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Quality Assurance Project Plan for the Holocene Project

Prepared by
Kentucky Research Consortium for Energy and Environment
233 Mining and Minerals Building
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Prepared for
United States Department of Energy Portsmouth/Paducah Project Office
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QUALITY ASSURANCE PROJECT PLAN

FOR THE

Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

APPROVALS

By their signature, following, the undersigned indicated that this Quality Assurance Project Plan (QAPP) shall be utilized to ensure quality data and information is obtained from the field activities at the Paducah Gaseous Diffusion Plant (PGDP).

Director - KRCEE
Lindell Ormsbee, Ph.D.

_____ _____
Signature Date

Assistant Director - KRCEE
Steve Hampson

_____ _____
Signature Date

NOTE TO READERS

Scope of Activities for Project Documents

The Field Work Plan, Health and Safety Plan, and Quality Assurance Project Plan for the Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky encompass only those project activities that will be conducted on the United States Department of Energy Paducah Gaseous Diffusion Plant Reservation. Soil cores collected during the project field investigation will be transported to the Kentucky Geological Survey Core Library in Lexington, Kentucky for assessment and storage.

Project core evaluation, lithologic characterization, collection of carbon-14 dating samples, and core correlations will be conducted at the Kentucky Geological Survey Core Library by the Holocene Displacement Project Technical Team. The Project Technical Team is comprised of experienced subject matter experts in seismic, geologic, lithologic, and geotechnical disciplines required by the Project's technical scope.

The core assessment methods employed by the Holocene Displacement Project Technical Team and the Teams observations and conclusions regarding Holocene-aged displacement of subsurface materials at the C-746-U Landfill will be reviewed by an Independent Technical Review Team comprised of experienced and published subject matter experts from disciplines related to the Project. When the Independent Technical Review Team's comments and concerns are satisfactorily addressed, core assessment methods and conclusions regarding Holocene-aged displacement of subsurface materials at the C-746-U Landfill will be detailed in a Project report that will be submitted for publication, provided to the United States Department of Energy, state/federal regulatory agencies, and stakeholders.

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1.0 Introduction

Successful cost-effective completion of remedial actions planned for the Paducah Gaseous Diffusion Plant (PGDP) requires the disposition of significant quantities of remedial waste. At present, there is insufficient capacity at the C-746-U Landfill to accommodate projected remedial waste volumes. In order to create the capacity to accommodate the projected volumes of remedial waste at the PGDP, DOE has been involved in the process of obtaining a permit that will allow for landfill expansion. Conservative fate and transport modeling and risk assessment conducted for the C-746-U Landfill have established that the public health and the environment will not be impacted above state and federal regulatory standards as a result of expected disposal inventories. Regardless of the fate and transport and risk assessment information, permitting to allow expansion of the landfill is contingent upon studies to evaluate whether Holocene-aged (within the last 10,000 – 11,000 years) displacement of material has occurred along faults identified at the landfill.

This Quality Assurance Project Plan (QAPP) addresses the implementation of core collection activities to determine whether displacement of Holocene aged material has occurred at the C-746-U Landfill. The KRCEE will obtain up to 88 Direct Push Technology (DPT) cores from target zones associated with faults identified by previous seismic studies to the North and West of the C-746-U Landfill (See Figure 3, Work Plan for "Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky").

This QAPP must be present and available to employees at the drilling/coring locations during all field work related to the seismic investigation. This QAPP is being submitted in conjunction with the Work Plan for this project entitled, Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky. The Work Plan should be consulted for detailed information concerning project objectives, site tasks, etc.

The major tasks to be performed during this project include:

- Surveying transects and borehole locations,
- Mobilizing and staging of equipment and supplies,
- Erecting temporary access controls around the drilling locations,
- Coring,
- Screening,

- Collecting cores,
- Closing core boreholes and drilling locations, and
- Surveying equipment.

Core assessment is not a part of this QAPP. Only the collection of cores is addressed by the project planning documents. All screening will be conducted in the field and there will be no laboratory analysis associated with the field segment of this project.

Personnel working on this project for KRCEE must review this document and understand its intent to encompass the basic strategies and procedures to ensure integrity of all cores and field data collected during the project.

2.0 Distribution List

- KRCEE subcontractors and DOE will be provided copies of the Work Plan, Health and Safety Plan, and the QAPP. In addition, key state and federal agencies will be provided the approved documents.
- Electronic copies of all documents will be maintained on the KRCEE ftp site. Presently DOE contractors have access to KRCEE ftp site and access to all Holocene documents and updates to documents.
- All documents will be maintained at the field work site.
- Distribution of documents to subcontractors and DOE will be under the authority of the KRCEE Project Manager.
- Control of documents will be by KRCEE's Project Manager.
- All program documents will be maintained in electronic format by KRCEE.
- Field logbooks will be converted to electronic format and posted on the ftp site
- Reports will be provided to KRCEE subcontractors and DOE.
- Reports will posted on the KRCEE ftp site in electronic format.

3.0 Project Management

Key project organizations, individuals, and project responsibilities are presented in the following table.

Table 3-1. Project Roles and Responsibilities

Position	Name	Phone
KRCEE Project Manager	Steve Hampson	859-564-8390x4507
Field Manager	Ken Davis – SAIC	270-462-4553
Geotechnical Management	William Lettis and Associates	925-256-6070
H&S Manager	John A. Volpe, Ph.D.	502-695-0828
ESHR	TRICORD, INC	270.443.4865
Drilling Contractor	Shane Hughes, Miller Drilling, Inc	931-762-7548

3.1 Key Personnel & Responsibilities

3.1.1 KRCEE - Project Manager

The Project Manager has overall responsibility and authority to direct the technical, management, cost, and contractual matters related to the project. The Project Manager is ultimately responsible for performing all project-associated activities on the site.

Specific responsibilities will include, but not be limited to, the following:

- Develops project schedule information
- Allocates resources throughout the project.
- Ensures project goals are met in a high-quality, timely manner.
- Responsible for implementation and enforcement of the QAPP.
- Serves as primary point of contact with DOE and its subcontractors

3.1.2 Field Manager

The Field Manager will be responsible for execution of overall project field activities and will coordinate and oversee day-to-day project field activities. The Field Manager is responsible for enforcing the field requirements of this QAPP. Specific responsibilities of the Field Manager are listed below:

- Conducting pre-job meetings and daily meetings prior to start of work;
- Enforcing compliance with the project QAPP;
- Coordinating drilling/coring operations, including subcontractor activities;
- Ensuring that subcontractors follow the requirements of this QAPP;
- Conducting or ensuring worksite inspections;
- Ensuring documentation of all meeting and activities; and
- Maintaining current copies of the project QAPP and other project related documents at the drilling site.

3.1.3 KRCEE Health & Safety Manger

The KRCEE Safety & Health Manger has the following responsibilities:

- Reviews project Health and Safety Plan (HASP),
- Responsible for KRCEE HASP surveillances and audits, and
- Interacts with the ESHR.

3.1.4 Environmental Safety and Health Representative

The ESHR has the following responsibilities and authorities:

- During field work, conducts (documents) HASP inspections of the KRCEE and KRCEE subcontractor work activities;
- Verifies that all on-site personnel have the required training and certification and maintains copies of required documentation in files;
- Provides project-specific training for new employees and visitors;
- Establishes and implements applicable HASP and QAPP procedures;
- Ensures that all operations are conducted so as to mitigate adverse environmental impacts (e.g., spill containment, erosion control, etc.);
- Establishes and maintains the hazard communication program [including material safety data sheets (MSDSs), employee training, and maintenance of an inventory listing material, CAS number, approximate quantity, and storage location];
- Evaluates the site for any hazards not identified in the Activity Hazard Assessment (AHA), initiates safety measures required to protect personnel, and revises documents accordingly;
- Establishes and maintains programs required to mitigate hazards identified in AHA;
- Maintains first-aid and Occupational Safety and Health Administration (OSHA) 300 logs; reports accidents and injuries through the appropriate channels; and conducts accident/incident investigations as required, including the completion of appropriate forms; and
- Coordinates with off-site emergency responders and medical service organizations to establish required services and verify that phone numbers, addresses, and contacts are current and accurate.

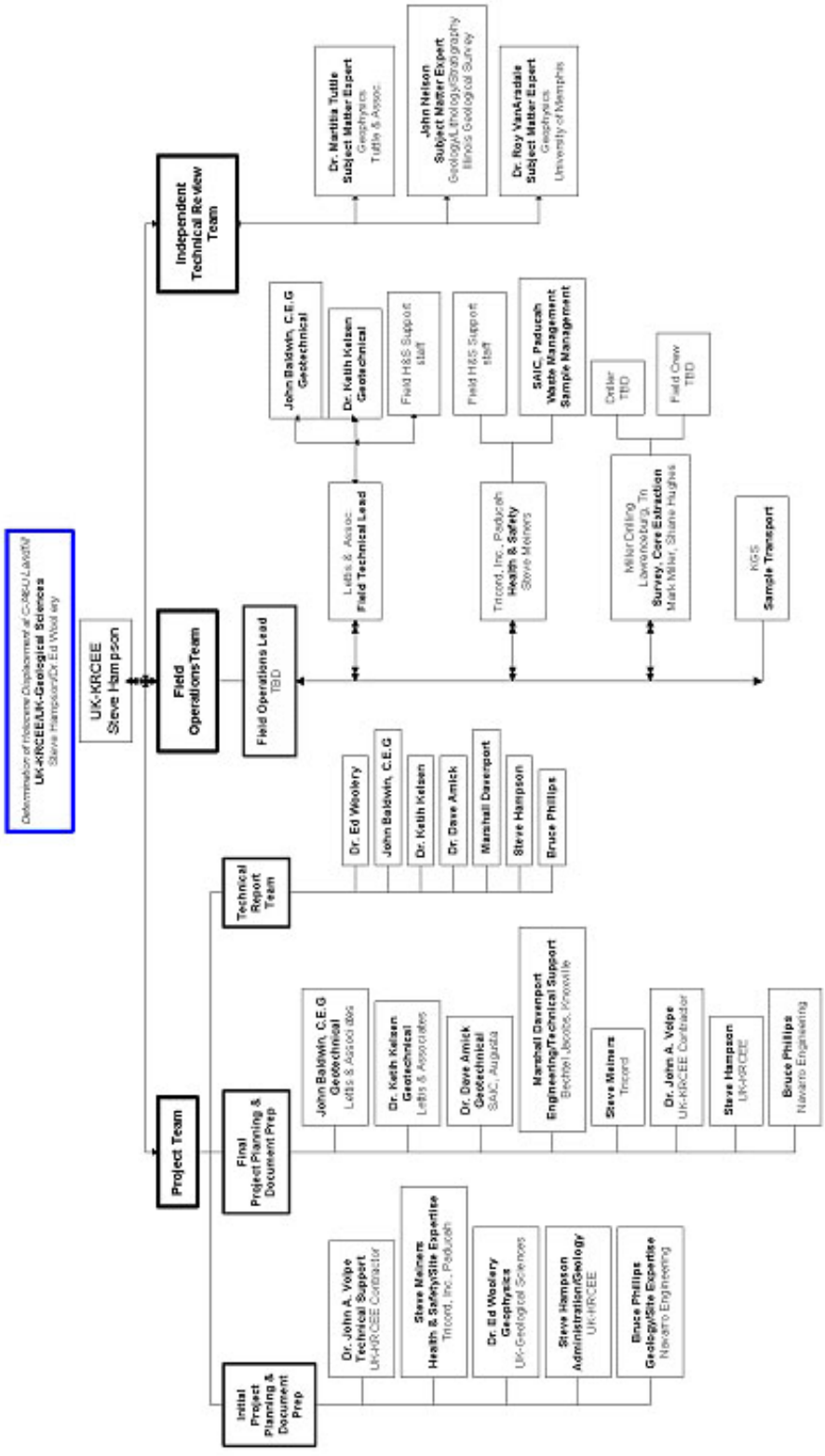
3.1.5 Project Team Responsiblilities

Table 3.2 Holocene Project Roles and Responsibilities

Role	KRCEE/Subcontractor
Project Management	KRCEE
Overall Task Coordination - Collaboration with the DOE representative	KRCEE
Planning Work Plan	 KRCEE, John A. Volpe, Ph.D., LLC

Role	KRCEE/Subcontractor
Drilling	Miller Drilling Inc.
Drilling Permits	Ken Davis, SAIC
Drawings	WLA
Surveying and Staking	Dummer Surveying
Field Support	TRICORD, Inc.
Final Report	KRCEE
Core Collection	
Drilling	Miller Drilling Inc
Core Assessment	KRCEE/Subcontractors
Site Safety/ESHR	TRICORD, INC
Site Security	TRICORD, INC
Photography/Videography	TRICORD, INC
H&S Plan/Implementation	TRICORD, INC
Core Transportation	KRCEE
RADCON	TRICORD, INC
Rad Surveying of Material	
Equipment Surveying	
Data Management	WLA
Chain-of-Custody Forms	TRICORD/SAIC
Field Logbooks	TRICORD/SAIC
Lithologic Logging	SAIC/WLA
Environmental	KRCEE
NEPA	
Regulatory Notifications	
Permit Issues	
Miscellaneous Support	KRCEE Miller Drilling, Inc., TRICORD, INC, SAIC
Transportation	
Safety	
Scheduling	
BCP	
Procurement	
QA	
Training	

Figure 3.1 PROJECT ORGANIZATION



3.2 Project Background and Problem Definition

The objective of this investigation is to determine if a horizon of datable Holocene material is present and widespread in the shallow subsurface at the site, and if the Holocene material has been displaced by active faulting within the past 11,000 years.

Successful cost-effective completion of remedial actions planned for the Paducah Gaseous Diffusion Plant requires the disposition of significant quantities of remedial waste. At present, there is insufficient capacity at the C-746-U Landfill to accommodate projected remedial waste volumes. In order to create the capacity to accommodate the projected volumes of remedial waste at the PGDP, DOE has been involved in the process of obtaining a permit that will allow for landfill expansion. Conservative Fate and Transport Modeling and Risk Assessment conducted for the C-746-U Landfill have established public health and the environment will not be impacted above state and federal regulatory standards as a result of expected disposal inventories. Regardless of the fate and transport and risk assessment information, permitting to allow expansion of the landfill has been stalled until studies are completed to evaluate whether Holocene-aged displacement (within the last 10,000 years) of material has occurred along faults identified at the landfill.

3.3 Areas and Work Task

The field work for the Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill Project will occur along one (1) E-W and one (1) N-S oriented transect coincident with gravel access roads and previous seismic reflection lines. The access roads are located directly north and west of the C-746-U Landfill (See Figure 3, Work Plan for "Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky"). The work area along the transects ranges in elevation from approximately 367' above mean sea level (msl) at the eastern end of the E-W transect, to 372' msl at the southern end of the N-S transect. The areas encompassing transects are currently grassed or covered with gravel and are readily accessible. Both transects are outside of the C-746-U Landfill security fence. The E-W transect cuts across the northern extent of the proposed C-746-U Landfill boundary.

In order to accomplish the investigative objective, Direct Push Technology (DPT) cores will be obtained from locations along the two transects in an approach that may include up to four distinct coring phases. The DPT cores will be 2 and ⅓ inches in diameter and will be obtained in approximately seven (7) 4-foot long sections and one 2-foot long section at each borehole location. The DPT cores will be obtained in a manner that will not generate waste. Following extraction, cores will be screened by field screening instruments for radiological and volatile chemical contamination.

The Project Technical Team that is comprised of experienced subject matter experts in seismic, geologic, lithologic, and geotechnical disciplines required by the Project's technical scope will be the users of the core collected from the field work.

The core assessment methods employed by the Holocene Displacement Project Technical Team and the Teams observations and conclusions regarding Holocene-aged displacement of subsurface materials at the C-746-U Landfill will be reviewed by an Independent Technical Review Team comprised of experienced and published subject matter experts from disciplines related to the Project.

3.4 Project Schedule

The general project schedule is outlined in the table below.

Table 3.3. General Project Schedule

Action	Start	Duration
Planning, documentation and preparation of HASP, SAP, WMP	February 2005	18 weeks
Civil Survey Site-specific training	September 12, 2005	2 Days
Mobilization Transect layout and walk-down Drilling/Coring Operations Field evaluation of cores Transport Cores to University of Kentucky	September 12, 2005 September 9, 2005 September 13, 2005 September 13, 2005 September 14, 2005	1 Day 1 Day 2-3 Weeks 2-3 Weeks 2-3 Weeks
Backfill Boreholes Site restoration Demobilization	September 13, 2005 September 26, 2005 September 26-30, 2005	2-3 Weeks 2-3 Weeks 1 Day

3.5 Quality Objectives and Criteria

- The intent of this investigation is to obtain quality information and data through project oversight that will permit a determination of whether a horizon of datable Holocene material occurs and is widespread across the shallow subsurface at the site and if the Holocene material has been displaced by seismic activity in the last 10-11,000 years.

- In order to obtain quality data, technical guidance for the project will be provided by nationally recognized experts, chosen specifically for their individual expertise related to seismic evaluations.

- Data control and assessment of cores will be conducted by the principal investigators and the expert project team.

- A written report prepared by subject matter experts will document observations, data, and other information collected during field activities and from laboratory data.

- The written report will be submitted to DOE and for professional journal publication.

3.6 Special Training/Certification

Project-specific training requirements are contained in the following table. Task-specific requirements are contained in the project AHA. Copies of certificates for the required training will be maintained by the ESHR. Table 3-2 details project specific training for all workers and managers associated with this project.

Table 3.4 - Project Specific Training

Project Specific Training				
Training Type	**Duration**	**Frequency**	**Provided By**	**Required For**
General Employee Training (GET)	2 hours	Prior to drilling	Web Based with Warning Horns at Site	Not applicable
Hazard communication	1 hour	Prior to using any chemicals	KRCEE or KRCEE Subcontractor	All personnel who will work with or near chemicals
HAZWOPER site worker	40 hours and 3-day OJT 8-hour annual refresher	Prior to drilling	Subcontractor	All personnel who enter the drilling area
Site training to include pre-job safety meeting, AHA review, daily safety meeting	Variable	Prior to performing hands-on work or entering restricted access areas and daily during the project	TRICORD, INC.	All on-site personnel
TASK SPECIFIC TRAINING				
First Aid and CPR (including blood-borne pathogens)	8 hours	As specified by the providing agency	TRICORD, INC	At least one person on each shift
Respirator training	2 hours	Prior to respirator use	TRICORD, INC.	All personnel who use respiratory protection
HAZWOPER Supervisor	8 hours	Prior to excavation	TRICORD, INC	Field Manager and ESHR
Hearing conservation	1 hour	Prior to work in high noise area	KRCEE Subcontractor	All personnel who may be exposed above 85 dBA

On-site training prior to initiation of drilling will include the following:

- Emergency procedures and emergency contacts, warning horns, and sirens,
- QAPP responsibilities,
- The nature and location of physical and chemical (contaminants and chemical tools) hazards,
- The location of Material Safety Data Sheets (MSDSs),
- Required hazard controls (AHA review), and
- Cold and Heat stress and required controls.

3.7 Documents and Records

All project personnel will be required to have reviewed the QAPP prior to the initiation of work activities. All documentation will be maintained in project field logbooks.

The implementation for logbook procedures is detailed in the Appendix of the Work Plan for "Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky". Responsibilities related to records and field logbooks is detailed Work Plan Appendix. KRCEE is responsible for maintaining all project documents and final reports.

- Field records will be maintained in field logbooks and signed and dated daily by the Field Manger.

- The Field Manager and the ESHR will maintain all training records, health and safety inspection, MSDS sheet, calibrations records, and all other records that may be generated by the field project. At the conclusion of the field work all records will be transferred to KRCEE as the official record. KRCEE will convert all paper records to electronic for storage on the KRCEE ftp site.

- Field screening of core material collected during the investigation will include field screening of cores for volatile constituents using a photoionization detector and radiological constituents using portable survey instruments. No laboratory analyses will be conducted for the field portion of the project.

- Results of the field screening will be recorded in field logbooks and used to direct health and safety oversight.

- Site and field logbooks will be used for the maintenance of field records and for documenting any information pertinent to field activities.

- These data will be obtained from observation and entered in the logbook by field personnel.

- Data to be recorded will include such information as the transect location, sampling interval/depth, borehole location, and applicable core screening.

- Field data will be maintained as appropriate for the following types of information:

    - Boring logs,
    - Sample logbooks (location of borehole and depth of sample will be established),
    - Chains-of-custody, and
    - Instrument calibration logs.

- Field logbook documentation of this investigation will be supplemented using still photographs.

- Throughout the field effort, digital photographs will be taken to document the investigative activities and the visual observations.

- All still photographs will become part of the project record at the conclusion of the field effort and be available for posting on the KRCEE ftp site.

3.8 Core Sample Identification, Numbering, and Labeling

- Each core collected during this investigation will be assigned a unique sample identifier, which will be permanently affixed to the core container, recorded in the field logbook, and recorded on the chain-of-custody forms.

- Sample identification numbers will be coded to enable identification of the location of the borehole and the sample depth interval.

- Positions 1 to 3 will be used to identify the owner of each sample.

- Position 4 will be used to identify the Transect Number

- Positions 5, 6 and 7 will be used to identify the borehole designator.

- Positions 8 to 11 will provide a unique sequential sample number for that depth interval.

- Field documentation will include physical descriptions and will relate cores to sample locations, depths, and collection dates and times. Figure 3-2 outlines the sample identification protocol.

- All field information will be recorded in field logbooks and signed and dated daily by the Field Manager.

Sample Identification: XXX n YYYdddd	
XXX = Agency identifier	<u>Examples:</u> UKK = KRCEE BJC = Bechtel Jacobs Company (DOE)

	EPA = Environmental Protection Agency KDP = Kentucky Department of Environmental Protection
n = Transect designator	Examples: 1 = Transect #1 2 = Transect #2
YYY= Seismic survey shot point number (a unique number for each boring location designator - from previous seismic survey)	Examples: Transect 1, Location 5 = 1,005
dddd = Core depth	Examples: Depth = - 1 ft to 5 ft = 01,05

Figure 3-3. Sample Identification Protocol

- The field information and records that are collected will be included in the data report package in electronic format.
- The final report to DOE will identify any records and documents applicable to the project.
- Detailed records of all activities shall be maintained for the Administrative Record.
- The records for the field project shall contain all information related to field activities, field sampling, and records needed to provide a complete description of any difficulties encountered.
- All records for the project will be maintained by the KRCEE.

3.9 Core Collection, Control, and Sampling Process

- Up to 88 soil cores will be collected for this investigation at locations~~,~~ along two transects (See Figure 3, Work Plan for "Field Study and Peer Review for Determination of Holocene Displacement at the C-746-U Landfill at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky").
- Core locations will be surveyed, flagged, and coordinates recorded by a licensed surveyor.

- Continuous cores will be collected at four (4) ft intervals at each boring location along the target zone geophysical transect in the area of investigation.

- The time elapsed to obtain a core section, geotechnical observations, and the time of extraction for each core section from a boring will be recorded.

- Following extraction from a borehole, cores will be screened for radiological and volatile organics.

- It is anticipated that approximately seven (7) 4-ft-long cores and one 2-ft-long core will be collected from each of the 80 shallow proposed borings.

- An additional ten (10) 4-ft-long cores will be collected from each of the eight (8) deeper boreholes.

- Cores will be removed from the DPT barrel, and placed on a plastic table in drilling area for screening. Cores are contained in plastic.

- Following screening, field logging, and documentation, the cores will be containerized and stored in a secure storage located at the investigation site prior to shipping to the Kentucky Geological Survey core facility in Lexington.

- In the event that a contaminated core is encountered, it will be evaluated as specified in Section 3.2.1 of the Work Plan.

- Cores will be shipped to Kentucky Geological Survey Core Library on a daily basis.

3.10 Sample Handling and Custody

- Sample chain-of-custody will be maintained through all transfers of custody from time of collection, storage, transport to, and receipt at the University of Kentucky – Kentucky Geological Survey (KGS) core facility or an appropriate analytical laboratory.

- Chain-of-custody records will accompany each packaged shipping container of cores.

- The KGS core facility and laboratories will not accept cores without a chain-of-custody record.

- Internal KGS records will document the custody of the sample through its final disposition.

3.11 Core Sample Shipment

In general, cores and core sample containers will be packaged according to the following procedure:

- Cores will be screened by field procedures to identify any potential radiation and hazardous chemicals prior to shipping.

- Core boxes will be used to containerize cores and these boxes will be wrapped in custody tape.

- Logbook entries and chain-of-custody forms will be completed with core collection information and names of all persons handling the sample in the field before packaging.

3.12 Analytical Methods

The focus of the field project addressed by this QAPP is the collection of soil core for shipment to laboratory facilities at the University of Kentucky/Kentucky Geological Survey. No analyses are planned for the fieldwork phase of the fault study.

3.13 Quality Control

Field samples will not be taken during the field phase of the work.

All sampling and sample analyses in support of this fault study will be performed as part of the laboratory activities at the University of Kentucky/Kentucky Geological Survey, which are addressed in other documents separate from the field work. As indicated in the note to readers, the Project Technical Team is comprised of experienced subject matter experts in seismic, geologic, lithologic, and geotechnical disciplines required by the Project's technical scope. These experts will provide quality control oversight for core assessment.

3.14 Instrument/Equipment, Testing, Inspection, and Maintenance

The only measuring and test equipment (M&TE) used during this field project is anticipated to be for H&S monitoring and field screening of cores. Operation of the DPT and logging of soil core will not require the use of M&TE.

An appropriate unique instrument identification number will be assigned to each individual piece of screening equipment and the due date of the next calibration will be attached to the equipment or documented in its equipment log. If this identification is not possible, records traceable to the equipment will be readily available for reference.

All measuring and test equipment (M&TE) will be calibrated against certified equipment and/or standards having known valid traceability to nationally recognized standards.

M&TE will be calibrated, adjusted, and maintained at prescribed intervals or before use. If no nationally recognized standards exist, the basis for calibration will be documented.

All standards used for equipment calibration will be traceable to the EPA, National Institute of Standards and Technology, or a commercially available certified standard. The source of the standard will be documented in a calibration logbook.

3.15 Instrument/Equipment Calibration and Frequency

Field instrumentation will be calibrated according to the procedures specified in the manufacturer's operating manual. Table 3.3 lists M&TE to be used, detection limits, and a schedule for calibration. Instrument logbooks or notebooks will be established and maintained by the ESHR, Field Manager, or designee, as appropriate.

All instruments will be maintained within factory calibration, in accordance with applicable manufacturers' recommendations and specifications described in the manufacturers' operation manuals. Daily calibration will be recorded in the field M&TE logbook in a section dedicated to calibration and vital information about the instruments.

Table 3.5. Field instrument uses, detection limits, and calibration.

Instrument	Uses	Detection Limits	Calibration	Comments
Total organic vapor meters	Breathing zone screening for VOCs	Detection limit varies by equipment	Daily calibration	Action level stated in Health and Safety Plan. PID can't detect compounds with ionization potentials > 11 eV.
Radiological monitoring	Monitoring of beta-gamma, gross gamma, and alpha surface contamination levels	Detection limit varies by equipment	Daily source check per manufacturer	Calibration to be performed by BJC
Noise meter	Establish hearing protection measures	N/A	Manufacturer	Action level stated in the Heal and Safety Plan

Scheduled periodic calibration of equipment will not relieve personnel of the responsibility of employing properly functioning equipment. If an individual suspects an equipment malfunction, the device must be removed from service, tagged so it is not inadvertently used, and project management notified of the malfunction. If equipment is found to be out of calibration, the appropriate project management personnel will evaluate and document (in the instrument logbook) the validity of previous inspection or test results and the acceptability of similar equipment previously inspected or tested. The

Field Manager will ensure devices that are out of calibration are (1) tagged and segregated from other equipment and (2) not used until they are recalibrated. Any equipment that is consistently found to be out of calibration will be replaced. Any such action shall be recorded in the instrument logbook.

3.16 Inspection/Acceptance of Supplies and Consumables

The Field Manager will establish a staging area for the delivery of all supplies and consumables for the field project. This staging area will consist of distinct receiving and disbursement areas. The Field Manager or his designee will inspect all materials before disbursement to the field project personnel. If unacceptable items are discovered, they will be identified and staged for return or disposal.

3.17 Non-direct Measurements

The daily conduct of the field project will not be based upon non-direct measurements.

3.18 Data Management

The primary scope of this field project is the collection of core samples for submission to a University of Kentucky/Kentucky Geological Survey Core Library where the cores will be examined for evidence of faulting. At the facilty samples will be collected for ^{14}C age dating. The above phase of the work is not subject to this QAPP.

Information from this field project will consist exclusively of hard-copy records as maintained in field logbooks and field forms. The primary data to be taken for the project include training, health and safety monitoring records, access records, coring and core collection information, chain-of-custody, and lithologic descriptions.

The Field Manager has the role of primary oversight of data management activities for the field project. The field project team consists of technical and support staff that conducts the various tasks required to successfully complete collection of cores. The field project team will be responsible for recording field activities in field logbooks and field forms.

The Field Manager is responsible for reviewing field logs to determine if the project team followed all applicable procedures. The Field Manager ensures that all cores were properly labeled, instruments were calibrated prior to taking measurements, and information was recorded correctly. Data management requirements for field logbooks and field forms specify that (1) core collection documentation must be controlled from preparation and initiation to completion, (2) all documents generated shall be maintained in a project file, and (3) modifications to planned activities and deviations from procedures shall be recorded in field logbooks.

Field logbooks, chain-of-custody forms, and field forms will be assigned document control numbers and maintained by the Field Manager. The Field Manager will copy

logbooks and field documentation daily. The copies will be forwarded to KRCEE's Lexington, KY Office; the originals will be maintained in the field until completion of field activities. The project file will be considered the Record Copy and, as such, will be stored in 1-hour-rated, fire-resistant, locked, file cabinets at KRCEE in Lexington, KY.

Field COC forms contain core-specific information recorded during collection of the cores and any field-collected samples. Any deviations from the Work Plan will be noted on the field COC form. The Field Manager will review each field COC form for accuracy and completeness as soon as practical following core collection.

Field COC forms will contain fields for the following information:

Information that is preprinted:	**Information that is entered manually:**
- COC number	- sample date and time
- project name or number	- top and bottom depths and units
- sample ID number	- sample comments (optional)
- sampling location (e.g., 001-001)	
- sample matrix (e.g., SO = soil)	
- sample container (volume, type)	

Lithologic description forms will contain lithologic information recorded by the Geologist during collection of cores from the boreholes. The Geologist will record the lithologic description in the field logbook and will transcribe the information to the lithologic description forms as soon as practical following completion of the borehole.

Upon completion of the field project, the Field Manager will forward original logbooks and other field documentation to the Project Manager at KRCEE in Lexington, KY.

4.0 ASSESSMENT AND OVERSIGHT

The Project Team participated in a Readiness Review on September 7, 2005 with the Bechtel Jacobs Company and DOE prior to initiation of field activities. Field surveillances may be conducted by the Project Manager and subject matter experts retained for the project to provide technical oversight. Due to the limited scope of this project, no audits or surveillances are anticipated at this time.

4.1 Reports to Management

Because of the short duration of the project, the Field Manager will make daily progress reports to the Project Manager. These reports will summarize daily activities and progress and the status of health and safety and quality control for the project.

5.0 Data Validation and Usability

This field project will not generate data requiring validation. Field activities will be documented to support data validation and usability for the follow-on laboratory and core assessment activities phase of the project.