Department of Energy

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MAY 1 3 2015

Ms. Julie Corkran
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

PPPO-02-2924475-15B

Ms. April Webb
Acting Interim Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
200 Fair Oaks Lane, 2nd Floor
Frankfort, Kentucky 40601

Dear Ms. Corkran and Ms. Webb:

CONTRACT NO. DE-AC30-10CC40020: TRANSMITTAL OF THE SAMPLING AND ANALYSIS PLAN TO SUPPORT THE ADDITIONAL FIELD INVESTIGATION FOR THE WASTE DISPOSAL ALTERNATIVES REMEDIAL INVESTIGATION/FEASIBILITY STUDY AT THE PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY (DOE/LX/07-2185&D1)

References:

1. Letter from J. Richards to J. Woodard, "Confirmation on DOE's Approach for Hydrologic Conditions Information for the Candidate Sites for the CERCLA Waste Disposal Alternatives (WDA) Evaluation, Paducah Gaseous Diffusion Plant, (DOE/LX/07-0244&D2)," dated April 23, 2015
2. Letter from A. Webb to J. Woodard, "Confirmation on DOE's Approach to Address US EPA's Hydrologic Conditions Information Request (2-10-15) for Candidate Sites for the CERCLA Waste Disposal Alternatives Evaluation (DOE/LX/07-0244&D2), Paducah Gaseous Diffusion Plant, Paducah, McCracken County, Kentucky," dated April 23, 2015
3. Letter from J. Woodard to J. Corkran and A. Webb, "Response to the U.S. Environmental Protection Agency Request for Hydrologic Conditions Information for Candidate Sites for the Comprehensive Environmental Response, Compensation, and Liability Act Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky," (PPPO-02-2802323-15) dated April 17, 2015
4. Letter from J. Richards to J. Woodard, "Request for Hydrologic Conditions Information for the Candidate Sites for the CERCLA Waste Disposal Alternatives (WDA) Evaluation, Paducah Gaseous Diffusion Plant," dated February 10, 2015

Please find enclosed for your review the Sampling and Analysis Plan to Support the Additional Field Investigation for the Waste Disposal Alternatives Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2185&D1. This document includes the sampling and analysis plan and quality assurance project plan for additional fieldwork at Waste Disposal Alternatives Candidate Sites 5A and 11. This additional fieldwork was scoped by the Federal Facility Agreement (FFA) parties on March 31, 2015, and April 8, 2015, and documented by the U.S. Department of Energy (DOE) in correspondence dated April 17, 2015. The Kentucky Department for Environmental Protection and the U.S. Environmental Protection Agency concurred with DOE's approach on April 23, 2015.

In order to meet the expedited schedule for implementation of field work and as agreed to among the FFA parties during the April 8, 2015, teleconference, please provide written comments or acceptance of the attached document no later than one week from the date of this transmittal.

If you have any questions or require additional information, please contact Jennifer Woodard at (270) 441-6820.

Sincerely,

Jennifer Woodard

Jennifer Woodard
Paducah Site Lead
Portsmouth/Paducah Project Office

Enclosure:
Sampling and Analysis Plan

e-copy w/enclosure:
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DOE/LX/07-2185&D1
Secondary Document

Sampling and Analysis Plan to Support the Additional Field Investigation for the Waste Disposal Alternatives Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

CLEARED FOR PUBLIC RELEASE

DOE/LX/07-2185&D1
Secondary Document

Sampling and Analysis Plan to Support the Additional Field Investigation for the Waste Disposal Alternatives Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

Date Issued—May 2015

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Revised by
LATA Environmental Services of Kentucky, LLC
managing the
Environmental Remediation Activities at the
Paducah Gaseous Diffusion Plant
under contract DE-AC30-10CC40020

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CONTENTS

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FIGURES

TABLES

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ACRONYMS

ASTM	American Society for Testing and Materials
DOE	U.S. Department of Energy
DPT	direct push technology
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	feasibility study
PGDP	Paducah Gaseous Diffusion Plant
RI	remedial investigation
RGA	Regional Gravel Aquifer
SAP	sampling and analysis plan
UCRS	Upper Continental Recharge System
USCS	Unified Soil Classification System
WDA	Waste Disposal Alternatives

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1. INTRODUCTION

This Sampling and Analysis Plan (SAP) documents how groundwater level measurements will be collected to support the Waste Disposal Alternatives (WDA) evaluation for Candidate Site 5A (Site 5A) and Candidate Site 11 (Site 11) at the Paducah Gaseous Diffusion Plant (PGDP). The U.S. Environmental Protection Agency (EPA) requested additional information on hydrologic conditions for the WDA Candidate Sites (EPA 2015a). This additional fieldwork was scoped by the Federal Facility Agreement (FFA) parties on March 31, 2015, and April 8, 2015, and documented by the U.S. Department of Energy (DOE) in correspondence dated April 17, 2015 (DOE 2015). Also as documented in the April 17, 2015, letter, the FFA parties agreed that no additional field investigation or data collection is needed at Candidate Sites 1, 3A, or 9 in response to the EPA request (EPA 2015b). The Kentucky Department for Environmental Protection and the EPA concurred with DOE's approach on April 23, 2015.

The resulting groundwater level measurements at Site 5A will be used to determine whether the depth to historical high water table within the footprint of Site 5A is less than or greater than 50 ft below ground surface. This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3) is necessary, specifically as related to the requirement for the historical high groundwater table, "…The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table."

The groundwater level data at Site 11 will be evaluated to determine whether groundwater in Site 11 is connected hydraulically to the stream that crosses Site 11. This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3) is necessary, as related to the requirement regarding hydraulic connection, "…There shall be no hydraulic connection between the site and standing or flowing surface water."

Additionally, soil samples for soil index properties will be collected during the field activities at Site 5A. The soil index properties data are not required to meet the objectives of this field investigation; however, the data will be used to plan future field investigations, as appropriate, if the On-Site Alternative is selected.

2. PURPOSE

Determine the depth to Upper Continental Recharge System (UCRS) groundwater within the footprint of Site 5A and determine whether groundwater at Site 11 is connected hydraulically to the stream that crosses Site 11. The parties have agreed that the following field approach and groundwater level measurement locations shown on Figures 1 and 2 will provide a sufficient basis on which to evaluate qualitative water level measurements at Site 5A and Site 11:

- A visual walkdown will be performed to evaluate site-conditions (e.g., presence of standing water; indications of hydraulic connections, such as the presence of crayfish burrowing, etc.). A description of the visual walkdown will be documented and will include photographs.

- Install piezometers and measure groundwater levels at 10 locations in Site 5A. The piezometers will be installed using direct push technology (DPT). The location, ground surface elevation, and top of casing elevation (relative to a standard datum) of each piezometer will be accurately located by field survey. Collect soil samples from the DPT cores at the locations in Site 5A, where different soil types

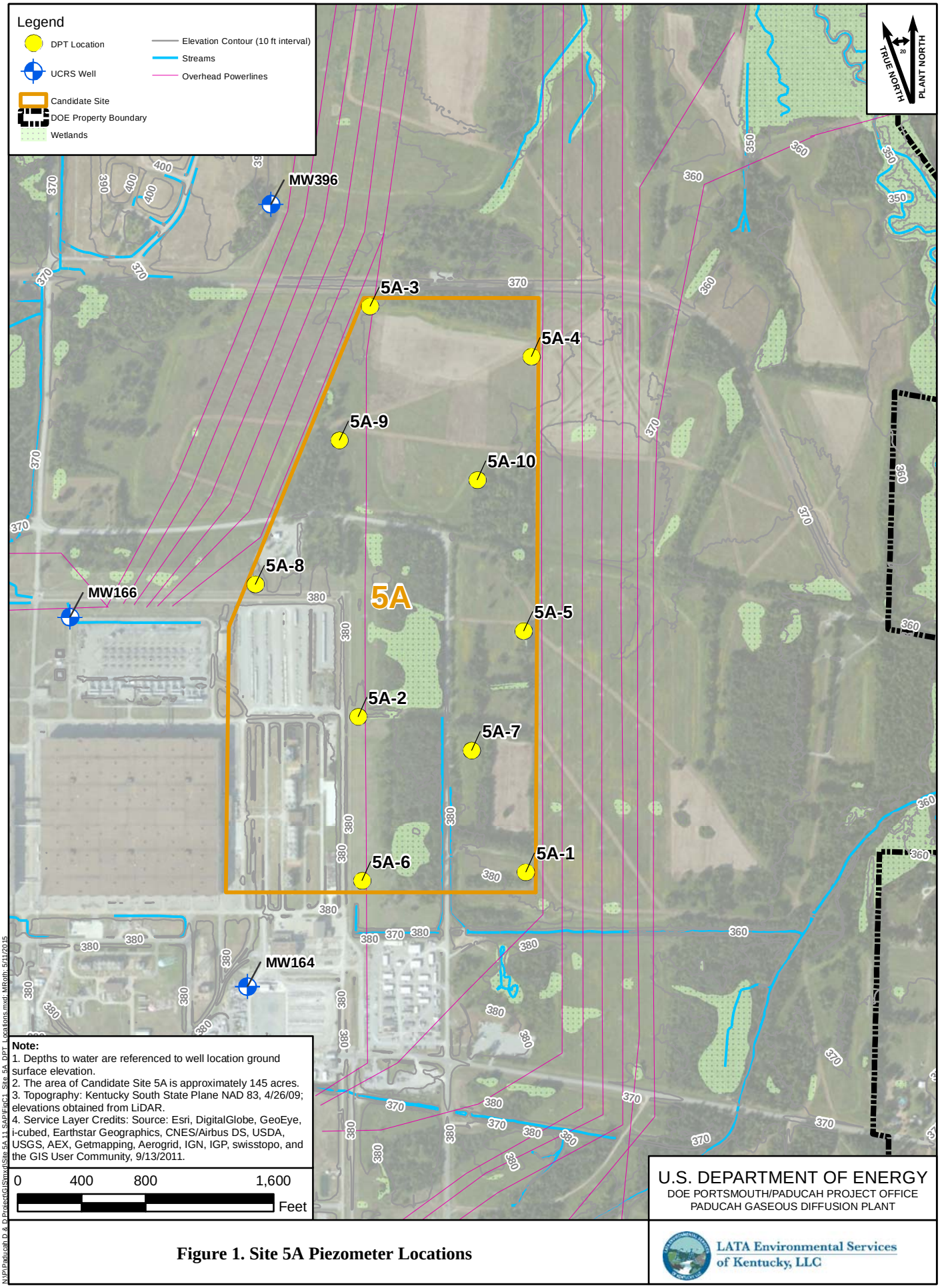

Figure 1. Site 5A Piezometer Locations

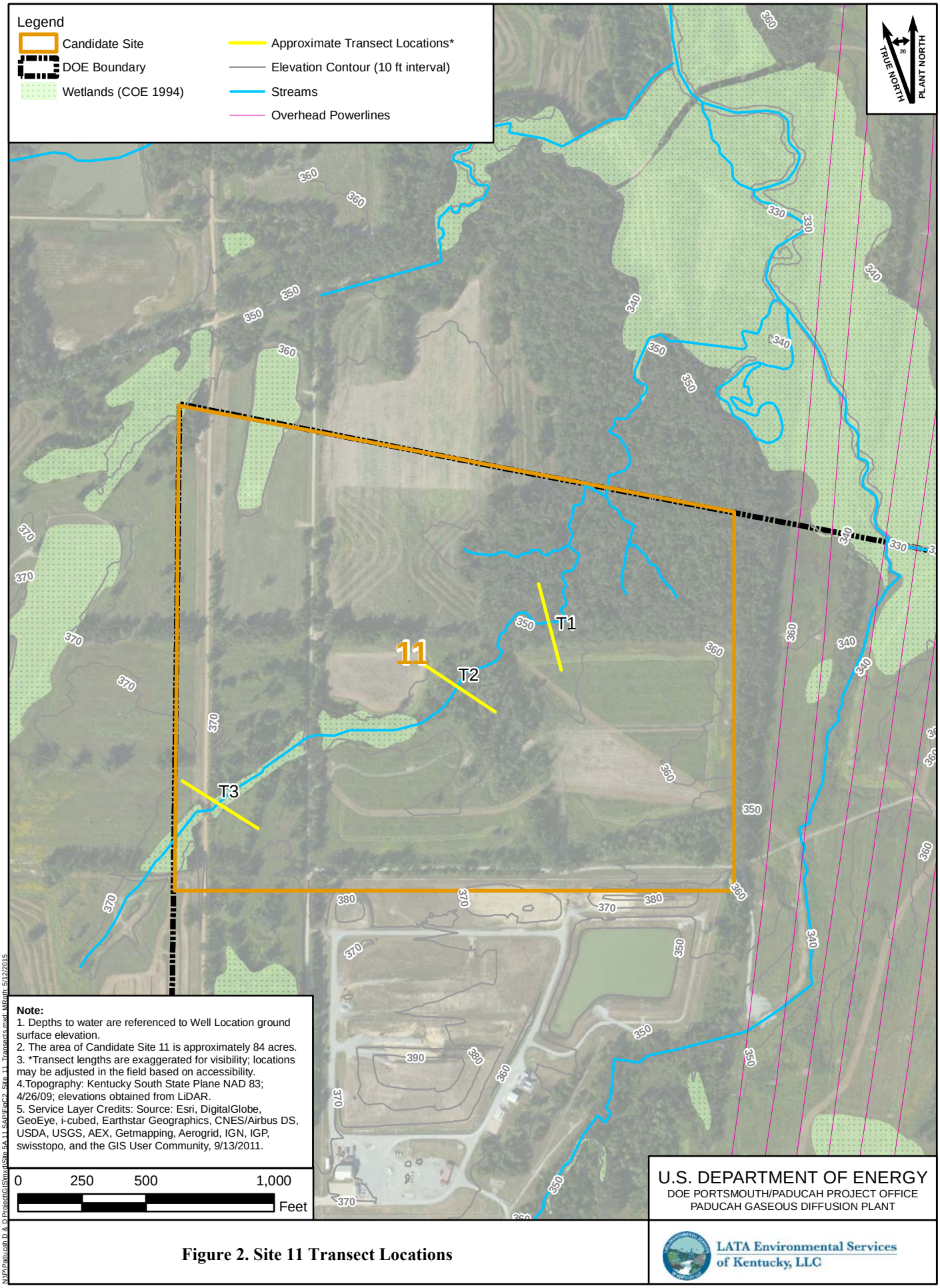

Figure 2. Site 11 Transect Locations

exist, as identified in the field, and analyze the soil samples for grain size analysis [American Society for Testing and Materials (ASTM) D422], Unified Soil Classification System (USCS) soil classification (ASTM D2487), Atterberg limits (ASTM D4318), and moisture content (ASTM D2216). Manual groundwater level measurements will also be taken at existing monitoring wells MW164, MW166, and MW396.

- Install piezometers by DPT along the three transects at Site 11 and place pressure transducers within the piezometers for two months to collect groundwater level data; analyze groundwater level data. The piezometers will be installed just below the elevation of the stream bed with a tight grout seal on the top. The location, ground surface elevation, and top of casing elevation (relative to a standard datum) of each piezometer will be accurately located by field survey.

3. INVESTIGATION BOUNDARY

The physical boundaries are the Site 5A and Site 11 areas, from the ground surface to a depth of 10-ft below the top of the piezometer screen.

4. NUMBER OF BORINGS

The 10 piezometer locations at Site 5A are shown in Figure 1. Table 1 provides the approximate coordinates for the piezometer locations at Site 5A.

Table 1. Candidate Site 5A DPT Boreholes and Associated Piezometers

Sample Boring	Relationship*	Approximate Plant Coordinates*	
		East	North
Boring 5A-1	Southeast Corner of Site 5A	-306	-700
Boring 5A-2	South Central Area of Site 5A	-1354	271
Boring 5A-3	Northwest Corner of Site 5A	-1278	2836
Boring 5A-4	Northern Location along Eastern Border of Site 5A	-272	2522
Boring 5A-5	Central Location along Eastern Border of Site 5A	-318	807
Boring 5A-6	Central Location along Southern Border of Site 5A	-1330	-754
Boring 5A-7	Southeastern Location of Site 5A	-644	60
Boring 5A-8	Central Location along Western Border of Site 5A	-1996	1097
Boring 5A-9	Northwestern Location of Site 5A	-1470	1999
Boring 5A-10	Northeastern Location of Site 5A	-610	1750

*Directions are with respect to Plant North.

The approximate transect locations at Site 11 are shown in Figure 2. Three piezometers will be installed along each transect with one piezometer (or in the case of the northern transect, a staff gage with a sump) in the center of the stream and a piezometer on either side of the stream and located no more than 20 ft from the edge of the stream bank. Table 2 provides the approximate coordinates for the central piezometer/staff gauge locations at each transect along the stream that crosses Site 11.

Table 2. Candidate Site 11 Transect Locations for DPT Boreholes and Associated Piezometers

Boring	Relationship	Approximate Plant Coordinates	
		East	North
Center of Transect 11-T1	Northern Location along Stream	-2298	7016
Center of Transect 11-T2	Central Location along Stream	-2659	6765
Center of Transect 11-T3	Southern Location along Stream	-3592	6308

5. DRILLING METHOD

For the field characterization effort at Site 5A, the investigation will use a DPT rig with a dual tube sampling system. A common sampler in use is the Dual Tube 22 sampler of Geoprobe®. The Dual Tube 22 sampler is a direct push system for collecting continuous core sample of unconsolidated materials from within a sealed casing of 2.25-inch probe rods. Samples are collected and retrieved within a liner that is threaded onto the leading end of a string of center rods. The center rods hold the liner in place as the outer casing is driven to fill the liner with soil. The inner rods are then retracted to retrieve the full liner. This system eliminates the generation of side slough in the sample and prevents cross-contamination. Thin-walled polyvinyl chloride (PVC) sample tubes will be used to contain and retrieve the core samples.

For the field characterization effort at Site 11, the investigation will use a DPT rig with a string of DPT inner rods with a bottom drive point within the sampler to keep soils from collecting inside the soil sample system.

If DPT cannot advance to the UCRS water level (in the case of Site 5A) or the maximum targeted depth, up to three 10-ft step-out attempts will be made.

Following completion of data collection activities and at such time when the piezometers are no longer needed, the piezometers installed as part of this field investigation will be abandoned in accordance with 401 *KAR* 6:350.[1]

6. SAMPLING METHOD

For the measurement of groundwater levels at Site 5A, manual groundwater level measurements will be taken at 1-inch diameter piezometers screened in the UCRS with the upper portion of the screen set at the encountered water level; No. 10 slot (0.010-inch screen size) piezometer screens will be 10 ft in length. Manual groundwater level measurements also will be taken at existing monitoring wells MW164, MW166, and MW396. Soil samples will be collected at Site 5A from the DPT cores.

For the analysis of groundwater level data at Site 11, the intent is to install pressure transducers in each 1-inch diameter piezometer to collect data for approximately two months. The piezometers will be

[1] If a piezometer is located in standing water at the time of planned abandonment, abandonment will be delayed until such time as the location is dry.

installed with the screened section set just below the ground surface; screens will be No. 10 slot (0.010-inch screen size) and 10 ft in length.

Following is the groundwater level measurement approach for Site 5A.

1. Advance a DPT sampler until UCRS groundwater is encountered or until within 5 ft of the anticipated depth of Regional Gravel Aquifer (RGA) groundwater.

2. If UCRS groundwater is encountered before reaching the anticipated depth of the RGA at a given location, then a water level measurement will be obtained and a 1-inch diameter piezometer will be installed at that location with the top of the screen set at the groundwater observation level. If the occurrence of UCRS groundwater is not apparent prior to reaching the anticipated depth of the RGA at a given location, a 1-inch diameter piezometer will be installed with the bottom of the screen interval set above the anticipated top of the RGA at that location. If DPT cannot advance to the UCRS water level or the maximum targeted depth, up to three 10-ft step-out attempts will be made.

3. Using a water level probe, measure the depth to water within the piezometer. Groundwater levels at the 10 piezometer locations will be measured following installation of the 10 piezometers as well as at existing monitoring wells MW164, MW166, and MW396. All measurements should be made within a 24-hour period to ensure comparability of data.

Following is the soil sampling approach for Site 5A:

1. Cut open DPT core liner and perform a radiological scan of the soil core to ensure the safety of the field samplers.

2. Collect soil samples in accordance with LATA Kentucky procedure PAD-ENM-0020, *Collection of Soil Samples with Direct Push Technology Sampling*. Soil samples will be collected for grain size analysis with hydrometer (ASTM D422), USCS soil classification (ASTM D2487), Atterberg Limits (ASTM D4318), and moisture content (ASTM D2216).

Following is the groundwater level measurement approach for Site 11:

1. Advance a DPT sampler to approximately 10 ft below the elevation of the stream bed at the transect location.

2. Install a 1-inch piezometer at the intersection of Transects 11-T2 and 11-T3 and the stream with the screen top located just below the elevation of the stream bed and having a tight grout seal on the top of the piezometers. These piezometers will consist of 10-ft long, 10-slot screens with the top of the screen set at the elevation of the stream bed or a minimum of 1 ft below the ground surface. At Transect 11-T1 and the intersection of the stream, install a staff gage consisting of a 2-ft deep sump, gravel, and a 2-ft long, 1-inch diameter, No. 10 slot (0.010-inch screen size) piezometer section. At each of the three transects, install a piezometer on each side of the stream and 20 ft from the stream banks.

3. Install a pressure transducer in each piezometer to collect water level measurements on a 15-minute interval for two months.

4. Record manual water level measurements at the time of installation and removal of pressure transducers. Perform weekly manual water level measurements during the two month data collection period.

7. QUALITY ASSURANCE

Appendix A of this SAP provides the project Quality Assurance Project Plan to incorporate the groundwater level measurements for Site 5A and Site 11 and the soil index property samples from Site 5A.

8. PROJECT DOCUMENTATION

If the D2 Remedial Investigation (RI)/Feasibility Study (FS) dispute has not been resolved prior to completion of field activities and data collection for Site 5A and Site 11, the results of the field investigations will be documented in *Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0244&D2/R1 (DOE 2012). If the dispute has been resolved and the D2/R1 RI/FS Report has been submitted prior to data collection, the results of this additional sampling will be documented in an addendum to *Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0244&D2/R1.

9. INVESTIGATION DECISION RULES

The primary intent of the field investigation is to determine whether the depth to historical high water table at Site 5A is less than or greater than 50 ft and to determine if there is a hydraulic connection between the stream that crosses Site 11 and groundwater.

Following are the general decision rules for Site 5A.

- **IF** UCRS groundwater is encountered before reaching the anticipated depth of the RGA at a given location, **THEN** a water level measurement will be obtained and a piezometer will be installed at that location with the top of the screen set at the observed groundwater level.

- **IF** the occurrence of UCRS groundwater is not apparent prior to reaching the anticipated depth of the RGA at a given location, **THEN** a piezometer will be installed with the bottom of the screen interval set above the top of the anticipated depth of the RGA at that location.

Following are the general decision rules for Site 11.[2]

- **IF** the groundwater level data for a given day and time from the two piezometers installed on either side of the stream are higher than the groundwater level of the piezometer located in the stream for the same day and approximately same time, **THEN** groundwater discharge to the stream will be assumed to have occurred (i.e., there is a hydraulic connection between the stream and the groundwater).

[2] The interaction, if any between the stream and the groundwater in the vicinity of the stream, may be dynamic and may change in response to changing field conditions (i.e., rainfall, etc.); therefore, groundwater level data will be collected over a two-month period, and data from approximately the same day and time will be compared for the two-month period. The decision rules will be applied to each set of data.

- **IF** the groundwater level data for a given day and time from the piezometer installed in the stream is less than or equal to the ground surface elevation at that piezometer and if the groundwater level data for the same day and approximately same time from the two piezometers installed on either side of the stream is lower than the groundwater level data from the piezometer installed in the stream, also for the same day and approximately same time, **THEN** stream losing conditions may have occurred. Further evaluation of water level trends will determine if a hydraulic connection exists between the stream and groundwater.

10. REFERENCES

DOE (U.S. Department of Energy) 2012. *Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Primary Document*, DOE/LX/07-0244&D1, U.S. Department of Energy, Paducah, KY, May.

DOE 2015. Letter from J. Woodard, U.S. Department of Energy, to J. Corkran, U.S. Environmental Protection Agency, and A. Webb, Kentucky Department for Environmental Protection, "Response to the U.S. Environmental Protection Agency Request for Hydrologic Conditions Information for Candidate Sites for the Comprehensive Environmental Response, Compensation, and Liability Act Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky," PPPO-02-2802323-15, dated April 17.

EPA 2015a (U.S. Environmental Protection Agency). Letter from Jon Richards, U.S. Environmental Protection Agency, to Jennifer Woodard, U.S. Department of Energy, "Request for Hydrologic Conditions Information for the Candidate Sites for the CERCLA Waste Disposal Alternatives (WDA) Evaluation, Paducah Gaseous Diffusion Plant," dated February 10.

EPA 2015b. Letter from Jon Richards, U.S. Environmental Protection Agency, to Jennifer Woodard, U.S. Department of Energy, "Confirmation on DOE's Approach for Hydrologic Conditions Information for the Candidate Sites for the CERCLA Waste Disposal Alternatives (WDA) Evaluation, Paducah Gaseous Diffusion Plant, [DOE/LX/07-0244&D2], dated April 23.

KDEP (Kentucky Department for Environmental Protection) 2015. Letter from April Webb, Kentucky Department for Environmental Protection, to J. Woodard, U.S. Department of Energy, "Confirmation on DOE's Approach to Address US EPA's Hydrologic Conditions Information Request (2-10-15) for Candidate Sites for the CERCLA Waste Disposal Alternatives Evaluation (DOE/LX/07-0244&D2), Paducah Gaseous Diffusion Plant, Paducah, McCracken County, Kentucky," dated April 23.

APPENDIX

QUALITY ASSURANCE PROGRAM PLAN

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CONTENTS

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QAPP WORKSHEETS

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ACRONYMS

ASTM	American Society for Testing and Materials
CAB	Citizens Advisory Board
DMC	Document Management Center
DOECAP	U.S. Department of Energy Consolidated Audit Program
DPT	direct push technology
DQI	data quality indicator
DQO	data quality objective
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	feasibility study
ID	identification
KDEP	Kentucky Department for Environmental Protection
KY	Commonwealth of Kentucky
LATA Kentucky	LATA Environmental Services of Kentucky, LLC
MBWA	Management by Walking Around
MDL	method detection limit
N/A	not applicable
NAL	no action level
NRDA	National Resource Damage Assessment
PEGASIS	Portsmouth/Paducah Project Office Environmental Geographic Analytical Spatial Information System
Paducah OREIS	Oak Ridge Environmental Information System
QA	quality assurance
QC	quality control
QAPP	quality assurance program plan
RGA	Regional Gravel Aquifer
RI	remedial investigation
SAP	sampling and analysis plan
SOP	standard operating procedure
TBD	to be determined
UCRS	Upper Continental Recharge System
USCS	Unified Soil Classification System
WDA	Waste Disposal Alternatives

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QAPP Worksheet #1
Title Page

Document Title: *Sampling and Analysis Plan to Support the Additional Field Investigation for the Waste Disposal Alternatives Remedial Investigation/Feasibility Study at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*

Lead Organization: U.S. Department of Energy

Preparer's Name and Organizational Affiliation: LATA Environmental Services of Kentucky, LLC (LATA Kentucky)

Preparer's Address, Telephone Number, and E-mail Address: 761 Veterans Avenue, Kevil, KY, 42053, Phone (270) 441-5000

Preparation Date (Month/Year): 5/2015

Document Control Number: DOE/LX/07-2185&D1

LATA Kentucky Environmental Remediation Project Manager	Signature Mark J. Duff	5-13-15 Date
LATA Kentucky Regulatory Manager	Signature Myrna Espinosa Redfield	5/13/15 Date
LATA Kentucky Sample/Data Management Manager	James L Morrow for Signature Lisa Crabtree	5/13/15 Date

QAPP Worksheet #2
QAPP Identifying Information

Site Name/Project Name: Paducah Gaseous Diffusion Plant
Site Location: Paducah, Kentucky
Site Number/Code: KY8890008982
Contractor Name: LATA Environmental Services of Kentucky, LLC
Contractor Number: DE-AC30-10CC40020
Contract Title: Paducah Gaseous Diffusion Plant Paducah Environmental Remediation Project
Work Assignment Number: N/A

1. Identify guidance used to prepare Quality Assurance Program Plan (QAPP):

   - Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Implementing Environmental Quality Systems, Version 2.0, 126 pages.
   - Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Quality Assurance Project Plans: Part 1 UFP QAPP Manual, Version 1.0, 177 pages (DTIC ADA 427785 or EPA-505-B-04-900A).
   - Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Quality Assurance Project Plans: Part 2A UFP QAPP Worksheets, Version 1.0, 44 pages.
   - Intergovernmental Data Quality Task Force, March 2005. The Uniform Federal Policy for Quality Assurance Project Plans: Part 2B Quality Assurance/Quality Control Compendium: Minimum QA/QC activities, Version 1.0, 76 pages.
   - *Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Plan*, DOE/LX/07-1269&D2/R2, U.S. Department of Energy, Paducah, KY, March 2015, 74 pages.

2. Identify regulatory program: Comprehensive Environmental Response, Compensation, and Liability Act and *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1707 [Federal Facility Agreement (FFA)]

3. Identify approval entity: DOE, U.S. Environmental Protection Agency (EPA) Region 4, and Kentucky Department for Environmental Protection (KDEP)

4. Indicate whether the QAPP is a generic or a project-specific QAPP (circle one).

5. List dates of scoping sessions that were held: March 31, 2015, and April 8, 2015, WDA Additional Field Work Meetings

QAPP Worksheet #2 (Continued)
QAPP Identifying Information

6. List dates and titles of QAPP documents written for previous site work, if applicable:

Title:	**Approval Date:**
Data and Documents Management and Quality Assurance Plan for Paducah Environmental Management and Enrichment Facilities, DOE/OR/07-1595&D2 (DOE 1998b)	10/5/1998
Paducah Gaseous Diffusion Plant Programmatic Quality Assurance Plan, Secondary Document, DOE/LX/07-1269&D2/R2	3/2015

7. List organizational partners (stakeholders) and connection with lead organization:
DOE, EPA Region 4, KDEP

8. List data users: DOE, LATA Kentucky, subcontractors, EPA Region 4, KDEP

9. If any required QAPP elements and required information are not applicable to the project, then indicate the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusion here.

   No elements specifically are omitted from this QAPP.

QAPP Worksheet #2 (Continued)
QAPP Identifying Information

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Worksheet No.
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2.4 Project Organization 2.4.1 Project Organizational Chart 2.4.2 Communication Pathways 2.4.3 Personnel Responsibilities and Qualifications 2.4.4 Special Training Requirements and Certification	• Project Organizational Chart • Communication Pathways • Personnel Responsibilities and Qualifications Table • Special Personnel Training Requirements Table	5, 6, 7, 8
2.5 Project Planning/Problem Definition 2.5.1 Project Planning (Scoping) 2.5.2 Problem Definition, Site History, and Background	• Project Planning Session Documentation (including Data Needs tables) • Project Scoping Session Participants Sheet • Problem Definition, Site History, and Background • Site Maps [included in the Sampling and Analysis Plan (SAP)]	9, 10
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QAPP Worksheet #2 (Continued)
QAPP Identifying Information

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Worksheet No.
Measurement/Data Acquisition		
3.1 Sampling Tasks 3.1.1 Sampling Process Design and Rationale 3.1.2 Sampling Procedures and Requirements 3.1.2.1 Sampling Collection Procedures 3.1.2.2 Sample Containers, Volume, and Preservation 3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures 3.1.2.4 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures 3.1.2.5 Supply Inspection and Acceptance Procedures 3.1.2.6 Field Documentation Procedures	• Sampling Design and Rationale • Sample Location Maps (included in the SAP) • Sampling Locations and Methods/Standard Operating Procedure (SOPs) Requirements Table • Analytical Methods/SOP Requirements Table • Field Quality Control Sample Summary Table • Sampling SOPs • Project Sampling SOP References Table • Field Equipment Calibration, Maintenance, Testing, and Inspection Table	17, 18, 19, 20, 21, 22
3.2 Analytical Tasks 3.2.1 Analytical SOPs 3.2.2 Analytical Instrument Calibration Procedures 3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures 3.2.4 Analytical Supply Inspection and Acceptance Procedures	• Analytical SOPs • Analytical SOP References Table • Analytical Instrument Calibration Table • Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table	23, 24, 25
3.3 Sample Collection Documentation, Handling, Tracking, and Custody Procedures 3.3.1 Sample Collection Documentation 3.3.2 Sample Handling and Tracking System 3.3.3 Sample Custody	• Sample Collection Documentation Handling, Tracking, and Custody SOPs • Sample Container Identification • Sample Handling Flow Diagram • Example Chain-of-Custody Form and Seal	26, 27
3.4 Quality Control Samples 3.4.1 Sampling Quality Control Samples 3.4.2 Analytical Quality Control Samples	• QC Samples Table • Screening/Confirmatory Analysis Decision Tree	28
3.5 Data Management Tasks 3.5.1 Project Documentation and Records 3.5.2 Data Package Deliverables 3.5.3 Data Reporting Formats 3.5.4 Data Handling and Management 3.5.5 Data Tracking and Control	• Project Documents and Records Table • Analytical Services Table • Data Management SOPs	29, 30

QAPP Worksheet #2 (Continued)
QAPP Identifying Information

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Worksheet No.
Assessment/Oversight		
4.1 Assessments and Response Actions 4.1.1 Planned Assessments 4.1.2 Assessment Findings and Corrective Action Responses	• Assessments and Response Actions • Planned Project Assessments Table • Audit Checklists • Assessment Findings and Corrective Action Responses Table	31, 32
4.2 QA Management Reports	• QA Management Reports Table	33
4.3 Final Project Report		
Data Review		
5.1 Overview		
5.2 Data Review Steps 5.2.1 Step I: Verification 5.2.2 Step II: Validation 5.2.2.1 Step IIa Validation Activities 5.2.2.2 Step IIb Validation Activities 5.2.3 Step III: Usability Assessment 5.2.3.1 Data Limitations and Actions from Usability Assessment 5.2.3.2 Activities	• Verification (Step I) Process Table • Validation (Steps IIa and IIb) Process Table • Validation (Steps IIa and IIb) Summary Table • Usability Assessment	34, 35, 36, 37
5.3 Streamlining Data Review 5.3.1 Data Review Steps To Be Streamlined 5.3.2 Criteria for Streamlining Data Review 5.3.3 Amounts and Types of Data Appropriate for Streamlining		

QAPP Worksheet #3
Minimum Distribution List

The distribution for this project-specific QAPP will be the same as that used for other FFA documents. Below is the current version of this list.

Standard Distribution List—FFA Documents

REGULATORY DISTRIBUTION				
	D1 and D2 Documents			
	Document	Redline[a]	E-copy[b]	CD
Environmental Protection Agency (EPA)				
Julie Corkran (original letter)	2	1	✓	2
Jana Dawson, TLI (copy of letter)	1	-	✓	1
State of Kentucky (KY)				
April Webb, Interim (original letter)	3	1	✓	1
Gaye Brewer (copy of letter)	1	-	✓	-
Unbound copy per KY request	1	1	-	-
U.S. Department of Energy (DOE)				
DOE[c]	1	1	✓	1
Citizens Advisory Board (CAB)[d]	-	-	-	2
LATA Environmental Services of Kentucky, LLC (LATA Kentucky)[e]				
Document Management Center (DMC)				
Administrative Record (unbound)	1	1	✓	-
National Resource Damage Assessment (NRDA) Trustees				
Kentucky Department of Fish & Wildlife				
Tim Kreher	-	-	-	1
Kentucky Energy and Environment Cabinet				
Dr. Len Peters, Cabinet Secretary	-	-	-	a
Tennessee Valley Authority				
Cynthia Anderson	-	-	-	1
Robert Casey	-	-	✓	-
A. Stephens	-	-	✓	-
U.S. Fish & Wildlife				
Tony Velasco	-	-	-	1
TOTAL DISTRIBUTION	10	5	-	10

[a] For KY, one redlined hard copy is sufficient if the document is less than 100 pages. If the document is greater than 100 pages, KY would like an additional redlined hard copy. For D2 documents, DOE has requested 3 redlined copies and 8 comment response summaries (CRS). Two additional redlined copies will be generated for the AR file and for the DMC file if the DOE letter cites that a redlined copy is enclosed. CRSs in response to DOE comments are provided to DOE only.

[b] Electronic distribution will be made via e-mail for documents less than 25 MB; otherwise, the link to the LATA Kentucky FTP and Public Documents Web site will be provided. DOE will be responsible for sending the e-copy e-mail. LATA Kentucky will be responsible for posting to the LATA Kentucky FTP and Public Documents Web site. Note: EPA/KY limits attachments via external e-mail to 10 MB. DOE and LATA Kentucky can receive and send up to 50 MB.

[c] CDs are provided to Kim Knerr.

[d] Environmental Reporting and Deliverables Quality (ERDQ)/Document Production (within the Regulatory Management group) will provide CAB CDs to Eddie Spraggs who will make distribution of the CDs.

[e] Additional copies needed for LATA Kentucky personnel are not included in the above totals. ERDQ will provide copies to the appropriate administrative staff to complete distribution of these documents.

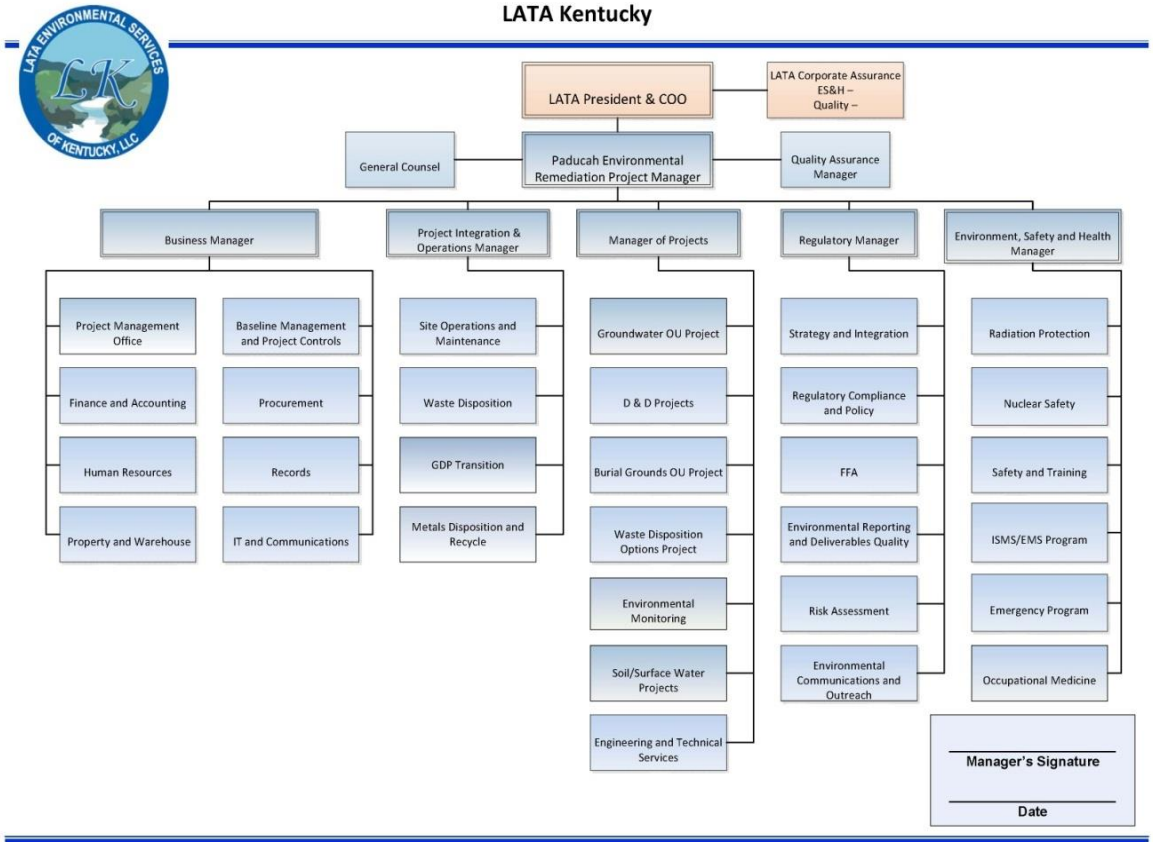
QAPP Worksheet #4
Project Personnel Sign-Off Sheet

Personnel actively engaged in sample collection, data analysis, and data validation for the projects is required to read applicable sections of this project-specific QAPP upon approval of its contents by all FFA parties. The master list of signatures will be kept with the project work control documentation and will be made available upon request.

Project Position Title	Organization	Signature	Date

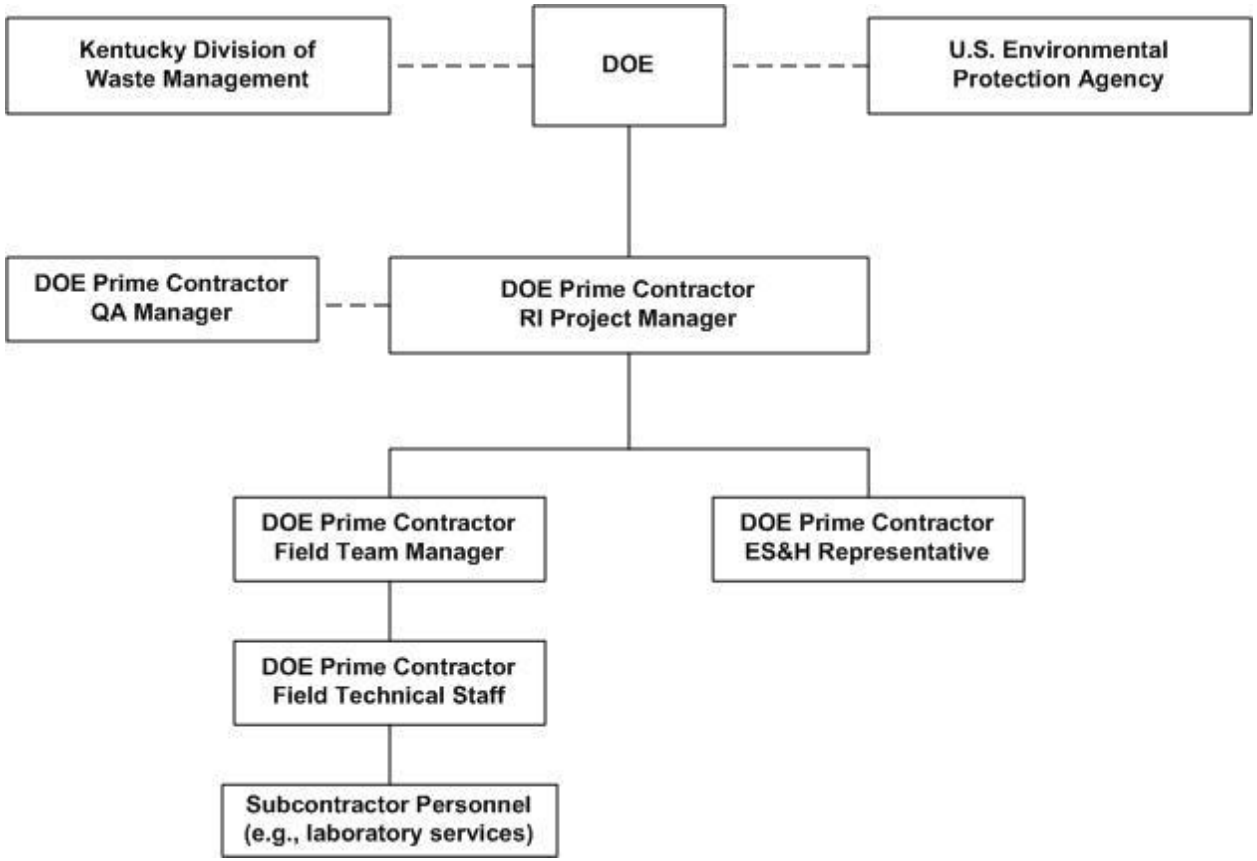
QAPP Worksheet #5-A
Project Contractor Organizational Chart*

This portion of the QAPP addresses the project organization as it provides for QA/QC coordination and responsibilities. This QAPP includes the overall project organization at the Remediation Project Manager level and its principal lines of communication and authority.



*A copy of the current organizational chart will be maintained at the LATA Kentucky Web site.

QAPP Worksheet #5-B
Project Level Organizational Chart



QAPP Worksheet #6
Communication Pathways

NOTE: Formal communication across company or regulatory boundaries occurs via letter. Other forms of communication, such as e-mail, meetings, etc., will occur throughout the project.

Communication Drivers	Organizational Affiliation	Position Title Responsible	Procedure
FFA	DOE Paducah Site Lead	Paducah Site Lead	All formal communication among DOE, EPA, and KDEP
FFA	DOE Paducah	Environmental Remediation Project Manager	All formal communication between DOE and contractor for Environmental Remediation Projects
All project requirements	LATA Kentucky	Environmental Remediation Project Manager	All formal communication between the project and the Site Lead
All project requirements	LATA Kentucky	Project Manager	All communication between the project and the LATA Kentucky Environmental Remediation Project Manager
Project Quality Assurance (QA) requirements	LATA Kentucky	Quality Assurance Manager	All project quality related communication between the QA department and LATA Kentucky project personnel
FFA compliance	LATA Kentucky	Regulatory Manager	All internal communication regarding FFA compliance with the LATA Kentucky Project Manager

Roles presented above are at the program level.

QAPP Worksheet #6 (Continued)
Communication Pathways

Communication Drivers	Organizational Affiliation	Position Title Responsible	Organizational Department Manager	Procedure
Sampling Requirements	LATA Kentucky	Sampling Lead	Project and Operations Manager	All internal communication regarding field sampling with the LATA Kentucky Project Manager
Analytical Laboratory Interface	LATA Kentucky	Laboratory Coordinator	Project and Operations Manager	All communication between LATA Kentucky and analytical laboratory
Waste Management Requirements	LATA Kentucky	Waste Coordinator	Project and Operations Manager	All internal communication regarding project waste management with LATA Kentucky Project Manager
Environmental Compliance Requirements	LATA Kentucky	Compliance Manager	Regulatory Manager	All internal correspondence regarding environmental requirements and compliance with the LATA Kentucky Project Manager
Subcontractor Requirements (if applicable)	LATA Kentucky	Subcontract Administrator	Business Manager	All correspondence between the project and subcontractors, if applicable
Health and Safety Requirements	LATA Kentucky	Environment, Safety, and Health Manager	Environment, Safety, and Health Manager	All internal communication regarding safety and health requirements with the LATA Kentucky Project Manager

NOTE: In the event the contractor changes, DOE will notify EPA and KDEP of the change, but not request approval of the report.

QAPP Worksheet #7
Personnel Responsibility and Qualifications Table

Position Title Responsible	Organization Affiliation	Responsibilities	Education and Experience Qualifications
Project Manager	LATA Kentucky	Overall project responsibility	> 4 years relevant work experience
Environmental Engineer	LATA Kentucky	Project sampling and analysis plan	Bachelor of Science plus > 1 year relevant work experience
Environmental Compliance Manager	LATA Kentucky	Project environmental compliance responsibility	Bachelor of Science plus > 4 years work experience
FFA Manager	LATA Kentucky	Project compliance with the FFA	> 4 years work relevant experience
Environmental Monitoring and Reporting Program Manager	LATA Kentucky	Support project on sampling and reporting activities	> 4 years relevant work experience
Sample/Data Management Manager	LATA Kentucky	Project sample and data management	> 1 year relevant work experience
Health and Safety Representative	LATA Kentucky	Project safety and health responsibility	Bachelor degree plus > 1 year relevant experience
Waste Coordinator	LATA Kentucky	Overall project waste management responsibility	> 4 years relevant experience
Data Validator	Independent third party contractor	Performing data validation according to specified procedures	Bachelor degree plus relevant experience
Geotechnical Laboratory Project Manager	Geotechnical Laboratory	Sample analysis and data reporting	Bachelor degree plus relevant experience

QAPP Worksheet #8
Special Personnel Training Requirements Table

Personnel are trained in the safe and appropriate performance of their assigned duties in accordance with requirements of work to be performed. There are no special training requirements other than what normally is required for work at the Paducah Gaseous Diffusion Plant site. QAPP development uses a graded approach. A work control package will be generated prior to implementation of the field sampling plan; the package will list specific project-level training requirements.

Project Function	Specialized Training—Title or Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/ Organizational Affiliation	Location of Training Records/Certificates*
Drill Rig Operator	Kentucky Certified Well Driller	State of Kentucky	To Be Determined (TBD)	Drill Rig Operator	Drill Rig Operator/TBD	TBD

*Training records are maintained by the LATA Kentucky training department. If training records and/or certificates do not exist or are not available, this should be noted.

QAPP Worksheet #9
Project Scoping Session Participants Sheet

Project scoping is the key to the success of any project and is part of the systematic planning process. A scoping meeting was held to develop the data quality objectives (DQOs) of the project.

Name of Project: Additional Field Investigation for WDA Remedial Investigation (RI)/Feasibility Study (FS)
Date of Session: April 8, 2105
Scoping Session Purpose: Develop DQOs

Position Title	Affiliation	Name	Phone #	E-mail Address	Project Role
Project Manager	DOE	Jennifer Woodard	270-441-6820	jennifer.woodard@lex.doe.gov	Program management
Project Manager	Geosyntec Consultants, Inc.	Stefanie Fountain	678-938-1420	sfountain@geosyntec.com	Project management and technical support
FFA Manager	KDWM	Todd Mullins	(502) 564-6716	todd.mullins@ky.gov	Project manager
Remedial Project Manager	EPA	Jon Richards	(404) 562-8648	richards.jon@epa.gov	Project manager
Risk Manager	DOE	Richard Bonczek	(859) 219-4051	richard.bonczek@lex.doe.gov	Technical support
Risk Assessment Specialist	SMSI	Martin Clauberg	(865)259-7155	Martin.Clauberg@lex.doe.gov	Technical support
Risk Assessment Specialist	SMSI	Bobette Nourse	(865) 712-2669	bobette.nourse@lex.doe.gov	Technical support
Regulatory Specialist	LATA Kentucky	John Morgan	(270) 441-5069	john.morgan@lataky.com	Regulatory support

QAPP Worksheet #9 (Continued)
Project Scoping Session Participants Sheet

Project scoping is the key to the success of any project and is part of the systematic planning process. A scoping meeting was held to develop the DQOs of the project.

Name of Project: Additional Field Investigation for WDA RI/FS
Date of Session: April 8, 2105
Scoping Session Purpose: Develop DQOs

Position Title	Affiliation	Name	Phone #	E-mail Address	Project Role
FFA Manager	LATA Kentucky	Jana White	(270) 441-5185	jana.white@lataky.com	FFA support
Groundwater	EPA	Noman Ahsanuzzaman	(404) 562-8047	Ahsanuzzaman.Noman@epa.gov	Technical support
Project Specialist	KDEP	Gaye Brewer	(270) 898-8468	gaye.brewer@ky.gov	Technical support
Project Specialist	Pro2Serve	George Butterworth, III	(270) 441-6803	George.ButterworthIII@lex.doe.gov	Program support
Radiation Health Supervisor	KYRHB	Stephanie Brock	(502) 564-8390	stephanieC.Brock@ky.gov	Technical Support
FFA Manager	EPA	Julie Corkran	(404)562-8547	corkran.julie@epa.gov	Program management
Project Specialist	KDEP	Brian Begley	(859) 219-4051	brian.begley@ky.gov	Technical support
Project Specialist	Pro2Serve	Tracy Taylor	(270) 441-6866	tracy.taylor@lex.doe.gov	Technical support

QAPP Worksheet #10
Problem Definition

The environmental questions being asked:

1. Site 5A

   Is the depth to historical high water table within the footprint of the Waste Disposal Alternatives (WDA) Candidate Site 5A (Site 5A) less than or greater than 50 ft below ground surface? This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3) is necessary, specifically as related to the requirement for the historical high groundwater table, "…The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table."

2. Site 11

   Is the groundwater hydraulically connected to the stream that crosses the WDA Candidate Site 11 (Site 11)? This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3) is necessary, as related to the requirement regarding hydraulic connection, "…There shall be no hydraulic connection between the site and standing or flowing surface water."

The problem to be addressed by the project:

The resulting groundwater level measurements at Site 5A will be used to determine whether the historical high water table within the footprint of Site 5A is less than or greater than 50 ft below ground surface. This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3), specifically as related to the requirement for the depth to the historical high water table, "the bottom of the landfill liner system or natural in-place soil barrier shall be at least 50 ft from the historical high water table," is necessary. Soil samples collected at Site 5A are not required to make the above decision, but may be used for future field investigation planning at Site 5A.

The groundwater level data at Site 11 will be evaluated to determine whether groundwater in Site 11 is hydraulically connected to the stream that crosses Site 11. This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3), specifically as related to the requirement regarding hydraulic connection, "there shall be no hydraulic connection between the site and standing or flowing surface water," is necessary.

QAPP Worksheet #10 (Continued)
Problem Definition

Observations from any site reconnaissance reports:

None.

A synopsis of secondary data or information from site reports:

The SAP summarizes the secondary data used to document the DQOs.

The possible classes of contaminants and the affected matrices:

Not applicable.

The rationale for inclusion of chemical and nonchemical analyses:

Worksheet #11 presents rationale for inclusion of nonchemical analyses. No chemical analyses are included in this SAP.

Information concerning various environmental indicators:

Water level measurements in Site 5A have been collected from the Regional Gravel Aquifer (RGA) and McNairy Formations.

Project decision conditions ("If..., then..." statements):

Site 5A: If Upper Continental Recharge System (UCRS) groundwater is encountered before reaching the anticipated depth of the RGA, then a water level measurement will be obtained and a piezometer will be installed with the top of the screen set at the groundwater observation level. If the occurrence of UCRS groundwater is not apparent prior to reaching the anticipated depth of the RGA, a piezometer will be installed with the bottom of the screen interval set above the top of the RGA.

Site 11[1]: If the groundwater level data for a given day and time from the two piezometers installed on either side of the stream are higher than the water level of the stream for the same day and time, then groundwater discharge to the stream will be assumed to have occurred (i.e., there is a hydraulic connection between the stream and the groundwater).

If the groundwater level data for a given day and time from the piezometer installed in the stream is less than or equal to the ground surface elevation at that piezometer and if the groundwater level data for the same day and approximate time from the two piezometers installed on either side of the stream is lower than the groundwater level data from the piezometer installed in the stream, also for the same day and approximate time, then stream losing conditions may have occurred. Further evaluation of water level trends will determine if a hydraulic connection exists between the stream and groundwater.

[1] The interaction, if any between the stream and the groundwater in the vicinity of the stream, may be dynamic and may change in response to changing field conditions (i.e., rainfall, etc.); therefore, groundwater level data will be collected over a two-month period, and data from approximately the same day and time will be compared for the two-month period. The decision rules will be applied to each set of data.

QAPP Worksheet #11
Project Quality Objectives/Systematic Planning Process Statements

Who will use the data?

DOE and its contractors (e.g., Pro 2 Serve, LATA Kentucky), KDEP, and EPA.

What will the data be used for?

Site 5A: This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3) is necessary, specifically as related to the requirement for the historical high groundwater table, "…The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table."

Site 11: This information will be considered by EPA, if the On-Site Alternative is selected, in deciding whether a waiver of 40 *CFR* § 761.75(b)(3) is necessary, as related to the requirement regarding hydraulic connection, "…There shall be no hydraulic connection between the site and standing or flowing surface water."

What types of data are needed? (target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques)

Quantitative groundwater level measurements and observations from the visual walk-down.

How "good" do the data need to be in order to support the environmental decision?

Data needs to meet the measurement quality objective and data quality indicators established by the systematic planning process. See Worksheet #12.

How much data are needed? (number of samples for each analytical group, matrix, and concentration)

The numbers of samples to be submitted to the fixed-base laboratories are identified in the SAP and Worksheet #18.

Where, when, and how should the data be collected/generated?

See the SAP.

Who will collect and generate the data?

A sample team of individuals who are properly trained and skilled in the execution of screening and sampling procedures will collect samples and perform the field screening measurements.

How will the data be reported?

Field data will be recorded on chain-of-custody forms and sample data forms. The fixed-base laboratory will provide data in an Electronic Data Deliverable (EDD). Groundwater level measurements will be placed into and reported from the Paducah Oak Ridge Environmental Information System (Paducah OREIS). Data loaded into Paducah OREIS will be made available to the public stakeholders via the Portsmouth/Paducah Project Office Environmental Geographic Analytical Spatial Information System (PEGASIS).

How will the data be archived?

Electronic data will be archived in Paducah OREIS in accordance with Section 8.5 (Data and Records Archival) of the Data and Documents Management and Quality Assurance Plan (DOE 1998).

QAPP Worksheet #12
Measurement Performance Criteria Table

Field Investigation Type	Data Quality Indicator (DQI)	QC Sample or Measurement Performance Activity	Measurement Performance Criteria
Manual Water Level Measurements	Precision	Water level measurement recording	Water level meter will measure within 0.05 ft.
	Accuracy	Depth to water measurement obtained at reference point	Establish and/or use the established reference point (north side of the piezometer casing). Record reference point location in field logbook.
	Sensitivity	Maintain operating equipment	No damage to water level probe and/or cable. Water level meter batteries are alive/charged. Water level meter will be decontaminated after use at each location. Periodically check cable against a surveyor's tape or other measuring device.
	Representativeness	Depth to water measurements will be obtained from multiple locations	Depth to water measurements will be obtained from 10 different locations within Site 5A.
	Comparability	The depth to water will be measured 24-hours following installation of piezometer	Depth to water measurements for each site should be completed over as short of a time period as possible, not to exceed 24 hours.
	Completeness	Number of locations	A depth to water will be obtained from each of the piezometer locations (100%).

QAPP Worksheet #12 Measurement Performance Criteria Table (Continued)

Field Investigation Type	DQI	QC Sample or Measurement Performance Activity	Measurement Performance Criteria
Pressure Transducer Water Level Measurements	Precision	Water level measurement recording	Water level meter will measure within 0.05 ft.
	Accuracy	Depth to water within manufacturer's specified range	Pressure transducer will not be submerged to a depth outside the manufacturer's range.
	Sensitivity	Maintain operating equipment	Equipment will be inspected on a regular basis.
	Representativeness	Depth to water measurements will be obtained from several locations	Depth to water measurements will be obtained along three transects at three different locations along the stream crossing through the Site 11.
	Comparability	Depth to water will be compared to manual depth to water readings	Pressure transducer data will be within range of manual depth to water readings.
	Completeness	Number of locations Number of depth to water readings over a two month period.	All locations will be installed with pressure transducer. Ninety-five percent of depth to water level readings will be achieved.

QAPP Worksheet #12 Measurement Performance Criteria Table (Continued)

Field Investigation Type	DQI	QC Sample or Measurement Performance Activity	Measurement Performance Criteria
Collection of Soil Samples	Precision	As per ASTM test method	As per ASTM test Method
	Accuracy		
	Sensitivity		
	Representativeness		
	Comparability		
	Completeness		

QAPP Worksheet #13
Secondary Data Criteria and Limitations Table

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/Collection Dates)	How Data Will Be Used	Limitations on Data Use
Paducah OREIS and PEGASIS Databases	Various	Various	Data will be used to determine need for additional depth to water data.	Data have been verified, assessed, and validated (if validation required). Rejected data will not be used.
Site Topography	LiDAR	DOE contractors, 2009	Data used in initial assessment to compare ground surface data with water level data from individual wells.	Data have been verified and assessed.
Survey of Piezometer Locations	Site Survey	Licensed Surveyor (TBD)	Data will be used to establish locations of individual piezometers, top of casing elevations, and ground surface elevations for assessment of groundwater level elevations.	Data have been verified and assessed.

QAPP Worksheet #14
Summary of Project Tasks*

Sampling/Field Tasks:
Install Piezometers, collect water level measurements, collect geotechnical samples at Site 5A, document field notes, complete chain-of-custody, label samples, package/ship samples, and measure groundwater levels per standard operating procedures Worksheet #21.

Analysis Tasks:
Receive samples, complete chain-of-custody, extract samples, analyze extract, review data, report data per standard methods Worksheet #21.

Quality Control Tasks:
QC will be per QAPP worksheets as follows:

- No QC samples will be obtained
- Equipment calibration—Worksheets #22 and #24
- Data review/validation—Worksheets #34, #35, #36, and #37

Secondary Data:
See Worksheet #13.

Data Management Tasks:
Data management will be per procedure PAD-ENM-5007, *Data Management Coordination.*

Documentation and Records:
Documentation and records will be per procedure PAD-RM-1009, *Records Management, Administrative Records, and Document Control.*

Assessment/Audit Tasks:
Assessments and audits will be per procedure PAD-QA-1420, *Conduct of Assessments.*

Prior to mobilization to perform fieldwork, an independent assessment (Internal Field Readiness Review) will be conducted to determine if the project is prepared to proceed (e.g., scope has been defined and is understood by workforce, scope has regulatory approval, scope properly contracts, personnel properly training to complete). One management assessment will be performed during Direct Push Technology (DPT) sampling at each area of field implementation (Site 5A and Site 11) to verify work is being performed consistent with the SAP.

Data Review Tasks:
Data review tasks will be per procedure PAD-ENM-5003, *Quality Assured Data.*

*It is understood that SOPs are contractor specific.

QAPP Worksheet #15
Reference Limits and Evaluation Table

Matrix: Soil
Analyte Group: Soil Index Properties

Soil Index Property	ASTM Standard	Project Action Limit/No Action Level (µg/kg)	Project Action Limit Reference	Site Chemical of Potential Concern?	Laboratory-Specific	
					Practical Quantitation Limits (µg/kg)	Method Detection Limits (MDLs) (µg/kg)
Grain Size Analysis with Hydrometer	D422	N/A	N/A	N/A	N/A	N/A
Moisture Content	D2216	N/A	N/A	N/A	N/A	N/A
Unified Soil Classification System (USCS) Soil Classification	D2487	N/A	N/A	N/A	N/A	N/A
Atterberg Limits	D4318	N/A	N/A	N/A	N/A	N/A

QAPP Worksheet #16
Project Schedule/Timeline Table

The SAP for Additional Investigation at Site 5A and Site 11 and Worksheet #17 of this QAPP describe the approach to field investigation and soil sampling to be used for field characterization. The total duration of the field sampling period for soils is approximately one month. An actual start date and corresponding finish date are not forecast at this time, pending approval of the SAP.

Fixed-based laboratory analyses consisting of soil index property testing are expected within 28 days of completion of the fieldwork.

QAPP Worksheet #17-A
Sampling Design and Rationale

Describe and provide a rationale for choosing the sampling approach (e.g., grid system, judgmental statistical approach):

Site 5A: The locations of the boreholes (and associated piezometers) for Site 5A were selected to cover the site generally, with an emphasis on locations around the perimeter of the site and interior to facilitate contouring of the groundwater surface, while avoiding the areas identified as wetlands and former operations areas. If additional restrictions on the DPT locations are identified during drilling, the boring and associated piezometer locations will be modified.

Site 11: The locations of the three transects (and associated piezometers) for Site 11 were selected to provide information regarding the potential for hydraulic connectivity of groundwater along the stream within Site 11.

Describe the sampling design and rationale in terms of which matrices will be sampled:

Site 5A Groundwater Level Measurement: A water level probe will be used to measure groundwater levels at 1-inch diameter piezometers screened in the UCRS, with the upper portion of the screen set at the encountered water level; screens will be 10 ft in length. Groundwater levels at the 10 piezometer locations will be measured following installation of the 10 piezometers as well as at existing monitoring wells MW164, MW166, and MW396. All measurements should be made within a 24-hour period to ensure comparability of data

Site 5A Soil Index Properties Sampling: Soil samples will be collected from the DPT cores where new soil types are encountered and as determined in the field.

Site 11 Groundwater Level Measurement: Following piezometer and staff gauge installation, a pressure transducer will be installed in each of the 8 piezometers and at the staff gauge at Transect 11-T1 to collect groundwater level measurements on a 15-minute interval for approximately 2 months.

What analyses will be performed and at what MDL?

Groundwater Level Measurement:

Site 5A: Depth to groundwater (manually with water level probe)
Site 11: Depth to groundwater (automatically with pressure transducer)

Soil Index Properties Sampling:

Site 5A: Grain size distribution (including hydrometer); moisture content; Atterberg Limits (i.e., liquid limit, plastic limit, and plasticity index); and classification using the USCS.

QAPP Worksheet #17-A (Continued)
Sampling Design and Rationale

Where are the sampling locations (including QC, critical, and background samples)?

- **Site 5A:** See Worksheet #18.
- **Site 11:** See Worksheet #18.

How many samples to be taken?

- **Site 5A:** See Worksheet #18.
- **Site 11:** See Worksheet #18.

What is the sampling frequency (including seasonal considerations)?

- **Site 5A:** One time groundwater level measurement event following installation of the 10 piezometers; one time soil sampling event during DPT work.
- **Site 11:** Two months of groundwater level measurements with readings taken at 15-minute intervals.

QAPP Worksheet #17-B
Soil Index Properties Sampling

	Media Type	Sample Location	Number of Samples	Test/Analytical Method	Project Action Limit	PQL
Geotechnical Analysis						
Grain Size Analysis with Hydrometer	Soil	Site 5A	TBD	ASTM D422	N/A	N/A
Moisture Content				ASTM D2216		
Atterberg Limits				ASTM D4318		
USCS Classification				ASTM D2487		

QAPP Worksheet #18
Sampling Locations and Methods/Standard Operating Procedure Requirements Table for Screening Samples

Sampling Location/ID Number	Matrix	Depth (units)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
Site 5A	Soil	Subsurface	Soil Index Properties	N/A	TBD	ASTM D422 ASTM D2216 ASTM D4318 ASTM D2487 See Worksheet #21	See Worksheet #17-A
	Groundwater	Subsurface	Quantitative Water Level	N/A	10	PAD-ENM-2100	See Worksheet #17-A
Site 11	Groundwater	Subsurface	Quantitative Water Level	N/A	Measurements on 15-minute intervals for two months	PAD-ENM-2100	See Worksheet #17-A

QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/ analysis)
Soil	Geotechnical	N/A	ASTM D422 ASTM D2216 ASTM D4318 ASTM D2487	TBD	TBD	TBD	TBD

NOTE: Sample volume container requirements will be specified by the laboratory.

QAPP Worksheet #20
Field Quality Control Samples

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	Inorganic / No. of MS	No. of Field Blanks	No. of Equip. Blanks	No. of Proficiency Testing Samples	Total No. of Samples to Laboratory
Field QC samples will not be collected.										

QAPP Worksheet #21
Project Sampling SOP References Table

Site-specific SOPs have been developed for site sampling activities. Below is a list of site sampling procedures that projects will select from for implementing sampling activities.

Reference Number	Title, Revision Date, and/or Number[a]	Originating Organization[b]	Equipment Type	Modified for Project Work? (Y/N)	Comments
1	PAD-ENM-0023, *Composite Sampling*	Contractor	Sampling	N	None
2	PAD-ENM-1001, *Transmitting Data to the Paducah Oak Ridge Environmental Information System (OREIS)*	Contractor	N/A	N	None
3	PAD-ENM-1003, *Developing, Implementing, and Maintaining Data Management Implement. Plans*	Contractor	N/A	N	None
4	PAD-ENM-2100, *Groundwater Level Measurement*	Contractor	Sampling	N	None
5	PAD-ENM-2303, *Borehole Logging*	Contractor	Sampling	N	None
6	PAD-ENM-2700, *Logbooks and Data Forms*	Contractor	N/A	N	None
7	PAD-ENM-2702, *Decontamination of Sampling Equipment and Devices*	Contractor	Sampling	N	None
8	PAD-ENM-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*	Contractor	Sampling	N	None
9	PAD-ENM-5003, *Quality Assured Data*	Contractor	N/A	N	None
10	PAD-ENM-5004, *Sample Tracking, Lab Coordination, and Sample Handling Guidance*	Contractor	N/A	N	None
11	PAD-ENM-5007, *Data Management Coordination*	Contractor	N/A	N	None
12	PAD-ENR-0020, *Collection of Soil Samples with Direct Push Technology Sampling*	Contractor	Sampling	N	None

[a] SOPs are posted to the LATA Kentucky intranet Web site. External FFA parties can access this site using remote access with privileges upon approval.
[b] The work will be conducted by LATA Kentucky staff or a subcontractor. In either case, SOPs listed will be followed.

QAPP Worksheet #22
Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment*	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
DPT Dual Tube Sampler	N/A	Inspect threads on drill rods for wear. Make sure DPT percussion hammer is charged properly with nitrogen.	N/A	Upon receipt, successful operation	Check threads and percussion hammer at beginning of each day.	N/A	Replace sampler if damage is detected.	Field Team Leader	Manufacturer's specifications
Water Level Indicator	Accuracy check at beginning of each day and periodically in the field.	Check battery levels. Check cable for damage.	Check accuracy against a surveyor's tape or other measurement device to verify marks on cable.	Upon receipt, successful operation	Check batteries prior to mobilizing to the field and after decontamination/ between wells. Check cable at beginning of each day.	N/A	Do not use if damage is discovered during inspection; replace water level indicator.	Field Team Leader	Manufacturer's specifications

QAPP Worksheet #22
Field Equipment Calibration, Maintenance, Testing, and Inspection Table (Continued)

Field Equipment*	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
Pressure Transducers	Accuracy check at beginning of monitoring period.	Check for damage.	Check current manufacturer's testing and certification.	Upon receipt.	Upon receipt of transducer.	Manufacturer's certification	Recalibrate or service as necessary.	Field Team Leader	Manufacturer's specifications
Field Equipment Global Positioning System	Daily check of known point beginning and end of each field day	Per manufacturer's specifications.	Measure known control points and compare values.	Upon receipt, successful operation	Daily prior to use.	Pass/Fail	Service by manufacturer.	Field Team Leader	Manufacturer's specifications

*Additional equipment may be needed: additional equipment will follow manufacturer's specifications for calibration, maintenance, inspection, and testing. Calibration data will be documented in logbooks consistent with PAD-ENM-2700, *Logbooks and Data Forms*.

QAPP Worksheet #23
Analytical SOP References Table

Reference Number*	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (USCS)	Definitive	Soil Index Properties	N/A	TBD	TBD
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils	Definitive	Soil Index Properties	Sieves and hydrometer	TBD	TBD
ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	Definitive	Soil Index Properties	Laboratory balance and oven	TBD	TBD
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils	Definitive	Soil Index Properties	Laboratory balance, oven, liquid limit device, grooving tool, ground glass plate, spatula, and sieves	TBD	TBD

QAPP Worksheet #24
Analytical Instrument Calibration Table

All laboratory equipment and instruments used for quantitative measurements are calibrated in accordance with the laboratory's formal calibration program. Whenever possible, the laboratory uses recognized procedures for calibration such as those published by American Society for Testing and Materials (ASTM). If established procedures are not available, the laboratory develops a calibration procedure based on the type of equipment, stability, characteristics of the equipment, required accuracy, and the effect of operation error on the quantities measured. Whenever possible, physical reference standards associated with periodic calibrations such as weights or certified thermometers with known relationships to nationally recognized standards, are used. Where national reference standards are not available, the basis for the reference standard is documented. Equipment or instruments that fail calibration or become inoperable during use are tagged to indicate they are out of calibration. Such instruments or equipment are repaired and successfully recalibrated prior to reuse.

QAPP Worksheet #25
Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference*
Analytical equipment will not be used.								

QAPP Worksheet #26
Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT	
Sample Collection (Personnel/Organization):	Sampling Teams/DOE Prime Contractor and Subcontractors
Sample Packaging (Personnel/Organization):	Sampling Teams/DOE Prime Contractor and Subcontractors
Coordination of Shipment (Personnel/Organization):	Lab Coordinator/DOE Prime Contractor
Type of Shipment/Carrier:	Direct Delivery or Overnight/Federal Express
SAMPLE RECEIPT AND ANALYSIS	
Sample Receipt (Personnel/Organization):	Sample Management/Contracted Laboratory
Sample Custody and Storage (Personnel/Organization):	Sample Management/Contracted Laboratory
Sample Preparation (Personnel/Organization):	Analysts/Contracted Laboratory
Sample Determinative Analysis (Personnel/Organization):	Analysts/Contracted Laboratory
SAMPLE ARCHIVING	
Field Sample Storage (No. of days from sample collection):	The fixed-base laboratory will archive samples for 4 months or less depending on project specific requirements.
Sample Extract/Digestate Storage (No. of days from extraction/digestion):	N/A
Biological Sample Storage (No. of days from sample collection):	N/A
SAMPLE DISPOSAL	
Personnel/Organization:	Waste Disposition/DOE Prime Contractor and Subcontractors
Number of Days from Analysis:	6 months

QAPP Worksheet #27
Sample Custody Requirements*

Chain-of-custody procedures are comprised of maintaining sample custody and documentation of samples for evidence. To document chain-of-custody, an accurate record of samples must be maintained in order to trace the possession of each sample from the time of collection to its introduction to the laboratory.

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory):

Field sample custody requirements will be per DOE Prime Contractor procedures, PAD-ENM-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*; and PAD-ENM-5004, *Sample Tracking, Lab Coordination, and Sample Handling Guidance.*

Laboratory Sample Custody Procedures (receipt of samples, archiving, disposal):

When the samples are delivered to the laboratory, signatures of the laboratory personnel receiving them and the courier personnel relinquishing them will be completed in the appropriate spaces on the chain-of-custody record, unless the courier is a commercial carrier. This will complete the sample transfer. It will be every laboratory's responsibility to maintain internal logbooks and records that provide custody throughout sample preparation and analysis process.

Sample Identification Procedures:

Sample identification requirements will be specified in work package documents.

Chain-of-custody Procedures:

Chain-of-custody requirements will be per DOE Prime Contractor procedures, PAD-ENM-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*; and PAD-ENM-5004, *Sample Tracking, Lab Coordination, and Sample Handling Guidance.*

*It is understood that SOPs are contractor specific.

QAPP Worksheet #28
QC Samples Table

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	DQI	Measurement Performance Criteria
QC Samples will not be collected.						

QAPP Worksheet #29
Project Documents and Records Table

All project data and information must be documented in a format that is usable by project personnel. The QAPP describes how project data and information shall be documented, tracked, and managed from generation in the field to final use and storage in a manner that ensures data integrity, defensibility, and retrieval.

Sample Collection Documents and Records	On-site Analysis Documents and Records	Off-site Analysis Documents and Records	Data Assessment Documents and Records*	Other
Data logbooks and associated completed sampling forms; sample chains-of-custody	Laboratory data packages, OREIS database, and associated data packages	OREIS database and associated data packages	PAD-ENM-5003, Att. G, Data Assessment Review Checklist and Comment Form	Form QA-F-0004, Management/ Independent Assessment Report

*It is understood that SOPs are contractor specific.

QAPP Worksheet #30
Analytical Services Table

Matrix	Analytical Group	Concentration Level	Sample Locations/ID Numbers	Analytical SOP	Data Package Turnaround Time	Laboratory/ Organization (Name and Address, Contact Person and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number)
Soil	Soil Index Properties—Site 5A	N/A	Site 5A	ASTM D2487 ASTM D422 ASTM D2216 ASTM D4318	28 days	TBD	TBD

QAPP Worksheet #31
Planned Project Assessments Table

LATA Kentucky will ensure that protocol outlined in the QAPP is implemented adequately. Assessment activities help to ensure that the resultant data quality is adequate for its intended use and that appropriate responses are in place to address nonconformances and deviations from the QAPP. Below is a list of assessments project teams may use.

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)	Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)	Person(s) Responsible for Identifying and Implementing Corrective Actions (Title and Organizational Affiliation)	Person(s) Responsible for Monitoring Effectiveness of Corrective Actions (Title and Organizational Affiliation)
Independent Assessment/ Surveillance	A	Internal	Prime Contractor QA	QA Specialists, Contractor, or Independent Assessor	Project Management, Contractor	Project Management, Contractor	QA Specialist, Contractor
Laboratory Audit	Annual	External	DOE Consolidated Audit Program (DOECAP)	Laboratory Assessor	Laboratory	Laboratory	DOECAP
Management Assessments	Annual	Internal	Prime Contractor Project Management	Regulatory Management, Contractor	Regulatory Management, Contractor	Regulatory Management, Contractor	QA Specialist, Contractor
Management by Walking Around (MBWA)*	B	Internal	Project Management	Project Management	Project Management	Project Management	Project Management
MBWA Follow-up surveillances	Quarterly	Internal	Project Management	Project Management or designee, Contractor	Project Management/Designee, Contractor	Project Management, Contractor	Project Management

A = assessment frequency determined by QA manager and conducted per PAD-QA-1420, *Conduct of Assessments*.
B = assessment frequency determined by regulatory manager and conducted per PAD-QA-1420.
*Reference: PAD-QA-1033 *Management by Walking Around (MBWA) Program*.

QAPP Worksheet #32
Assessment Findings and Corrective Action Responses*

All provisions shall be taken in the field and laboratory to ensure that any problems that may develop shall be dealt with as quickly as possible to ensure the continuity of the project/sampling events. Field modifications to procedures in the QAPP must be approved before the modifications are implemented and then documented. The process controlling procedure modification is PAD-PD-1107, *Development, Approval, and Change Control for LATA Kentucky Performance Documents*. Field modifications are documented through the work control process per PAD-WC-0021. Corrective action in the field may be necessary when the sampling design is changed. For example, a change in the field may include increasing the number or type of samples or analyses, changing sampling locations, and/or modifying sampling protocol. When this occurs, the project team shall identify any suspected technical or QA deficiencies and note them in the field logbook. Listed in Worksheet #32 is how project teams will address assessment findings.

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Time frame of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (Name, Title, Org.)	Time Frame for Response
Management, Independent, and Surveillances	Form QA-F-004, Management/ Independent Assessment Report, and QA-F-0710, Issue Identification Form	Project management, issue owner, contractor	Upon issuance of Form QA-F-004, Management/ Independent Assessment Report, form QA-F-0710, Issue Identification Form, will be completed and attached to the assessment report	QA-F-0710, Issue Identification Form, documents the issue response and/or corrective actions	Action owner as designated by issue owner, contractor	Fifteen days for initial issue response, corrective action schedule determined by issue owner, per PAD-QA-1210

*It is understood that SOPs are contractor specific.

QAPP Worksheet #33
QA Management Reports Table

Reports to management include project status reports, field and/or laboratory audits, and data quality assessments. These reports will be directed to the QA Manager and Project Manager who have ultimate responsibility for assuring that any corrective action response is completed, verified, and documented.

Type of Report	Frequency (daily, weekly monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
Field Change Requests	As needed	Ongoing	Field staff	QAPP recipients
QAPP Addenda	As needed	Not Applicable	Project Manager	QAPP recipients
Field Audit Report	TBD as determined by QA Manager	30 days after completion of audit	QA Manager	LATA Kentucky Project Manager QA Manager

QAPP Worksheet #34
Verification (Step I) Process Table

This section of the QAPP provides a description of the QA activities that will occur after the data collection phase of the project is completed. Implementation of this section will determine whether the data conforms to the specified criteria satisfying the project objectives.

Verification Input	Description*	Internal/ External	Responsible for Verification (Name, Organization)
Field Logbooks	Field logbooks are verified per LATA Kentucky procedure, PAD-ENM-2700, *Logbooks and Data Forms*, and PAD-ENM-5003, *Quality Assured Data*.	Internal	Project Management or designee, Contractor
Chains-of-custody	Chains-of-custody are controlled by LATA Kentucky procedure, PAD-ENM-5004, *Sample Tracking, Lab Coordination and Sample Handling Guidance*. Chains-of-custody will be included in data assessment packages for review as part of data verification and data assessment.	Internal	Sample and Data Management, Project Management, and QA Personnel, Contractor
Field and Laboratory Data	Field and analytical data are verified and assessed per LATA Kentucky procedure, PAD-ENM-5003, *Quality Assured Data*. Data assessment packages will be created per this procedure. The data assessment packages will include field and analytical data, chains-of-custody, data verification and assessment queries, and other project- specific information needed for personnel to review the package adequately. Data assessment packages will be reviewed to document any issues pertaining to the data and to indicate if data met the DQOs of the project.	Internal	Sample and Data Management, Project Management, and QA Personnel**, Contractor
Sampling Procedures	Evaluate whether sampling procedures were followed with respect to equipment and proper sampling support using audit and sampling reports, field change requests and field logbooks.	Internal	Sample and Data Management, Project Management, and QA Personnel**, Contractor
Laboratory Data	All laboratory data will be verified by the laboratory performing the analysis for completeness and technical accuracy prior to submittal to LATA Kentucky. Subsequently, LATA Kentucky will evaluate the data packages for completeness and compliance.	External/ Internal	Laboratory Manager, LATA Kentucky Sample and Data Management
EDDs	Determine whether required fields and format were provided.	Internal	Sample and Data Management
QAPP	All planning documents will be available to reviewers to allow reconciliation with planned activities and objectives.	Internal	All data users

*It is understood that SOPs are contractor specific.
**QA specialist performs general QA review.

QAPP Worksheet #35
Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description*	Responsible for Validation (Name, Organization)
IIa	Chain-of-Custody, Sample Handling, Sampling Methods and Procedures, and Field Transcription	These items will be validated during the data assessment process as required by LATA Kentucky procedure, PAD-ENM-5003, *Quality Assured Data*. The documentation of this validation will be included in the data assessment packages.	Sample and Data Management Personnel, Contractor
IIa	Audits	The audit reports and accreditation and certification records for the laboratory supporting the projects will be considered in the bidding process.	QA Personnel

*It is understood that SOPs are contractor specific.

QAPP Worksheet #36
Validation (Steps IIa and IIb) Summary Table

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
Step IIa/IIb	Soil	Soil Index Properties	N/A	N/A	N/A

QAPP Worksheet #37
Usability Assessment*

LATA Kentucky shall determine the adequacy of data based on the results of validation and verification. The usability step involves assessing whether the process execution and resulting data meet project quality objectives documented in the QAPP.

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:

Field and analytical data are verified and assessed per procedure PAD-ENM-5003, *Quality Assured Data*. Data assessment packages will be created per this procedure. Data assessment packages will include field and analytical data, chains-of-custody, and other project-specific information needed for personnel to review the package adequately. Data assessment packages will be reviewed to document any issues pertaining to the data and to indicate if DQOs of the project were met.

Describe the evaluative procedures used to assess overall measurement error associated with the project:

PARCCS parameters (precision, accuracy, representativeness, comparability, completeness, and sensitivity) will be evaluated per procedure, PAD-ENM-5003, *Quality Assured Data*.

Identify the personnel responsible for performing the usability assessment:

Project and QA personnel.

Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:

Data assessment packages will be created, which will include data assessment comments/questions and laboratory comments. Data verification and assessment queries indicating any historical outliers and background soil exceedances also will be included in the data assessment packages.

*It is understood that SOPs are contractor specific.