DIVISION OF ENVIRONMENT
QUALITY MANAGEMENT PLAN

PART III:

ORPHAN SITES PROGRAM
QUALITY ASSURANCE MANAGEMENT PLAN

Revision 6
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Kansas Department of Health and Environment
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QAMP Revision History		
Date	Revision	Change
	1	Updated Sections and references
11/29/2011	2	Updated Sections 1-4 and references
3/14/2016	3	Updated Sections 2, 3 and 4 and references
2/20/2017	4	Numerous grammatical changes, not technical revisions
3/21/2018	5	Minor update to reflect staffing changes
2/22/2019	6	Updated concurrence form and grammatical changes

Section 1

INTRODUCTION

1.1 PURPOSE OF PLAN

This document presents the quality assurance management plan for the Orphan Sites Program (OSP). The plan describes the mission, developmental history, organizational structure, environmental monitoring protocols, data handling procedures, and quality assurance (QA) and quality control (QC) requirements of these programs. SOPs and equipment used in the programs are presented in Appendix A.

1.2 PLAN REVISIONS

To be effective and useable, this document must be maintained in an up-to-date condition. As required by the Division of Environment Quality Management Plan (Part I, section 7), the contents of the plan are reviewed on at least an annual basis. Minor changes in the report's organizational structure or terminology may be approved by the Section Chief. However, major revisions which substantially change the contents of the document, especially in terms of QA policies or procedures, require the added approval of the Section Chief, Bureau QA Representative and the Bureau Director.

Section 2

DESCRIPTION OF PLAN

2.1 HISTORICAL OVERVIEW

The Orphan Sites Unit is responsible for the implementation and development of the OSP. The OSP was developed in response to legislation, specifically, the State Water Resources Planning Act (K.S.A. 82a-901 et seq.). The State Water Resources Planning Act (SWRPA) was drafted in 1986 and implemented to provide a mechanism to ensure the supply of water in the State of Kansas is of sufficient quantity and quality to meet the current and future

needs of its citizens. The SWRPA consisted of numerous subsections which are generally programs delegated to State Agencies for implementation and operation. Funding for operation of the SWRPA programs is provided on an annual appropriations budget with overall funding generated by fees applied on municipal, industrial, and stock watering water use; fees on fertilizer and pesticide sales; and from the State General Fund. KDHE/BER developed its OSP to implement the "Contamination Remediation" Subsection of the SWRPA. In 2015, an Environmental Stewardship Fund (ESF) was created following passage of legislation. The ESF is used to help pay for assessment and remediation activities at contaminated “orphan” sites (i.e. sites with no party responsible for cleanup). The OSP receives ESF funding to assist with assessment, remediation and monitoring.

2.2 MISSION AND GOALS

KDHE/BER's OSP was developed to provide the resources to initiate assessment and remedial procedures when a responsible party is unknown, cannot, or will not undertake necessary actions. Elements of the OSP include: 1) potentially responsible party (PRP) searches; 2) site assessments; 3) comprehensive investigations; 4) long term monitoring; 5) corrective action studies; 6) corrective action plans; 7) corrective action implementation; 8) and cost recovery for expended funds upon determination of a responsible party.

Sites addressed through BER's OSP are generally referred to as "Orphan Sites". These are sites that generally fall outside the parameters of other programs which means there are no alternative state, federal, or other funding sources to provide for assessment and cleanup activities. Sites that can be addressed through BER's OSP are those where no responsible party has been identified, or if identified, the responsible party is financially unable to or not willing to undertake necessary activities to address the contamination.

The goals of KDHE/BER’s OSP are defined as follows:

(1) Ensure that the state's water supplies which have been contaminated are carefully evaluated for both human health risks and environmental impact in a timely manner;

(2) develop procedures within the program to standardize a consistent approach to addressing contaminated sites and maximize efficiency of limited resources in addressing the sites;

(3) develop, maintain, and implement a ranking system to allow sites with greatest potential impact to be addressed in order of priority;

(4) based on ranking, undertake necessary monitoring, investigative, and remedial actions as appropriate to address contaminated sites;

(5) provide a funding and resource mechanism for expedited response in

addressing emergency sites (highest order ranking);

(6) refer sites to appropriate programs upon determination of a viable responsible party;

(7) Close out sites when no further monitoring, investigative, or remedial actions are considered necessary.

2.3 ORGANIZATION AND RESPONSIBILITIES

ORGANIZATIONAL CHART

(See Exhibit 1 in the BER QA Plan Part II)

The Bureau Director's responsibilities are defined in the BER QA management plan presented in Part II of the QMP.

The Section Chief is responsible for supervising the Unit Manager of the Orphan Sites Unit. The operations and implementation of uniform policies and procedures for the OSP is the responsibility of the Section Chief. The Section Chief and the Unit Manager, respectively, are responsible for planning, organizing, supervising and directing the statewide activities of the OSP. Additionally, the Section Chief is responsible for coordination between the units within the section.

The Unit Manager is responsible to ensure that the requirements of the program-level QA management plans and SOPs are implemented in a consistent, timely and reliable manner. Working with the Section Chief, the Unit Manager strives to improve the precision, accuracy and reliability of all environmental monitoring data collected as part of the OSP through the effective allocation of staff and resources.

The Unit staff serve as project managers in OSP and are responsible for conducting all aspects of OSP assessments and cleanup activities under the supervision of the Unit Manager.

For assessment and monitoring work completed by staff, a Work Plan which meets the objectives and minimum data quality and quantity required of such investigations is developed and submitted to and approved by the Unit Manager. All final site reports must be approved by the Unit Manager before submission to the Section Chief.

Much of the actual investigative or remedial work conducted pursuant to the OSP is conducted by private environmental consulting firms working under an environmental services contract developed between BER and the environmental consulting firms. The Unit Manager and the Project Manager (PM) actively participate in the site-specific request for quotes and contract award process.

OSP staff provide direction and oversight of all scientific investigations and remedial actions performed relative to the program. PMs are responsible for many of the following functions:

(1) Review and evaluate hydrogeologic investigation work plans and reports for completeness, accuracy and technical adequacy;

(2) provide technical direction to allow for correction of perceived deficiencies in work plans and reports;

(3) administer project management for groundwater, surface water and soil remediation sites where ongoing investigations and cleanups are occurring;

(4) evaluate monitoring and general remedial data to ensure that the project is progressing at an acceptable time frame;

(5) review or design groundwater quality sampling programs to assure that the proper evaluation of potential sites is performed;

(6) collect split, duplicate, or collocated environmental samples to ensure the representativeness and general quality of the various samples collected at a site throughout the investigation;

(7) prepare scopes of work and reviews and negotiates cost proposals for investigative or remedial work to be conducted to achieve objectives in a cost-effective manner. Track costs and reviews invoices for work performed for accuracy;

(8) conduct detailed review of site information for the purposes of ranking the health and environmental risk posed by contamination at a site; and

(9) represent the Agency at public meetings and other forums to present information regarding program activities;

Section 3

QUALITY ASSURANCE / CONTROL POLICY STATEMENT

PMs and unit managers possess SOPs for administration of QA/QC for the OSP. PMs can develop site specific Quality Assurance Project Plans (QAPPs), when appropriate, in accordance with KDHE's SOPs and numerous federal regulatory guidance documents for QA/QC. Sometimes the Unit's role within the program is limited to reviewing and approving work plans and reports for

investigative and remedial activities conducted by an environmental contractor. As an element of the review process, the Unit requests the environmental contractor provide a well-defined QAPP, with respect to certain SOPs included in Appendix A. PMs review each of these site specific QAPPs to determine compliance with KDHE's SOPs.

Environmental consultants working under contract prepares a QAPP and Field Sampling Plan, which together, comprise the Sampling and Analysis Plan. These plans are reviewed by PMs to determine their ability to satisfy QA and QC objectives established and documented in the KDHE Quality Management Plan.

The PM's role within the OSP includes development or review of scopes of work for site monitoring, investigations, remedial designs and remedial actions. The PM submits the scopes of work to a contractor for bidding purposes. The contractor awarded the project submits cost proposals, work plans, and reports for review by the PM. As an element of the review process, the PM ensures that the environmental contractor had prepared a suitable site specific QAPP to ensure established data quality objectives will be achieved. Each PM also ensures site specific QAPPs and SOPs are in compliance with KDHE's SOPs and SOPs provided in federal regulatory guidance documents.

PMs are often independently involved with the collection of soil and groundwater samples at OSP sites. All sampling activities conducted by PMs or designated technicians comply with the following program policies:

(1) The objectives of any environmental monitoring project shall be determined prior to implementation of data collection activities. This determination shall be accomplished during the planning stage of the project so that appropriate procedures will be incorporated into the design of the project and the resulting data will have a reasonable probability of meeting the stated objectives.

(2) Sample collection and analysis activities and data management activities shall be subjected to periodic evaluation by supervisory personnel to identify and correct deficiencies and enhance the overall credibility of the Section's environmental monitoring programs.

(3) All data collection activities will be accomplished and documented in accordance with a divisional QA plan and applicable SOPs, included in Appendix A.

Federal guidance documents frequently referenced for QA/QC by OSP staff include, but are not limited to:

- A Compendium of Superfund Field Operations Methods (EPA/540/P-87/001, December 1987);
- Data Quality Objectives for Remedial Response Activities (EPA/540/G-87/003, March 1987);
- Guidance for Data Usability in Risk Assessment (EPA/540/G-90/008, October 1990);
- Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004, October 1988); and
- Risk Assessment Guidance for Superfund (EPA/540/1-89/002, December 1989);
- Standard Operating Safety Guidelines (EPA Publication 9285.1-03/PB92-963414, June 1992);
- Standard Practices for the Description and Identification of Soils: (American Society for Testing and Material Standard D-2488, October 1990);
- Standard Practices for the Design and Installation of Groundwater Monitoring Wells in Aquifers (American Society for Testing Materials Standard D-5092, October 1990);
- Standard Practices for Soil Investigation and Sampling by Auger Boring (American Society for Testing and Materials Standard D-1452, October 1990).

Section 4

QUALITY ASSURANCE / CONTROL CRITERIA AND PROCEDURES

4.1 FIELD STATION SITE SELECTION

The selection of sampling locations is based on several factors including type and purpose of the sample, representativeness, accessibility (permission to sample), location of existing wells, location of potential source areas of contamination and location of potential target areas. Selection criteria vary depending upon the type of medium being sampled and the purpose of the sampling which are described in site-specific QAPP plans.

4.2 FIELD EQUIPMENT INSTALLATION

Generally field staff will use non-dedicated sampling equipment that is either disposable or reusable. Sampling equipment designated for reuse must be decontaminated as specified in SOP (BER-05). Some sites as designated by the PM may have dedicated sampling equipment in place.

4.3 SAMPLING TYPES

OSP staff primarily provide QA/QC management services through the oversight of work conducted by environmental contractors, and possibly, collection of split, duplicate, replicate, and/or collocated environmental samples concurrent with environmental sampling performed by environmental contractors. In addition, OSP staff may occasionally be required to independently collect environmental samples.

Groundwater is the most frequent environmental media sampled, followed by surface and subsurface soils, surface water, sludge, sediment, and air. In addition, program staff may be required to collect special samples including influent and effluent water samples associated with groundwater or surface water remedial systems, or remedial performance samples including potentially hazardous wastes or materials which have been stabilized to facilitate handling and transport or to reduce contaminant mobility.

OSP staff collecting QA/QC environmental samples adhere to the sample collection procedures specified in the KDHE-approved site-specific Field Sampling Plan (FSP). QA/QC sample collection procedures proposed by environmental contractors are reviewed for compliance with their standard QAPP and SOPs as well as KDHE's SOPs. KDHE's approval of the site-specific FSP is dependent upon the FSP's compliance with field methods and sampling procedures provided in the "Compendium of Superfund Field Operations Methods", which is a compilation of demonstrated field techniques that have been used during remedial response activities at hazardous waste sites (U.S. EPA, September 1987). The purpose of the FSP is to ensure that sampling data collection activities will be comparable to and compatible with data previously collected.

OSP staff independently collecting environmental samples follow various internal SOPs. SOPs developed for program staff include: BER-01 for the collection of groundwater samples; BER-03 for the collection of soil samples; BER-02 for the collection of surface water samples; BER-04 for the collection of sediment samples; and BER-11 for sample control, i.e. identification, transport and chain-of-custody.

4.4 SAFETY CONSIDERATIONS

Field and laboratory staff that participate in environmental monitoring programs encounter potentially dangerous situations on a frequent basis. In addition to the routine possibility of automobile or equipment accidents, employees may encounter extremely slippery surfaces,

toxic or hazardous substances, infectious microorganisms, fire or electrocution hazards, vicious dogs, belligerent persons, or other threatening situations. Injuries or illnesses resulting from such situations may lead to substantial human suffering and, from a QA/QC perspective, deprive monitoring programs of the services of a valuable employee for an extended period.

Although it is not possible to predict every conceivable risk that may arise during the course of work, supervisors must ensure that those risks faced by staff on a recurring basis are addressed in the SOPs and are discussed during employee training. Field and laboratory staff are expected to abide by the safety protocols contained within the QA management plans and SOPs and to integrate safety considerations into all aspects of their work. Field staff should follow SOPs BER-18, BER-21 and BER-22. BER routinely budgets for ongoing safety training expenses and annual medical physicals for field staff associated with monitoring and/or field inspections of hazardous materials (refer to BER-17).

Non-supervisory employees are expected to bring potentially unsafe practices or situations to the attention of their unit manager. In turn, the unit manager shall evaluate the practice or situation and either take the appropriate corrective action or, in complicated circumstances, seek the advice of the appropriate Section Chief or higher-level supervisor. Major corrective actions those warranting changes in an SOP shall be implemented by staff only upon approval of the Section Chief, Bureau QA Representative and Bureau Director.

4.5 REQUESTING ANALYTICAL SERVICES

OSP staff independently collecting samples can employ several approaches for the submission of environmental samples to a laboratory for analyses. Staff can submit environmental samples directly to the Kansas Health and Environmental Laboratory (KHEL) or contract the services of an outside laboratory. Samples submitted for laboratory analysis by an environmental contractor are submitted to a laboratory that has been previously approved by the PM during the work plan review and approval process.

The laboratory selected by the PM or environmental consultant must have a specific QAPP approved by the Division Director prior to utilization by the Section. Generally, the KHEL will be used for a majority of the program's analytical service. However, the purpose of the contractual arrangements is to provide additional analytical capacity; QA/QC (inter-laboratory duplicates); and to provide expanded analytical services.

4.6 PROCEDURES FOR ASSESSING DATA PRECISION, ACCURACY, REPRESENTATIVENESS AND COMPARABILITY

4.6.1 ONGOING QUALITY ASSURANCE REVIEW AND SPECIAL AUDITS

All QA/QC aspects of the OSP are subject to ongoing review by the Unit Manager

and Section Chief. Non-supervisory staff are expected to cooperate fully with administrative requests for information on data precision/accuracy and overall QC performance. The Unit Manager is expected to track the QC performance of PMs, assist managers in identifying QC deficiencies within their assigned projects, and facilitate the initiation of necessary corrective actions (see section 4.7, below). The Section Chief is expected to track the overall QA/QC performance of the program, assist the Unit Manager in identifying QC deficiencies, and facilitate the initiation of necessary corrective actions. The Section Chief also is responsible for summarizing the overall QA/QC performance of the program in annual reports required under Part I, section 7, of the QMP.

To enhance the quality and credibility of the environmental data gathered by OSP staff, the OSP may, at the discretion of the Section Chief, Bureau Director or Division Director, be required to participate in QA/QC audits performed by an independent party. Audit findings, and corrective actions implemented in response to such findings, are reported to the Bureau QA Representative, Bureau Director and Division Director in the annual program QA/QC reports.

4.6.2 EQUIPMENT CALIBRATION AND MAINTENANCE

Environmental contractors are required by the PM to identify all field equipment to be used during field activities. The PM reviews all proposed equipment to ensure the equipment is appropriate for the intended task and desired data quality objectives. The PMs also review proposed calibration procedures and frequencies of field equipment to determine compliance with the environmental contractor's approved SOPs. The environmental contractors are required to provide post documentation of calibration and results conducted during field activities. Environmental contractors are generally required to provide a statement that all equipment is maintained in accordance with manufacturer's direction (usually included with the SOPs provided in the contract procurement process).

For field work conducted independently by OSP staff, all field equipment must be checked out from the Bureau's Equipment and Supply Technicians. The individual users of field equipment are responsible for the maintenance (in accordance with manufacturer's procedural manuals and/or SOPs) of the equipment while being used in field operations. The user should ensure the equipment is checked for proper operation and is current with calibration requirements (if needed) prior to leaving for field. The user should record any malfunctions encountered while in the field in the logbook associated with the equipment. The user should make sure the malfunctions are communicated to Unit Manager and Bureaus' Equipment and Supply Technicians upon return of the equipment to storage so that appropriate action can be initiated to repair the item of equipment, or initiate actions (e.g., prepare a Purchase Requests or Purchase Acquisitions) to get the equipment repaired upon return from the field.

4.6.3 QUALITY CONTROL BLANKS AND SPIKES

QC procedures must be taken by field staff to ensure the integrity of the samples collected. Without checks on the sampling and analytical procedures, the potential exists for contradictory or incorrect results. Procedures describing QC samples are defined in BER-12 or are included in specific SOPs.

4.7 CORRECTIVE ACTION PROCEDURES

In the context of QA, program corrective actions are procedures that may be implemented on environmental samples that do not meet predetermined QA specifications. In general, the corrective action procedures program addresses the analysis of any cause precipitating a negative audit finding and identifies the appropriate corrective action(s) necessary to address it. Program staff, or the appropriate QA/QC program designee, are responsible for reviewing data validation reports, audit reports and nonconformance reports, to identify significant or repetitious conditions adverse to quality, or deficiencies regarding the implementation or adherence to required QA practices. In addition, the OSP staff, or QA/QC designee, is required to investigate the source(s) of the problem and is responsible for defining and/or implementing the necessary actions to remedy the problem.

The quality characteristics of data generated by sampling, monitoring, or analyzing, is defined in the following terms:

Accuracy: The degree of agreement of a measurement, or an average of measurements of the same thing, X, with an accepted reference or true value, T, usually expressed as the difference between the two values, X - T, or the differences as a percentage of the reference or true value, 100 (X - T)/T, and sometimes expressed as a ratio, X/T. Accuracy is a measure of the bias inherent in the system.

Precision: A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Various measures of precision exist depending on the prescribed similar conditions.

Completeness: A measure of the amount of the valid data obtained from a measurement system, compared with the amount that was expected to be obtained under correct normal conditions, and that was needed to be obtained in meeting the project data quality objectives.

Representativeness: The degree to which data accurately and precisely represent a characteristic of population, the parameter variations at a sampling point, a process condition, or an environmental condition. It also includes how well the sampling point represents the actual parameter variations that are under study.

Comparability: The confidence with which one data set can be compared with another; a qualitative characteristic that must be assured in terms of sampling, analysis, reporting, etc.

The exact values of the quality characteristics will vary depending upon the analytical processes and procedures employed. Site-specific work plans will detail the recommended field activities and analytical methodologies necessary to establish the appropriate data quality characteristics. Corrective actions may include re-sampling, re-analyzing samples, or auditing laboratory procedures.

4.8 DATA MANAGEMENT

All work plans submitted in association with the OSP require a data management system including: field logs, sample management/tracking procedures, document control and inventory procedures for both laboratory data and field measurements to ensure that the data collected during the investigation are of adequate quality and quantity to support the findings of the investigation, risk assessment (if performed), and corrective action study.

For each measurement, the data reduction scheme planned for collected data, including all equations used to calculate the concentration or value of the measured parameter, should be described. The principal criteria employed to validate the integrity of the data during collection and reporting should be referenced. All data collected should be validated at the appropriate field of laboratory QC level to ascertain whether it is appropriate for its intended use. All task management and quality controls implemented shall be documented within the appropriate report appendix.

4.9 QUALITY ASSURANCE/CONTROL REPORTING PROCEDURES

All reports or deliverables submitted through the OSP require a QA/QC status summary of the project and any conditions adverse to the quality. The report should contain an assessment of measurement data accuracy, precision and completeness, results of any performance audits, results of system audits, any reported non-conformance, and any QA problems, together with recommended solutions or corrective actions.

In addition, end-of-year program QA evaluations are conducted by the Section Chief and the results submitted, in writing, to the Bureau Director and the Division Director by February 15 of the following year. The reports must indicate when, how, and by whom the evaluation was conducted, the specific aspects of the program subjected to review, a summary of important findings, and technical recommendations for necessary corrective actions. The Section Chief is expected to discuss the findings of these evaluations with the Unit Managers and all participating field, laboratory and data management staff.