POLK COUNTY AIR QUALITY DIVISION

QUALITY MANAGEMENT PLAN
(QMP)

Revision 11

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POLK COUNTY DEPARTMENT OF PUBLIC WORKS
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DISTRIBUTION LIST

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1 QMP Requirements

A Quality Management Plan (QMP) needs to be in place for the Polk County Public Works Ambient Air Program to document all management practices, including Quality Assurance/ Quality Control (QA/QC) activities, to ensure that the results of all technical work associated with the ambient air program are of the type and quality needed for their intended use.

This QMP reflects Polk County Public Works Ambient Air Program's commitment to a Quality System. This document is in place to address the organizations management practices so that it is understood by all stakeholders the role and mission of this organization in providing a quality ambient air monitoring program. This QMP also addresses the coordination with other agencies that is required in providing a quality monitoring system.

2 Management and Organization

2.1 Organizations Policy on QA Activities

An important part of this QMP document is to define the QA/QC activities located under the Quality Assurance Project Plan (QAPP) and Standard Operating Procedures (SOP) of the Polk County Air Quality Division (PCAQD). The QA/QC activities ensure the validity of all data that is produced from the ambient air monitoring network.

The PCAQD monitors the ambient air in Polk County for criteria and non-criteria pollutants in conjunction with the Iowa Department of Natural Resources (IDNR) in their efforts to fulfill the State Implementation Plan (SIP) requirements of the Region VII Environmental Protection Agency (EPA). The Polk County Ambient Air Monitoring Program is in place to ensure that the regulatory permitting policies that are currently in force are sufficient in maintaining the air quality standards set by the EPA and in protecting and informing the public of the health effects associated with these pollutants.

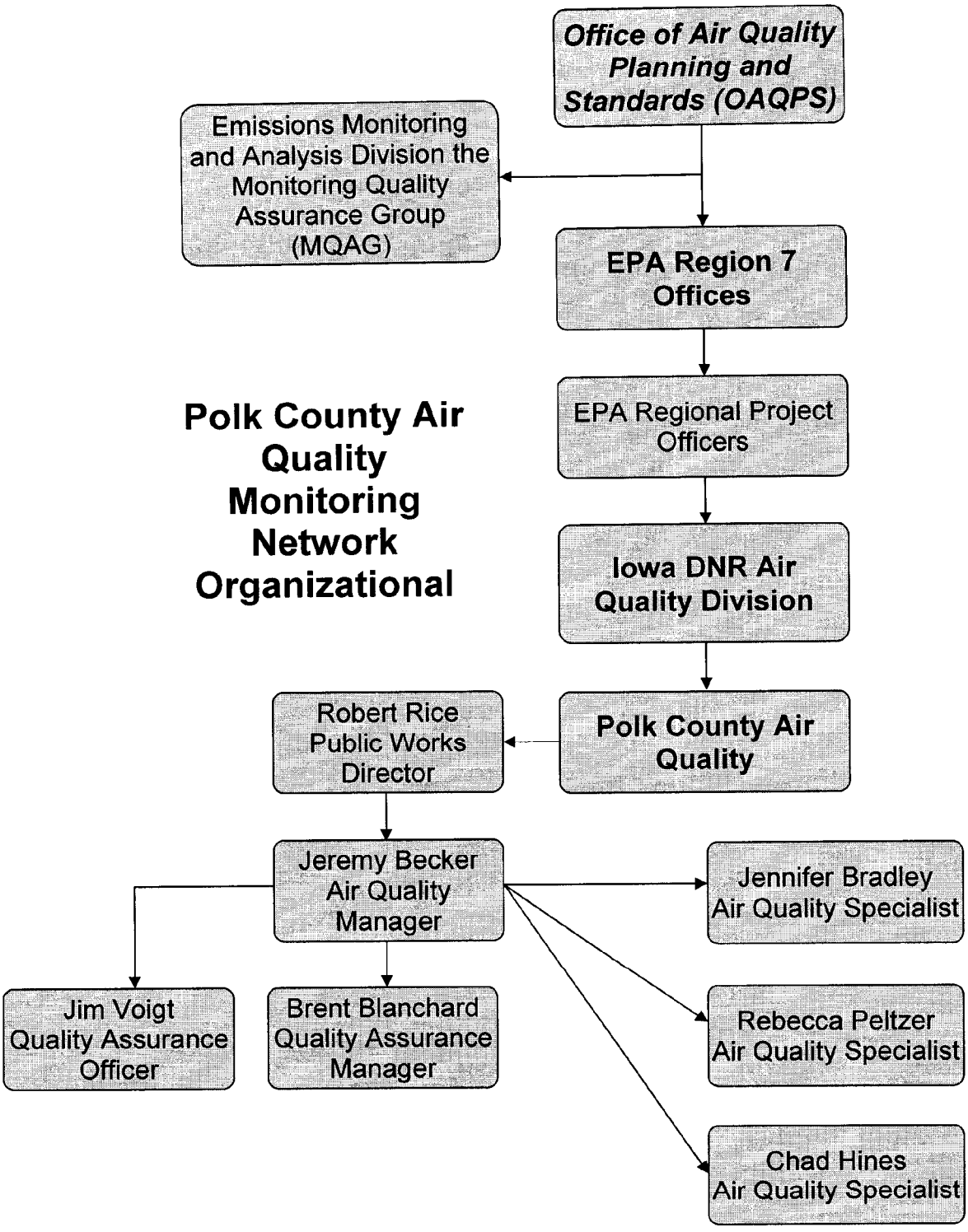
The results from the monitoring data are used in the regulatory policy and decision-making procedures. Data is used to determine compliance or progress towards meeting the ambient air quality standards, and to observe pollution trends throughout the state. Data is also used to activate emergency control procedures that will prevent air pollution episodes, as well as develop long term control strategies. If the data used is not of sufficient quality, the health and well being of the residents of Polk County are at risk. The QA/QC activities are in place to ensure that the data retrieved is of the highest quality and that the monitoring objectives of each site are satisfied. The details of this QMP plan apply to all monitoring activities conducted by the PCAQD.

All resources allocated to this program must be utilized to provide for a Quality System. The resources shall be used by personnel to provide adequate monitoring coverage to fulfill all the requirements of the agency QAPP and SOP. Resources must also be utilized for purchasing of

all needed instrumentation, and data transfer and management tools to provide adequate resources to accomplish the goals of the Quality System. Another important factor of any Quality System is the training of the current personnel to keep them up to date of all new advances in the monitoring field. This is provided through EPA sponsored training session as well as training from equipment manufacturers and tools from the Air Pollution Training Institute (APTI). Funding sources must also be used to provide audit materials and resources to the agency for evaluating the Quality System from a source outside of the agency.

Funding is provided annually through the IDNR Air Quality Bureau by contractual agreement. Funding needs are sent to the IDNR prior to contractual proceedings. It is up to the Polk County Air Quality Division's Air Quality Manager (AQM) to provide adequate details to assist in the funding determination. If during the course of the contract period the funding needs are deemed to be inadequate to maintain a Quality System, Polk County shall contact the IDNR to discuss possible solutions to the funding problem. It is Polk County's responsibility to balance the funding in such a way as to provide the requirements noted above for a Quality System.

Polk County Air Quality Monitoring Network Organizational



2.2 Discussion of Authorities

Federal, state and local agencies all have important roles in developing and implementing satisfactory Quality System Program. The EPA is responsible for developing National Ambient Air Quality Standards (NAAQS), defining the quality of data needed to make a comparison to the NAAQS and identifying a set of QA/QC standards to judge the data quality. The state and local organizations are responsible for taking this information and developing and implementing a Quality System that meets all of the data quality requirements. It is then the responsibility of the EPA and state/local organizations to assess the quality of the data and to take corrective action when necessary.

OAQPS- the Office of Air Quality Planning and Standards (OAQPS) is the organization charged under the authority of the Clean Air Act (CAA) to protect and enhance the quality of the nations' air resources. OAQPS sets standards for pollutants considered harmful to the public health or welfare. The EPA's regional offices, in cooperation with state and local programs, enforce compliance of the standards through state implementation plans (SIP's) and regulations controlling emissions from stationary sources. The agency then evaluates the need to regulate potential air pollutants and develops national standards. OAQPS works with state and local agencies to develop plans for meeting these standards, monitors national air quality trends and maintains a database of information on air pollution and controls. Within the OAQPS Emissions Monitoring and Analysis Division, the Monitoring and Quality Assurance Group (MQAG) is responsible for the oversight of the ambient air quality monitoring network. The MQAG ensures that the methods and procedures used in making air pollution measurements are adequate to meet the program objectives and that the resulting data is of satisfactory quality. They also evaluate the performance of organizations making air pollution measurements, implement quality assurance programs over the EPA's air quality monitoring network and operate the national performance audit program (NPAP).

EPA Regional Offices- the regional offices have been developed to address environmental issues related to the states within their jurisdiction and to administer and oversee regulatory mandated programs. The main QA responsibilities of the EPA regional offices regarding the air quality program are the coordination of QA matters between the EPA and the state and local agencies. The regional office also evaluates the capabilities of the state and local agencies to measure criteria pollutants. This is done through network reviews and systems audits that are addressed in the Code of Federal Regulations (CFR).

Iowa DNR Air Quality Bureau- 40 CFR Part 58 defines the state agency as the air pollution control agency primarily responsible for the development and implementation of the SIP under CAA.

Polk County Public Works Air Quality Division (PCAQD)- 40 CFR Part 58 defines the local agency as any local government agency other than the state agency which is charged with the responsibility for carrying out a portion of the SIP.

The PCAQD monitors ambient air under the written contract with the IDNR Air Quality Bureau.

This contract lays out the required monitoring activities needed to fulfill the requirements that the IDNR has with the Region VII EPA Air Monitoring and Compliance Division. These requirements include all monitoring, reporting and QA/QC activities carried out by the PCAQD in all phases of the data collection process.

Air Quality Manager (AQM) - this position is in place to evaluate the Quality System of the ambient air monitoring program. The AQM assesses the fulfillment of all requirements located in the agency QMP, QAPP and SOP documents. The AQM is not involved in the data collection or generating groups. The AQM has the independent discretion to evaluate the Quality System without any influence from the data groups in the system.

The AQM shall be provided the needed assessment tools/documents and training opportunities to fulfill the needs of this position. The AQM provides regular required reports indicated in the QAPP to the Polk County Public Works Director to provide information as to the acceptability of the Quality System. The Polk County Public Works Director will then provide support to the AQM to correct the problems noted in the QA report. If the AQM does not feel the Polk County Public Works Director has provided the needed support the AQM shall contact the IDNR Air Quality Bureau for guidance and support to complete the needs of the system.

It is the responsibility of the AQM to make sure that all personnel involved in all aspects of the monitoring has sufficient knowledge and training to perform all areas involved with the monitoring project. Some of the items to be considered are educational levels of the personnel and the degree of experience the personnel has with the required duties to be carried out. This is a very important part in the reporting of high quality and accurate data. Personnel performance shall be reviewed on a yearly time frame in evaluating their performance.

Quality Assurance Manager (QAM) - The Air Quality Manager shall appoint an individual to serve as QAM. This individual must have organizational independence from groups generating, compiling and evaluating environmental data, and have access to the AQM in order to plan, assess, and improve Polk County's Quality Management System. The QAM reports directly to the AQM on quality assurance issues. The appointed designee shall be indicated within the QMP.

The QAM will review all monthly, quarterly, and annual reports prepared by the Air Quality Monitoring Specialists. The QAM reviews and approves all corrective actions in the monitoring program. The QAM works in conjunction with the AQM on all budgetary and contractual items. The QAM shall be provided with the needed assessment tools/documents and training opportunities to fulfill the needs of this position. The QAM provides regular required reports indicated in the QAPP to the AQM to provide information as to the acceptability of the Quality System. The AQM will provide support to the QAM to correct problems addressed in the QA report.

Quality Assurance Officer (QAO) – The QAO assists the QAM. The QAO performs regular system audits of the ambient air monitoring network. These activities include audit calibrations required by the 40 CFR 58 Appendix A, and all auditing of record books associated with each site.

The QAO shall be provided with the needed assessment tools/documents and training opportunities to fulfill the needs of this position. The AQM will provide support to the QAO to correct problems addressed in the QA report.

Air Quality Monitoring Specialist (AQMS)- is responsible for all monitoring equipment/instrumentation calibrations, QC, repairs, data retrieval, data transfer to the Aerometric Information Retrieval System (AIRS) and AIRNow Systems, all data storage and most required monitoring activity reports included in the IDNR contract. The AQMS is also responsible for all site selections activities and setup, monitor selection, all purchases and inventory activities. The AQMS visits each monitoring site at a minimum of once every 14 days to inspect the monitoring activities, perform all required QC and to retrieve data.

2.3 Technical Programs

The technical program that is supported under this QMP is the PCAQD Ambient Air Monitoring Program which monitors the ambient air for determination of compliance with the NAAQS.

Coordination and oversight of all groups involved in the QA/QC activities must occur in an efficient manner for a Quality System to function properly. All activities that include the QA/QC items indicated in the QAPP and SOPs, shall be coordinated with the QAM. All other items, such as site problems, instrument and parts procurement, data assessment or training items shall be coordinated with the AQM.

The activities that require quality management controls include:

Selection of Methods- Reference methods and SOPs have been written for each criteria pollutant monitor in use in the network.

Quality System Training- Training shall be provided to all individuals involved in the data collection, Quality System management procedures. A list of training given or required is listed in the QAPP and SOP manual. Monitoring personal are provided with an annual training plan detailing appropriate courses to attend, including training opportunities at local, state and federal levels.

Guidance Documents- This QMP as well as other EPA reference documents have been developed for the Ambient Air Monitoring Program and are available in the laboratory document area of the Polk County Air Quality Division or in electronic format in the air monitoring directory on the Polk County Public Works network.

Procurement of Items- Procurement of items for the contract period are determined on an annual basis during negotiations with the IDNR Air Quality Bureau. Items or services will be purchased to fulfill the requirements of the IDNR in implementing the SIP. A list of needed items is sent to IDNR from the AQMS annually. The approved items and services are then included in the contract.

QC Checks- these are conducted by the AQMS and are described in the CFR as well as in each monitoring method SOP. These checks can be used to provide overall assessment of measurement uncertainty. These checks also provide an internal quality control check of proper operation of the measurement system, and are specified in the SOP.

Internal Audits- these are performance audits used to provide an independent assessment on the measurement operations of each instrument by comparing performance samples of a known concentration.

EPA/State External Audits- This audit is conducted by EPA regional personnel and is intended as a management systems review to assess the Quality System.

National Performance Audit Program (NPAP)- the goal of the NPAP is to provide audit material for blind assessment of the proficiency of agencies that are operating in the State and Local Air Monitoring Stations/ National Air Monitoring Stations (SLAMS/NAMS) and Prevention of Significant Deterioration (PSD) networks.

Annual Certifications- Certification is the process which ensures the traceability of various QC standards.

Precision and Accuracy Reports- These reports are generated quarterly and annually and evaluate the precision and accuracy data against acceptable criteria.

Network Reviews- The annual network review, conducted by the AQMS and reviewed by the QAM, is used to determine how well the air monitoring network is achieving its required air monitoring objective indicated in the QAPP and how it should be modified to continue to meet its objective.

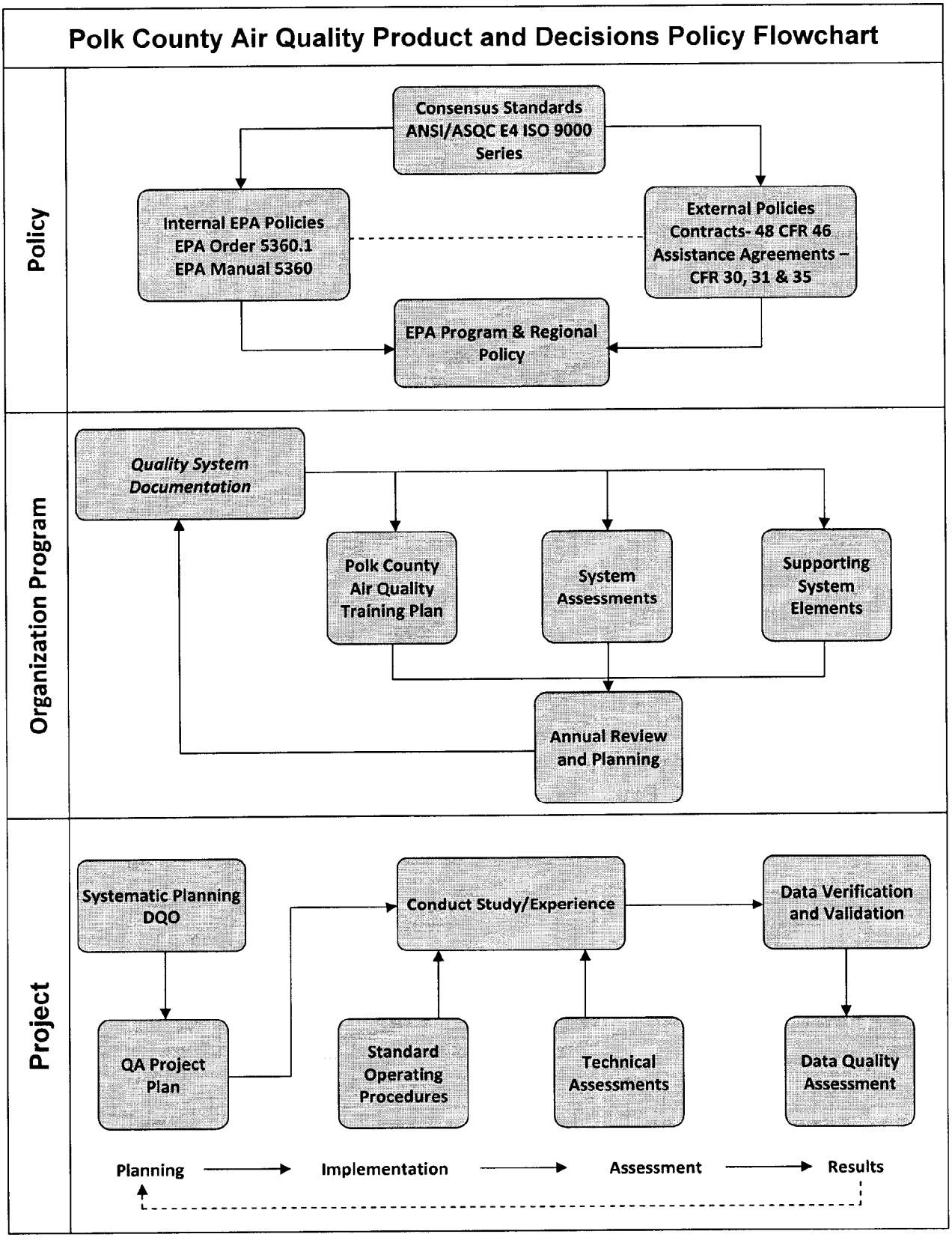
All information pertaining to all technical activities included in a Quality System shall be made available for the affected parties. The management shall provide all reference documents, audit reports, corrective action requirements, training items and annual review reports to all groups involved in the Quality System.

All parties involved in the Ambient Air Monitoring Program are required to review all documents associated with the Quality System. After each revision the affected parties shall be notified by the management of the document changes and will be instructed to review said document. The QAM will provide documentation of review for all reviewed documents. Documents are located in the laboratory document storage area while all reports and corrective actions are sent via electronic format or given to the groups in a paper format. Keeping all groups informed as to the condition of a Quality System, creates a productive monitoring network. All communication shall be held in storage for the same period as any other Quality System documents or data.

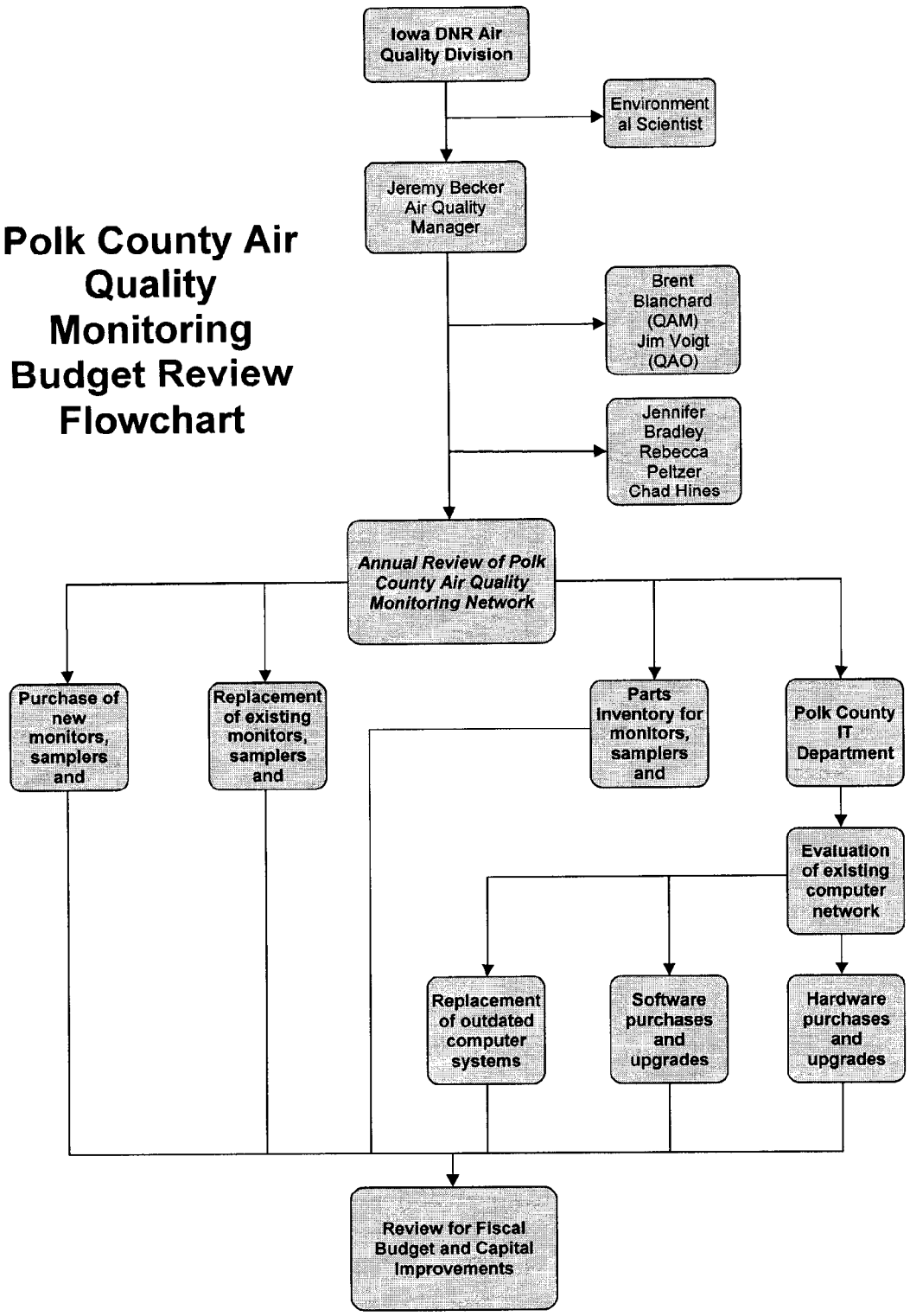
2.4 Dispute Resolution

It is the policy of the PCAQD that all disputes regarding any portion of the Quality System shall be filed in a corrective action file for reference during the annual network review.

The dispute shall be provided to the AQM for assessment of the dispute. The AQM shall contact all involved parties including the IDNR Air Quality Bureau as part of this assessment. If a deficiency or problem is noted during the assessment of the Quality System a corrective action plan shall be implemented along with a time frame to satisfy all involved parties. A follow-up assessment of the corrective action shall be completed during the next Quality Systems review.


Polk County Air Quality Product and Decisions Policy Flowchart
Policy
Consensus Standards ANSI/ASQC E4 ISO 9000 Series
Internal EPA Policies EPA Order 5360.1 EPA Manual 5360
External Policies Contracts- 48 CFR 46 Assistance Agreements – CFR 30, 31 & 35
EPA Program & Regional Policy
Organization Program
Quality System Documentation
Polk County Air Quality Training Plan
System Assessments
Supporting System Elements
Annual Review and Planning
Project
Systematic Planning DQO
Conduct Study/Experience
Data Verification and Validation
QA Project Plan
Standard Operating Procedures
Technical Assessments
Data Quality Assessment
Planning
Implementation
Assessment
Results

Polk County Air Quality Monitoring Budget Review Flowchart



3 Quality System Components

It is the policy of the PCAQD to maintain a Quality Assurance Program relative to the collection and reporting of all air monitoring data such that the goals of the network are met. The data collected must be complete, precise, and accurate with respect to the analytical method, representative of the spatial scale intended to be monitored, and comparable to data being generated in other states. A QAPP is included in the Ambient Air Monitoring Manual and details all aspects of the PCAQD's Quality Assurance Policy.

The Quality Assurance System effectively describes management policies, organizational authorities, responsibilities, accountability and implementation for all persons that are part of the Quality System. The system applies to planning, assessment and implementation and ensures quality in all work processes, products or services of the organization. This section will describe the Quality Assurance applications that ensure effective QA/QC activities for the environmental data operations as required by the EPA recommended guidelines for Air Quality.

3.1 Polk County's Quality System

The PCAQD shall develop and implement an EPA Quality System to assure the quality of its air monitoring activities. The Quality System developed by Polk County Air Quality shall be completely autonomous from that of IDNR. The PCAQD has the responsibility for developing procedures and oversight sufficient to demonstrate that the environmental data generated meets the requirements of EPA and IDNR. Polk County's Quality System shall include:

Development and implementation of a Quality Management Plan (QMP) which must meet all applicable requirements as outlined in EPA *Requirements for Quality Management Plans, March 2001* (EPA QA/R-2).

Development and implementation of Quality Assurance Project Plans (QAPPs) which must meet all applicable requirements as outlined in EPA *Requirements for Quality Assurance Project Plans, March 2001* (EPA QA/R-5).

Development and implementation of Standard Operating Procedures (SOPs) which must meet all applicable requirements as outlined in EPA *Guidance for the Preparation of Standard Operating Procedures, March 2001* (EPA QA/G-6).

The QAPP/SOP shall be modified as necessary to remain current with EPA requirements outlined in 40 CFR Part 58, the current edition of EPA's Quality Assurance Handbook for Air Pollution Measurement Systems ("the Redbook"), and applicable EPA guidance. Polk County Air Quality shall designate members of its Air Monitoring Staff as QAPP/SOP reviewers. A complete set of QMP/QAPP/SOPs for all air monitoring activities shall be submitted to IDNR and EPA in hardcopy and in PDF format as a component of the annual review of air monitoring activities.

3.2 Tools for Implementing the Quality System

3.2.1 Quality Management Plan

The QMP is a policy requirement of the EPA for all organizational agencies and their QA programs. This document describes the organizational structure for Polk County's Air Monitoring Network, responsibilities of management and staff, lines of authority and required processes for planning, implementing and assessing all activities. The hardcopy will be filed with OAQPS Document Control Manager. The approval of this document is good for a five-year interval pending changes to the organizations Quality Systems during the interim.

The QMP shall be revised as needed to clarify roles and responsibilities, correct problems and institutionalize improvements. Revisions to the QMP shall be initiated by Polk County's AQM. Conditions requiring revisions of an approved QMP:

- Expiration of document;
- Changes or clarifications in mission, responsibilities, standards, processes or procedures;
- Re-organization of existing functions that affect programs covered by the Quality Management System; and
- Assessment findings requiring corrective actions and response.

The organization's QAM shall approve revisions to an approved QMP.

3.2.2 Quality Assurance Project Plan

QAPP is a formal document describing the necessary QA/QC and other technical activities that must be implemented to ensure the results obtained from data collection or analysis activities are of the type, quantity and quality needed and expected. Any environmental data collection effort conducted by or for the PCAQD, to include acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computer models, data bases and information systems shall be conducted in accordance with an approved QAPP.

AQMSs are responsible for developing the QAPP. *Guidance on Quality Assurance Project Plans* (EPA QA/G-5) will serve as a reference for AQMSs in the development of QAPPs. QAPPs must be supportive of DQOs, as specified in section 3.2.4. Once drafted, the QAPP will be reviewed by technical experts for the area in which it was developed.

The QAM will review and approve the QAPP, as well as any revisions to it. This certification attests that the QAPP contains the required elements as prescribed by EPA QA/R-5 and that the QA/QC provisions are commensurate with:

- the purpose of the environmental data operation (e.g., enforcement, research and development, rulemaking),
- the type of work to be done (e.g., pollutant monitoring, site characterization, risk characterization), and
- the intended use of the results (e.g., compliance determinations, selection of remedial technology and/or approach, development of environmental regulation, impairment status determination).

Following review, the draft QAPP shall be submitted to the QAM for approval.

The QAPP shall be reviewed on an annual basis. However, the QAPP shall be valid until the conclusion of the data collection or analysis effort for which they were developed, or for five years, whichever is less. Prior to expiration, the QAPP must be re-approved by appropriate management if still required.

3.2.3 Standard Operating Procedures

Standard Operating Procedures (SOPs) document routine or repetitive administrative and technical activities to facilitate consistency in the quality and integrity of the product or end-result. SOPs will be developed and implemented for all routine procedures related to: monitoring and measurement; sample collection, handling, and preservation; data analysis; and inspection and maintenance of equipment. The appropriate SOPs are either included or referenced in each QAPP.

SOPs should contain the main elements from the EPA *Guidance for the Preparation of Standard Operating Procedures, March 2001* (EPA QA/G-6):

- Scope and applicability;
- Procedures to use;
- QC activities; and
- References.

SOPs are prepared by the appropriate staff member, and are peer reviewed. The SOP should be validated by one or more individuals with appropriate training and experience in the process. The QAM will review and approve all SOPs and revisions to SOPs. The AQM has the authority to approve SOPs for the PCAQD. The PCAQD shall not initiate data collection without an appropriate approved SOP.

SOPs need to remain current, and as such will be reviewed on an annual basis. Whenever procedures are changed, SOPs should be updated and re-approved. This review shall be conducted by the AQMS utilizing such SOPs.

SOPs shall not be valid for a period of more than five years unless re-approved by appropriate management.

3.2.4 Data Quality Objectives (DQO)

DQOs are qualitative and quantitative statements that clarify technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions. Intended use of the data will be defined before the data collection effort begins. DQOs will be identified before any new data collection efforts are initiated. The QAM have the responsibility for developing DQOs, with assistance from AQM. PCAQD shall use EPA *Guidance for the Data Quality Objective Process, August 2000* (EPA QA/G-4) as guidance for developing DQOs. This helps ensure that the level of detail in planning is commensurate with the importance and intended use of the work and the available resources.

3.2.5 Data Quality Assessments (DQS)

The quality of all data must be assessed after it is generated and before it is used in order to ensure that it is satisfying the intended data user's needs and QA requirements. The level of effort for the DQA will be commensurate with project objectives and intended use of the data. This assessment will be conducted by the AQMS who have the expertise to conduct these statistical analyses. This assessment should focus on five basic data quality indicators:

- Accuracy - Can the data's accuracy be determined, how was it determined, and is it acceptable for the planned use?
- Precision - Can the data's precision be determined, how was it determined, and is it acceptable for the planned use?
- Completeness - Is a sufficient amount of data available for the planned use?
- Representativeness - Generally, how well does the data represent actual conditions at the sampling location, considering the original study design, sampling methods, analytical methods, etc., which were used?
- Comparability - Generally, how comparable is the group of data with respect to several factors, including: consistency of reporting units; standardized siting, sampling, and methods of analysis; and standardized data format relative to applicable criteria and standards.

All of these factors will initially be considered when designing a study, and will be addressed in all QAPPs. Where applicable the EPA *Guidance for Data Quality Assessment* (EPA QA/G-9) can be used in evaluating the data to determine if the data is of the right type, quality, and quantity to support the intended use.

The results of the DQA will be documented and provided to the QAM. The QAM will then be responsible for reviewing the results, determining if and what corrective actions are needed, and for confirming implementation and effectiveness of corrective actions.

3.3 Revision of Quality Assurance Documents

Substantive revision of the PCAQD's QAPP and SOPs require approval of the Polk County AQM and Public Works Director. The QAM will review and approve the initial QAPP, and all QAPP revisions. The QAM will also review the initial SOP, and any SOP revisions. QAPP and SOP revisions shall be submitted to the IDNR following:

Promulgation of new monitoring rules or procedures by EPA;

Written notification of a deficiency in procedures by EPA/IDNR; or

Receipt of new equipment for which no QAPP/SOP exists.

Upon receipt of EPA or IDNR QAPP or SOP comments, the PCAQD shall review and, upon concurrence, incorporate the recommended changes into the QAPP and SOPs. The PCAQD shall not initiate data collection without an associated approved QAPP and SOP.

4 Personnel Qualifications and Training

4.1 Training Policy

Ambient monitoring personnel shall maintain familiarity with applicable monitoring procedures, techniques, and technologies by routinely attending pertinent EPA, IDNR, or other public or private training classes. Attendance at the National Association of Clean Air Agencies (NACAA) conference is encouraged. Polk County Air Quality Division's AQM shall submit to IDNR a training plan for all ambient monitoring staff. The training plan shall be submitted on an annual basis for IDNR review and recommendation. Individual training plans for ambient monitoring staff will be developed based on the employee's background, previous training and experience.

4.2 Training Program Specifications

New employees receive a thorough indoctrination into the QA/QC policies and procedures of ambient air quality monitoring. The QMP, QAPP, and all associated SOPs are required reading for all new employees. All employees participating in ambient air quality monitoring activities are involved in review and revision of these documents annually. All new employees participate in orientation seminars offered by the Polk County Human Resource Department. New supervisory staff is also expected to complete introductory management courses offered by the Polk County Human Resource Department.

All personnel involved in any function related to ambient monitoring data quality must have sufficient training in their duties to report data of high quality. Such duties include sample collection, equipment and instrument operation, audits, data processing and oversight. A new employee will job shadow a current employee on a regular basis to get a feel for the process of the Quality System.

The PCAQD maintains a library of educational materials and has access to a satellite television receiver system which may be utilized for training and/or continuing educational purposes. Workshops, symposia, or continuing education courses offered by firms, colleges, or various government agencies are available to staff. In order for an employee to participate, the subject matter must be applicable to a program or project, funding must be available, and supervisory and administrative approval must be secured in advance.

Annually, each employee is given a performance evaluation. The AQM will evaluate the goals accomplished from the previous evaluation to determine if these goals have been met. The evaluation will also look at all of the required proficiency results and audits conducted on the system that the employee is in charge of. If this review indicates any deficiencies, the employee and supervisor will look at training opportunities available to help with the skill deficiency.

Since the ambient air monitoring program is a rapidly changing area, the PCAQD realizes that on-going training is required after initial training to keep up with the new technologies. Whenever a program function has changed to a great extent, the PCAQD will actively pursue training opportunities to ensure that all participants have the sufficient knowledge and skills to perform the changed or updated function.

5 Procurement of Items and Services

The PCAQD shall have procedures in place for the procurement and tracking of items and services associated with the ambient air-monitoring program.

5.1 Approval Process

The PCAQD shall purchase all needed supplies and services necessary to fulfill the requirements included in the monitoring contract with the IDNR Air Quality Bureau.

The AQM is in charge of approving purchases of all items required for the Quality System. Prior to the contract period, a list of estimated instrumentation, services, parts or subcontracted laboratory services and equipment leases are given to the IDNR to help the contractual process. This list is based on conversations with the IDNR as to the monitoring requirements that will be included in the coming year contract. After approval of the budget process, the AQM shall delegate the authority to purchase said items listed in the contract.

Since not all supplies or items can be anticipated due to unexpected failures in the monitoring system or needed changes to the network, the QAM shall contact the IDNR if items not listed in the contract need to be purchased. At that time it will be determined if the IDNR will purchase said items, if the PCAQD will purchase the items, or if a line item in the contract will be diverted to the new item for purchase. A revision or letter stating such needs shall be addressed to the contractual party.

Since a monitoring network functions efficiently if the majority of the instrumentation is of the same type, a priority will be to purchase instrumentation currently in the monitoring network.

However, if a problem becomes known pertaining to a supplier of said item, the AQMS shall look at all vendors for the supply item.

At time of the initial procurement process, the selected vendors are contacted for a specification list to be sent for review. The AQM shall review all specifications to see if the item fulfills the requirements in the QAPP and if the item is allowed for use according to the USEPA specifications noted in the CFR. All instrumentation must be equivalent or reference methods to be part of the PCAQD Ambient Air Monitoring Network. The exception shall be Special Purpose monitors (SPMs), which are used for special studies conducted in the monitoring network.

Any contracting of laboratory services shall be conducted with a laboratory recognized by the EPA. A QAPP will be requested from the laboratory for review prior to determination of acceptability. All contracted laboratory services shall only be paid after the completion of the service. If the service is no longer needed for any reason during the contract period the fee for service will terminate at that time.

After information is obtained from the vendors or laboratory, the AQMS will request for pricing of item or service. A review of the quote is then conducted to determine if the budget allowed in the IDNR contract is sufficient to cover said item. Verbal contact with the supplier of service or item shall be conducted prior to any decisions. This contact will be to clarify any questions or items on the specification information provided and to get an indication of the time line for completing the purchase if the vendor is selected. All items received from the vendors shall be filed for a period of three years from time of process. A return policy must be stated on the quotation as well as the period that the quote is good for. Vendors must allow the return of goods found insufficient after inspection of received items or the policy is not to purchase from said vendor.

Suppliers are evaluated according to several main criteria. One is the availability of the type and quantity of needed instruments, services, and consumables to prevent down time of the Quality System. Another is the receiving time for supplies, depending on the supplier's vendor access and shipping distance. The warranty provided for the item is a critical part, as maintenance costs must be considered prior to purchase. The final criteria is price. Pricing does not dictate the supplier, but if a supplier can provide the required quality for a lower price, and the above guidelines are met, the policy of the PCAQD is to purchase from this supplier.

After a vendor has been selected the laboratory shall request a purchase order (PO) from the accounting department stating the item, part number, quantity, and price per unit. The budget item that the funds will be provided from must be indicated. The purchase order is then created by the accounting department and given to the AQM for final approval. Once the final approved PO is sent to the AQMS, a purchase of item is completed by either faxing of the PO or mailing to the supplier.

The PCAQD shall submit a monthly report to the IDNR which itemizes monitoring equipment purchases. This report shall include: a description of the equipment, the quantity purchased; the

cost per unit and total cost, the dates the items were ordered and received; and a running total of all expended equipment funds during the Contract period.

The PCAQD shall maintain a complete and current list of all equipment in its air monitoring network purchased in full or in part with state or federal funding, including the location, description of equipment type, model number, serial number, ownership agency, and both DNR and the Polk County's inventory tag number. The PCAQD shall record in the equipment inventory the installation date for equipment newly installed in the air monitoring system. Equipment purchased by the IDNR for use by the PCAQD shall be included on its equipment inventory. The PCAQD shall supply the IDNR a copy of the up to date equipment inventory within seven (7) days of a request by the Department.

5.2 Ensuring Procured Items are of Acceptable Quality

Evaluation of new equipment is conducted at time of receipt. The return policy is noted on the order and quote acknowledgement received with the item. It is important to ensure that an instrument is in good working order before the time period of the return policy has expired. For instrumentation, a packing list is reviewed and compared to the purchased order to assure that all items have been received. The AQMS shall sign the packing list and send it to the accounting department to help facilitate quick payment. A record of all transactions will be filed with all procured items for the current budget cycle. If all items are not received the AQMS shall contact the vendor. A running tally of the budget items is kept by the QAM for tracking of expenditures throughout the budget period.

Consumables are reviewed for obvious defects at time of receipt. When consumables are installed and defects are noted after installation the vendor shall be contacted for a replacement of such item. The inventory is tracked using an in-house Excel program that will include site inventory for each monitor location. This is performed annually at the same time of the IDNR inventory review process. The AQMS shall indicate in the field maintenance logbook anytime a repair is performed and what parts where replaced at the time.

Items in the inventory database include date of installation, serial number of instruments, cost of each instrument, the tag number of either IDNR or Polk County for fixed asset items.

All vendors, at the request of the PCAQD, IDNR or EPA, shall provide a QMP and QAPP document. The EPA requires that all suppliers have quality-related documentation of their Quality System before becoming a supplier for ambient air supplies. The PCAQD uses only manufacturers that are recognized by the EPA for equivalent or reference method instrumentation.

6 Documents and Records

6.1 Quality-Related Documents and Records

Polk County Air Quality prepares and maintains several documents and records as part of their Quality System:

Quality Management Plan
Quality Assurance Project Plan
Standard Operating Procedures for all instruments and QC devices
Procurement Reports
AQS/PARS Data Reports
External Audit Reports
Training Logs
Network/Quality Assurance Review

6.2 Document Review Guidelines

All quality-related documents that provide the guidelines for the Polk County Air Monitoring Network (i.e. the QMP, QAPP, and SOPs) are reviewed on an annual basis throughout the calendar year. Each document review will include a comparison to the guidelines outlined by the EPA document developers.

The QMP will include a review of the entire EPA reference document EPA QA/R-2 to insure that all areas of documentation for the Quality Systems in place are part of the Polk County QMP document. Revision guidelines will be as recommended by the EPA and all signatures required for the 5-year review will be included within the annual review for that period. This document is available at the EPA website: www.epa.gov/quality/qs-docs/r2-final.pdf.

The QAPP will be compared to the quality assurance guidelines established by the reference methods in place for compliance with the standards set forth by the EPA (i.e. CFR 40, EPA Order 5360.1, and the Quality Assurance Handbook (QAH II), and QA/R-5). This document is available at the EPA website: www.epa.gov/quality/qs-docs/r5-final.pdf.

Review of the SOPs will include a comparison of operating procedures to those found in the equipment operator's manual. The review will also establish that monitor operation will satisfy federal air monitoring requirements contained in 40 CFR Parts 50 and 58. EPA guidance contained in EPA's Quality Assurance Handbook (QAH II), EPA technical assistance documents and other EPA guidance will also be considered when developing SOP's.

During the review process, notations can be made directly within the printed documents. Changes to the computerized documents are completed prior to the final annual revision. All revisions will be noted on the report sign off sheet and the final revised document will be signed and dated by the person who prepared the document and the QAO. All revisions are e-mailed to the IDNR and the document management division of the EPA. All electronic final versions are saved in PDF format to protect the integrity of the documents and will be stored on the Polk

County Computer Network. Hardcopies of each of the quality-related documents will also be available upon the completion of the revision process.

All documents that are under revision shall be located on the Polk County Public Works network under a file folder called Draft in the Air Quality folder.

All documents and policies shall be identified as to the revision, date of issue, number of pages, and authorizing signature page. After a document is deemed acceptable and is finalized the document is printed into a PDF format to ensure that no changes shall occur to the original document. If during the course of the use of a quality-related document it is determined that some changes need to be completed these changes shall be noted and initialed by the QAM on the original hard copy document in the reference manual for that project. During the annual review or before if deemed necessary the changes are incorporated into a new revision of the document and printed in hard copy as well as in PDF format.

All final revised documents will be e-mailed and a hard copy mailed to the IDNR and the document management division of the EPA.

Outdated or invalid documents shall be filed and noted as such in the project file directory and kept for a minimum of 3 years from date of replacement.

6.3 Quality Assurance Records

Field operators' logbooks, which document routine site visits, routine maintenance, instrument malfunctions, corrective action and quality control checks, are reviewed monthly by the QAM for compliance with the quality assurance guidelines in place within the QAPP and SOPs. These records are reviewed in accordance with the guidelines of the QAPP and SOP's and are retained for the minimum 5-year period. Air Quality personnel retain the electronic monthly reports, in a folder on the network specifically for Air Quality personnel. These records will be retained for a minimum of five years. Field operators' logbooks are retained for a five-year period from the last year of information entered in the logbook. After the five-year period, these documents are placed in long-term storage for an additional five years and then destroyed.

A report is prepared by the QAM indicating the results of an audit comparing the procedures actually used by the field operators to operate and maintain air monitoring equipment with the written SOPs for the equipment. In the event that discrepancies exist between the actual and written procedures, the report shall detail these discrepancies, establish the validity of the data gathered with the undocumented procedures, and update SOPs, where necessary, to reflect actual field practice. This report will be reviewed by the AQM. Corrective action policies and procedures described elsewhere in this QMP will be utilized to ensure a satisfactory resolution of any discrepancies.

6.4 Electronic Records

All raw electronic data is stored on a specified drive on the Polk County Computer Network. This information is password protected and access is available only to Air Quality personnel.

Backup copies of all downloaded data from laptops or palmtops are filed on the computer network on a specified drive with access available only to Air Quality personnel. All electronic quality control records are placed in folders specifically identifying the quality control software and the year the analysis was performed. Records are retained electronically for a minimum of five years. Folders are created for raw data that is transmitted from contract laboratories involved in performance of some of the quality control for a specific part of a process (i.e. State Hygienic Laboratory weighs all pre-analytical and post-analytical filters for $PM_{2.5}$ monitors). Edited data are stored in electronic folders identifying the current year and files are labeled to identify the month the data was processed and reviewed by the QAM.

6.5 Chain of Custody

Where evidentiary records are involved, the applicable QAPP shall establish appropriate chain of custody and confidentiality procedures for the affected records.

7 Computer Hardware and Software

7.1 Computer Policy

The Polk County Information Technology Department (IT) is responsible for the set up and configuration of all computers within the Air Quality Division. Installation of all specialty software (i.e. AirVision) and software version upgrades is also performed by IT. All software installations and upgrades are entered in the Polk County Inventory Database. Dates of installation for software upgrades are a critical component for assessing data quality and could be a potential cause of system malfunctions that affect the quality of the data.

The Polk County IT Department is also responsible for setting up and maintaining the Polk County Air Quality Website. The PCAQD will meet with IT staff on a quarterly basis to review website deficiencies, problems and progress. Polk County's IT staff will perform an audit to ensure that all computers used in the ambient monitoring network are secure and adequately backed up on an annual basis.

Relevant Training manuals are available for the Air Quality Division. Offsite training is provided for software used within Polk County Computer Network (i.e. Microsoft Word, Excel and Access). In addition, specialized training offered by the software developers (i.e. Agilaire) is encouraged as part of the Polk County Air Quality Training Program.

7.2 System Assessment

A system assessment process is used when purchasing computers, laptops, palmtops, computer hardware and system supporting elements necessary for the collection of data, evaluation of data, and routine use within each of the Quality Systems. Factors that are considered include: minimum software requirements, intended use within the Quality System, cost-effective decision making on replacing out-dated systems with new systems, and the purchase of supporting system elements to enhance the effectiveness of the Quality System.

7.3 Assessment of Computer-Generated Data

Data assessment generated from the quality-related software within the Polk County Air Quality Division undergoes extensive evaluation. The computer-generated information is checked against field logs for completeness, instrument malfunctions that would invalidate data, and unusual occurrences on site or within the vicinity that could skew the data interpretation. The AQMS evaluates computer-generated data on a daily basis and views specific quality control charts to assess trends and shifts which could indicate the early development of an instrument malfunction. When trends or shifts occur, the QAM is notified. All data is assessed for compliance within the quality control guidelines established for each process within the QAPP and the Measurement Quality Objectives (MQO).

For data entry, a checkpoint review system is utilized which includes a re-check of entered data against the data from the original document. Hardcopy of the information is printed upon verification of results within both systems. A Quality Review Report is prepared by the AQMS and sent to the QAM for review. This report includes but is not limited to the following:

1. Checklist system for each site and each parameter for QC compliance.
2. Notification of dates of failure (when applicable)
3. Notification and date of notification to QAM of QC failures
4. Dates of all flagged data and error code(s) that represents the cause for flagging data.
5. Corrective action performed to correct malfunction.
6. Dates new software versions are installed.
7. Dates that $PM_{2.5}$ or PM_{10} monitors failed to run.
8. The AQMS file the monthly reports in a specified drive on the Polk County Computer Network.

8 Planning

8.1 Planning Specifications

The PCAQD works in conjunction with the IDNR on the planning of the air monitoring program for criteria and non-criteria pollutants in their efforts to fulfill the SIP requirements of the Region VII EPA. The Polk County Ambient Air Monitoring Program is in place to ensure that the regulatory permitting policies are sufficient to maintain the NAAQS, and to protect and inform the public about the health problems associated with these pollutants.

Monitoring data results are used for regulatory policy and decision making procedures. Data is used to determine compliance or progress towards meeting the ambient air quality standards. Data is also used to observe pollution trends throughout the state and to activate emergency control procedures that will prevent air pollution episodes and develop long term control strategies. If the data used is not of sufficient quality, the health and well being of the residents of Polk County are at risk. The QA/QC activities are in place to ensure that the data is of the highest quality, and that the monitoring objectives of each site satisfied. The details of this QMP apply to all monitoring activities conducted by the PCAQD.

During the planning process, the PCAQD works with IDNR to determine a schedule sufficient to fulfill the IDNR requirements in the SIP. This is a year round project that will continue until the SIP requirements indicate this project no longer is needed. The budget is completed on a fiscal year of July 1 through June 30th. This budget is indicated in the contract that the PCAQD has with the IDNR. This contract is negotiated on a yearly basis.

The type of data required for this project are concentrations of the targeted pollutant, reported in a consistent format for all data users involved. The quantity of data is determined by the method if it is a continuous (24 hours each day) or non-continuous (midnight to midnight on designated day). Specific requirements are stated in the DQOs for individual pollutants. The data collected for this project will be used to determine compliance with the NAAQS, as well as for use in all scientific studies that the IDNR determines to be in the best interest of the stakeholders.

The data will be collected in a manner that is in compliance with EPA regulations and requirements for each monitoring method. The data will be collected in a field setup such that the data is transferred back to a fixed facility, either by hand or via electronic transmission, for QA/QC review. Since the data is collected in a field environment, the evaluation must also include a review of the conditions at the time of collection. This is done during annual site assessment or when a site has had influence from items such as weather.

The planning process shall include QA/QC activities to allow the data users the ability to assess the quality of the collection system performance. These activities are indicated in the QAPP as well as in the individual SOPs. An annual data assessment shall be performed to determine the effectiveness of the QA/QC activities. Section 10.1 defines the annual data assessment process.

There are a number of stakeholders involved in the planning process for the data operations of the PCAQD. Section 2.2 defines all stakeholders involved. It is the policy of the PCAQD to work with all stakeholders involved in the planning process of the program in order to create a Quality System that will produce data that can be relied upon to make policy planning and regulatory decisions.

8.2 Quality Assurance Project Plan

The QAPP is reviewed on an annual basis, when changes in the program require revision, or after request for a revision by EPA or IDNR. Upon receipt of a request for a revision by EPA or IDNR, the PCAQD shall review the request, and, upon concurrence, incorporate the recommended changes into the QAPP. The QAPP is approved by PCAQD. The PCAQD shall not initiate data collection without an associated approved QAPP.

9 Implementation of the Work Processes

9.1 Purpose

It is the policy of the PCAQD to implement the work processes within the organization in a satisfactory manner to ensure that data or information collected are of the needed quality for their desired use.

9.2 Specifications

Ultimately, the AQM is responsible for ensuring that the work is performed in accordance with appropriate quality assurance requirements. The QMP provides the framework for defining the procedures to ensure that environmental data operations are implemented in accordance with an approved QAPP. The QAPP describes in detail the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure results of work performed will meet the stated performance criteria. Sections 3.2 and 3.3 discuss implementation of QAPPs.

Routine technical and administrative activities will be documented in SOPs to ensure consistency in the quality of the products and/or processes. Implementation of SOPs is outlined in Section 3.2. The removal of obsolete documentation is discussed in Section 6.2.

10 Assessment and Response

It is the policy of the PCAQD to have sufficient activities to determine the suitability and effectiveness of the implemented Quality System of the Ambient Air Monitoring Program.

10.1 Annual Assessment of the Quality System

On an annual basis, the PCAQD will complete and submit to the IDNR an annual network/quality assurance review in order to demonstrate that its Quality System is sufficiently developed, and its monitors are appropriately sited and adequate in number to meet EPA's minimum requirements. In addition, the PCAQD will review its Air Quality System (AQS) Precision and Accuracy Data (PARS) and site/monitor parameters in the AQS database for errors, and generate graphical and statistical summaries of the data. The PCAQD will evaluate the data relative to EPA acceptance criteria for data completeness, precision and accuracy. On the basis of this review, the PCAQD will submit its annual SLAMs certification letter. The Annual Network/Quality Assurance review shall contain the following components:

a) A complete, current set of Quality assurance documentation (QMP/QAPPs/SOPs), submitted as a hard copy and in portable document format (PDF);
b) AQS/PARS raw data listings generated from the AQS system [AQS P/A Raw Data Report (AMP 250), AQS Raw Data (AMP 350)] for all monitors operated;
c) Graphs of concentration vs. time (and concentration vs. wind direction where applicable) submitted in hard copy and portable document format (PDF) for all monitors operated;

d) Complete, current network review checklists to document conformance with 40 CFR Part 58 Appendix E requirements;

e) An annual quality assurance report following the example contained in Volume II, Appendix I, of EPA's Quality Assurance Handbook for Air Pollution Measurement Systems (rev 12/10/08);

f) An annual State and Local Air Monitoring Stations (SLAMS) report from AQS [Quick Look for Criteria and Non-criteria Parameters (AMP 450 and 450NC) and AMP 255 (Precision and Accuracy Quality Indicator Summary)] along with a letter certifying the accuracy of the report based on a review of all materials contained in the annual review; and

g) A report from the QAM indicating the results of an audit comparing the procedures actually used by the field operators to operate and maintain air monitoring equipment with the written standard operating procedures for the equipment. In the event that discrepancies exist between the actual and written procedures, the report shall detail these discrepancies, establish the validity of the data gathered with the undocumented procedures, and update standard operating procedures, where necessary, to reflect actual field practice.

10.2 External Audits

The PCAQD shall participate in EPA's National Performance Audit Program (NPAP), performance evaluation program (PEP) for $PM_{2.5}$ monitoring, and EPA Technical Systems Audits (TSAs). In addition, the PCAQD shall participate in quality assurance systems audits conducted by the State of Iowa Hygienic Laboratory (SHL). The PCAQD shall fund at least one annual NPAP audit for all monitors for which NPAP audit devices are available. The PCAQD will respond promptly to address deficiencies identified in these audits.

10.3 Management Review

All information pertaining to all assessment activities included in a Quality System shall be made available for the affected parties. The management shall provide access to personnel, as well as all reference documents, audit reports, corrective action requirements, training items and annual review reports to all groups involved in the Quality System. All parties involved in ambient air monitoring are required to review all documents associated with the Quality System. After each revision, the management will notify the affected parties of the document changes for their review. Keeping all groups informed of the condition of a Quality System, creates a system that will produce results to meet the needs of the monitoring network. All communication shall be held in storage for the same period as the Quality System documents or data.

10.4 Corrective Action

If a deficiency is identified during the assessment process, a corrective action process shall be implemented. This will include a letter of response to the assessment agency identifying any known causes, and detailing the necessary steps to correct the deficiency. It is the policy of the PCAQD that all corrective actions will be completed within 90-days of notification.

10.5 Dispute Resolution

It is the policy of the PCAQD that all disputes regarding any portion of the Quality System shall be filed in a corrective action file for reference during the annual network review.

The dispute shall be provided to the AQM for assessment of the dispute. The AQM shall contact all involved parties including the IDNR Air Quality Bureau as part of this assessment. If a deficiency or problem is noted during the assessment of the Quality System a corrective action plan shall be implemented along with a time frame to satisfy all involved parties. A follow-up assessment of the corrective action shall be completed during the next Quality Systems review.

11 Quality Improvement

11.1 Purpose

It is the policy of the PCAQD to have in place a system that will improve the organization's Quality System.

11.2 Quality Improvement Specifications

Since the PCAQD works under contract with the IDNR Air Quality Bureau, the personnel involved in the identifying, planning, implementing and evaluating the quality improvement activities come from both of these agencies.

Various reports and audits are required by contract with the IDNR. These include quality assessment (Annual Network Reviews) reports, quarterly data assessment reports, as well as corrective actions needed during the TSA. Reports and audits are sent to IDNR for review, and then a letter is sent to the Polk County Air Quality stating any required corrective actions. The Network Reviews are forwarded from the IDNR to the Region VII EPA Monitoring QA Section for their file and assessment activities.

One of the most important portions of the Quality System is the corrective action portion and follow-up assessment activity. It is realized that no system is perfect. The process of recognizing program deficiencies and formulating corrective actions that lead to a resolution, brings the Air Quality Program closer to achieving the quality goals of the agency.

Through the use of quarterly IDNR meetings and periodic in house staff meetings, a line of communication is opened to bring to the forefront any details that are of concern or any items that need to be reviewed pertaining to the Quality System. The policy of the PCAQD is to encourage open discussion of concerns by all involved parties. The electronic mail network for the PCAQD allows for easy transfer of all communications from EPA, State and local agencies to the local personnel in an effort to keep everyone informed to the changes and resources available to them to help with improving the Quality System. Regular lines of communication are in place between the PCAQD and the IDNR for communication over all aspects of the Quality System.