



# Environmental Update #15

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## Quality Assurance/Quality Control (QA/QC) in Brownfields Redevelopment Projects

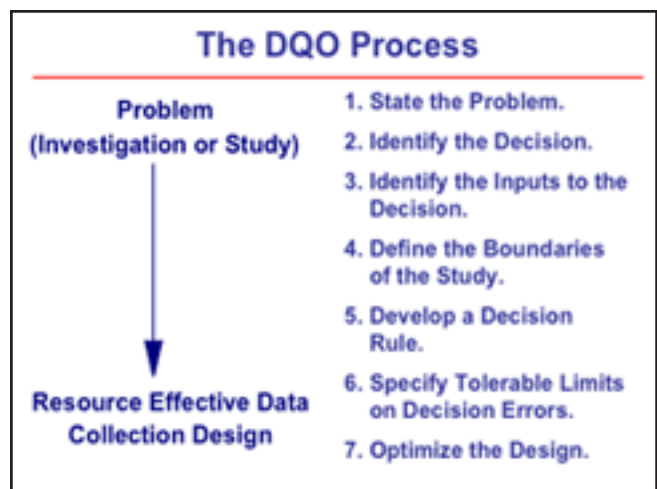
The “quality system,” as its name implies, is not a single document or equipment calibration requirement but a complex grouping of checks and balances used to support environmental decisions. The system is often viewed as an “add-on” or extraneous to the actual work being done, so the challenge for environmental professionals as well as brownfields stakeholders is to view quality as an integral part of the brownfields redevelopment process.

While the term Quality Assurance/Quality Control (QA/QC) is familiar to many professionals, it may seem foreign to others. QA and QC are the two primary legs of a quality system. Quality assurance is a set of management activities that helps to ensure that environmental data is of the type and quality needed and expected. Quality control is the measuring tool used to test the process against known standards<sup>1</sup>. Visually, quality in Brownfields activities can be thought of as three legs on a stool. The top or seat of the stool is the quality system, held up by 1) the question under consideration; 2) quality assurance; and 3) quality control.

### Quality System Overview

If a community receives a grant from the U.S. Environmental Protection Agency (EPA) to conduct an inventory or assessment of brownfields, that money comes with an agreement that the community will abide by specific quality requirements. If a community does not receive financial assistance from EPA to redevelop brownfields, it is still prudent for entities from that community to apply appropriate quality requirements. With or without EPA financial assistance, brownfields assessment activities generally take place under local state voluntary investigation and remediation (VIRP) regulations, which carry their own set of quality assurance requirements that can complement EPA requirements.

One would expect a discussion of quality and environmental measurements to focus invariably on the lessons on precision and accuracy; statistical significance; or laboratory/field duplicates. While these are important in producing high-quality environmental information, perhaps the most vital discipline is planning. The quality assurance/quality control process begins with the question: what information do I need to solve my problem? In the quality arena, this is known as setting the data quality objectives (DQO), and for brownfields projects the DQO's can be applied to everything from office filing systems to Phase II site assessments. EPA summarizes the DQO process as a seven-step program, as shown above.



*This graphic is from the EPA Training Course, “Introduction to Data Quality Objectives,” [www.epa.gov/quality/trcourse.html#intro\\_dqos](http://www.epa.gov/quality/trcourse.html#intro_dqos).*

This approach to problem solving considerably enhances efficiency in an environmental project. As shown in the diagram at the right, the DQO process strikes a balance between what is possible and what is necessary.

### Quality Management Plans

EPA requires organizations that collect environmental data with EPA resources to have a quality system. The quality management plan (QMP) documents that quality system.

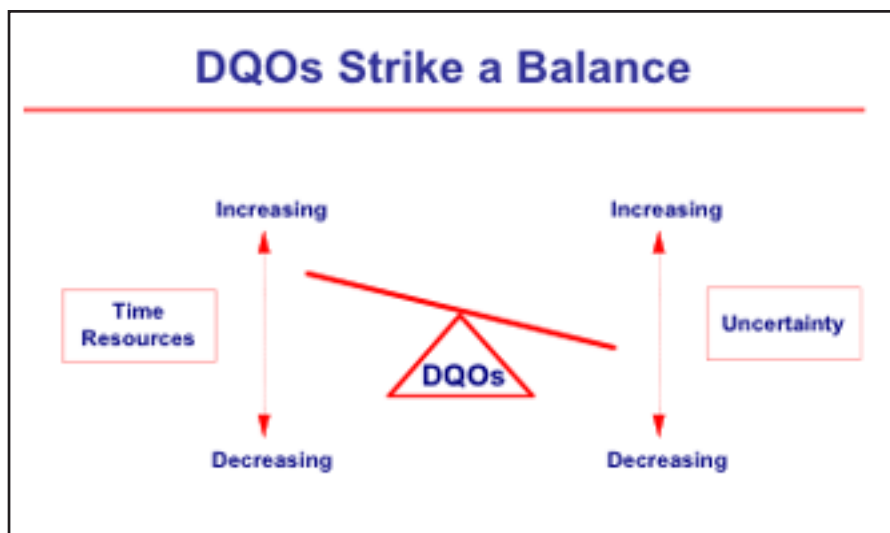
The brownfields QMP covers everything from office management to site assessments.

Organizations redeveloping brownfields may have many of these processes already in place, and these existing processes should be considered when developing a brownfields QMP. In simple terms, the purpose of the QMP is shown below.

### Quality Assurance Project Plans

While the quality management plan (QMP) documents the entire quality system, the quality assurance project plan (QAPP) lays out the specific quality objectives for brownfields site assessment activities. Usually, QAPP requirements are outlined in an organization's QMP. A QAPP, the more detailed document,

describes the technical and quality requirements of an assessment. The components of the QAPP are enacted and utilized to help ensure that the data will meet the needs at hand. The data quality objectives (DQO) process is used to prepare a QAPP. Other elements of a QAPP are listed on the next page. Many elements of the QAPP are found in the more common, standard site assessment work plan. Usually these two documents can be combined.



*This graphic is from the EPA Training Course, "Introduction to Data Quality Objectives," [www.epa.gov/quality/trcourse.html#intro\\_dqos](http://www.epa.gov/quality/trcourse.html#intro_dqos).*

### QMP Purpose

- The QMP documents **what** you are going to do, **how** you are going to do it, and **how** you know you did it.

*This graphic is from "Introduction to Quality Management Plans" Course and Briefing Package, [www.epa.gov/quality/trcourse.html#intro\\_dqos](http://www.epa.gov/quality/trcourse.html#intro_dqos).*

## Resources/ U. S. EPA Contacts

The following individuals and web sites may be helpful in providing information regarding quality requirements at brownfields sites.

Office of Solid Waste and Emergency Response (OSWER)  
Greg Jordon  
Telephone: 202-566-2751

EPA Region 6  
Don Johnson, QA Manager  
Telephone: 214-665-8343

EPA Region 4  
Gary Bennett, QA Contact  
Telephone: 706-355-8500

Quality Assurance Guidance for Conducting Brownfields Site Assessments  
[www.epa.gov/swerosps/bf/pdf/bfqag4.pdf](http://www.epa.gov/swerosps/bf/pdf/bfqag4.pdf)

EPA Quality System Contacts and Web Sites  
[www.epa.gov/quality/contacts.html](http://www.epa.gov/quality/contacts.html)

## References

1 Quality Assurance Guidance for Conducting Brownfields Site Assessments, EPA 540-R-98-038, OSWER 9230.0.83P, September 1998.

## Quality Assurance Project Plan Elements

### Project Management

- Title and Approval Sheet
- Table of Contents
- Distribution List
- Project/Task Organization
- Problem Definition/Background
- Project/Task Description
- Quality Objectives and Criteria
- Special Training/Certification
- Documents and Records

### Data Generation and Acquisition

- Sampling Process Design (Experimental Design)
- Sampling Methods
- Sample Handling and Custody
- Analytical Methods
- Quality Control
- Instrument/Equipment Testing, Inspection, & Maintenance
- Instrument/Equipment Calibration & Frequency
- Inspection/Acceptance of Supplies & Consumables
- Non-direct Measurements
- Data Management

### Assessment and Oversight

- Assessments and Response Actions
- Reports to Management

### Data Validation and Usability

- Data Review, Verification, and Validation
- Verification and Validation Methods
- Reconciliation With User Requirements