

**EMERGENCY RESPONSE
QUALITY ASSURANCE SAMPLING PLAN**

FOR

**HURRICANE KATRINA RESPONSE
Screening Level Sampling for Sediment
in Areas Where Flood Water Receded
SOUTHEAST, LOUISIANA**

Prepared by

U.S. Environmental Protection Agency Region 6

1445 Ross Avenue
Dallas, TX 75202
214-665-9780

September 2005

EMERGENCY RESPONSE
QUALITY ASSURANCE SAMPLING PLAN

HURRICANE KATRINA RESPONSE
Screening Level Sampling for Sediment
in Areas Where Flood Water Receded
SOUTHEAST, LOUISIANA

SIGNATURE PAGE

Chris Peterson
U.S. EPA Region 6
Operations Chief
Regional Response Center

Date

Kathleen Aisling
U.S. EPA Region 6
Technical Specialist
Regional Response Center

Date

Randy Sturgeon
U.S. EPA Region 3
Technical Specialist
Regional Response Center

Date

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.	INTRODUCTION	1
1.1	PROJECT OBJECTIVES	1
1.2	PROJECT TEAM	2
1.3	QASP FORMAT.....	2
2.	SITE BACKGROUND	2
2.1	SITE LOCATION AND DESCRIPTION	3
2.2	SITE CONCERNS.....	3
3.	SAMPLING APPROACH AND PROCEDURES	3
3.1	OVERVIEW OF SAMPLING ACTIVITIES.....	3
3.1.1	Health and Safety Plan Implementation	3
3.1.2	Community Relations	4
3.1.3	Coordination of Pesticide Sampling with the State.....	4
3.2	SAMPLING/MONITORING APPROACH.....	4
3.2.1	Sampling	4
3.2.2	Sampling and Sample Handling Procedures.....	6
3.3	SEDIMENT SAMPLING.....	6
3.4	SAMPLE MANAGEMENT.....	6
3.5	SAMPLE EQUIPMENT DECONTAMINATION	7
3.6	SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES.....	7
4.	ANALYTICAL APPROACH.....	7
5.	QUALITY ASSURANCE	11
5.1	QUALITY ASSURANCE SAMPLES	11
5.2	SAMPLE CHAIN OF CUSTODY PROCEDURES	11
5.3	PROJECT DOCUMENTATION.....	13
5.4	DATA VALIDATION.....	17

APPENDICES

APPENDIX TITLE

- A Data Quality Objective
- B Standard Operating Procedures
- C EPA Region 6 Media Specific Screening Levels

TABLE

Table 4-1 Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

1. INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and tasking by FEMA under ESF #10 of the National Response Plan, EPA Region 6 has prepared this Quality Assurance Sampling Plan for EPA Region 6 Response and Prevention Branch to conduct initial assessment activities of residential areas where floodwaters from Hurricane Katrina have receded. This Quality Assurance Sampling Plan (QASP) describes the technical scope of work to be completed as part of this Emergency Response. The objective of this initial sampling is to determine the nature and type of contaminants that may have impacted residential areas due to migration of hazardous materials by flood. Further assessment may be warranted based on the results of this initial sampling, and/or if the particular residential area is located near an area of potential concern (such as an area of known chemical storage), and will be addressed in a subsequent QASP. In addition, the information collected during this phase may be used to develop a plan for further detailed sampling of residential areas in the affected parishes. Initial sampling will be performed at 24 sediment (residue) locations within an area no larger than one-square mile area to be determined by EPA. These locations will be residential areas in southern Louisiana parishes where flood waters have receded to such an extent that the public can be allowed to return. Exact sample locations will be determined in the field by sampling personnel.

1.1 PROJECT OBJECTIVES

The objective is to determine the nature and type of contaminants in sediments in residential areas where flood waters have receded. Sediments samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, herbicides, PCBs and metals, fecal coliform, total petroleum hydrocarbons and percent moisture. This information will be used to help assess the presence of hazardous substances in residential sediments and the potential for exposure of residents to contaminants in sediments.

The objective will be achieved by collecting 24 grab samples with duplicates from surface sediments sample locations in residential areas of southeast Louisiana where flood waters from Hurricane Katrina have receded.

1.2 PROJECT TEAM

The OSC for this assessment is Gary Moore. Gary Moore will direct all field activities. The sampling may be conducted by several field teams. Each field team will coordinate with Gary Moore in determining the location for sample collection in the field, collecting samples as necessary, logging the activities at each sample location in the field logbook, verifying the sample documentation, and utilizing SCRIBE software.

1.3 QASP FORMAT

This QASP has been organized in a format that is intended to facilitate and effectively meet the project objectives. The QASP is organized in the following sections:

- Section 1 - Introduction
- Section 2 - Site Background
- Section 3 - Sampling Approach and Procedures
- Section 4 - Analytical Approach
- Section 5 - Quality Assurance

Appendices are attached with the following information:

- A Data Quality Objective
- B Standard Operating Procedures
- C EPA Region 6 Human Health Medium-Specific Screening Levels

2. SITE BACKGROUND

On 25 August 2005, Hurricane Katrina made first landfall on the south Florida coast, then crossed the state and greatly increased in intensity as it moved over the Gulf of Mexico. On 28 August 2005, Hurricane Katrina turned north and made second landfall on the south U.S. coast, causing massive damage and flooding to broad areas of Alabama, Louisiana, and Mississippi. EPA Region 6, which has responsibility for the State of Louisiana, has sent and is continuing to

send personnel and resources to Louisiana to address hurricane damage. EPA Region IV is providing assistance to the States of Mississippi and Alabama.

2.1 SITE LOCATION AND DESCRIPTION

Areas of southeast Louisiana where Hurricane Katrina flood waters have receded.

2.2 SITE CONCERNS

The primary concern being addressed by this QASP is to screen for hazardous substances, which are hazardous to human health and the environment, in areas where flood waters have receded.

3. SAMPLING APPROACH AND PROCEDURES

Samples collected by EPA Region 6 will be used to evaluate the types of contaminants present.

3.1 OVERVIEW OF SAMPLING ACTIVITIES

The EPA OSC and designated sampling personnel will determine appropriate sample locations. EPA will use SCRIBE software to manage sample data in an electronic format.

3.1.1 Health and Safety Plan Implementation

Health and Safety operations will be conducted consistent with activities and responsibilities of the Incident Command System (ICS). All field activities will be conducted in accordance with a site-specific health and safety plan (HASP). The Field Safety Officer (FSO) will be responsible for implementation of the HASP during all field investigation activities. All EPA contractors and subcontractors will be required to conduct their activities according to the guidelines and requirements of the HASP.

3.1.2 Community Relations

Community relations may require additional EPA involvement due to the general nature of the site. It is anticipated that the EPA OSC will be available at all times, and community relations issues will be directed to the EPA OSC. If the EPA OSC is not present, the sampling personnel will manage community relations in the field as directed by the EPA OSC.

3.1.3 Coordination of Pesticide Sampling with the State

The Louisiana Department of Agriculture and Forestry (LDAF) has sole state authority over pesticides, including use, sale, commercial/industrial container disposal, spills, contamination, and site remediation of pesticide producing or pest control operating facilities within the state of Louisiana. EPA will consult with LDAF on pesticide issues in Louisiana if pesticides are found in this screening level analysis. Dick Watkins is Region 6's point of contact on pesticides issues in Louisiana.

3.2 SAMPLING/MONITORING APPROACH

All samples will be collected in accordance with the US EPA Environmental Response Team standard operating procedure 2012 (Appendix B). The specific sampling procedures are described below.

3.2.1 Sampling

The area to be sampled will be a residential area where the public is or could return at this time. Twenty-four samples will be collected over an area not exceed one-square mile. The EPA OSC will determine this area. The number of samples (24) was selected based on time constraints (i.e., in order to collect all the samples in one day). The area of one-square mile was selected based on the team's judgment that this number of samples would not provide meaningful screening level information if collected over a larger area, and based on logistical concerns in trying to cover a larger area.

For this screening level analysis, biased sampling was selected as the most appropriate method in order to give the highest probability of finding contamination. Therefore, efforts should be made

to bias the samples toward areas that are more likely to contain elevated levels of contamination, such as areas that contain oily sediments or large stains. The 24 samples will be spread throughout the sampling area at locations determined by field personnel (GPS coordinates of samples will be documented). The field personnel may decide not to sample certain areas based on safety and logistical concerns.

All samples will be grab samples collected from the surface by scraping the surface with the appropriate sampling device. Efforts should be made to collect samples that contain finer grained sediments and limit collection of coarse or debris laden sediments. Also, the sample must be of the deposited material and not contain the previously existing soil. The sample will be placed immediately into appropriate sample containers.

Samples will be collected from residential yards or, if access is an issue, from such areas as parks or streets to be determined by the field personnel. This plan assumes that level of contamination in sediment samples collected outside the homes will be approximately the same as the level of contamination found in samples collected inside the home. Therefore, to avoid access and safety issues, sediment samples will only be taken from outside the homes.

The EPA OSC will be notified, and concurrence will be obtained, should significant deviations from the planned sampling scheme be necessary (e.g., due to security concerns). Details regarding deviations of the QASP will be documented in the site logbook.

The samples will be delivered to a laboratory to be specified prior to sample collection. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, pesticides, herbicides, polychlorinated biphenyls (pcbs), total coliform analyses, and total petroleum hydrocarbons (TPHs) analyses will be conducted, utilizing 1) EPA Publication SW-846, test methods for evaluating solid waste, physical/chemical methods, and 2) the environmental microbiology proficiency analytical testing (EMPAT) program testing (the holding time is 24 hours).

3.2.2 Sampling and Sample Handling Procedures

Samples will be collected using equipment and procedures appropriate to the matrix, parameters, and sampling objective. The volume of the sample collected must be sufficient to perform the laboratory analysis requested. Samples must be stored in the proper types of containers and preserved in a manner appropriate to the analysis to be performed.

All clean, decontaminated sampling equipment and sample containers will be maintained in a clean, segregated area. All samples will be collected with clean decontaminated equipment. All samples collected for laboratory analysis will be placed directly into pre-cleaned, unused glass or plastic containers as appropriate based on the particular analytical method. Sampling personnel will change gloves between each sample collection/handling. All samples will be assembled and catalogued prior to shipping to the designated laboratory.

3.3 SEDIMENT SAMPLING

EPA Region 6 will collect 24 sediment samples (plus all appropriate quality assurance samples) as part of the emergency response task to document the type of contaminants in residential areas where flood waters have receded. Quality assurance samples will be collected at the frequency of one duplicate sample for every ten field samples (total of three). Duplicates will be collected concurrently from particular sample locations.

3.4 SAMPLE MANAGEMENT

Specific nomenclature that will be used by EPA will provide a consistent means of facilitating the sampling and overall data management for the project. The OSC must approve any deviations from the sample nomenclature proposed below.

Sample nomenclature will follow a general format regardless of the type or location of the sample collected. The general nomenclature consists of the following components:

- Geographic location.
- Collection type (grab).

- QA/QC type (normal, duplicate, etc.).
- Sequence - An additional parameter used to further differentiate samples.

Sample data management will be completed utilizing the EPA-provided Forms II Lite software.

3.5 SAMPLE EQUIPEMENT DECONTAMINATION

The nondisposable sampling equipment used during the sample collection process will be thoroughly pre-cleaned before initial use, between use, and at the end of the field investigation. Equipment decontamination will be completed in the following steps:

- High-pressure water spray or brush, if needed.
- Non-phosphate detergent and potable water wash to clean the equipment.
- Final potable water rinse.
- Equipment air-dried.

3.6 SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES

Once collected, samples will be stored on ice at 4 degrees Celsius in coolers while at the site and until submitted for laboratory analysis. The samples will be sent by common carrier to the laboratory or driven by the field personnel. See the holding times in Table 4-1 below. Of particular note is the 6-hour holding time for fecal coliform.

4. ANALYTICAL APPROACH

Samples collected by EPA during the sampling task will be delivered to EPA-designated laboratories for VOCs, SVOCs, total metals, pesticides, herbicides, PCBs, fecal coliform analyses and total petroleum hydrocarbons, utilizing EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* and EMPAT Program testing. In determining the nature and extent of potential contamination, analytical results (on a dry weight

basis) will be compared to EPA Region 6 Human Health Medium-Specific Screening Levels (MSSLs) for soils in addition to site-specific background levels. The sediments in these yards may become part of the soil. Additionally, the analytical results will be compared to background. The EPA Region 6 MSSLs are provided as Appendix C. Table 4-1 below provides requirements for containers, preservation techniques, sample volumes, and holding times.

TABLE 4-1

REQUIREMENTS FOR CONTAINERS, PRESERVATION TECHNIQUES, SAMPLE VOLUMES, AND HOLDING TIMES

Bottle	Parameter Category	Collected By	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time	Analytical Methods	Laboratory
Hg	Mercury	EPA	4 oz. wide-mouth glass jar	4°C	Fill to capacity	28 days	SW7471A	TBD
Non-Hg Metals	TAL Metals	EPA	4 oz. wide-mouth glass jar	4°C	Fill to capacity	180 days	SW6010B	TBD
USGS	Fecal Coliform	EPA	8 oz. wide-mouth glass jar	4°C	Fill to capacity	6 hours	ASTM 9222D	TBD
EPA	Volatile Organic Compounds (VOCs)	EPA	8 oz. wide-mouth glass jar with Teflon cap liner	4°C	Fill to capacity	14 days	SW8260B	TBD
EPA	Semi-Volatile Compounds (SVOCs)	EPA	8 oz. wide-mouth glass jar with Teflon cap liner	4°C	Fill to capacity	14 days	SW8270C	TBD
EPA	Pesticides	EPA	8 oz. wide-mouth glass jar – one jar can be used for both Pest and PCBs with Teflon	4°C	Fill to capacity	14 days	SW8081B	TBD

Bottle	Parameter Category	Collected By	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time	Analytical Methods	Laboratory
			cap liner					
EPA	PCBs	EPA	8 oz. wide-mouth glass jar – one jar can be used for both Pest and PCBs with Teflon cap liner	4°C	Fill to capacity	14 days	SW8082B	TBD
EPA	Herbicides	EPA	8 oz. wide-mouth glass jar with Teflon cap liner	4°C	Fill to capacity	14 days	SW8151A	TBD
EPA	TPH	EPA	8 oz. wide-mouth glass jar with Teflon cap liner	4°C	Fill to capacity	14 days	SW8015B	TBD
	% Moisture	N/A	Each Sample				ASTM D2216	

5. QUALITY ASSURANCE

Quality assurance will be conducted in accordance with this Quality Assurance Sampling Plan.

5.1 QUALITY ASSURANCE SAMPLES

The number of QA samples is based upon the assumption that the screening samples (covered by this report) will be conducted in one day. Quality assurance/quality control (QA/QC) samples will be collected according to the following:

- Sampling equipment rinsate blanks will be prepared by pouring laboratory grade deionized water over non-disposable sampling equipment after it has been decontaminated and collecting the rinse water in sample containers for analyses. These samples will be prepared to demonstrate that the equipment decontamination procedures for the sampling equipment were performed effectively. The sampling equipment rinsate blanks will be prepared each day that non-disposable sampling equipment is used. It is estimated that two equipment rinsate samples will be collected during sampling activities.
- Field blanks will be collected when VOC samples are taken and are analyzed only for VOC analytes. The field blank consists of American Society of Testing and Materials (ASTM) Type II reagent grade water poured into a VOC sample vial at the sampling site. It is handled like an environmental sample and transported to the laboratory for analysis. Field blanks are used to assess the potential introduction of contaminants from ambient sources (e.g., gasoline motors in operation, etc.) to the samples during sample collection. Field blanks shall be collected and submitted once per day that VOC samples are collected.
- Material Spike/Material Spike Duplicates will be prepared using a known weight of material and added to a split sample of known weight. The material will be thoroughly mixed to provide a consistent proportion of sample and spike material throughout the sample.
- One duplicate will be collected for every 10 samples. A total of three duplicates will be collected for the 24 samples.

5.2 SAMPLE CHAIN-OF-CUSTODY PROCEDURES

EPA/Contractor will utilize SCRIBE desktop and SCRIBE Enterprise for all sample documentation and chain-of-custody (COC) preparation needs. Because of the sensitive nature of sample collection, the possession of samples must be traceable from the time the samples are

collected until they are introduced as evidence. After sample collection and identification, the samples will be maintained under the COC procedures. If the sample collected is to be split, the sample will be allocated into similar sample containers. Sample labels completed with the same information, as that on the original sample container, will be attached to each of the split samples. All personnel required to package and ship coolers containing potentially hazardous material will be trained accordingly.

A COC record will be completed each time a sample or group of samples is prepared for shipment to the laboratory. The record will repeat the information on each of the sample labels and will serve as documentation of handling during shipment. A copy of this record will remain with the shipped samples at all times, and the member of the sampling team who originally relinquished the samples will retain another copy. EPA/Contractor personnel will complete a COC form for all samples sent to the EPA designated off-site laboratory.

Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

- The COC record will accompany samples. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. This custody record documents transfer of sample custody from the sampler to another person or to the laboratory.
- Samples will be properly packed for shipment and dispatched to the designated laboratory for analysis with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be custody-sealed for shipment to the laboratory. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to the seal to ensure that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape.
- If sent by common carrier, a bill of lading or airbill will be used. Bill of lading and airbill receipts will be retained in the Hurricane Katrina Response Support file as part of the permanent documentation of sample shipping and transfer.

5.3 PROJECT DOCUMENTATION

Field Documentation

EPA/Contractor will perform field documentation of site activities during all fieldwork. The primary methods of documentation will be completion of a field logbook and production of photographic documentation. All documents will be completed legibly and in ink. Any corrections or revisions will be made by lining through the original entry and initialing the change. The following field documentation will be maintained:

Locational Data

Latitude/longitude (“lat/long”) coordinates will be collected and documented with environmental related data samples. This is in addition to, and not precluding, other critical location identification data that may be needed to satisfy individual program or project needs, such as depth, street address, elevation or altitude.

1. A goal of 25 meter level of accuracy will be achieved; managers of individual data collection efforts will determine the exact levels of precision and accuracy necessary to support their mission within the context of this goal. The use of global positioning systems (GPS) is recommended to obtain lat/longs of the highest possible accuracy.

2. Program data managers must collect and document the following information:

- Latitude/longitude coordinates in accordance with federal Interagency Coordinating Committee for digital Cartography (FICCDC) recommendations. The coordinates may be present singly or multiple times, to define a point, line, or area, according to the most appropriate data type for the entity being represented. The format for representing this information is:

+/-DD MM SS.SSSS (latitude)

+/-DDD MM SS.SSSS (longitude)

where:

- Latitude is always presented before longitude
 - DD represents degrees of latitude; a two-digit decimal number ranging from 00 through 90
 - DDD represents degrees of longitude; a three-digit decimal number ranging from 000 through 180.
 - MM represents minutes of latitude or longitude; a two-digit decimal number ranging from 00 through 60
 - SS.SSSS represents seconds of latitude or longitude, with a format allowing possible precision to the ten-thousandths of seconds.
 - + specifies latitudes north of the equator and longitudes east of the prime meridian
 - - specifies latitudes south of the equator and longitudes west of the prime meridian
3. Specified method used to determine the lat/long coordinates (e.g., remote sensing techniques, map interpolation, cadastral survey)
 4. Textual description of the entity to which the latitude/longitude coordinates refer (e.g., north-east corner of site, entrance to facility, point of discharge, drainage ditch).
 5. Estimate of accuracy in terms of the most precise units of measurement used (e.g., if the coordinates are given to tenths-of-seconds precision, the accuracy estimate should be expressed in terms of the range of tenths-of-seconds within which the true value should fall, such as “+/-0.5 seconds”).
 6. Recommended labeling of the above information is as follows:
 - “Latitude”

- “Longitude”
- “Method”
- “Description”
- “Accuracy”

Field Logbook

The field logbook is a descriptive notebook detailing site activities and observations so that an accurate, factual account of field procedures may be reconstructed. The individuals making them will sign all entries. Entries should include, at a minimum, the following:

- Site name and project number.
- Names of personnel on-site.
- Dates and times of all entries.
- Descriptions of all site activities, including site entry and exit times.
- Noteworthy events and discussions.
- Weather conditions.
- Site observations.
- Identification and description of samples and locations, including GPS coordinates (latitude and longitude).
- Subcontractor information and names of on-site personnel.
- Dates and times of sample collections and COC information.
- Records of photographs.
- Site sketches.

Sample Labels

Sample labels will be securely affixed to the sample container. They will clearly identify the particular sample and should include the following information:

- Site name and project number.
- Date and time the sample was collected.
- Sample preservation method.
- Analysis requested.
- Sampling location.

COC Record

A COC record will be maintained from the time of sample collection until final deposition. Every transfer of custody will be noted and signed, and each individual who has signed it will keep a copy of the record. The COC is discussed in Subsection 5.2, Sample Chain-of-Custody Procedures.

Custody Seal

Custody seals demonstrate that a sample container has not been opened or tampered. The individual who has custody of the samples will sign and date the seal and affix it to the container in such a manner that it cannot be opened without breaking the seal.

Photographic Documentation

Photographic documentation will be used by EPA/Contractor to document site conditions and activities as site work progresses. Initial conditions should be well documented by photographing features that define site-related contamination or special working conditions. Representative photographs should be obtained of phase of site activity. The photographs should show typical operations and operating conditions as well as special situations and conditions that may arise during site activities. Site final conditions should also be documented by photograph as a record of how the site appeared at completion of the work.

All photographs will be date-stamped and should be provided by using a film camera, a digital camera, or a video camera capable of recording the date on the image. Details of each photograph should be recorded in the logbook with the location of the photographer (including GPS coordinates), direction the photograph was taken, the subject of the photograph, and its significance (i.e., why the picture was taken). Where appropriate, the photograph location, direction, and subject should also be shown on a site sketch.

5.4 DATA VALIDATION

All finalized data provided by the laboratory will receive a 10 to 20% validation following *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (January, 2005), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (October, 2004), and the Regional Protocol for Holding Times, Blanks, and VOA Preservation (April 13, 1989). This validation will be conducted by a contractor independent from the laboratory. The electronic preliminary data provided by the laboratory will be provided in a Staged Electronic Data Deliverable (SEDD) format and undergo an initial compliance screen using the Automated Data Review (ADR) software.

APPENDICES

APPENDIX A

SEDIMENT DATA QUALITY OBJECTIVE

**DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: Sediment (Residue)**

STEP 1. STATE THE PROBLEM	
Residue (sediment) samples will be collected from areas where flood waters from Hurricane Katrina have receded to screen for the presence of hazardous waste (potential contaminants of concern) that could present an unacceptable risk to human health and the environment, including residents either revisiting or occupying their residences.	
STEP 2. IDENTIFY THE DECISION	
Are there potential chemicals of concern in sediment, represented by a sample, based on comparison to residential screening benchmarks?	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	<ul style="list-style-type: none"> • If any contaminant exceeds the specified benchmark in the sediment, the sediment will need for further characterization (unless the area is near the vicinity of a known chemical storage area). • If no contaminants exceed the specified benchmarks in sediment, no further screening will be necessary for contaminants being analyzed.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	Contaminant concentrations in sediment samples collected from where Hurricane Katrina flood waters have receded from residential areas.
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	<ul style="list-style-type: none"> • Sediment samples from where Hurricane Katrina flood waters have receded from residential areas. • Analytical results from VOC, SVOC, pesticides, herbicides, metals, PCBs, BAC-T, and TPH.
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	For sediment, EPA Region 6 Human Health MSSLs (unless constrained by limits of detection).
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	<ul style="list-style-type: none"> • Grab samples of surficial sediments that appear to be predominately fined-grained . • Locations from yards (specific yards to be determined in field [if access is an issue, samples shall be collected from locations such as parks or streets]). • See Table 4-1 QASP

**DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: Sediment (Cont'd)**

STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	Location within a southeast Louisiana as determined by EPA where the public is being allowed to return.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentrations in sediment at the sample locations.
DEFINE THE SCALE OF DECISION MAKING.	The 24 samples will be collected from an area no larger than approximately one-square mile.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The analytical data will apply until such a time as additional sampling activities are conducted and/or response actions taken.
DETERMINE WHEN TO COLLECT DATA.	Samples will be collected during the field sampling activities.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	Inclement weather.
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	The concentrations of chemicals identified in sediment samples.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	For sediment, EPA Region 6 Risk-Based Concentrations for residential exposure to soil (unless constrained by detection limits).
DEVELOP A DECISION RULE.	If any result in a sediment sample is above the contaminant specific screening level, then further characterization may be necessary (which would be addressed by a QASP for a future phase).

**DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: Sediment (Cont'd)**

STEP 6. SPECIFY LIMITS ON DECISION ERRORS	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from non-detect to above the screening values for sediment
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<u>Type I Error</u> : Deciding that the specified area represented by the sediment sample does not exceed the specified screening level when, in truth, the sediment concentration of the contaminant exceeds its screening level. The consequence of this decision error is that contaminated sediment exists in a neighborhood, possibly endangering human health and the environment. This decision error is more severe.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<u>Type II Error</u> : Deciding that the specified area represented by the sediment sample does exceed screening level when, in truth, it does not. The consequences of this decision error is that further characterization would take place thereby delaying the time when residents may return.
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	The true state of nature when the sediments are decided to be below the screening levels when in fact, they are not below the screening levels, is that further characterization may be necessary. The true state of nature when the sediments are decided to be above the screening levels when in fact, they are not above the specified action levels, is that further characterization may not be necessary.
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H_0) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H_a).	H_0 : The sediments represented by the sample are above the screening level. H_a : The sediments represented by the sample are below the screening level.

**DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: Sediment (Cont'd)**

<p>ASSIGN THE TERMS “FALSE POSITIVE” AND “FALSE NEGATIVE” TO THE PROPER DECISION ERRORS.</p>	<ul style="list-style-type: none"> • False Positive Error = Type I • False Negative Error = Type II
<p>ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.</p>	<p>The assignment of probability values is not applicable to this DQO because these samples are being collected for baseline and screening purposes.</p>
<p>STEP 7. OPTIMIZE THE DESIGN</p>	
<p>REVIEW THE DQOs.</p>	<p>Review results of this screening level sampling event(s) to determine if modification of this DQO is necessary and/or determine what other steps may be necessary.</p>

In developing the DQOs, the team considered the potential exposure routes for residents of dermal exposure, incidental ingestion, and inhalation. These exposure routes, and other risk scenarios will be characterized more fully, and utilized in the development of DQOs for subsequent sediment sampling plans.

APPENDIX B

STANDARD OPERATING PROCEDURE

EPA Environmental Response Team SOP 2012 Rev. 1.0 (7/11/01)

APPENDIX C
EPA Region 6 MSSLs

See: http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm