

Photodocumentation:
Quality Assurance Project Plan

Prepared by the
Oklahoma Conservation Commission
Water Quality Division

A1 TITLE AND SIGNATURE PAGE

**Oklahoma Conservation Commission
Water Quality Division
Quality Assurance Project Plan for
Photodocumentation**

Approving Officers:

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Signature: _____ Date: _____

Name: Approving Officer, Region VI United States Environmental Protection Agency

Signature: _____ Date: _____

Project Objectives and Responsibilities

Objectives and Purpose

Photodocumentation is an important tool for environmental monitoring. It can reinforce monitoring through documentation of specific circumstances related to the project goals. Photographs create a record by preserving a moment in time, enhancing a physical description, and can also be used to compare before and after implementation of best management practices or presence/absence of best management practices. Storage of photographs requires less processing and uses less space than actual on-the-ground surveys. In the case of biological collections, the number of specimens that must be kept can be decreased by carefully photographing the organism and releasing it.

Photodocumentation will be completed for multiple purposes including:

- documenting the effects of the implementation of best management practices intended to protect water quality. Detectable changes in water quality often require longer than the project period to be measured. The quality of cover vegetation has been proven to affect the concentrations of pollutants in runoff. Land with better quality cover vegetation will leach fewer nutrients, soil particles and other pollutants into runoff than land with poorer quality vegetation. In watersheds where nonpoint source pollution is a significant source of threat or impairment, improving the quality of land cover /vegetation is a crucial step to restoring and protecting water quality. Photodocumentation allows a quantifiable measure of the change in land cover quality that will ultimately affect water quality. Photodocumentation can also detect changes in soil erosion or streambank stability over time. Photodocumentation can either be done comparing before and after or presence/absence of BMPs;
- documenting site conditions that might influence data collected at a water quality monitoring site such as landuse, location of a bridge, riparian condition, upstream flood control structure, low water dam, or other activities;
- documenting methods used to collect environmental data
- verifying the species of fish captured to allow release rather than requiring that all individuals be preserved;
- documentation of likely sources of contamination such as a lateral field pipe in a stream, an eroding stream bank, improper storage of animal waste, or poorly managed construction sites.
- Documentation of an event such as a workshop, 100 year flood, educational tour, or some other event that could influence water quality in the watershed of concern.

The following processes are necessary to meet the above goals and purposes of photodocumentation:

- Diligent recording and logging of photo information including date, time, site information, and other data as specified in OCC's photodocumentation Standard Operating Procedures (SOPs),
- Use of reference information such as landmarks, distances, directions, reference objects such as rulers, fence posts, meter boards, etc. to ensure that photodocumentation is repeatable and defensible,
- Adherence to the methods and practices defined in OCC's photodocumentation SOPs, and
- Regular and repeated photodocumentation, as appropriate to illustrate changes over time.
 - Regular and repeated photo-documentation must occur under conditions as similar as possible those in which the initial photo was collected in order to maximize the utility of the photographs. In other words, if the initial photos were collected during the morning of a sunny day, then the latter photos should be collected under similar conditions.
 - One set of before and after photos may not be sufficient for comparisons. Once the before photos have been collected, following establishment of the practice, it may be necessary to collect several sets of follow-up photos to ensure the photos are comparable.
 - The similarity in collection conditions between the photos to be compared corresponds to the level of detail that can be obtained from the comparison.
 - Collection of photographs must occur at a time interval that is meaningful compared to the type of practice implemented and the amount of detail sought in the comparison. For example, comparison of the extent of vegetative cover (amount of bare spots) might be something that could be compared between photographs collected prior to or immediately after implementation and then at the end of the current growing season. However, in order to compare the quality and diversity of the vegetation, it might be necessary to compare photos from successive growing seasons to those collected at the onset of implementation.

Personnel with Photodocumentation Responsibilities:

Oklahoma Conservation Commission Photodocumenters

Dan Butler, Director
Shanon Phillips, Assistant Director
Jim Leach, Finance & Costshare Director
Judith Wilkins, Environmental Projects Coordinator
Greg Kloxin, Senior Technical Writer/QA Officer
Candace Cunningham, Technical Writer
Stacy Hansen, Technical Writer
Stacey Day, Environmental Manager/Technical Writer
Chris Dubois- Wetlands Program Manager
Brooks Tramell- Monitoring Director
Wes Shockley- Water Quality Specialist II
Leonard Moore- Water Quality Specialist II
Jason Ramming- Water Quality Specialist II
Jerry Carr- Water Quality Specialist II
Ben Berry- Water Quality Specialist II
Jeanette Lamb- Water Quality Specialist II
Cheryl Cheadle- Statewide Blue Thumb Coordinator & Educ. Program Supervisor
Jean Lemmon- Blue Thumb Quality Assurance Officer
Kim Shaw- Statewide Blue Thumb Educator
Monty Ramming- Fort Cobb Project Coordinator
Ed Crall- Fort Cobb Project Education Coordinator
Kevin Gustavson- Grand Lake Project Coordinator
Marti Mefford- Honey Creek Project Coordinator
Jill Ashbrener- Spavinaw Creek Project Education Coordinator/Plan Writer
Joe Schneider- Spavinaw Creek Project Coordinator

Responsibilities:

- Photodocumentation of:
 - Sampling sites
 - Before and after BMP implementation
 - Presence/absence of BMP implementation
 - Monitoring methods
 - Fish collections
 - Notable land uses
 - Sources of pollution
 - Events related to project goals
 - Events that may affect project outcomes such as 100 floods, severe drought, fish kill, etc.
- Photographic analysis according to OCC SOPs for BMP
Photodocumentation to verify changes in vegetative cover, soil erosion, bank stability, etc, due to implementation of BMPs

Data Sources and Selection

Sources of photos may include historical photos, OCC current photos, aerial photography such as digital orthophotos, and photos taken by known and unknown photographers. Not all photos collected will be suitable for all types of photodocumentation. Any analysis of photographically collected information such as that collected to document BMP effectiveness will require sufficient documentation (such as that listed in OCC's SOPs) to verify that before and after pictures and presence/absence photos are comparable. This includes, but is not limited to, information about distance from subject matter, direction, and reference points. In addition to those requirements, listed below are the criteria for selection of photos for the different types of photodocumentation:

1. documenting the effects of the implementation of best management practices intended to protect water quality.
 - Photos must have been captured following the procedures outlined in OCC's SOP for BMP photodocumentation.
2. documenting site conditions
 - Photos must have been captured following the procedures outlined in OCC's SOP for photodocumentation
3. documenting methods used to collect environmental data
 - Photos must be labeled with appropriate information including subject matter, date, samplers, and preferentially, with site information.
4. verifying the species of fish captured;
 - Photos must have been captured following the procedures outlined in OCC's SOP for photodocumentation
5. documentation of likely sources of contamination
 - Photos must be labeled with site, date, and subject information.
6. documentation of an event such as a workshop, 100 year flood, educational tour, or some other event that could influence water quality in the watershed of concern.
 - Photos must be labeled with site, date, and subject information.

Data Reporting, Reduction, and Validation

Reporting

Photodocumentation will be presented in various final and interim reports and other documents specified as outputs in OCC workplans.

Data Reduction

Not all photos collected may be useful for purposes of photodocumentation as described in OCC Photodocumentation SOPs. Whether this has to do with inadequate labeling, inappropriate camera settings, ineffective use of reference points, or for some other reason, not every photo collected will be used in photodocumentation. For instance, comparison of photos collected at different times necessitates that conditions between the two sets of photos are as similar as possible (sunny vs. cloudy, morning vs. late afternoon, growing season vs. winter, etc). Photos that were not collected under similar conditions may not be as useful for documenting changes or differences and therefore, may not be utilized in the analysis. However, all will be stored as described in OCC SOPs and available for future use.

Validation

Validation is the process of verifying the ability of photodocumentation to make predictions about the events that actually occurred, the improvement in water quality due to BMP implementation, or the degradation due to lack of BMPs. Validation would also verify whether photodocumentation would predict whether or not samplers always adhere to certain protocols or whether or not other conclusions drawn from photodocumentation are truly accurate. Validation for the many different types of photodocumentation will take the following forms:

- BMP effectiveness: continued water quality monitoring will always be employed (although perhaps as part of a separate project) to ascertain whether BMPs have had an impact. Computer models such as StepL, PreDICT, and SWAT can also be used to quantify load reductions due to BMP implementation.
- Use of specific monitoring methodology: Field staff participate in quarterly quality assurance sessions to verify the appropriate calibration of their instruments and methodology in the field analysis they complete. They participate in annual "fish school" to refresh and test their knowledge of fish identification and fish collection methods. They also are evaluated, at least annually, on field methods with a field audit.
- Site conditions: in some cases, validation of site conditions will be verified through repeat photodocumentation. If algal mats or cattle trails remain through multiple site visits, they can be assumed to have a lasting impact on water quality or to be a lasting effect of conditions at the site.
- Fish identification: Any time a fish species is photodocumented such

that it can be released, it is photographed such that verification will be possible from our fish taxonomist who identifies all the fish OCC collects.

- Likely sources of contamination: validation of this will include repeat photos of the same types of source, perhaps in multiple areas of the watershed, or of the same source, over time.
- Significant events such as 100 year floods, workshops, seminars, will have supporting documentation to validate that the photos accurately represent the event such as attendance sheets, newspaper articles, etc.