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Quality Assurance Plan
for pH Analysis Only
Associated with Industrial Storm Water Runoff

Provided for assistance to comply with the Kentucky Wastewater Laboratory Certification
Requirements in 401 KAR 5:320

FACILITY
KPDES PERMIT #:

Date

Version 0

Prepared By: Name of Agency/Organization developing QAP

Address

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Prepared For: Name of Agency/Organization

Address

Phone/Email

Date: Date QAP is prepared

Revision Date: Date QAP is revised – also update the ‘revision history page’

Revision No.: Consecutive number of QAP, starting with 0.0 as the initial document

(Footer should reflect the document control information, as outlined in footer below. Please fill in Title, creation date and Revision number below)

Quality Assurance Plan For << Project Name >>

Signatures: An official QAP must include signatures of all relevant personnel. - Insert additional reviewers or authors as necessary – examples may include laboratory personnel, data reviewers, etc.

_____ Name / QAP Author, Organization	_____ Date
_____ Name / Project Manager/Supervisor, Organization	_____ Date
_____ Name / Project Quality Assurance Officer, Organization	_____ Date
_____ Name / Other, Organization	_____ Date

Revision and Annual Review History

This page documents the annual review and the revisions over time to the QAP. The most recent iteration should be listed in the first row, with consecutive versions following. Signatures may be required for revised documents. It is a requirement that this be signed annually.

Date of Revision or Annual Review	Page(s)/Section(s) Revised	Revision Explanation

1 Introduction

The Quality Assurance Plan (QAP) establishes the planning, implementation, documentation and assessment of environmental analytical testing procedures. This document has been prepared in accordance with EPA's *Quality Standard for Environmental Data Collection, Production, and Use by External Organizations* (2106-S-02.0) (1). The scope of this QAP is limited to the field analysis of non-potable water for pH. Methodologies utilized for pH analysis must be EPA approved (40 CFR 136) (2). Quality control parameters specified in 40 CFR 136.7 are also addressed. This document shall be used in conjunction with a pH analysis standard operating procedure (SOP) which will provide specific method only information and criteria. This QAP and related SOP(s) must be used for pH analysis of non-potable water for KPDES compliance sample analysis within the Commonwealth of Kentucky.

- 1) EPA Final Draft. *Quality Standard For Environmental Data Collection, Production, and Use By Non-EPA (External) Organizations (EPA CIO 2106-S-02.0)*. Office of Environmental Information.
- 2) 40 CFR Part 136 On-line Version (e-CFR) Website; <http://www.ecfr.gov>.

1.1 QAP Objectives

To produce storm water monitoring data for pH that is reliable and representative of site conditions, this QAP describes where and when storm water samples will be collected, collection and handling procedures, the type of analysis required, and how the sample results will be evaluated.

1.2 Responsible Person(s)

The following key personnel are responsible for field analysis of environmental samples as they pertain to this QAP. A brief description of their duties, or roles, is provided. Other duties may also apply, or multiple duties assigned to an individual.

Project Manager is the official responsible for this project, overseeing overall project operations and budget, as well as tasking personnel with work required to complete this project. The project manager communicates project needs to all applicable personnel.

Quality Assurance Manager is responsible for reviewing and approving the QA Plan. The QA Manager may provide technical input on analytical methodologies and data review. The QA Manager must ensure that the project quality objective (e.g. EPA Data Quality Objectives) and measurement performance criteria are met. The QA Manager is responsible for ensuring that all field technicians receive any specific training requirements or certification.

Field Technician(s) is responsible for all field related activities including the analysis of environmental samples, including but not limited to:

- Instrument care and daily maintenance, including corrective actions
- Instrument calibration in accordance with appropriate methods or manufacturer's instructions
- Analysis and proper documentation of applicable environmental samples
- Analysis and proper documentation of all applicable quality control samples
- Proper maintenance of field logbook(s)

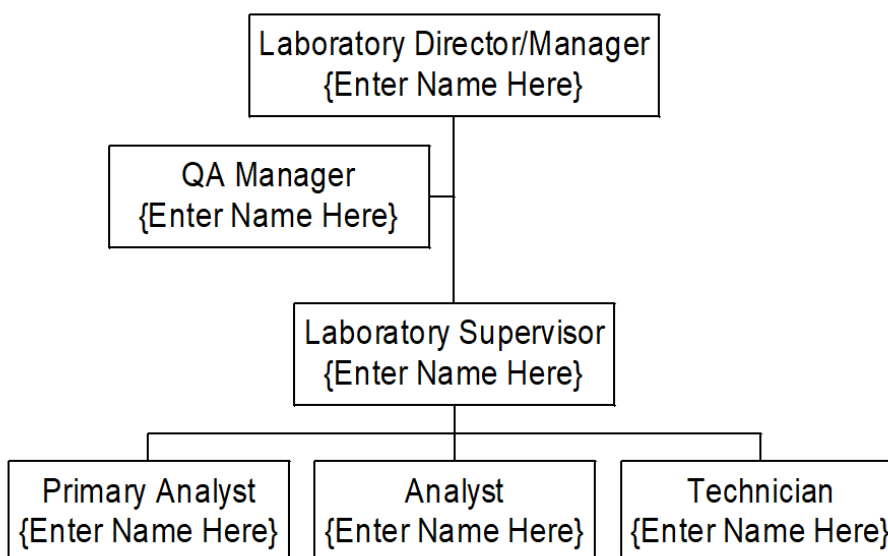
Provide a concise organization chart indicating the relationships and lines of communication among all project participants. Include other data users who are outside of the organization generating the data for whom the data is intended.

Below are examples for your use. Choose whichever example works best for your organization or use your own chart. (Delete highlighted areas after completion).

Example 1. Laboratory Organization Chart. One person may have more than one title and associated role or responsibility.

Title	Reports To	Role / Responsibility
Laboratory Director/Manager	President	
Laboratory Supervisor	Laboratory Director/Manager	
QA Manager	President	
Primary Analyst	Laboratory Supervisor	
Analyst	Laboratory Supervisor	
Technician	Laboratory Supervisor	
Technician	Laboratory Supervisor	

Example 2. Laboratory Organization Chart. One person may have more than one title and associated role or responsibility.



2 QAP Elements for the Collection of Data by Direct Measurement

2.1 Discharge Points/Sampling Locations

Prior to the initial sampling event, sampling locations must be determined. All samples collected must be representative of storm water associated with industrial activities. This QAP may be used at any (KPDES permit designated) sampling location(s) for the field analysis of non-potable water for pH as listed above.

2.2 Training

Individuals responsible for maintaining and implementing the field instruments will be trained in the operation, maintenance, and calibration of field instruments. The manufacturer's instruction manuals will be readily available for field personnel.

2.2.1 Field Analysis

Individual(s) performing field analyses of pH will be qualified Field Technician(s).

pH will be analyzed at the time and location of discharge using field instrument(s) that can be calibrated.

2.3 Field Analysis of Storm Water Discharge

2.3.1 Minimum Levels

Ensure field equipment is set to sample with quantitative results no greater than, and the resolution no less sensitive than, the Minimum Level.

2.3.2 Instrument Calibration

The table below identifies the calibration points, calibration frequency and measurement accuracy requirements for pH analysis. Each field instrument will be calibrated using at least two calibration point solutions, unless more calibration points are specified by the manufacturer's instructions. If the measurements exceed the allowable drift, ensure the instrument is properly maintained or return to manufacturer for service.

Field Instrument Calibration & Accuracy Criteria

Constituent	Points per Calibration*	Pre-Measurement Calibration	Allowable Drift (Measurement Accuracy)
pH	2-3	immediately before field analysis	+/- 0.1 pH units

*Calibration buffers must bracket sample measurement. All 3 buffers (4, 7 and 10) are recommended. A two-point calibration (4 & 7 or 7 & 10) is allowed if sample measurements fall within the range of the two calibration buffers.

To determine the accuracy of an instrument, use the solution of a known calibration standard. Take a measurement of the solution and determine if the value measured by the instrument is within the identified acceptable accuracy range.

Example of pH Accuracy Determination:

- Accuracy range for pH: +/- 0.1 pH units
- Known value of pH solution: 10.0 pH units
- pH meter measurement: 9.9 pH units

Acceptable accuracy for pH measurement shall be within 0.1 pH units of the pH 10.0 solution; in other words, the accuracy is acceptable because the measurement of pH 9.9 was between pH 9.9 and pH 10.1.

2.3.3 Instrument Calibration Log

Calibration of all field instruments will be documented in a calibration log. The calibration log will contain the following information:

- Type of instrument,
- Manufacturer & Model Number,
- Standard concentration concentrations,
- Date & time of calibration, and calibration reading
- Signature of the person(s) performing the calibration.
- All buffer solutions used in calibration, including the manufacturer lot number and expiration date of each buffer
- Any calibration difficulties or other relevant notes about the calibration.
- List of corrective actions taken.

2.4 Documentation and Records Requirements

Field personnel utilize a notebook and indelible ink to document all relevant observations and information related to field activities. DATA MAY ALSO BE KEPT ELECTRONICALLY.

INCLUDE THE APPLICABLE FIELD OBSERVATION INFORMATION BELOW

Field activities include the following:

- Date and location of sampling, name, organization and phone number of the sampler, and analyses required
- Sample type (grab or composite)
- Container size, container type and type of preservation.
- Sample collection time **and** analysis time.
- Results of field measurements such as pH

All applicable field documents will be stored INSERT WHERE HERE for a period of five (5) years or until the next on-site audit.

2.5 Data/Project Quality Objective

Data quality objectives (DQOs) for all field-testing activities associated with this QAP have been established to meet the requirements of the KPDES Permit Number: XXXXXX (If multiple permits please list all that apply. An appendix sheet is allowed.) and the associated Kentucky DOW Water Quality Standards are fulfilled and that data collected are scientifically verifiable and valid.

2.6 Data Acquisition

The scope of this QAP is limited to the analysis of pH samples from direct field measurements using EPA approved methods and field instrumentation (as specified in 40 CFR 136).

2.7 Analytical Methods Requirements and Task Description

This QAP is limited to field analysis for pH. A list of EPA approved methods is provided in 40 CFR 136.

2.8 Quality Control Requirements

EPA has specified twelve critical quality assurance quality control elements that must be addressed within this QAP. Section 3 provides a list of the critical elements with explanations regarding the relevancy of each as it pertains to field analysis of samples for KPDES permits. The associated field analysis SOP specifies the type and frequency of quality control samples and their acceptance criteria.

2.9 Instrument/Equipment Testing, Calibration and Maintenance Requirements, Supplies and Consumables

Field instruments must be verified annually by a third party or a qualified individual (Successful completion of annual Proficiency Test will fulfill this requirement.) The instrument verification must be documented and maintained for five (5) years. Instruments that do not meet verification acceptance criteria may not be used for the analysis of compliance samples for KPDES permits. Instruments must be calibrated in accordance with the field analysis SOP or the manufacturer's requirements.

3 Quality Control Critical Elements for pH analysis per 40 CFR 136.7

#	Parameter	Performed (Yes/No)	Frequency
1	Demonstration of Capability (DOC)	No	
2	Method Detection Limit (MDL)	No	
3	Laboratory reagent blank (LRB), also referred to as method blank (MB)	No	
4	Laboratory fortified blank (LFB), also referred to as a spiked blank, or	No	
	Laboratory control sample (LCS) [second source standard]	Yes	Defined in SOP
5	Matrix spike (MS) & matrix spike duplicate (MSD), or laboratory fortified matrix (LFM) and LFM duplicate, may be used for suspected matrix interference problems to assess precision	No	
	Field Duplicates	Yes	
6	Internal standards (for GC/MS analyses), surrogate standards (for organic analysis) or tracers (for radiochemistry)	No	
7	Calibration (initial and continuing), also referred to as initial calibration verification (ICV) and continuing calibration verification (CCV)	Yes	Defined in SOP
8	Control charts (or other trend analyses of quality control results)	No	
9	Corrective action (root cause analysis)	Yes	Address failed QC
10	QC acceptance criteria	Yes	Defined in SOP
11	Definitions of preparation and analytical batches that may drive QC frequencies	Yes	Defined in Wastewater Manual as (20) samples
12	Minimum frequency for conducting all QC elements	Yes	Defined in SOP