DIVISION OF ENVIRONMENT
QUALITY MANAGEMENT PLAN

PART III:

WASTEWATER POLLUTION CONTROL PROGRAM
PRETREATMENT PROGRAM
QUALITY ASSURANCE MANAGEMENT PLAN

Revision 12
03/21/2019

Kansas Department of Health and Environment
Division of Environment
Bureau of Water
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SIGNATURES/APPROVALS

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3/25/2019
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1 INTRODUCTION

1.1 Historical Overview of Program

In 1907, K.S.A. 65-164 was passed. This statute forbade discharges of sewage into the waters of the state and authorized the Kansas State Board of Health (KSBH) to investigate sources of pollution detrimental to the health of the citizens. Since that time, a wastewater pollution control program, in some form, has existed.

Until the early 1970s, there were six KSBH "area engineers" that performed water supply and wastewater treatment plant inspections. One or two engineers in the Topeka central office reviewed plans and specifications for new wastewater treatment facilities and sewer extensions. They served under the Chief of Water Pollution Control.

Municipal wastewater treatment systems were predominantly Imhoff tank-trickling filter systems until the late 1950s. At that time, waste stabilization ponds began to be an accepted form of wastewater treatment. Many wastewater treatment facilities on the larger streams were primary plants, usually consisting only of Imhoff tanks and sludge drying beds. Many communities in Kansas did not have sewer systems and utilized private systems ranging from septic tank systems to cesspools, abandoned wells, and other poorly constructed systems. Municipalities were not required to monitor their discharges and the small wastewater treatment plants, as a general rule, were very poorly operated. Enforceable standards for wastewater effluent quality did not exist.

Industrial wastewater treatment plants served mainly refineries, large industries, meat packing plants, etc. Most of the small cooling water discharges, quarries, and other miscellaneous discharges were uncontrolled.

The federal Clean Water Act was enacted in 1972 and things began to change. The initial thrust of the Clean Water Act was to provide secondary treatment and technology-based effluent limits. Under the Act's National Pollutant Discharge Elimination System (NPDES), municipalities were issued permits renewable every five years. These permits contained requirements for monitoring and had enforceable, categorical, technology-based standards for effluent quality. In 1974 the State of Kansas was conferred primacy for the NPDES program. This program was administered jointly by the Municipal Programs and Industrial Programs sections within the KSBH.

At the same time the construction grants program was started, and was administered by the Municipal Program Section. This program provided a 75 percent federal grant requiring a 25 percent local match. Collection systems were not eligible initially but were later funded through this system. Hundreds of small municipal systems had "Step I" studies (facility plans) done by consulting engineers. Many facilities could not meet the United States Environmental Protection Agency (EPA) definition of secondary treatment and upgraded their plants with federal assistance. Most of the antiquated Imhoff tank/trickling filter plants, some of which were built by the Work Progress Administration during the 1930s, were replaced with waste stabilization pond systems. A few years later, collection systems began to be funded through the grant program and many communities had sewage treatment facilities constructed for the first time.

Accompanying these changes was a major reorganization of the agency administering the provisions of the Clean Water Act in Kansas. Specifically, KSBH was abolished and the Kansas Department of Health and Environment (KDHE) was formed in its stead in 1974. The Municipal Programs and Industrial Programs sections became a part of the Bureau of Water Protection. Many new engineers and technicians were hired to administer the Clean Water Act and its various programs. Some of these new positions were allocated to the district offices to assist the "District Engineers" in carrying out their expanded duties under the NPDES program.

Today, essentially all of the municipal wastewater facilities in Kansas meet the definition of secondary treatment and most are in compliance with their NPDES permits. Most industrial facilities meet categorical effluent limitations and are likewise in compliance with their NPDES permits. Emphasis has gradually shifted to water quality-based permit limits and the protection of the designated uses of surface water under the Kansas surface water quality standards (K.A.R. 28-16-28 *et seq.*). Many of the treatment plants constructed during the 1970s and early 1980s are being upgraded to meet the more stringent limits in the latest revision of the water quality standards. Many older plants are being replaced. The construction grants program is virtually ended and has been replaced with the State revolving loan fund which is administered by the Municipal Programs Unit.

Within KDHE, the NPDES program is administered jointly by the Municipal Programs Unit, the Industrial Programs Unit, and the Technical Services Unit, all within the Water Permitting and Compliance Section. The Municipal Programs Unit is involved in the design, financing, construction and permitting of municipal wastewater treatment facilities in Kansas. The Industrial Programs Unit has evolved to include, stormwater control, and pretreatment programs, in addition to the plan review and permitting functions with respect to industrial wastewater treatment plants. Duties include handling registrations, plan and specification reviews, technical assistance and permit development. The Technical Services Unit provides the administrative part of the permitting process, including compliance monitoring, and enforcement. Municipal, industrial, and stormwater inspections are routinely conducted by staff of the Bureau of Environmental Field (BEFS) field offices. The Technical Services Unit provides guidance to BEFS relating to these inspections. Municipal Pretreatment Audits, Pretreatment Compliance Inspections (PCI's) industrial pretreatment inspections are routinely conducted by the Industrial Programs staff.

KDHE Industrial Programs Unit of the Bureau of Water (BOW) administers the State/Federal Pretreatment Program on behalf of the U.S. Environmental Protection Agency in Kansas. The Pretreatment Program is designed to reduce the amount of pollutants discharged by an industry and other non-domestic wastewater sources into municipal sewer systems, and thereby, reduce the amount of pollutants released into the environment from publicly owned wastewater treatment plants. The program is a cooperative effort of the federal, state, and local regulatory environmental agencies established to protect water quality. The objectives of the program are to protect the Publicly Owned Treatment Works (POTW) or municipal wastewater treatment facility from pollutants that may interfere with plant operations, pass through the plant untreated directly into the environment, and to improve opportunities for the POTW to reuse treated wastewater and sludges (biosolids) that are generated. The term "pretreatment" refers to pollutant control requirements for non-domestic sources discharging wastewater to sewer systems that are connected to POTWs. Limits on the amount of pollutants allowed to be discharged are established by EPA, the state, or the local authority. Pretreatment limits may be

met by the industry through pollution prevention or through the treatment of the wastewater. The federal Pretreatment Program authority comes from Section 307 of the Clean Water Act (CWA). The federal government's role in the pretreatment program began with the passage of the Clean Water Act in 1972. The CWA called for EPA to develop national pretreatment standards to control industrial discharges into municipal sewer systems. Under the federal Pretreatment Program, there are two sets of standards i.e., Categorical Pretreatment Standards and Prohibited Discharge Standards. These are uniform national requirements which restrict the level of pollutants that may be discharged by non-domestic sources to sanitary sewer systems. The Prohibited Discharge Standards are specified in 40 CFR 403. The Categorical Pretreatment Standards are typically specified in 40 CFR 400 et seq. Municipalities (POTWs) that have design flows greater than 5 MGD or which are required by EPA or the state to develop a local pretreatment program are required to implement a Pretreatment Program which must be able to enforce the federal standards. The Categorical Pretreatment Standards are technology-based limitations on pollutant discharges to POTWs promulgated by EPA in accordance with Section 307 of the Clean Water Act that apply to specified process wastewaters of a particular industrial category. The Prohibited Discharge Standards are standards that prohibit the discharge of waste that will pass through or interfere with POTW operations (including sludge management). There are also specific prohibitions that prohibit the discharge from all non-domestic sources certain types of wastes that:

1. Create a fire or explosion hazard in the collection system or treatment plant,

2. are corrosive, including any discharge with a pH less than 5.0, unless the POTW is specifically designed to handle such wastes,

3. are solid or viscous pollutants in amounts that will obstruct the flow in the collection system and treatment plant, resulting in interference with operations,

4. any pollutant discharged in quantities sufficient to interfere with POTW operations, and

5. discharges with temperatures above 104° F when they reach the treatment plant, or hot enough to interfere with biological processes.

The federal Pretreatment Program regulations were originally promulgated in 1978. As indicated previously, KDHE is currently administering the federal Pretreatment Program on behalf of EPA in Kansas. The state Pretreatment Program essentially addresses two primary areas i.e., development and administration of local POTW programs and issuance of industrial pretreatment permits. Typically, activities involving the Industrial Program staff are associated with the inspection and sampling of industrial facilities that are either regulated by a POTW or are industrial facilities with a pretreatment permit issued by KDHE. Periodic compliance screening samples are collected by the Industrial Program staff to monitor industrial compliance. This sampling is limited in scope typically with less than 20 samples collected annually. Spot checks for certain pollutant parameters i.e., metals, VOCs, etc. may be analyzed for a spot check. All sampling done by Industrial Program staff is conducted primarily for a screening purpose only as typically instantaneous grab samples are collected because of manpower, resource, and equipment limitations. The state program is administered under the Kansas Pretreatment Regulations which are K.A.R. 28-16-83 thru 28-16-98.

1.2 Quality Assurance/Control Objectives

Quality assurance (QA) and quality control (QC) activities conducted within KDHE's water pollution control program are intended to ensure that all monitoring and analytical data are scientifically valid, defensible and of known and acceptable precision and accuracy. The remainder of this document describes the procedural QA/QC criteria developed to meet these objectives. Standard Operating Procedures (SOPs) and equipment are described in the appendices of this program management plan.

2 QUALITY ASSURANCE/CONTROL ORGANIZATION

2.1 Administrative Organization

The Water Pollution Control Program - Pretreatment Program in the Bureau of Water is part of the Industrial Program Section and the organizational framework can be viewed on the KDHE intranet at:

http://kdhenet/appnet/ops/orgchart/

2.2 Staff Responsibilities

The following paragraphs summarize the primary functions and responsibilities of the Industrial Programs Section and the Pretreatment Unit.

Industrial Programs Section - This section consists of three units: the Pretreatment Unit, Industrial Unit and Industrial Stormwater Data/Support Unit.

The Industrial Unit administers the NPDES and State Water Pollution Control program for industries which discharge to waters of the state. Duties include engineering report review, plan and specification review, technical assistance, development of NPDES and State Water Pollution Control permits and assists with compliance/enforcement

The Industrial Stormwater Data/Support Unit administers the stormwater program permitting activities. Responsibilities of the unit include permit development, issuance, and administration. Conducting enforcement and administrative actions. Provides outreach, information, and education related to stormwater program activities.

The Pretreatment Unit administers the State/Federal Pretreatment Program. The unit currently oversees the development and administration of local pretreatment programs currently being administered by 18 municipalities, which includes one inactive pretreatment program. As of October 1, 2018, 216 industries are permitted by POTWs with approved local pretreatment programs. KDHE is currently administering approximately 59 pretreatment permits to industries that are located outside of POTWs with approved local pretreatment programs. Responsibilities of pretreatment program staff include administrative oversight of the 17 POTWs with active, approved local pretreatment programs to ensure compliance with State/Federal requirements. In addition, administrative oversight includes compliance by industries permitted and regulated by the approved POTWs to ensure compliance with Pretreatment Program permit requirements. Staff provide technical assistance to the POTW program staff regarding implementation of state/federal requirements. KDHE develops, issues, and provides compliance enforcement monitoring for industries subject to EPA categorical standards which are located outside of POTWs which do not have approved local Pretreatment Programs. Staff provide technical assistance to facility operators when requested. Staff also provide assistance to municipalities when operational upsets or permit noncompliance has resulted from industrial wastes being directed to the collection/wastewater treatment system. Staff also assist POTWs in developing

local Sewer Use Ordinances and technically based local limits, which may, in some cases, be more stringent than either State or Federal requirements. The Pretreatment Program staff implement compliance/enforcement activities when state or federal law is violated and formal compliance actions are deemed necessary. Pretreatment staff also assists program cities with developing and approving Enforcement Response Plans (ERP's).

3 QUALITY CONTROL CRITERIA AND PROCEDURES

3.1 Monitoring Site Selection Criteria

The selection of field monitoring sites is based on several factors including type and purpose of sample, whether the sample is representative of the discharge, ability to document or relocate the sampling site, prevention of sample contamination from wastes not regulated, accessibility, and safety. Selection of industries to be sampled will be coordinated with EPA. Priority will be to industries identified as being in non-compliance, industries yet to be sampled by KDHE, and industries in POTWs which appear to have compliance problems associated with the industrial wastes they receive.

3.1.1 Pretreatment Samples

Industrial pretreatment samples are collected from a wide variety of industries and industrial processes. The major types of samples collected are “instantaneous grab” samples and "grab composites." Samples may be categorized as "end-of-process" or "end-of-pipe." End-of-pipe samples are collected at the point at which the industry's wastewater discharge enters the city collection system and generally include a substantial fraction of domestic wastewater. End-of-process samples are preferred for compliance purposes and are collected at the end of all regulated waste streams including any wastewater treatment system the industry may have. Typically, pretreatment samples are collected from sampling ports following any treatment and prior to dilution with unregulated waste streams. By taking end-of-process samples, it avoids the use of the Combined Waste-Stream Formula (CWSF).

Safety concerns at industrial sampling sites include strong acids and bases, toxic materials, toxic atmospheres, slippery floors, electrical hazards and confined spaces, to name a few. It is important that the sampler have the necessary safety equipment and safety training. Confined spaces, such as manholes, must not be entered.

3.2 Sampling Procedures and Sample Custody

3.2.1 Pretreatment Samples

Pretreatment samples should be collected from rinse vats or other vessels in such a manner that "dipping" is avoided; rather, the waste stream should be intercepted and allowed to flow by gravity into the sample container. In cases where discharge piping discharges directly into a floor drain, dipping from the vat may be necessary. If so, the appropriate containers and funnels must be utilized in order to avoid immersing the sample container itself.
Samples may be a single grab, a series of individual grab samples composited by time, or samples from two or more unit processes, combined proportionally, in cases where an "end-of-process" sampling point is not available.

Sample containers, preservatives, and holding times must comply with 40 CFR 136.3 Table II. The sample collector shall log the date, time, name, and the exact location of sample collection as per K.A.R. 28-16-63.

The samples shall be analyzed using laboratory techniques approved by EPA and the State of Kansas. The analyst shall record the dates the analyses were performed, who performed the analyses, analytical techniques/methods used, and the results of such analyses.

3.2.2 Sampling Procedures and Sample Custody

Regulated entities required to sample wastes as a condition of their Pretreatment permit shall abide by the procedures set forth in their permit. Samples to be analyzed in an onsite laboratory shall be collected in an appropriate sample container, and transported immediately to the laboratory where chain of custody will be transferred to the laboratory analyst or other designated employee. Collection, preservation, storage, and analysis shall be in accordance with 40 CFR 136 and/or Appendix B, (SOP for "Sample Collection, Preservation and handling – Industrial Pretreatment Samples"). The sample collector shall log the date, time, name, and the exact location of the sample collection as per K.A.R. 28-16-63.

The sample shall be analyzed using laboratory techniques approved by EPA and KDHE. The analyst shall record the dates and the analyses were performed, who performed the analyses, analytical techniques/methods used, and the results of such analyses. The permittee shall maintain the records for a minimum of three years.

Samples to be transported to an offsite laboratory shall be preserved and iced as per 40 CFR 136.3, Table II. Custody may be retained by the sample collector and transferred to the laboratory, transferred to a transporter, or the sample may be mailed directly to the laboratory, providing holding times will not be exceeded. Ultimately, the sample chain of custody will be transferred to the laboratory in accordance with the laboratory QA/QC protocols.

3.3 Analytical Procedures

Analytical procedures to be discussed in this section are generally field laboratory tests, either performed in the field with portable test kits and reagents or in a wastewater laboratory. The analytical procedures can be grouped as titrations, gravimetric, potentiometric or colorimetric analyses. IPS Pretreatment Program staff typically do not conduct any field laboratory tests. Samples for compliance monitoring and evidentiary samples (except for those field tests which must be done on-site) shall be collected and transported to the KDHE laboratory or an approved commercial laboratory.

Staff are expected to utilize their best professional judgment when confronted with an "out of the ordinary" situation. They are to report the situation to their supervisor and explain what actions they took to address the situation.

3.4 Internal Procedures for Assessing Data Precision, Accuracy, Representativeness and Comparability

3.4.1 In-house Audits

During system audits, staff responsible for field operations are required to demonstrate consistent technique regarding sample collection, sample preparation, and chain-of-custody. The section chief is responsible for maintaining a log of audit results and for summarizing these results in annual QA reports to the Division QA director (see section 3.8, below).

3.4.2 Procedural Blanks, Duplicate Measurements and Spiked Samples

The possibility of sample contamination during sample preparation, storage and analysis is assessed through the use of procedural blanks, prepared with ASTM Type I-quality water and subjected to the same treatment as the rest of the samples collected as a result of the investigation or project. Under this protocol blanks are utilized in the following manner:

(a) Should the blank concentration exceed the sample concentration, a corrected concentration normally is not included in the data file; however, should the sample concentration be less than the Minimum Detection Limit (MDL) of the analytical method, the concentration is recorded as such regardless of the blank concentration.

(b) Should the blank concentration be less than the MDL, the sample concentration is recorded without modification.

In the event a blank level exceeds the MDL, the level is not deducted from the reported sample concentration; rather, a sequence of corrective action procedures is initiated in accordance with section 3.6.

The possibility of sample contamination from sample containers is assessed through the analysis of container blanks. Five percent of the sample collection containers are selected at random, partially filled with ASTM Type I-quality water, sealed, and stored for a 48-hour interval. The resulting container blank is analyzed to determine levels of impurities leached from the container walls. If detectable concentrations of impurities are observed, a sequence of corrective action procedures is initiated.

In the case of a special monitoring program, one of the sampling sites in the network shall be equipped with two composite samplers, located side-by-side to facilitate the collection of duplicate samples. The alternative is to collect two grab samples at a selected station each time. Data generated by the duplicate sampling effort are used to assess the chemical variability of the sampling and analysis activities. In the case of a special investigation or fishkill, a duplicate sample shall be collected at one of the sampling points. These data provide a basis for quantifying the statistical uncertainty inherent in sample collection.

For water samples related to Pretreatment compliance monitoring, it is important that the magnitude and variability of contamination be reduced as much as possible. For metals analyses, for instance, a blank level greater than one-half the respective sample concentration initiates corrective action. This action may include decontamination of containers used for collection and storage of the samples and related equipment. Should contamination problems persist the section chief performs an unscheduled system audit of field performance audit. If necessary, the Section Chief works with the Kansas Health and Environmental Laboratory (KHEL) to identify any contributing sources of contamination. The scope and magnitude of any sample contamination problem, as well as all corrective action implemented to resolve the problem, are documented in the annual QA reports to the Division QA Director (see section 3.8, below).

At the discretion of the Section Chief, the Bureau Director, or the Bureau QA Director, blind reference samples, spiked with known concentrations of one or more parameters, may be submitted to KHEL and used as a general indicator of the overall accuracy of the data reported by the laboratory.

3.4.3 Safety Procedures

Safety procedures for handling field sampling and laboratory equipment must be followed carefully. Safety hazards include handling strong acids, strong bases, and toxic reagents. Materials to be sampled also present safety concerns, particularly sewage with its potential for infection.

3.5 External Procedures for assessing Data Precision, Accuracy, Representativeness and Comparability

3.5.1 Onsite Audits

Bureau of Water monitoring programs may, at the discretion of the Director of the Bureau of Water, be required to participate in periodic QA/QC audits conducted by an independent third party. Audit findings, and corrective actions implemented in response to such findings, shall be reported to the Bureau Director and Bureau QA Director and addressed in detail within the annual program evaluation.

3.5.2 Interlaboratory Sample Comparison Programs

Whenever possible, samples shall be split between the permittee or other entity and KDHE and the samples sent to the respective laboratories. Comparison between laboratory results shall be reviewed by the program manager or unit chief and passed on to the Section Chief for inclusion in the annual QA report. Consistent finding of disparities greater than 10% shall be cause for implementation of corrective action procedures.

3.6 Corrective Action Procedures

3.6.1 Sample Contamination

The discovery of sample contamination as outlined in section 3.4.2 will lead to corrective action procedures should the contamination exceed the MDL. Possible sources of contamination could include impure sample preservative, the wrong preservative, improper handling, or improper storage, the Section Chief or Program Manager will investigate and take the necessary steps for correction. The steps taken will be recorded for inclusion in the annual QA report.

3.6.2 Staff Performance Problems

Should a member of the project or field staff have difficulty with a given work procedure (e.g. as determined during an internal performance audit) an effort is made by the Section Chief to identify the scope and seriousness of the problem, identify any data affected by the problem, and recommend an appropriate course of corrective action. All effected data are either deleted from the file or flagged within the file, at the discretion of the Section Chief. Possible corrective actions include further in-house or external training for the employee, a reassignment of work duties, or modification of the work procedure.

3.7 Data Management

Completed sample analysis reports from KHEL are delivered by inside mail to the Chief of the Technical Services Section, then routed to the appropriate project staff or program manager for data reduction and validation. The data are checked for conspicuous oversights or dubious results. Should problems be noted in the data reports, corrective action procedures are initiated in accordance with section 3.6.

Each analysis report is electronically filed at the laboratory; hard copies are filed in the appropriate BOW file after they are reviewed by staff. Copies of pretreatment monitoring reports should be kept on file for a minimum of three years.

3.8 Quality Assurance Reporting Procedures

The Section Chief is responsible for informing the Bureau Director or Bureau QA Director of project QA/QC status and of any QA/QC needs within the wastewater pollution control program. They are also responsible for maintaining adequate communication with KHEL with regard to program QA/QC concerns.

In addition to these routine communication requirements, the Section Chief prepares an annual program QA/QC status report which is routed through the Bureau Director to the Division QA Director. This report contains the following types of information:

(a) status of QA project plan;

(b) description of data accuracy, precision, completeness, representativeness and comparability;

(c) discussion of significant QA/QC problems, corrective actions, progress, needs, plans and recommendations;

(d) results of internal and any external system or performance audits;

(e) summary of QA/QC-related training performed since the last QA/QC status report; and

(f) any other pertinent information specifically requested by the bureau director or the Division QA Director.

APPENDIX A

INVENTORY OF PROGRAM FIELD AND LABORATORY EQUIPMENT

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INVENTORY OF PROGRAM FIELD AND LABORATORY EQUIPMENT

I. INDUSTRIAL PRETREATMENT SAMPLES

A. Safety and Sampling Equipment

1. KDHE laboratory sample collection bottles for metals, nutrients, volatile organics (43 ml and 200 ml), bacteriological, organics and pesticides, inorganics cubetainers, dissolved oxygen bottles (Winkler method)

2. Cooler

3. Hard Hat

4. Safety Glasses

5. Gloves

6. Sample Dipper

B. TESTING EQUIPMENT

IPS Pretreatment Program staff do not utilize field testing equipment.

APPENDIX B

STANDARD OPERATING PROCEDURE

SAMPLE COLLECTION, PRESERVATION AND HANDLING

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I.	WASTEWATER SAMPLING		
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I. SAMPLING

A. Industrial Pretreatment Samples

When possible collect "end of process" samples following any treatment system rather than "end of pipe" samples. If it is necessary to collect process wastewater without the influence of domestic wastes and a well-defined "end of process" sampling point is not available, collect and composite samples from each of the process units such as phosphating rinse tanks, plating rinse tanks or other contributing sources in amounts proportional to the contribution of each source. Samples should be collected to represent the actual discharge.

In cases where it is impossible to collect "end of process" samples, samples shall be collected at "end of pipe". If federal limits are applicable, dilution waste streams must be accounted for using the Combined Waste Stream Formula (CWSF).

Samples shall be collected in the following manner:

1. Determine the processes which are regulated and must be sampled in the particular industry discharging to the Publicly Owned Treatment Works (POTW).

2. Determine the type of samples to be collected with which to determine compliance with local pretreatment ordinances, city-issued permit or with a KDHE pretreatment permit.

3. Collect the appropriate safety equipment, sample containers, and sample storage chest with ice. Put on the hard hat, safety goggles and appropriate gloves for personal protection before entering the area in which samples are to be collected.

4. For "end of process" samples, allow the wastewater being sampled to enter the mouth of the sample container or funnel. For instantaneous grab samples or "grab composite samples" dip the sample from the process vat with a clean plastic or stainless-steel container, depending on the pollutant to be analyzed, and pour into the funnel and into the sample container. Do not immerse the sample container itself. If containers receive any spillage, rinse thoroughly with clean water before placing the sample container in the ice chest for transport.

5. Sample containers and preservatives should conform to 40 CFR Part 136, Table II. In general samples for heavy metals and cyanide analysis should be in very clean plastic containers obtained from the KDHE laboratory which already have the appropriate preservative. Samples for COD and TSS may be collected in one-quart collapsible plastic containers, (cubitainers). Samples for pesticides, base neutrals and acid extractables should be collected in one-gallon brown glass jugs supplied by the KDHE laboratory. Organic compounds should not be collected with plastic containers or funnels.

6. Implement the chain-of-custody documentation.

APPENDIX C

STANDARD OPERATING PROCEDURE

MANAGEMENT AND REPORTING OF DATA

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I. DATA CUSTODY

The purpose of this standard operating procedure (SOP) is to establish uniform policies and procedures for maintaining an accurate written record of a sample from the time it is collected through its introduction as evidence into litigation proceedings and to ensure that a sample has not been tampered with or altered throughout the process.

A. The sample by definition is in custody if:

1. It is in actual physical possession of the sample collector.

2. It is in view of the sample collector after being in the collector's physical possession

3. It is locked up after being in the sample collector's physical possession.

4. It is placed in a designated secure area.

B. FIELD PROCEDURES

1. Chain -of- Custody procedures will be followed for all tests deemed to be of importance for compliance with Statutes and regulations and for those which could become evidence in litigation. Samples for plant process control, field screening analyses, or other samples collected for a technical or information purposes will not need to follow chain of custody procedures. In general, those samples submitted to the KDHE laboratory <u>will</u> be subject to chain of custody procedures.

2. In order to insure adequate control and documentation of collected samples, the number of personnel handling the samples should be minimized.

3. A unique number shall be assigned to each sample for identification purposes. If a sample consists of several bottles for analysis of different parameters from the same sample, the same sample number is used for each portion of the original sample.

4. If the samples are to be shipped to other laboratories for analysis a sample label is attached to each sample container at the time of collection.

5. Record all field measurements and other pertinent data on the field sheet.

6. Custody of the sample is initiated at the time of sample collection by insuring that the sample is in the sample collector's physical possession or view at all times, or is stored in a locked place where there could be no reasonable possibility of tampering. The sample collector is responsible for the collected samples until they are received by the laboratory or have been appropriately shipped to the lab. The chain of custody record is initiated at the time of sample collection and a copy accompanies the samples. The chain of custody record is at the bottom of the KDHE laboratory sheet. Signatures and dates on the sample custody sheet shall be signed in indelible ink. The sample shall make sure the name, date, time, exact location, sample identifiers and parameters for analysis are listed before signing off. The person assuming custody shall sign and date the custody section of the sheet in the sample collector's presence. An exception is samples delivered after hours; these must be placed in the designated sample storage area of the KDHE laboratory by the individual having custody.

II. DATA MANAGEMENT

Data received from the laboratory shall be forwarded to the Technical Support Unit Leader within the Bureau of Water's Administrative Section, or a designated project manager. The data will be examined, and any unusually high values or values considered to be unreasonable will be noted and brought to the attention of the laboratory and the appropriate section or unit chief. High values for a given contaminant or parameter may indicate a real problem, but occasionally occur as a result of a decimal error, a missed dilution at a permittee laboratory, sample collection at the wrong location or other error. Such errors should be corroborated and noted and initialed on the data reporting sheet prior to passing the information along or filing.

Significant figures must be checked to ascertain that no unusual degree of accuracy is implied by the result. For instance, BOD values expressed to thousandth of a milligram per liter. Report results shall be checked for comparison with the degree of accuracy expressed as the permit limits.

The laboratory results shall then be forwarded to the appropriate section or project manager. The copy distribution list shall be reviewed to make sure the information is distributed to all who need it. A copy is routed to the appropriate file and/or electronic data base.

The IPS Pretreatment staff does not utilize ancillary data obtained from third parties.

Semi-annual/Annual reports are provided to EPA as a condition of the federal program grants received to administer the NPDES program.

APPENDIX D

STANDARD OPERATING PROCEDURE

EVALUATION OF DATA QUALITY

APPENDIX D
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QUALITY CONTROL AND STATISTICAL EVALUATION OF DATA

Accuracy is a measure of how closely the analytical result or the average of a set of analytical tests approaches the true value of a parameter. Two types of error affect accuracy: systematic error and random error. An example of systematic error would be inaccuracy in a piece of laboratory equipment, for example a laboratory balance that consistently under-weighs. Random error is error from a variety of sources which cannot be totally controlled. Errors in the use of pipettes, graduated cylinders, or other laboratory equipment are examples. Random error is controlled by averaging a series of replicate analyses of a sample.

Precision measures how closely a series of replicate measurements approaches the average. It is a measure of how well results can be reproduced. A laboratory may have a high degree of precision on a given test but be inaccurate. It is necessary to control both precision and accuracy to achieve a consistency of data quality.

A number of methods are available for evaluating both accuracy and precision. However, these measures do not account for errors in sampling and handling that occur prior to laboratory analysis.

A. Wastewater Laboratories

Wastewater laboratories and commercial laboratories providing effluent quality data to the Bureau for compliance purposes shall be certified by the Kansas Department of Health and Environment and shall follow the Laboratory Certification Section guidelines for data evaluation and quality.

B. Contract laboratories analyzing samples for a Bureau project must conform to the following general guidelines for data quality and evaluation:

1. At least 10% of a given number of samples should be for quality control purposes. At least one blank, one spike sample and one set of duplicates shall be analyzed with each sample set.

2. For accuracy determinations spiked samples shall be used. The use of spikes is preferable to the use of analysis of known standards as the spikes more nearly approach the true range of values encountered in analyzing the samples. The procedure involves the addition of a known quantity of standard to a known volume of unknown sample. Replicate analyses of both the known and the unknown sample are run and the results are compared to generate a percent recovery. Ideally, the result should be 100% but results between 90% and 110% are acceptable. The procedure for calculating percent recovery is as follows:

a. Determine the unknown sample concentration by averaging the results of replicate analyses.

b. Calculate the theoretical concentration of the spiked sample. (See Wastewater Sampling for Process and Quality Control, Water Environment Federation, 1979, p64.

c. Determine the spiked sample concentration by averaging the results of the duplicate analyses.

d. Divide the spiked sample concentration by the theoretical concentration. Multiply the result by 100. The result is the percent recovery.

3. For measurement of precision it is necessary to measure a series of replicate samples. The degree of precision required shall be determined at the outset of the project and incorporated onto the project QA/QC Plan. The determination of precision shall be through the use of average deviation, variance and standard deviation.

C. Pretreatment Samples

Cities who have developed pretreatment programs and perform laboratory analyses on industrial discharges will be encouraged to have an approved QA/QC plan and data quality control procedures. These procedures shall be reviewed by qualified KDHE Laboratory staff.

Many industries are located in small towns and discharge to the local wastewater collection systems. These entities are therefore not in a locally managed pretreatment program and have KDHE issued pretreatment permits. The following data control procedures apply in these cases:

1. Whenever possible these industries will be targeted for split samples. One portion of the sample will go to the industry's commercial laboratory and one portion will go to the KDHE laboratory for comparison.

2. Sample values in any parameter differing by more than 10% will be cause for concern. Consistent failure by any one commercial laboratory will be cause for an extensive evaluation of the commercial laboratory quality control procedures.

APPENDIX E

BIBLIOGRAPHY

REFERENCES

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