

## **Gathering Evidence and Collecting Samples**

### **Introduction**

Evidence is anything that an inspector may collect or testify to that supports or refutes a matter of fact. Unified Program Agencies should provide their inspectors with a common method for gathering evidence, including collecting samples.

All procedural aspects of gathering evidence – collecting samples, preservation, storage, shipping, and chain of custody are important. Properly done the evidence can be of significant assistance to successful enforcement. Improperly done, it can lead to a dismissal of an otherwise solid case.

### **Three Types of Evidence**

1. Demonstrative
2. Testimonial
3. Physical

#### **Type 1: Demonstrative**

Demonstrative evidence describes or documents a condition or occurrence.

Examples include:

- Photographs and video provide valuable documentary evidence of events and conditions. Photographs and video provide a visual reference
- Maps and diagrams
- Documents, records, reports and other correspondences can be collected for use as evidence. An original document is always preferred to a copy. This is known as “best evidence”. If photocopies of records are collected in lieu of the actual documents, have the business sign a receipt of copies provided.
- Sample analytical reports

#### **Type 2: Testimonial**

Testimonial evidence is a statement made by a witness to support the facts. An inspector’s observations are considered testimonial evidence.

#### **Type 3: Physical**

Physical evidence is concrete and tangible (available to touch, feel, look at, or smell.)

Examples include

- Samples (not the analytical results)
- Containers
- Products / crops
- Vehicles

#### **Rules to Remember**

When gathering evidence remember the following:

- Have evidence for each violation.
- Have evidence of how and when the violation(s) occurred.
- Talk to your Prosecuting Agency early and often, especially on “big” cases.
- Dates of violation(s) to ensure it is within the statute of limitations. Additionally, the dates must account for evidence that on each and every day the violation occurred on multi day violations and for violations that have a time requirement (e.x. generator’s storage of hazardous waste for more than 90 days.)

#### **Training**

Training on gathering evidence and collecting samples is offered by the California CUPA Forum Board during the Annual California Unified Program Conference

<http://www.calcupa.net/conference.html>.

## Sampling

Sampling is a process or method of drawing a representative unit from a particular medium or substance. It represents the condition of the medium or substance sampled.

## Sampling Equipment

Sampling equipment will vary by program and media. Inspectors should become familiar with the types of sampling equipment needed.

## Why Sample

A sample provides more compelling evidence that a condition, spill, discharge, or threshold has been broken or has occurred.

## Standard Operating Procedure for Sampling

Standard operating procedures (SOP) establish a documented procedure that is generally accepted and appropriate for the type of sampling. SOPs also provide sampling consistency.

US EPA's SOP for soil sampling is available at:

[http://www.epa.gov/earth1r6/6pd/qa/qadevtools/mod5\\_sops/soil\\_sampling/ertsop2012-soil.pdf](http://www.epa.gov/earth1r6/6pd/qa/qadevtools/mod5_sops/soil_sampling/ertsop2012-soil.pdf).

## Sampling Goals

- Ensure the samples represent the condition or quality of the material
- Ensure there is consistency in the sampling technique

## Sample Types

Grab – A representative sample collected at a discrete location and time.

Composite – A series of grab samples combined and analyzed as a single sample. (Air monitoring samples are composite samples.)

Authoritative – A judgment or target sampling often used to support illegal disposal and discharge cases.

Random – Is used to determine the overall concentration of a contaminant in a waste material, soil, water, or plant material.

## Sample Considerations

- Know the objective and purpose of taking a sample
- Medium, Media and Matrix
- Physical State
- Method

## Sample Plans and Design

Sampling requires careful thought and consideration. Developing a plan for collecting samples will allow an inspector to meet the sampling objectives. The plan should describe the sampling to be done and the justification for selecting the sample sites, describe the quality assurance and quality control methods, a description of the stand operating procedures utilized, and a description of sample preservation and chain of custody requirements.

## Sample Collection

It is important to collect a sample of the suspected pollutant from the source. If it is a petroleum product then enough product for chemical confirmation should be collected. Petroleum products are sampled from the source directly into a small 60mL jar. Receiving water samples are usually dispersed or diluted and harder to collect. If a sheen is present, a piece of fiberglass cloth can be used to collect the petroleum from the water's surface without collecting much water. The fiberglass used for sampling is put into a clean glass jar for storage and shipping.

### **Water Samples**

Water samples should be taken at the water surface.

When sampling streams or rivers, a minimum of four samples should be taken. The sampling points should include: the source (suspected point source pollution), upstream (control sample), point of entry to the stream or river, and downstream (continue downstream until no effect is apparent, if necessary).

Sampling locations for lakes and reservoirs include: the source, other water flow sources into the lake, the suspected point of entry of the pollutant into the lake, and as many samples as is necessary to determine the extent of pollution.

If the identity or toxicity of a pollutant is not known, an acute toxicity fish bioassay is the most helpful. This test requires a substantial volume of water sample. Whenever possible collect 5 gallons of sample material (receiving water). If the suspected material is paint, detergent or other household product collect at least 250 mL of pure product.

### **Soil Samples**

Soil samples may be collected using a variety of methods and equipment depending upon the type of sample required (disturbed vs. undisturbed), and the soil type.

### **Analytical Laboratory**

Consult with the analytical laboratory doing the analysis prior to sampling to ensure the proper amount of a sample is collected and the sample is properly preserved.

### **Chain of Custody**

“Chain of custody” is a term applied to the preservation of evidence in its original condition through its successive custodians. A chain of custody is used to ensure the integrity of the sample or evidence. Chain of custody is a process or procedure not a piece of paper.

### **Chain of Custody Procedure**

A chain of custody procedure:

- Governs the collection, handling, storage, testing, and disposition of evidence;
- Safeguards against tampering with or substitution of evidence; and
- Documents that these steps have been carried out.

Inspectors typically establish chain of custody by using a chain of custody form. The form should identify:

1. Sample collector
2. Sample description, type, and number
3. Sampling data and location
4. Any custodians of the sample

Sample chain of custody forms are available at:

<http://www.calepa.ca.gov/CUPA/Resources/>. (under the inspection section)

### **Sample Logs / Notes**

A notebook should be utilized to document the conditions, techniques, and procedures used during the sampling event. A bound notebook is preferable since it is easier to detect if pages have been removed. Use photographic documentation to show that proper procedures were followed.

### **Quality Control Measures**

Establishing quality control measures will demonstrate proper methods and techniques were followed. For example, inspectors could collect “blind” replicates and/or background samples.

### **Data Interpretation**

Inspectors will need to interpret the analytical results of the samples collected. Understanding the analytical results, units, detection limits, lab spikes / controls / duplicates, and the regulatory thresholds / permit conditions will help inspectors interpret the data.