left to the discretion of the KDHE Project Manager.
- 3.10.2** A heated headspace analysis will be conducted on all discrete samples collected in the field. The analysis will be conducted using a photoionization detector, flame ionization detector, colorimetric tubes or other field testing equipment approved by KDHE for hydrocarbon analysis. Field instrumentation must be calibrated according to the manufacturer's recommendations for each piece of equipment. At a minimum, each piece of equipment must be calibrated daily. Field personnel must know how to properly calibrate each piece of equipment used. Calibration records must be included in the field notes.
- 3.10.3** Each discrete sample collected for field analysis will be prepared as follows: fill a clean quart jar or a new quart-sized zipper type bag half full of the discrete sample to be analyzed, seal the jar or zipper bag and let it stand until the sample reaches a minimum of 70°F for at least 15 minutes (allowing volatilization to occur) and a maximum of 60 minutes prior to testing.
- 3.10.4** At the discretion of the KDHE Project Manager, soil samples may be collected and sent for laboratory analysis from each borehole in the source area.
- 3.10.5** If lab analyses of soil samples are requested by the KDHE Project Manager, the soil samples submitted will be from the interval showing the highest field readings within the borehole. This sample will be separate and discrete from the field-screened sample.
- 3.10.6** All laboratory analyses will be performed by a laboratory approved by KDHE for the specific analyses and laboratory method.
- 3.10.7** All samples designated for laboratory analysis will immediately, upon collection, be sealed in a laboratory approved sample container, properly preserved and transported to the laboratory. Reimbursement will be denied for any samples that have exceeded holding time prior to analysis.
- 3.10.8** Samples from monitoring and/or test wells must be analyzed for total lead at sites that are candidates for soil excavation and landfarming. These samples shall be obtained from at least one well in the source area or other area(s) where excavation is planned. No more than four samples may be sent for analysis. Collect samples

from zones of greatest contamination as determined by field readings (gasoline range) and/or sight and odor for heavier range hydrocarbons.

3.11 WASTE DISPOSAL

3.11.1 Waste soils, drilling fluid and wastewater generated will be treated and disposed in accordance with all local, state, and federal statutes and regulations.

3.11.2 Vendor is responsible for contacting the appropriate agencies to obtain disposal approval of waste soil, drilling fluid and wastewater generated. Approval must be documented in writing.

3.12 PERMITS- Vendor is responsible for obtaining all permits and authorization necessary to develop the RDP. Vendor is no longer responsible for locating, permitting and securing access to a landfarm, unless specified in the SSI.

3.13 FULL SITE SURVEY AND MAP

3.13.1 The full site survey must be conducted by a Kansas licensed land surveyor. The work product will be developed using standard survey equipment and standard industry practices.

3.13.2 A site benchmark will be established by measuring from a local National Geodetic Survey (NGS) benchmark. The site benchmark will be located 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. Concrete pads or survey pins associated with wells or soil borings cannot be used as the site benchmark.

3.13.3 A site survey map will be prepared from the site survey data. The location of the site benchmark and NGS benchmark will be indicated on the site survey map. The map will show the surveyed locations of all site features, including, but not limited to, property boundaries, buildings, overhead structures, test wells, monitoring wells, roads and driveways (center lines indicated), underground and overhead utility lines, manholes, storm sewer and catch basins, above ground and underground storage tanks, fuel dispensers, fuel supply lines, paved areas, gravel areas, grassy areas, drainage ways, bridges, culverts, trees and fences. Dimensions of all paved areas will be measured, and the type of paving material indicated. The elevations of the permanent measuring point marked on the top of well casings and survey bolts on well pads will be measured to within 0.01 feet. Northings and Westings also will be measured to 0.1 feet. Flow directions for sewer and water lines will be indicated by arrows on the site map.

3.13.4 Buildings and other rectangular structures will be located by surveying a minimum of two corners, and the dimensions measured. Free-standing cylindrical structures should be located by two points and the diameter stated. Grain elevators on pads and above ground storage tanks within a containment structure can be located by measurements from the pad edge or containment walls. The material, wall height,

and measured dimensions of above ground storage tank containment structures will be recorded.

3.13.5 The surveyor's report will include at a minimum:

- 1) All field notes.
- 2) Tabulated latitude and longitude of all monitoring wells and test wells.
- 3) Tabulated Northings and Westings of all monitoring wells and test wells
- 4) Tabulated elevation of permanent measuring points on well casings and survey pins associated with test wells and monitoring wells.
- 5) A full site survey map with a North arrow, map scale and legend.

3.13.6 The site survey map must be stamped, dated and signed by the Kansas licensed land surveyor.

3.14 PROPERTY RESTORATION

3.14.1 Photographs submitted in digital format must be taken to document the site conditions prior to starting any field activity at the location. After site activities are completed, another series of photographs must be taken to document all site restoration. Photographs will be made of on-site parking surfaces, drive ways, curbs/sidewalks, grass areas, buildings/foundations, and all secondary containment structures, foundations and retaining walls located within 50 feet of any drilling or testing. A detailed log must be generated and available to KDHE for verification of utility locates and contacts which were made prior to any activities.

3.14.2 Any property damaged or destroyed during implementation of the project must be repaired to its original condition within 30 calendar days after the damage or destruction has occurred. All damaged property (i.e. marked utilities, marked product lines, marked electrical supplies, etc.) will be repaired or replaced at Vendor's expense. Failure to restore the property to (at least) original condition within 30 calendar days will result in denial of incentive payments until restoration is complete. Failure to restore the property could result in disqualification from KDHE Trust Fund work.

3.14.3 Vendor must notify KDHE District and Topeka offices immediately and describe the situation and affected utility or infrastructure.

3.14.4 Utilities damaged by Vendor, or their subcontractors, will be repaired by Vendor. All repairs must be made by a qualified, bonded, and licensed professional, and must be completed in a period 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 Vendor.

3.14.5 If any landscaped areas are disturbed during construction activities, restoration

must be completed by a Landscaping Professional. Documentation of the restoration will be required.

SECTION 4.0 DELIVERABLES

4.1 WORK NOTIFICATION REQUIREMENTS

- 4.1.1** Vendor will notify the O/O, the KDHE Project Manager, and appropriate KDHE District Office, by telephone or in writing, three working days in advance of drilling. The notice will include the date and time the drilling is scheduled to begin. Failure to provide adequate notification to all necessary parties may result in denial of payment for work performed.
- 4.1.2** Vendor will notify the KDHE Project Manager and the appropriate KDHE District Office, by telephone or in writing, three working days in advance of conducting the pilot tests. The notice will include the date and time the tests will be performed. Failure to provide adequate notification to all necessary parties may result in denial of payment for work performed.
- 4.1.3** Vendor will notify the O/O and the KDHE Project Manager, in writing, when all drilling activities and pilot tests have been completed. The notification will include the date field work was completed. This notification must be within three working days after the work is completed.

4.2 DEADLINES AND NOTICE TO PROCEED

- 4.2.1** Vendor will complete and submit the Remedial Design Field Work Plan Worksheet (see ATTACHMENT C) to KDHE within 30 days after the contract between the O/O and Vendor has been signed by all parties. All due dates are based off the contract sign date.
- 4.2.2** KDHE will review the Remedial Design Field Work Plan Worksheet and provide written comment, or if approved, written authorization for Vendor to proceed with field activities within 21 calendar days following the date KDHE receives the plan.
- 4.2.3** Vendor may request that KDHE send written authorization to proceed in the U.S. Mail to the Vendor's office at the address provided by Vendor, or facsimile to Vendor's office at a number Vendor provides. Unless otherwise requested by Vendor, written Notices to Proceed will be sent by U.S. Mail to the contact person provided by Vendor in the RFP.
- 4.2.4** Vendor will proceed with field activities after KDHE has approved, in writing, the Remedial Design Field Work Plan Worksheet.
- 4.2.5** Vendor will submit the Remedial Design Report within 60 days after the Remedial Design Field Work Plan Worksheet has been approved, in writing, by KDHE.

- 4.2.6 KDHE will review the Remedial Design Report and provide written comment, or if approved, written authorization for the Vendor to proceed with the Remedial Design Plan within 42 calendar days following the date KDHE receives the report.
- 4.2.7 Vendor will submit the Remedial Design Plan within 60 days after the Remedial Design Report has been approved, in writing, by KDHE.
- 4.2.8 The Remedial Design Plan is due 213 calendar days after the contract is signed.
- 4.2.9 KDHE recommends a teleconference (or meeting) with Vendor Project Manager, Design Engineer, and the KDHE Project Manager to discuss proposed remedial technologies prior to completing the design.

4.3 REMEDIAL DESIGN REPORT

- 4.3.1 Submit two copies of the Remedial Design Report (RDR). The RDR will be a comprehensive description of all work performed, data requested and information gathered during all activities conducted under this contract.
- 4.3.2 Incomplete reports will not be accepted by KDHE; a received date will not be recorded.
- 4.3.3 The Project Geologist and Project Engineer must stamp and sign the RDR.
- 4.3.4 The RDR will include all information outlined in the format and order as described in Attachment K.

4.4 REMEDIAL DESIGN PLAN

- 4.4.1 Submit two copies of the Remedial Design Plan. The Remedial Design Plan (RDP) will provide all information that is necessary to implement the RDP, and construct and operate the remedial system.
- 4.4.2 Incomplete reports will not be accepted by KDHE; a received date will not be recorded.
- 4.4.3 The RDP must be stamped and signed by the Project Engineer and the Project Geologist.
- 4.4.4 The RDP will include all information outlined in the format and order as described in Attachment L.

SECTION 5.0 REIMBURSEMENT

- 5.1 **REIMBURSEMENT GUIDELINES-** Vendor invoices must be submitted to the O/O for payment.

5.1.1 All Requests for Reimbursement must include the following:

5.1.1.1 Completed Request for Reimbursement forms signed by the O/O or their authorized representative. (Must be original signatures - copies not accepted.) Request for Reimbursement forms must be complete, clean and accurate.

5.1.1.2 If the Request for Reimbursement is being submitted by Vendor as “Attorney in Fact” for O/O, then the following must occur:

5.1.1.2.1 A copy of the “Attorney in Fact” agreement must either be on file with KDHE, or included with the request.

5.1.1.2.2 The Request for Reimbursement form must be marked to indicate it is being submitted as “Attorney in Fact” for O/O.

5.1.1.2.3 The Request for Reimbursement form must show the correct remittance address.

5.1.1.3 Vendor invoices must be in the same format as the Bid Proposal Sheets.

5.1.2 Total reimbursement will not exceed the lesser of the actual costs incurred for each line item or the total cost for each line item in the Project Bid Proposal Sheet unit pricing.

5.1.3 Vendor will only receive payment for work conducted and accepted in accordance with the specifications outlined in this document.

5.1.4 Payment to the Vendor will be prorated in accordance with actual work performed (i.e. if only 50% of the scheduled drilling activities are required then 50% of the drilling activities will be reimbursed). The following categories will be prorated: Drilling Activities (excluding mobilization), Surveying, Hydrologic Tests, Waste Handling and Treatment, Sampling and Analytical, and Permits.

5.1.5 Vendor may submit invoices for reimbursement at the following stages of the Project:

<u>Completion</u>	<u>Invoice Amt.</u>	<u>Pay Amount</u>
Work Plan	100%	90% of the invoiced amount. Work must be completed.
Drilling must be completed.	100%	90% of the invoiced amount. Work must be completed.
Sampling and Analytical	100%	90% of the invoiced amount. Work must be completed.

RDR, RDP, Permits	100%	90% of the invoiced amount. Work must be completed.
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5.1.6 KDHE will review the Remedial Design Plan within thirty calendar days and submit written comment to the Vendor, or if approved, the remaining 10% will be released.

If KDHE fails to review the Remedial Design Plan and approve it or provide written comment within thirty calendar days, the remaining 10% will be automatically released.

5.2 Documentation Requirements

5.2.1 Vendor invoices must be submitted in the same format as the Bid Proposal Sheets.

SECTION 6.0 PROPOSAL AND WORK-SPECIFIC DEFINITIONS

- 6.1 AIR SAMPLES--**This item shall include total cost associated with the collection and analysis of air samples taken (i.e. purging, labor, equipment, shipping, etc.). All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in the bid sheet. **Maximum holding time for air samples is 72 hours.** Provide the per sample cost for analysis of each constituent indicated.
- 6.2 AIR SPARGE TEST--**This item shall include all labor, equipment, materials, and any other costs that are necessary to conduct an air sparge test. The test will be conducted for a minimum of 8 hours. Reimbursement will not be provided for improperly conducted tests. KDHE reserves the right to alter the number of sparge tests or the length of time the test will be conducted at the site. This item shall be bid on an hourly rate and shall be reimbursed in accordance with the actual number of hours the test was conducted.
- 6.3 AIR SPARGE TEST SETUP AND DISMANTLE--**This item shall include all labor, equipment, materials, and any other costs that are necessary to set-up and dismantle the ASP test. This shall be bid on a lump sum basis. KDHE reserves the right to alter the number of tests that will be conducted at the site.
- 6.4 BORING PERMITS--**This item shall include the cost charged by the local government entity for drilling or installing a soil boring or monitoring well on city property, city easements, or any other property. This item will be bid on a per boring/well basis.
- 6.5 DECONTAMINATION--**This item shall include the per foot cost for decontamination of all sampling and drilling equipment as described in the KDHE SOP, BER-05.
- 6.6 DIRECT PUSH EC LOG RIG MOB-** This line item shall include all costs for transporting direct push EC equipment, personnel, and supplies to and from the site and locations around the site. Direct Push EC Log Rig Mob costs must be included for EC Log Rig work listed in the bid sheets. This line item will be bid on a per mob basis.

- 6.7 DIRECT PUSH EC LOG RIG W/CREW-** This line item shall include all labor, equipment, materials, hole plugging material, and decontamination necessary to advance the electric conductivity probe with direct push equipment and generate electric conductivity logs for the footage indicated on the bid.
- 6.8 DIRECT PUSH RIG MOB-** This line item shall include all costs for transporting direct push drilling equipment, drilling personnel, and drilling supplies to and from the site and locations around the site. Direct Push Rig Mob costs must be included for all direct push work listed in the bid sheets. This line item will be bid on a per mob basis.
- 6.9 DIRECT PUSH RIG W/CREW-** This item shall include all costs associated with use of the direct push rig, crew, and all equipment. This should only include the operator and helper(s). Do not include any professional field staff responsible for collecting and conducting field analyses of samples. This item must be bid on a per foot basis.
- 6.10 DRILL RIG/WITH CREW--**This item shall include all costs associated with use of the drilling rig, drilling crew, and all drilling equipment. This should only include the driller and helper(s). Do not include any professional field staff responsible for collecting and conducting field analyses of drilling samples. This item must be bid on a per foot basis.
- 6.11 FIELD GEOLOGIST--** This is the designated site representative for Vendor. This position works under the direct supervision of Vendor's designated Professional Geologist. Minimum qualifications for this position are:
- 1) Has a Bachelor of Science Degree in Geology from an accredited four-year college or a related degree with a minimum of 30 semester hours of geologic course work.
 - 2) Has overseen drilling activities and has described and recorded the subsurface lithology during the drilling of at least 21 boreholes.
 - 3) Has performed a minimum of 3 successful soil vapor extraction /air sparge tests of at least eight hours duration per test.
- 6.12 FIELD NOTES--**These are a complete and accurate account of all field activities that relate to work conducted on a Trust Fund site. The notes are to be kept in a bound, hard covered notebook with waterproof, resin-impregnated paper. Field notes are a legal document and must be treated as such with a new page for each day work is conducted. All entries must be legible, and errors should be lined out with a single line with no erasing. The notes should include but not be limited to date, time, site name/project number, weather conditions, drill crew/field staff/support personnel, and contacts on and off site. A complete description of all field activities must be recorded: field equipment calibration, drilling and excavations with drill rig size/type and/or equipment used, amounts and types of material used, depths reached, sediments, field readings, all amounts of material used for completions; pilot testing: distance from each extraction or injection well to each observation well, and other information detailed under SVE or AS testing; trenching/piping installation: description of soils removed, bedding material, and piping elevation survey information; and all information needed for complete record keeping.

Hand drawn maps/charts should be included when necessary. At the end of the work day, a diagonal line will be drawn through any remaining space on the page and the keeper of the field notes shall sign and date the page. Field notes must be made available upon request by KDHE personnel, and included within Appendix 4-Field Notes of the RDR.

- 6.13 FIELD STAFF**--All staff required to complete the field work must be listed by title within the bid proposal sheets. Line items within this category will be bid on a per hour basis.
- 6.14 FIELD STAFF (GROUNDWATER SAMPLING)**--This category will include all labor associated with well gauging, proper well purging, collection and preservation of groundwater samples that will be submitted for laboratory analysis, and preparation of groundwater samples for shipping. Labor listed in this category will be bid on a per well basis.
- 6.15 FIELD TEST EQUIPMENT**--This item shall include the per day cost to use the listed field analytical equipment such as a photoionization detector, organic vapor analyzer, colorimetric detector tubes, interface probe, etc.
- 6.16 FIELD WORK PLAN**--This item shall include all labor and equipment costs to properly complete and submit the Field Work Plan Worksheet. The Field Work Plan Worksheet is included as Attachment C.
- 6.17 FULL SITE SURVEY**-- This item shall include all costs associated the site survey as described in Sec.3.13
- 6.18 GEOPHYSICAL SURVEY**-- This item shall include all costs for conducting the geophysical survey. The costs shall include all activity relative to conducting the survey; i.e., mobilization, all necessary equipment, equipment placement, field analysis of the data, removal of equipment, crew member(s) to operate and oversee the survey; and imaging of the data for inclusion in the RDR. The equipment used for conducting the survey must use an appropriate technology for identifying and quantifying the location of buried utility lines and underground tanks; i.e., radar or seismic imaging are appropriate methods, whereas, a metal detector is not an appropriate method. All underground utility lines and buried tanks must be documented through geophysical profiles and their locations shall be depicted on a base map of the site (Figure 1) and included in the RDR.
- 6.19 GROUNDWATER SURVEY**--This item shall include the per probe cost for conducting the groundwater survey. The per probe cost shall include all activity relative to each probe; i.e., mobilization, necessary equipment, probe installation to groundwater, groundwater extraction, field analysis of the sample, removal of the probe, and crew member(s) to operate and oversee the survey. The equipment used for analyzing groundwater samples in the survey must detect and quantify concentrations for each specified compound (benzene, toluene, ethylbenzene, and xylene) with detection levels equal to or less than the Kansas Action Levels (KALs). Any contamination detected, even if below KALs, must be documented and included in the RDR.
- 6.20 HAZARDOUS SUBSTANCE**--This shall have the meaning ascribed to such term by Section 101 of the Comprehensive Environmental Response, Compensation and Liability

Act (CERCLA) of 1980 of the United States as in effect on January 1, 1992.

- 6.21 **KDHE PROJECT MANAGER**--This is the KDHE staff geologist/environmental scientist designated to be the lead technical interface with Vendor.
- 6.22 **LABORATORY ANALYTICAL METHODS**--This item shall include designation of the EPA methods to be used for laboratory analysis of air, soil, and water samples.
- 6.23 **LABORATORY NAME**--This item shall include the designation of the KDHE approved laboratory that will be performing the analyses of air, water and soil samples.
- 6.24 **LANDSCAPED AREAS**--Any area located within the remedial project that has either been previously landscaped or where grass and vegetation have been maintained. These areas will require a professional landscaping company to restore to the original condition.
- 6.25 **LANDSCAPING PROFESSIONAL**--An individual or company that performs landscaping as a primary line of business, and possesses a tax ID number and liability insurance. The landscaping professional cannot be an employee of Vendor.
- 6.26 **MOBILIZATION**--This item shall include all costs of mobilizing staff and equipment from their duty station to the site for the required work. All staff time and vehicle expense must be included within this category where this term is used within the bid sheets. This item will be bid on a per mob basis.
- 6.27 **OTHER**--This item shall include all costs not included elsewhere on the bid sheet. If this category is used, the bidder must list each item and briefly explain its function.
- 6.28 **PER DIEM**--This item covers lodging and expenses and is bid on a per day basis. Per Diem will be approved only for each night an employee is required to remain overnight for project work.
- 6.29 **PERMITS AND EASEMENTS**--This item shall include all labor, mobilization, equipment, supplies, and any other costs necessary to obtain all permits and easements to implement the RDP.
- 6.30 **PRODUCT DISPOSAL**--This item shall include all labor, equipment, and supply costs that are necessary to handle and dispose of separate phase petroleum product generated during remedial activities. All applied methods must comply with local, state, and federal laws.
- 6.31 **PRODUCT SAMPLES**--This item shall include the total cost associated with the collection and analysis of the product sample (i.e., labor, equipment, shipping, etc.). Provide the per sample cost for analysis of each constituent indicated.
- 6.32 **PROJECT GEOLOGIST**--This position is either the designated site representative for Vendor, or the designated supervisor of Vendor's Field Geologist(s). This item shall be bid

on an hourly basis. The Project Geologist for the project must be a Licensed Geologist in the State of Kansas and meet all minimum qualifications of a Field Geologist. This position is responsible for the preparation and certification of all geological information in reports and maps.

- 6.33 PROPERTY RESTORATION**--This item includes all costs of restoring the site to conditions prior to site activities, including re-seeding, installing sod, grading, and other required restoration. This work may require a Landscaping Professional.
- 6.34 PUBLIC WELL INFLUENCE TEST**--This item shall include all labor, per diem, equipment, materials, and any other costs necessary to conduct a public well influence test. The public well influence test shall be conducted for a period of 24 hours, unless indicated otherwise by the KDHE Project Manager or as indicated on the Project Bid Proposal Sheets. Prior to start of test, the Vendor must notify City water personnel or well owner to shut down well for a period of at least 24 hours. This will allow the aquifer to recover from pumping stress before the test is conducted. Required data will consist of the flow rate of the public well and draw down in no more than four monitoring wells. After initial water levels are measured, water level measurements will be obtained hourly from the monitoring wells unless otherwise indicated by the KDHE Project Manager. Water will be discharged through the existing City system. This item shall be bid on an hourly rate and shall be reimbursed in accordance with the actual number of hours the test was conducted. Reimbursement will not be provided for improperly conducted tests. The purpose of the test is to determine if hydraulic communication exists between the aquifer into which the public water supply is completed and the aquifer impacted by the petroleum hydrocarbon release. Well recovery data will not be considered part of the Public Well Influence Test.
- 6.35 REMEDIAL DESIGN PLAN**--This item shall include all labor and equipment cost to properly complete and submit the Remedial Design Plan. The Remedial Design Plan requirements and format are included in ATTACHMENT J of this document.
- 6.36 REMEDIAL DESIGN REPORT**--This item shall include all labor and equipment cost to properly complete and submit the Remedial Design Report. The RDR requirements and format are included in ATTACHMENT I of this document.
- 6.37 RIG MOBILIZATION**--This item shall include all costs for moving drilling equipment, drilling personnel, and drilling supplies to and from the site and at locations throughout the site.
- 6.38 SOIL BORING PLUGGING**--This item shall include the cost for labor, equipment and supplies to plug all soil borings in accordance with KDHE Regulations and Guidelines. This item must be bid on a per foot basis.
- 6.39 SOIL SAMPLES**--This item shall include total cost associated with the collection and analysis of samples taken (i.e., labor, equipment, shipping, etc.). All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in the bid sheet. Provide the per sample cost for analysis of each constituent indicated.

- 6.40 SOIL WASTE**--This item shall include all labor, equipment, and supply costs necessary to handle, treat, and dispose of soil waste generated during field activities. Preferred method of handling and treatment of soils: scarification-achieved by spreading hydrocarbon contaminated soils **6" thickness or less** across the site and turning it until the contamination level, based on field screening methods, falls below KDHE standards for soil remediation. Scarification of soils must be located away from receptors such as sewer inlets, open boreholes, etc. **All applied methods must comply with local, state, and federal laws.**
- 6.41 SUPPORT VEHICLE**--This item shall include the cost for all vehicles necessary to transport all staff to conduct the investigation. This item will be bid on a per day basis per vehicle and is inclusive of all incidental costs i.e., tolls, maintenance expense, gas, etc.
- 6.42 SVE TEST**--This item shall include all labor, equipment, materials, and any other costs that are necessary to conduct a soil vapor extraction test. The test will be conducted for a minimum of 8 hours. Reimbursement will not be provided for improperly conducted tests. KDHE reserves the right to alter the number of soil vent tests or the length of time the test will be conducted at the site. This item shall be bid on an hourly rate and shall be reimbursed in accordance with the actual number of hours the test was conducted.
- 6.43 SVE TEST SETUP AND DISMANTLE**--This item shall include all labor, equipment, materials, and any other costs that are necessary to set-up and dismantle the SVE test. This shall be bid on a lump sum basis. KDHE reserves the right to alter the number of tests that will be conducted at the site.
- 6.44 TECHNICIAN**--Vendor representative qualified to perform certain on-site activities as specified in the SRP RFP. Minimum qualifications are:
- 1) OSHA 40-Hour Hazardous Material training and annual 8-Hour Refreshers.
 - 2) Knowledge of EPA/KDHE sampling protocol.
 - 3) Experience in collecting groundwater samples for laboratory analysis from at least 30 monitoring wells.
- 6.45 UTILITY SURVEY**--This item shall include all costs necessary for surveying each underground and aboveground utility on-site and on adjacent property(ies) affected by the remedial system installation. This item shall be bid on a lump sum basis.
- 6.46 VENDOR**--This is any person (individual, partnership, association or corporation) who is seeking or is chosen to enter into a procurement contract with the O/O.
- 6.47 WASTE WATER**--This item shall include all labor, equipment, and supply costs that are necessary to handle, treat (i.e air stripping, carbon, etc.) and dispose of water waste generated during field and hydrologic testing activities. Waste water will not be left on-site. **All applied methods must comply with local, state, and federal laws.**
- 6.48 WATER SAMPLES**--This line item shall include costs for water sampling materials (e.g. bailers, line, plastic sheeting, gloves, sample containers, etc.), water sample shipping, and

analytical costs associated with groundwater samples. All samples shall be analyzed in accordance with the criteria provided in this document for the constituents outlined in the bid sheet. The Chain of Custody for each sampling event is required to be submitted with

corresponding Request for Reimbursements. This line item will be bid on a per sample basis.

- 6.49** **WELL COMPLETION**--This item shall include the cost for a well pad, flush or stick up protective locking cover, well development, and well tagging for all wells. All wells must be completed in accordance with regulations and KDHE guidelines. All wells must be developed to the extent that each well can be fully used for their intended purpose. This cost shall be bid on a per well basis.
- 6.50** **WELL GAUGING**--This line item includes costs to access monitoring wells, measure depth to free product and /or groundwater and total depth of the well, record data, and re-secure well cover. This line item is for monitoring wells from which water samples cannot be collected and will be bid on a per well basis.
- 6.51** **WELL PLUGGING**--This item shall include all labor, equipment, and materials necessary to plug wells, sizes specified per line item, in accordance with KAR 28-30-7(d) included as ATTACHMENT G or current KDHE-approved procedures. This item will be reimbursed on the actual footage plugged.
- 6.52** **WELLS**--This line item shall include costs for labor, blank well casing, well screen, annular space gravel pack, annular seal, and grout for all wells installed. Do not include wellhead completion. This line item will be bid on a per foot basis. KDHE will not reimburse for improperly constructed wells or wells that cannot be used for the intended purpose.

ATTACHMENT A
OWNER/OPERATOR STANDARD CONTRACT

CONTRACT

This **CONTRACT** is entered into between _____ hereinafter referred to as the Owner/Operator; and _____ hereinafter referred to as the Vendor.

WHEREAS, the Owner/Operator is in need of Storage Tank consulting and testing services at KDHE project name _____, KDHE project code _____ - _____ - _____, site address _____,

the Owner/Operator has requested bids from qualified firms to provide said services, and the Vendor is qualified to provide the required services, the Owner/Operator and Vendor agree as follows:

1. The Vendor shall perform all services called for under the Request for Proposal (RFP) in accordance with the specifications called for in said RFP.
2. The Owner/Operator shall compensate the Vendor for its services under the terms and conditions of said RFP in the amount of \$ _____, with payment to be made upon successful completion of the services required by the RFP which is incorporated herein.
3. It is expressly agreed that the terms of each and every provision in this Contract shall prevail and control over the terms of any other conflicting provision in any other document relating to the subject matter of this Contract or to which this Contract is attached.
4. This Contract shall be subject to, governed by, and construed according to the laws of the State of Kansas.
5. The Vendor shall comply with the Kansas Act Against Discrimination (K.S.A. 44-1001 et seq.) and the Kansas Age Discrimination in Employment Act (K.S.A. 44-1111 et seq.) and shall not discriminate against any person who performs work pursuant to this Contract, because of race, religion, color, sex, physical handicap unrelated to such person's ability to engage in this work, national origin or ancestry, or age.
6. This Contract shall not be considered accepted, approved or otherwise effective until the Owner/Operator receives the required insurance certificates.
7. By signing this Contract, the respective representatives of the Owner/Operator and Vendor hereby represent that they are duly authorized to execute this Contract on behalf of the party they represent and that their principal agrees to be bound by the provisions herein.
8. The Owner/Operator will not be responsible for, nor indemnify a Vendor for, any federal, state or local taxes that may be imposed or levied upon the subject matter of this Contract.

Owner/Operator

Date

Vendor

Date

ATTACHMENT B
OFF-SITE ACCESS PAYMENT SCHEDULE

**OFF-SITE ACCESS AGREEMENT
AND PAYMENT SCHEDULE**

KDHE PROJECT NAME: _____

KDHE PROJECT CODE: _____

OWNER(S) OF PROPERTY: _____

ADDRESS OF PROPERTY: _____

The owner(s) of the above described property grant to _____ (owner/operator of KDHE project), the right and privilege to enter on the above described property for the purpose of conducting remedial activities which will include the following:

_____ drilling and plugging of soil borings/groundwater survey probes;	_____ X \$	50.00	= \$ _____
_____ drilling and construction of groundwater monitoring wells;	_____ X \$	250.00	= \$ _____
_____ drilling and construction of groundwater reinjection wells, and any necessary piping;	_____ X \$	500.00	= \$ _____
_____ installation of any necessary piping.	_____ X \$	100.00	= \$ _____

This property access agreement shall terminate upon the accomplishment of the above stated purpose(s).

All well completions will meet or exceed the KDHE Standard Monitoring Well Design; any changes to this design will require obtaining a variance from the appropriate local and state regulatory authority. Soil borings not completed as monitoring wells will be plugged in accordance with all state regulations and guidelines as outlined in K.A.R. 28-30-7(d) Article 30-Water Well Contractor's License: "Water Well Construction and Abandonment".

A compensation amount for a total of \$ _____ will be payable to the owner upon completion of the above stated activities and after the proper invoices have been submitted by the vendor. This amount will be eligible for reimbursement from the Petroleum Storage Tank Release Trust Fund (Trust Fund) administered by the KDHE. This compensation is being provided to alleviate any inconvenience to the property owner and to secure property access for the collection of groundwater and/or air samples from the wells for the duration of the project. Subsequent to all remedial activities, the property will be restored, as nearly as reasonably possible, to the condition it was in at the time this consent agreement was executed.

Upon completion of the project, a compensation amount of \$100.00 per well for a total of \$ _____ will be payable to the owner to allow property access to properly abandon all wells installed during remedial activities. All wells will be plugged and abandoned in accordance with K.A.R. 28-30-7(d).

Prior to termination of this property access agreement, all materials and equipment shall be removed from the property and the property will be restored, as nearly as reasonably possible, to the condition it was in at the time this property access agreement was executed. Piping/lines will either be properly plugged and left in place, or will be removed from the property.

Property Owner Signature Date

WITNESSES:

Date

Date

ATTACHMENT C
FIELD WORK PLAN WORKSHEET

D. Borehole Plugging:

Materials to be used _____

Procedure _____

2. Laboratory Analytical

Soil Samples: Collection Equipment _____
Analytical Methods _____

Water Samples: Collection Equipment _____
Analytical Methods _____

Air Samples: Collection Equipment _____
Analytical Methods _____

3. Waste Handling Procedures: Briefly describe how soil and water waste generated during drilling, development and sampling activities will be handled, treated, and disposed:

Soil: _____

Water: _____

4. Decontamination: Briefly describe decontamination equipment, methods, and procedures to be employed:

III. Saturated and Unsaturated Zone Testing

1. Soil Vapor Extraction (SVE)

A. SVE Wells: Number of extraction wells (VEW): _____

Number of observation wells (VOBW): _____

Provide the following information for each VEW and VOBW: (include information for existing wells to be used)

Well	_____	_____	_____	_____
Distance From VEW	_____	_____	_____	_____
Total Well Depth	_____	_____	_____	_____
Casing/Screen	_____	_____	_____	_____
Diameter & Material	_____	_____	_____	_____
Screen Slot Size	_____	_____	_____	_____
Screened Interval (feet bgs)	_____	_____	_____	_____
Grout Material	_____	_____	_____	_____
Filter Pack Material and Size	_____	_____	_____	_____
Drilling Scenario (A or B)	_____	_____	_____	_____

B. Testing Equipment:

Extraction (e.g. soil vapor extraction blower):

Brand/Model _____

Specifications _____

Flow Meter (for extraction well):

Brand/Model _____

Specifications _____

Vacuum Pressure Monitoring (for VEW and VOBW):

Brand/Model _____

Specifications _____

C. Test Parameters:

Duration of Test _____

Proposed Step Test Vacuum (inches H₂O) _____

Vacuum Measurement Frequency _____
(VEW's and VOBW's)

Flow rate Measurement Frequency _____
and Location (VEW)

D. Test Analytical:

Field Analysis:

Sampling Frequency _____

Device (Brand/Type/Specifications) _____

Calibration Standard & Frequency _____

Laboratory Analysis:

Number of Samples _____

Collection Frequency _____

Collection Location _____

Analytical Method _____

Laboratory to Conduct Analysis _____

Collection Methods _____

4. Air Sparge Test (AS) Provide the requested information as indicated.

A. Observation Wells (OBW): (check appropriate blank)

_____ All observation wells will be installed

_____ Existing Well to be used (identify existing well to be used: _____)

_____ Observation wells will be installed and used in conjunction with existing wells
(Identify wells to be used: _____)

Provide the following information for each AS well and OBW: (include information for existing wells to be used)

Well	_____	_____	_____	_____
Distance from	_____	_____	_____	_____
Injection Well	_____	_____	_____	_____
Total Well Depth	_____	_____	_____	_____
Casing/Screen	_____	_____	_____	_____
Diameter & Material	_____	_____	_____	_____
Screen Slot size	_____	_____	_____	_____
Screened Interval (feet bgs)	_____	_____	_____	_____
Grout Material	_____	_____	_____	_____
Filter Pack Material and Size	_____	_____	_____	_____
Drilling Scenario (A or B)	_____	_____	_____	_____

B. Testing Equipment:

Injection (e.g., air sparge compressor);

Brand/Model _____
 Specifications _____

C. Test Parameters:

Duration of Test _____
 Proposed Air Injection Rate (scfm) _____

D. Test Analytical:

Field Analysis:

Sampling Frequency _____
 Sampling Method _____
 Device (Brand/Type/Specifications) _____
 Calibration Standard & Frequency _____

Laboratory Analysis:

Number of Samples _____
 Collection Frequency _____
 Collection Location _____
 Analytical Methods _____
 Laboratory to Conduct Analysis _____
 Collection Methods _____

5. Other Testing Required for RDP. If testing, other than listed in this worksheet, will be required to develop a remedial design plan, provide an attachment to this worksheet that describes in detail the testing proposed, field or laboratory work associated with the testing, and how the testing will be utilized for the remedial technology proposed.

IV. Site Map

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

Prepare and submit with this worksheet a site map in accordance with and containing the following information:

- A.** Scale of not more than 1 inch = 50 feet for smaller site and not more than 1 inch = 100 feet for larger sites.
- B.** Site property boundaries, buildings, and other fixed objects.
- C.** Site map must depict the site including a minimum of a one block radius around the site with the general use of surrounding properties identified; i.e., residential, industrial, business (indicate what type- restaurant, service stations, etc.). List owners' names relative to off-site properties.
- D.** Tanks, lines, and pump islands, currently or formerly located at site.
- E.** Proposed boring and monitoring well locations. Include any existing wells within the specified area.
- F.** Proposed vapor extraction, air sparge and observation well locations for the SVE and AS test.
- G.** Accessible easements within the specified area.

V. Field Personnel

List Vendors' personnel and any subcontracting firms that will be involved in the field work. Indicate each individual's name, company, position title, and general duties. If resume documenting education, experience, and safety training certification have not been provided with the original bid package for all those listed, submit the information with this worksheet. Attach additional sheets if necessary.

Name	Company	Position Title	Duties

ATTACHMENT D
KDHE WELL TAGGING PROCEDURE

INSTRUCTIONS FOR THE KDHE/BER WELL TAG FORM

A KDHE/BER well tag record must be developed for all wells installed or/and monitored at Leaking Underground/Aboveground Storage Tank sites (including existing private or public wells). The well tag record is used to uniquely identify individual sampling points at LUST/LAST (and other) projects. To establish a well tag record, a KDHE/BER Well Tag form must be completed and a numbered tag must be permanently affixed to the well, then the form is to be returned to KDHE. Specific instructions (and exceptions) for completing the KDHE/BER Well Tag form and affixing the tag are described below.

Part I: KDHE/BER Well Tag Form

- 1) A separate KDHE/BER Well Tag form must be completed for each KDHE project code.
- 2) No two well tag numbers are the same. EACH MONITORING WELL INSTALLED MUST HAVE A UNIQUE WELL TAG NUMBER ATTACHED, additionally, GROUPS OF WELLS MAY BE ASSIGNED THE SAME PROJECT CODE.
- 3) If any existing well has already been tagged (and the tag is readable), do not tag the well again. Also see the "Caution" statement in the tag installation notes on affixing tags to existing wells.
- 4) Write the well tag number in the upper margin near the right edge of the Water Well Record form (form WWC-5) for each monitoring well installed at a LUST/LAST site.
- 5) The form must be completed according to the instructions herein. Failure to submit the forms or submitting inaccurate data could restrict or delay reimbursement for work completed. The forms must be completed and submitted to the address below within two weeks after tagging the well. Copies of the KDHE/BER Well Tag forms must be included in the appropriate appendix of the final report. Any unused well tags must be returned to the address below.

Kansas Department of Health & Environment
Bureau of Environmental Remediation
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367

Part II: Affixing the Tag to a Well

The tag is made of brass and measures approximately 0.75 X 2.5 X 0.02 inches. It can be easily molded to the shape of the surface to which it will be affixed. The method of installing the tag will depend on how a well head was completed. Note the tags are provided, however, installation hardware must be supplied by the contractor. Acceptable methods of tag installation are discussed as follows:

- 1) Above-grade well head completion: For monitoring wells that have casing terminating above grade with exterior steel or PVC well head protector (standard monitoring well design), the well tag is to be installed on the exterior of the protective cover approximately 3.0 inches below the hasp used in locking the protective cover cap. The tag must be secured to the protective cover by means of two one-way metal screws or pop-rivets. Do not use adhesives to affix the tag to the protective cover.
- 2) Flush-mounted monitoring well heads: Since flush-mount manholes vary in design, there is not an entirely standard method for affixing the well tag, but, the tag must be installed inside the manhole in an area and manner leaving the tag readily visible and accessible. The tag may be affixed to the inside of the manhole cover or anchored by some means to the concrete inside the manhole. Do not use adhesives to affix the tag.
- 3) Private or public wells: The method for affixing a tag to a private or public water well must be determined according to the specific well head design, which will vary. Keep in mind the tag must remain visible and accessible after it is permanently affixed to the well. Common methods of affixing tags to these types of wells are anchoring the tag to the concrete pad at the base of the well, attaching the tag to the well house, or wiring the tag to the well casing. Remember to obtain permission prior to sampling or tagging private or public wells.

Notes on tag installation:

CAUTION! State regulations prohibit perforation of a well casing. See K.A.R. 28-30-6(e) as stated below.

K.A.R. 28-30-6(e) provides in part: "...No opening shall be made through the well casing except for the installation of a pitless adapter so designed and fabricated to prevent soil, subsurface and surface water from entering the well."

- A. Remember, the tag must be visible and must remain permanently affixed to the well sampled as part of the investigation.
- B. When affixing a tag to any well that does not have a protective casing installed, state regulations will not allow any holes to be drilled into an existing well casing. An alternative method for affixing the tag must be used.
- C. Prior to sampling or tagging any private or public water supply well, specific permission must be obtained from the appropriate authority.
- D. If there are any questions on installing the tag or completing the KDHE/BER Well Tag form, contact the KDHE project manager.

ATTACHMENT E
KDHE MONITORING WELL DESIGN

STANDARD MONITORING WELL DESIGN

WELL HEAD PROTECTOR

Steel or PVC cover with water tight cap, set in the concrete pad. Should be equipped with a locking device to prevent tampering. Cover should provide adequate space to allow access to the well.

CONCRETE PAD

Should be a minimum of 2'x2'x4" thick to secure the protective cover, prevent pooling of water and vegetative growth around the well, and allow for placement of a surveyor pin.

IMPERVIOUS GROUT

The upper 20' of the well must be grouted with impervious grout as required by K.A.R. 28-30-2k and 6b (see next page for quotes)

SCREEN SEAL

A 2' layer of bentonite chips or pellets should be placed on the gravel pack to prevent infiltration of grout into the gravel pack.

GRAVEL PACK

The gravel pack should be sized to prevent infiltration of fines into the well. The source of the gravel pack material should be carefully determined to eliminate the possibility of contamination of the well during construction.

WELL CASING

Well casing shall terminate not less than one foot above ground surface. The following well casings are acceptable for monitoring well use.

2" I.D. PVC schedule 40 or thicker

4" I.D. PVC SDR 26 or thicker

5" I.D. PVC SDR 26 or thicker

Steel casing shall be 10 gauge or thicker

All casing materials must be connected without use of solvents, glues, or materials which would induce contamination into the well.

Some other casings are approved for well construction but are not as commonly used.

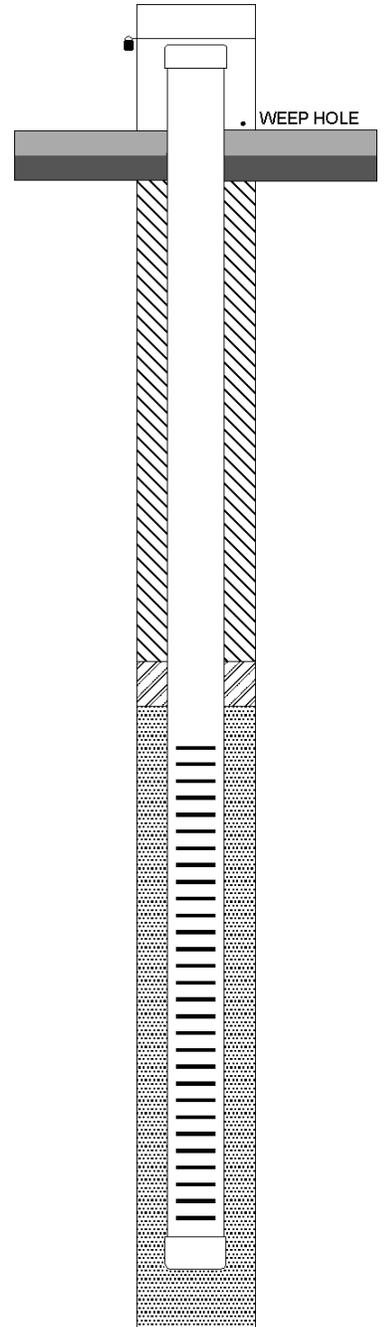
All casing materials must be selected so that incompatibility problems do not occur.

SCREEN

Wells must be equipped with manufactured well screen which provides adequate communication with the aquifer to provide a representative sample without allowing the sediments to enter the well.

CONTRACTOR LICENSING

All monitoring wells must be constructed by a licensed water well contractor as specified under K.A.R. 28-30-3. (See next page for quotes)



K.A.R. 28-30-2 (k) Grout

Grout means cement grout, neat cement grout, bentonite clay grout or other material approved by the department used to create a permanent impervious watertight bond between the casing and the undisturbed formation surrounding the casing or between two or more strings of casing.

- (1) "Neat cement grout" means a mixture consisting of one 94 # bag of portland cement to 5-6 gallons of clean water.
- (2) "Cement grout" means a mixture consisting of one 94 # bag of portland cement to an equal volume of sand having a diameter no larger than 0.080 inches (2 millimeters) to 5-6 gallons of clean water.
- (3) "Bentonite clay grout" means a mixture consisting of water and commercial grouting or plugging sodium bentonite clay containing high solids such as that manufactured under the trade name of "volclay grout", or an equivalent as approved by the department.
 - (A) The mixture shall be as per the manufacturer's recommendations to achieve a weight of not less than 9.4 pounds per gallon of mix. Weighing agents may be added as per the manufacturer's recommendations.
 - (B) Sodium bentonite Pellets, tablets or granular sodium bentonite may also be used provided they meet the specifications listed in K.A.R. 28-30-2(k), (3), above.
 - (C) Sodium bentonite products that contain low solids, are designed for drilling purposes or that contain organic polymers shall not be used.

K.A.R. 28-30-6 (b) Grouting

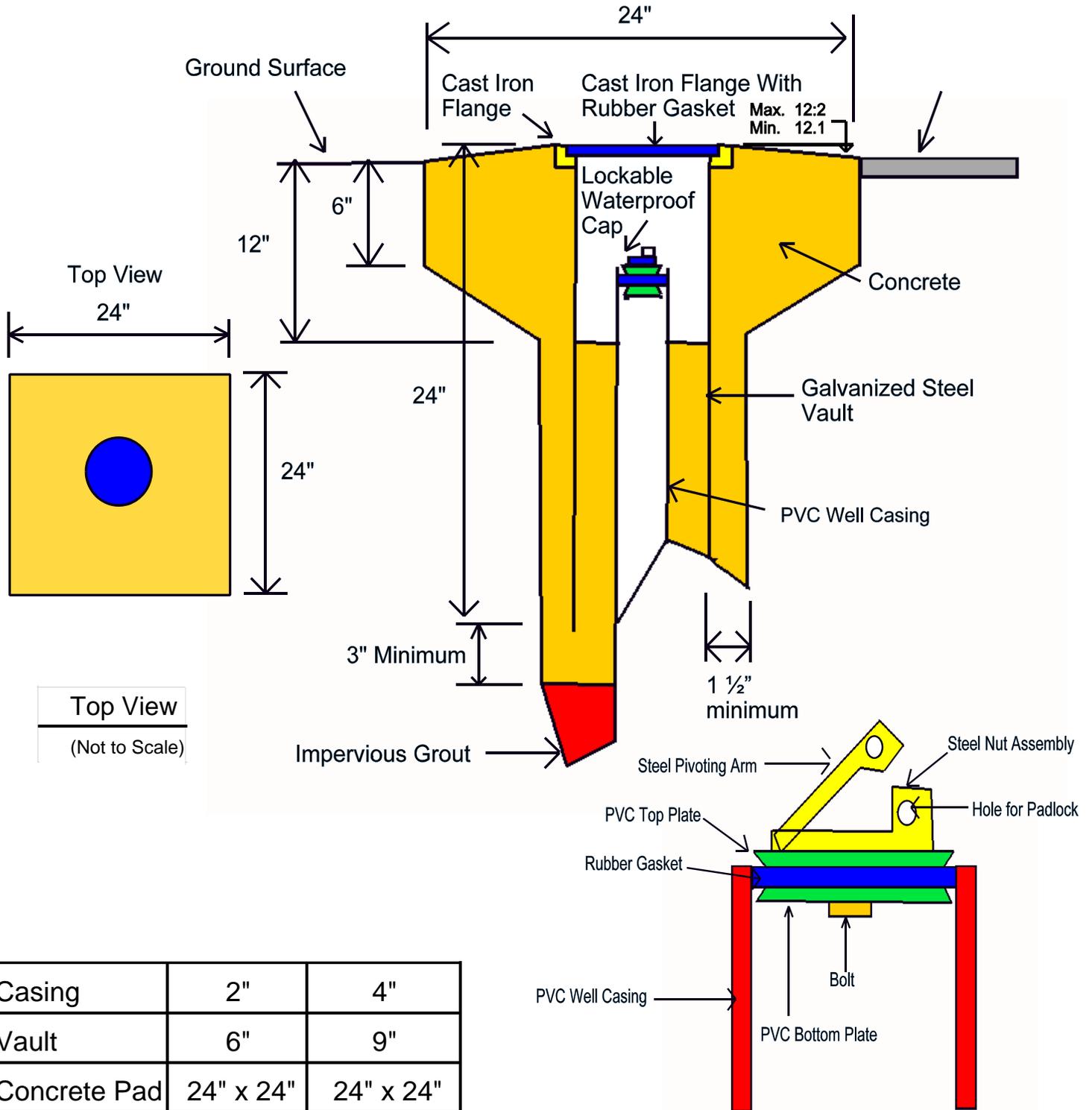
- (1) Constructed or reconstructed wells shall be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay or shale layer, if present, whichever is greater. If a pitless well adapter or unit is being installed, the grouting shall start below the junction of the pitless well adapter or unit where it attaches to the well casing and shall continue a minimum of 20 feet below this junction or to a minimum of five feet into the first clay or shale layer whichever is greater.
- (2) To facilitate grouting, the grouted interval of the well bore shall be drilled to a minimum diameter at least three inches greater than the maximum outside diameter of the well casing. If a pitless well adapter or unit is being installed on the well's casing, the well bore shall be a minimum diameter of at least three inches greater than the junction diameter of the well casing through the grouted interval below the junction of the pitless well adapter or unit where it attaches to the well casing.
 - (c) If groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified to meet local conditions if approved by the department.

K.A.R. 28-30-3 Licensing

- (a) Eligibility. To be eligible for a water well contractor's license an applicant shall:
 - (1) Have passed an examination conducted by the department; or
 - (2) Meet the conditions contained in subsection (c).
- (b) Application fees.
 - (1) Each application shall be accompanied by an application fee of \$ 10.00.
 - (2) Before issuance of a water well contractor's license, each contractor shall pay a license fee of \$ 100.00 plus \$ 25.00 for each drill rig operated by or for the contractor. These fees shall accompany the application and shall be by bank draft, check or money order payable to the Kansas Department of Health and Environment- water well licensure.
- (c) Reciprocity.
 - (1) Upon receipt of an application and payment of the required fees from a nonresident, the secretary may issue a license, providing the nonresident holds a valid license from another state and meets the minimum requirements for licensing as prescribed in K.S.A. 82a-1207, and any amendments thereto.
 - (2) If the nonresident applicant is incorporated, evidence shall be submitted to the Department of Health and Environment showing that the applicant meets the registration requirements of Kansas Secretary of State.
 - (3) Nonresident fees for a license shall be equal to the fee charged a Kansas contractor by the applicant's state of residence but shall not be less than \$ 100.00. The application fee and drill rig license fee shall be the same as the Kansas resident fees.

FLUSH-MOUNT WELL CONSTRUCTION DETAIL

(Not to Scale)



LOCKABLE WATERPROOF CAP

(Not to Scale)

MONITORING WELL DESIGN ADDITIONAL INSTRUCTIONS

FLUSH-MOUNT WELL HEAD COMPLETION:

K.A.R. 28-30-6 (e) does not allow well casing to be terminated less than one foot above finished ground surface. Because storage tank site investigations are often conducted in areas where completing monitoring well heads above grade is not practical, consideration must be given to completing flush-mount monitoring well heads.

If monitoring well must be completed with a flush-mount well head design, a waiver of K.A.R. 28-30-6 (e) must be requested in writing. The procedures for requesting a waiver of this regulation are described as follows:

- 1) Prior to the monitoring well installation, the written request must be submitted to the address indicated below.
- 2) The request must contain the following information:
 - a. facility name and street address
 - b. legal description of the property where the wells are proposed to be located.
 - c. number of wells to be installed with flush-mount well heads
 - d. reason(s) why the regulation should be waived
 - e. approximate depth to groundwater in the local area
 - f. the general geology or lithologies expected to be encountered in drilling
 - g. specifications and/or diagrams of the vault proposed to be installed including the manufacturer's name and any other descriptive information such as a manufacturer's trade sheet.
- 3) Wait for approval of the waiver request before completing monitoring wells.
- 4) When waivers are approved and monitoring wells are installed with a flush-mount wellhead design, the well head completion must be indicated accordingly in the lithologic section of the WWC-5 water well record form. The name of the KDHE contact person that approved the waiver must also be provided in the lithologic section of the WWC-5 form.

Any waiver of regulations applies only to the wells and information indicated in the written request. A verbal request for waiver of regulations may be approved on any additional wells needed for the same area or site. The verbal request must be directed to the phone number below.

MONITORING WELL GROUTING REQUIREMENTS:

K.A.R. 28-30-6, part (b) requires that constructed or reconstructed wells be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay layer, whichever is greater. Part (c) of the same regulation specifies if groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified to meet local conditions if approved by the department. A waiver of K.A.R. 28-30-6(b) must be obtained following the same procedures as described for flush-mount well heads above.

Submit requests for waivers and direct any questions on well design regulations to:

Kansas Department of Health & Environment
Bureau of Water, Geology Section
1000 SW Jackson, Suite 420
Topeka, Kansas 66612-1367
Phone: (785)296-5522

ATTACHMENT F

**DIRECT PUSH METHOD OF ELECTRICAL CONDUCTIVITY
LOGGING AND SOIL SAMPLING**

DIRECT PUSH METHOD OF ELECTRICAL CONDUCTIVITY LOGGING AND SOIL SAMPLING

ATTACHMENT F

This attachment outlines the recommended procedure for conducting electrical conductivity logging and soil sampling using direct push methods to advance the probe into the subsurface soils. This procedure should be used in conjunction with conventional drilling methods on underground storage tank Remedial Design Plans performed for KDHE where alluvial deposits are anticipated.

GENERAL

The contractor must have available a Geoprobe, Earthprobe, or similar direct-push vehicle capable of collecting continuous soil cores or discrete soil samples to the depth indicated in the approved Site Work Plan. Soil conductivity logs will be accomplished using a direct-push EC Probe. The operator should be a licensed water well driller in the State of Kansas and personnel should be OSHA certified in accordance with OSHA 29 CFR 1910.120.

All drilling and well construction activities are to be performed in accordance and consistent with ASTM Standards D6282-98 (Guide for Direct Push Soil Sampling for Environmental Site Characterizations), D6001 (Guide for Direct-Push Water Sampling for Geoenvironmental Investigations), D5753 (Guide for planning and Conducting Borehole Geophysical Logging) and applicable KDHE requirements and BER Standard Operating Procedures.

The contractor and the Kansas Department of Health and Environment project manager prior to the work will, mutually agree upon, any deviation from these standards necessitated by field conditions and/or other circumstances, in writing.

ELECTRICAL CONDUCTIVITY (EC) PROBE METHODS

Electrical conductivity logging of in-situ soils can be a useful tool to map subsurface lithologic conditions on sites where samples may be difficult to obtain through traditional drilling methods. Obtaining correct lithology and representative samples in formations with heaving sands and saturated soils are imperative. EC logs allow indirect observation of subsurface lithology in a relatively undisturbed state. Environmental remediation system designers can use EC in prevention of setting remedial wells into and below aquatards, which, restrict air injection and recovery well systems. In general, fine-grained sediments exhibit higher electrical conductivities than medium and course grained sediments. EC is an extremely useful tool when properly applied and calibrated with discrete sampling and in conjunction with traditional soil sampling and monitoring wells.

A continuous full depth EC log will be generated for each proposed location. Due to differences in vertical resolution and depths of current penetration, both Wenner and dipole array logs may be performed on each site in accordance with the approved work plan. Dipole-array probes provide better vertical resolution of lithology. However, the electrical current does not penetrate the

formation to as great a horizontal depth as a Wenner Array. It is possible for dipole array probes to not extend beyond the borehole smear zone. Therefore it is recommended that logs utilizing both arrays be used on a site.

The EC probe shall be configured so that either a Dipole Array or Wenner Array can be selected. Separate probes for each array are acceptable as long as both are available on-site and can be changed quickly between probes to prevent delays. The EC probe shall be advanced into the soil using a hydraulic direct-push machine with percussive impact. No drilling or open borehole shall be required once surface pavement is penetrated. Probe locations and sample depths will be performed in accordance with the approved work plan.

The probe shall be tapered to allow continuous contact between the soil and the probe electrodes. An electrical current will be sent through the formation between at least two electrical contacts integrated on the probe. The probe will be connected to the real-time data logger with a direct readout screen so that the operator and geologist can graphically see results in the field. The data logger will also save data in spreadsheet compatible format for downloading to a computer. The on screen readout shall chart the soil electrical conductivity at the depth encountered as well as the penetration speed of the probe. EC readings will be recorded in milli-Siemens per meter (mS/m). Probe shall be advanced at a rate approved by the manufacturer for optimum resolution.

Printouts of the spreadsheet data and graphical EC logs shall be incorporated into the RDR Report under the Boring Log Section. Soil conductivity logs shall be correlated with the conventional drill logs and direct push sampling. EC-log data should be included into cross sections where appropriate.

DISCRETE (PISTON) SAMPLING

Following Completion of the EC probe(s), the KDHE project manager and/or site geologist will determine elevations for discrete sampling using a piston-type sampler. The piston sampler is designed to collect discrete (interval specific) samples in difficult sampling conditions, such as flowing/heaving sands and swelling clays. The system also works well in soils below groundwater. The piston sampler is driven to the desired sampling depth where sampling is to begin. An internal rod attached to the inner drive tip is removed. The sampler is pushed and the sample is retrieved. Pilot holes will be allowed when appropriate. This method prevents flowing or caving materials from entering or plugging the sampler prior to reaching sample depth.

Discrete samples will be required to confirm lithology below the water table. In practice, when a fine-grained (Silt/Clay) soil layer is indicated in the EC log, a discrete sample will be taken to identify composition and lithology.

CONTINUOUS SAMPLED - DIRECT PUSH PROBES

Continuous sampled, direct push soil probes will be conducted in conjunction with EC logging to confirm site lithology. Continuous sampling shall not be conducted on the same probe hole as the EC logging. Continuous samplers will be constructed to attach to the drill rods and the tube sampler will be sturdy enough to be driven by percussion into soils encountered. A core catcher shall be used on every sampling event to prevent loss of sample. Continuous samplers shall be capable of collecting a minimum 4-foot sample. Sample diameters of at least 1.5 inches are desirable, however, alternate sizes may be used if approved by the KDHE Project Manager. A clear, contaminant-resistance liner shall be used within the sample tube to hold core samples until opened for logging. The enclosed core sample will be carefully transported to the appropriate area

where the geologist will open the liner, describe sample. Headspace analysis shall be performed by PID / FID in accordance with the site work plan. All lithology shall be submitted in written boring log form to KDHE.

Soil Probes are to be continuously sampled per the approved work plan. If the geologist and/or the KDHE project manager determine that; continuous sampling cannot not be performed in onsite, saturated soils, discrete samples may be taken to confirm lithology. Depths of discrete samples will be based upon other site borings and prior EC logging. A minimum of one (1) discrete sample per five of depth will be obtained unless the KDHE project manager approves alternate sampling regime.

PROBE HOLE PLUGGING

All soil probes shall be properly grouted. All waste materials shall be disposed of in accordance with local, state and federal regulations.

SAFETY

This document does not purport to address any safety concerns associated with its use. It is the responsibility of the Vendor to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.

ATTACHMENT G
SOIL BORING PLUGGING CRITERIA

ARTICLE 30 – WATER WELL CONTRACTORS LICENSE; WATER WELL CONSTRUCTION AND ABANDONMENT

This article regulates the construction, reconstruction, treatment and plugging of water wells and sets forth procedures for the licensing of water well contractors as required by K.S.A. 82a-1201 to 82a-1215 and amendments thereto.

Kansas Administrative Regulation (K.A.R.) 28-30-7(d)(2)(A) states,

“The entire hole shall be plugged with an approved grouting material from bottom of the hole, up to within three feet of the ground surface, using a grout tremie pipe or similar method.”

Refer to K.A.R. 28-30-2(k) and (t) for definitions of grout and tremie pipe.

WELL PLUGGING/ABANDONMENT REQUIREMENTS

The following requirements supplement section K.A.R. 28-30-7(d)(2)(A) of Article 30.

- A) The following requirements will be mandatory for plugging monitoring wells that have **20 feet or greater of grout (including the bentonite plug):**
- 1) The well head, concrete pad and protective cover (if above grade completion) must be removed.
 - 2) The well must be filled with an approved plugging material. After the casing or casing void has been filled with an approved plugging material, the casing shall be cut off to a level three (3) feet below ground surface. The remaining excavation may then be backfilled with native soils.
 - 3) The property will be restored as near to the original condition subsequent to plugging.
- B) The following requirements will be mandatory for plugging monitoring wells that have **less than 20 feet of grout (including the bentonite plug) and was given an approved waiver request for the original installation of the monitoring well by the Bureau of Water, Kansas Department of Health and Environment:**
- 1) The well head, concrete pad and protective cover (if above grade completion) must be removed.
 - 2) The well must be filled with an approved plugging material. After the casing or casing void has been filled with an approved plugging material, the casing shall be cut off to a level three (3) feet below ground surface. The remaining excavation may then be backfilled with native soils.
 - 3) The property will be restored as near to the original condition subsequent to plugging.

ATTACHMENT H
DOMESTIC WELL CONTACT FORM

ATTACHMENT I

SOIL VAPOR EXTRACTION PILOT TEST RESULTS

ATTACHMENT J
AIR SPARGE PILOT TEST RESULTS

Table 6. Air Sparge Pilot Test Results

Test Date: _____	Observation Well ID: _____	Observation Well ID: _____
Test Start Time: _____	Diameter (inches): _____	Diameter (inches): _____
	Screened Interval (ft. bgs): _____	Screened Interval (ft. bgs): _____
Site Elevation (ft. AMSL): _____	SWL Prior To Test (ft. bgs): _____	SWL Prior To Test (ft. bgs): _____
AS Well ID Number: _____	Observation Well ID: _____	Observation Well ID: _____
Diameter (inches): _____	Diameter (inches): _____	Diameter (inches): _____
Depth to Top of Screen (ft. bgs): _____	Screened Interval (ft. bgs): _____	Screened Interval (ft. bgs): _____
Depth to SWL (ft. bgs): _____	SWL Prior To Test (ft. bgs): _____	SWL Prior To Test (ft. bgs): _____

AS Injection Well #: _____	Time	Time Since SVE Off (hr:min)	Air Injection Pressure (psi)	Air Injection Rate (scfm)	SVE Effluent Vapor Concentration (ppm, during time SVE and AS tests overlap)
Calculated Air Flow-entry Pressure (psi): _____					
Radius of Influence of AS Test Well (ft.): _____					

	Time	Water Level (ft BGS)	Field Analysis of VOCs in Air (ppm,)	DO (mg/L or ppm)	Wellhead Pressure (psi)
OBW #: _____					
Distance from AS Well (ft.): _____					

OBW #: _____					
Distance from AS Well (ft.): _____					

OBW #: _____					
Distance from AS Well (ft.): _____					

OBW #: _____					
Distance from AS Well (ft.): _____					

ATTACHMENT K
REMEDIAL DESIGN REPORT FORMAT

ATTACHMENT K: REMEDIAL DESIGN REPORT FORMAT

Cover Page: The RDR shall include a cover page with the following information: report title; site name; site address; KDHE project code; section, township, and range to four quarters; report date, the names of the people who prepared the report. Report cover page must be stamped, signed and dated by the Project Engineer and Project Geologist as per K.A.R.-66-6-1 et seq.

Table of Contents: The RDR shall include a table of contents with the following information: 1) section titles (see 4.5.7 below) and page numbers of all sections 2) tables and page numbers and 3) a list of each Drawing, Figure, and Appendix.

Label Tabs: The RDR shall include a labeled tab for each of the Section titles and each appendix.

Maps: All maps must be drawn to scale and labeled with the titles provided. The scale must not exceed 1 inch = 50 feet for smaller sites and 1 inch = 100 feet for larger sites. Include a north arrow, scale, and legend on all maps.

Report Format: The Remedial Design Report will include all information outlined below in the format and order described. Use the Section titles and subtitles provided, and number each page. Abbreviations or material referenced from other publications should be explained. Incomplete or improperly formatted reports will be returned for corrections.

SECTION 1.0 DISCUSSION

1.1 Report Summary

Provide a brief summary of the contamination detected. Describe the areal extent and thickness of the aquifer. Include the extent, degree, migration, and any impact or potential impact of the contamination to sensitive environments, or public and private water supplies.

1.2 Proposed Remedial Plan

- 1) Provide a detailed description of the proposed remedial technology(ies).
- 2) Explain the expected effectiveness of the proposed remedial technology(ies) relative to site conditions and other technologies.
- 3) Explain the expected cost effectiveness of the proposed remedial technology(ies) relative to other technologies.

Table 1 Summary of Work Completed

Include the following information for work completed during this phase of site work.

- 1) Total number of direct push borings, including footage drilled and footage plugged.

- 2) Total number of Electrical Conductivity borings, including footage drilled and footage plugged.
- 3) Total number of borings installed, including footage drilled and footage plugged.
- 4) Total number of monitoring wells installed including footage drilled.
- 5) Total number of SVE pilot test wells installed, including footage drilled.
- 6) Total number of AS pilot test wells installed, including footage drilled.
- 7) Total number of any other wells installed, specifying type, including footage drilled.
- 8) Total footage drilled.
- 9) Total number of groundwater samples submitted for laboratory analysis.
- 10) Total number of soil samples submitted for laboratory analysis.
- 11) Total number of air samples submitted for laboratory analysis.
- 12) Type and number of saturated zone tests and unsaturated zone tests conducted.

Figure 1 Full Site Base Map

A map which is the result of the full site survey includes the area of the contaminant plume as detected during this phase of work. Include and label the location of all groundwater probes, soil borings, and wells. Include the location of all buildings, property boundaries, rights-of-way, roads, underground and aboveground utilities, present and past locations of all underground and aboveground storage tanks, pump islands, product lines, site surface conditions, and any other major structures and potential receptors, e.g. basements, in the area of the contaminant plume.

SECTION 2.0 WELLS AND GROUNDWATER SAMPLING

Table 2 Well Completion Information

Include the following information for each well installed or sampled. Groundwater levels must be measured under static conditions on the same day, and measurements must be corrected if petroleum product is detected. If product is detected, explain at the bottom of the table how the measurements were corrected.

- 1) Well number (assigned by the consultant).
- 2) The identification number from the KDHE Well Tagging Form (Attachment D of the RDP RFP).

- 3) The surveyed elevation of the well's vertical datum control point (survey pin) and the elevation of the top of casing.
- 4) Date of well installation.
- 5) Volume of water removed during well development.
- 6) Total depth of boring (ft. below ground surface).
- 7) Casing material, diameter, and wall thickness.
- 8) Total depth of casing in feet (ft. below top of casing within 0.10 inch).
- 9) Screened interval, slot size, gravel pack, and well seal in feet (ft. below top of casing within 0.10 inch).

Table 3 Groundwater Analytical Results

Include the following information for each groundwater sample and separate phase hydrocarbon sample collected for laboratory analysis to date at the site. Present all results for each sample point in chronological order.

- 1) Well ID number (see Table 2.2).
- 2) The concentrations of each specified constituent in parts per billion (ppb).
- 3) The type of product identified for the separate phase hydrocarbon sample.
- 4) The volume of water removed during well development.
- 5) The volume 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 testing method and laboratory analytical detection limit.

Figure 2 Groundwater Isoconcentration Maps

Develop all groundwater isoconcentration maps that are outlined below and in EXHIBIT 1, Site Specific Information using the most recent analytical data. Use Figure 1 as the template. Sample points shall be labeled with concentrations in ppb. Each isoconcentration map shall include the location of all monitoring wells and sampling points. Isocontour lines shall be labeled with concentrations in ppb. Develop isoconcentration maps only if the constituent is detected in three or more sampling locations.

Figure 2.1 Total BTEX groundwater.

Figure 2.2 Benzene.

Figure 2.3 MtBE.

Figure 2.4 Naphthalene.

Figure 2.5 1,2 Dichloroethane.

Figure 2.6 Polynuclear Aromatic Hydrocarbons (if specified).

Figure 2.7 Ethylene Dibromide (if specified).

Figure 3 Groundwater Flow Map

A map, adapted from Figure 1, depicting each well location and showing the elevation of water levels in each well using the most recent data collected under static conditions, labeled equipotential contours, and arrow(s) indicating predominant flow direction.

2.1 Separate Phase Product Discussion

- 1) Describe the extent of separate phase product encountered at the site. Include any product detected during previous investigations.
- 2) Discuss the feasibility of product recovery at this site. Provide a brief discussion indicating whether data collected at the site confirms the use of this technology. Include all potential receptors proximate to the product plume and discuss risk. Past experience at similar sites is not considered acceptable justification for implementing a technology.
- 3) Discuss the remedial options for addressing separate phase product.

Figure 4 Separate Phase Product Isopach Map

Develop all isopach maps utilizing Figure 1 as the template. Each isopach map shall include the location of all monitoring wells or sampling points. Develop an isopach map any time separate phase product has been detected.

SECTION 3.0 PILOT TEST RESULTS

3.1 Soil Vapor Extraction Pilot Test Discussion

- 1) Describe in detail how the soil vapor extraction test was conducted.
- 2) Discuss all results obtained during the soil vapor extraction test.
- 3) Describe the unsaturated zone characteristics determined and explain how they were determined.

- 4) Discuss the feasibility of soil vapor extraction at this site. Provide a brief discussion indicating whether data collected at the site confirms the use of this technology. Include all potential receptors of SVE exhaust and discuss options for off-gas treatment. Past experience at similar sites is not considered acceptable justification for implementing a technology.
- 5) If SVE is proposed, provide the extraction rates and number of wells necessary to create zones of remediation needed to meet the remedial goals. Explain how this was determined.

Table 4 Soil Vapor Extraction Pilot Test Results

Use the Soil Vapor Extraction Pilot Test Results table found in Attachment I as a template to present the pilot test data (table available from KDHE as a Microsoft® Excel spreadsheet).

3.2 Unsaturated Zone Data

Include all raw data (laboratory tests, grain size distribution plots, soil vapor extraction test data, etc.) and calculations used to determine the unsaturated zone characteristics. Identify the variables and provide the calculated or assigned values.

Table 5 Soil Field Screening and Laboratory Results

Include the following information for each soil sample collected to date at the site. **Include all past samples collected and analyzed.** Present all results for each sample point in chronological order.

- 1) Boring and/or monitoring well ID (see Table 2).
- 2) The depth where each sample was collected.
- 3) The field screening results in parts per million (ppm) for every sample, including samples not sent for laboratory analysis.
- 4) The concentrations of each constituent in parts per million (ppm).
- 5) The date each sample was collected.
- 6) The EPA testing method and laboratory analytical detection limit.
- 7) The field instrument used for each sample.

3.3 Air Sparge Pilot Test Discussion

- 1) Describe in detail how the air sparge test was conducted and why it was conducted in this manner.
- 2) Discuss all results obtained during the air sparge test.

- 3) Describe the saturated zone characteristics and explain how they were determined.
- 4) Discuss the feasibility of air sparging at this site. Provide a brief discussion indicating whether data collected at the site supports the use of this technology. Include all potential receptors proximate to the sparge points and discuss risk. Past experience at similar sites is not considered acceptable justification for implementing a technology.
- 5) If air sparging is proposed, provide the number of wells necessary to achieve the remediation goals. Explain how this was determined.

Table 6 Air Sparge Pilot Test Results

Use the Air Sparge Pilot Test Results table found in Attachment J as a template to present the pilot test data (table available from KDHE as a Microsoft® Excel spreadsheet).

3.4 Air Sparge Data

Include all raw data (air sparge test data, plots of graphical analyses, grain size distribution plots, etc.) and calculations used to determine the saturated zone characteristics. Identify the variables and provide the calculated or assigned values.

SECTION 4.0 UNSATURATED ZONE TEST RESULTS

Figure 5 Zone of Remedial Influence Map

Use Figure 1 as a template to develop a map depicting the areal zone of influence of all SVE and air sparging systems proposed, differentiating each system.

SECTION 5.0 GEOLOGIC CROSS SECTIONS

Figure 6a Geologic Cross Section – A

Construct a geologic cross section plotted relative to actual mean sea level elevations of monitoring wells, of the area with the highest level of soil contamination at the site based on all available data, using a minimum of three bore holes. Each cross section must include the following information:

- 1) Soil profile lithological units of each well and boring;
- 2) All field screening data, laboratory analytical results and product thickness plotted relative to associated depths;
- 3) Location and screened intervals of SVE/AS and monitoring wells located within the area of the cross section;
- 4) Depth to water and separate phase product (if present);

- 5) Vertical and horizontal bar scales with vertical exaggeration noted;
- 6) Legend using standard geologic soil/lithology symbols; and

Also include an inset plan view map of the site with wells and borings plotted depicting the orientation and labeled reference points for the cross sections.

Figure 6b Geologic Cross-Section – B

Construct a second cross-section including the same information required in Figure 6a, but oriented approximately perpendicular to it.

SECTION 6.0 DRILLING LOGS

Include schematics for each boring drilled or advanced during this phase of the work. Do not make reference to, or include in this section, any discussion, tables, photographs, maps, or other documents included in this or any other report. Written and graphic well completion information must be included on the drilling log.

Drilling logs must be typed. At a minimum, the following information must be included on each log:

- 1) The boring and monitoring well ID number.
- 2) Date and time drilling was conducted.
- 3) Name of the Driller and Geologist.
- 4) Description of the sediments, including soil texture, grain size and shape, sorting, color, odor, staining, relative moisture (i.e. dry, moist, wet). Include field screening for contaminant distribution and other information such as fracturing or solution cavities, and organic content.
- 5) Field screening results corresponding to depth.
- 6) Depth at which the saturated zone was encountered and elevation of the static water level.
- 7) The measured intervals of the following: well screen, blank casing, sump, filter pack, bentonite seal, and grout seal. Also include details of well head completion and the surveyed elevations of the top of the casing and the pad.
- 8) Specific type and amounts of well construction material used, such as, casing type and diameter, screen slot size, filter pack particle size, method of placement and amount of water used.
- 9) Provide the type of drill rig, drilling method, soil sampling equipment, and soil analyses equipment utilized.

SECTION 7.0 DOCUMENTATION

Include all information requested in the following format.

Appendix 1 BER Well Tag Forms

Include a copy of the completed Form.

Appendix 2 KDHE Water Well Records

Include copies of the KDHE Water Well Records (form WWC-5) for each well installed. Include copies of WWC-5P forms if applicable.

Appendix 3 Laboratory Data

Include all analytical laboratory reports, QA/QC reports, and chain of custody documents.

Appendix 4 Field Notes

Include copies of all original field notes and drilling logs maintained in the field. Include a copy of the complete surveyor's report in this appendix. Refer to Field Notes definition 6.12 in the RFP.

Appendix 5 Off-Site Waste Handling Documentation

Provide documentation, indicating how wastes addressed off-site were handled and treated.

Appendix 6 On-Site Waste Handling Results

Include the following information for wastes handled.

- 1) The type of wastes generated (soil, water, etc.).
- 2) The quantity of waste generated for each type of waste.
- 3) The storage methods used for each type of waste.
- 4) The field analyses results of the wastes during the on-site treatment process.
- 5) The laboratory analyses of wastes.

Appendix 7 Photographs

- 1) Photographs must provide views of the entire site from multiple directions, including pump islands, dispensers, tank basins, obstructions, canopies, overhead utilities and signs.

- 2) At a minimum, all surfaces on which drilling equipment will be operated and driven should be photographed prior to moving drilling equipment on site.

Appendix 8 Site Approval and Electrical Verification

- 1) Include site map with trenching and equipment approval signed by the O/O, tenant, and Project Engineer.
- 2) Include electrical power verification map stamped, signed, and dated by the Project Engineer.

ATTACHMENT L
REMEDIAL DESIGN PLAN FORMAT

ATTACHMENT L: REMEDIAL DESIGN PLAN FORMAT

Cover Page: The design plan shall include a cover page with the following information: report title; site name; site address; KDHE project code; section, township, and range to four quarters; report date, the name of the person who developed the design plan, and the name of the people who conducted the work for the design. The RDP cover page must be stamped, signed and dated by the Project Engineer and the Project Geologist.

Table of Contents: The design plan shall include a table of contents with the following information: 1) section titles and page numbers of all sections 2) tables and page numbers and 3) list each Drawing, Figure, and Appendix.

Labeled Tabs: The design plan shall include a labeled tab for each of the section titles and each appendix.

Report Format: The Remedial Design Plan will include all information outlined below in the format and order described:

SECTION 1.0 CONSTRUCTION PLANS

Provide detailed plans for all construction. *All plans, specifications, drawings, and diagrams must meet applicable local, state, and federal requirements.*

1.1 Summary of Work

Concisely describe all work necessary to implement the remedial design plan.

1.2 Well Installation

The specifications for all project drilling will include, but is not limited to: materials, methods, special conditions, equipment, installation, testing, and completions.

1.3 Piping and Trenching

The specifications for all piping and trenching will include, but is not limited to: methods, materials, dimensions, special conditions, installation, surface completions, and verification and testing.

1.4 Electrical

All specifications and description of work for the electrical service will include, but is not limited to: NEC rating, materials, boxes/enclosures and special conditions.

1.5 Electrical Power Verification

Vendor will provide a map of the area showing the location and type of power supply for the proposed remedial system. This map will depict the exact location of the existing power, the type of power and distance to the proposed system. Vendor must discuss future power needs with the appropriate local power company representative

to determine both the lead time necessary to extend the power, and the cost to the extend the power to the proposed location. Vendor must include the name and phone number of the power company representative, date of discussion, as well as the estimated cost to extend this power. This map will be signed, dated and stamped by the Project Engineer.

1.6 Equipment

Specifications for all required remedial equipment will include, but are not limited to: specific model information, materials, sizes/quantities, soil and groundwater remediation systems, equipment enclosure/trailer and installation.

1.6.1 Operation and Maintenance Schedule and Consumables

Provide a complete service schedule for all equipment including the manufacturer's servicing recommendation for each piece of equipment. Provide a list of consumables for the two year period of OM&M (e.g., rotary vane replacement kit, filters, belts, lubricants). This list will also be included in the bid sheets.

1.7 Remedial Plans

The following plan drawings must be submitted with the report. All drawings must be stamped, signed and dated by the Design Engineer.

Drawing 1.7.1 Site Plan

Provide a site plan that depicts the project area incorporating the information developed in the Full Site Survey (see Section 3.13 of the RDP RFP) and the proposed locations of all remedial equipment, wells and lines, and any other items pertinent to remedial implementation. Identify all major components of the remedial system and fixed objects on the facility property.

Drawing 1.7.2 Process and Instrumentation Diagrams (P&ID)

Provide P&ID diagrams for all remedial equipment. Identify by type and size and label all components.

Drawing 1.7.3 Equipment Drawings

Provide detailed scaled drawings of all remedial equipment, remedial enclosures and security measures.

Drawing 1.8.4 Electrical Diagrams

Provide detailed diagrams and schematics of the electrical system and electrical lines. The wiring diagram must include, but is not limited to, type of power supply (phase, cycles, voltage, and amperage capacity); circuit breaker or fuse ratings; motor control sizes, controls, wire sizes, load for each branch of the circuit; interlocks; meters;

remote controls, modems or logic control systems; and safety or alarm systems.

Drawing 1.8.5 Well Drawings

Provide detailed drawings of all well completions. Drawings will include the subsurface completion of the well, total depth of each well, well head completion and piping extending from the well to the remedial systems.

Drawing 1.8.6 Trenching/Piping Diagram

Provide detailed drawings and cross sections of the piping and trenching.

1.9 Design Calculations and Considerations

Include in this section the design and sizing calculations for the remedial equipment.

1.10 Manufacturer's Specification Sheets

Provide manufacturer's specification sheets for the proposed remedial equipment.

SECTION 2.0 OPERATION, MAINTENANCE, AND MONITORING SPECIFICATIONS

Provide specifications for the Operation and Maintenance (O&M) of the equipment, monthly and quarterly monitoring specifications, reporting requirements, permitting requirements and site- specific information.

Provide a list of consumables for the first two years of O&M and a schedule of manufacturer- recommended maintenance for this two- year period as referenced in 1.6.1.

SECTION 3.0 REMEDIAL IMPLEMENTATION BID SHEETS

The information presented in this section will be used in conjunction with the above information to obtain bids for remedial implementation. The bid proposal sheets must include detailed line items. This information must be presented using columns for the item, unit rate, quantity, and cost. All equipment, supplies, parts, maintenance, and monitoring must be accompanied with the actual quantities necessary to implement the RDP.

Sample bid sheets will be provided by KDHE upon request.

SECTION 4.0 LIEN RELEASES

A lien release from all Subcontractors and Equipment Vendors must be provided as an attachment to the Remedial Design Plan.

EXHIBIT 1
SITE SPECIFIC INFORMATION

EXHIBIT 2
PROJECT BID PROPOSAL SHEETS