

US EPA ARCHIVE DOCUMENT

**DATA QUALITY OBJECTIVE  
DEEPWATER HORIZON INCIDENT  
MEDIA OF CONCERN: SHORELINE, NEAR SHORE and OFF SHORE WATER**

<b>STEP 1. STATE THE PROBLEM</b>	
Are water samples collected from the shoreline, nearshore and off shore water pathway affected by contamination due to chemical constituents of dispersant compounds and/or crude oil?	
<b>STEP 2. IDENTIFY THE DECISION</b>	
Are the concentrations of chemicals of concern in the water represented by the water samples at concentrations that may cause negative short and/or long-term impacts on the aquatic environment?	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	<ul style="list-style-type: none"> <li>• If any contaminant exceeds the screening level concentrations in water samples analyzed, the shoreline near and off shore water represented by that sample will be considered contaminated and will require additional attention.</li> <li>• If no contaminants exceed the screening level concentrations in water samples analyzed, the shoreline near and off shore water represented by that sample will not require additional attention.</li> </ul>
<b>STEP 3. IDENTIFY INPUTS TO THE DECISION</b>	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	<ul style="list-style-type: none"> <li>• Contaminant concentrations in shoreline, nearshore and off-shore water samples collected from the assessment boundaries shown on Figure 3-1.</li> </ul>
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	<ul style="list-style-type: none"> <li>• Nearshore water samples collected from 11 sample stations near shore and to be determined off shore locations along the Louisiana coast line.</li> <li>• Monitoring and sampling will be conducted incorporating visual monitoring, real-time water column monitoring and collection of grab water samples. Fluorometric measurements will be used to make measurements of the dispersed oil plume. On board and/or laboratory spectrofluorometer will be used to provide quantitative information on the extent of oil dispersion.</li> </ul>
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	The site specific screening levels for water are based on EPA Saltwater Aquatic Life Criteria - chronic and upon State standards (Appendix D).
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	Water grab samples collected using Kemmerer or rosette (Niskin bottle) samplers analyzed for: VOCs, SVOCs, Alkyl PAHs, dispersant chemicals, COD, BOD, DO, using EPA Test Methods 8260B and 8270C; ASTM Method D7363-07, aqueous direction injection, Std Methods 410.3, 5210B; 360.1; and E353.2 and E445.0.

<b>STEP 4. DEFINE THE BOUNDARIES OF THE STUDY</b>	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	The boundaries for the water sediment and air sampling are shown on Figures 3-1.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentrations and fluorometer measurements in water at the sample locations.
DEFINE THE SCALE OF DECISION MAKING.	The scale of decision will be for the site activities occurring at the time of the sample collection.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The analytical data will apply until the water represented by the sample receives appropriate response action or future samples and analysis replace this data.
DETERMINE WHEN TO COLLECT DATA.	Shoreline water samples will target locations of likely to have oil and/or dispersant contamination. Nearshore water samples will be collected during the field sampling activities at the 11 locations along the Louisiana coastline. The off shore samples will be collected based on the initial condition sampling location criteria outlined in Section 3.2.1.1.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	<ul style="list-style-type: none"> <li>• Inclement weather.</li> <li>• Access not attainable.</li> </ul>
<b>STEP 5. DEVELOP A DECISION RULE</b>	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	The sample concentrations at each sample location will be compared to the water screening levels presented in Appendix D.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	The site specific screening levels for water are based on EPA Saltwater Aquatic Life Criteria- chronic (Appendix D)
DEVELOP A DECISION RULE.	<p>FOR SHORELINE AND NEAR SHORE WATER SAMPLES: If any result in a water sample is above the EPA Saltwater Aquatic Life Criteria then the water represented by that sample will require additional attention, otherwise the water does not require additional attention. Additional attention could result in additional sampling, remedial measures taken to disperse the crude oil and chemical dispersant, or other action deemed necessary by EPA.</p> <p>FOR OFF SHORE WATER SAMPLES: If any result of the real-time water column monitoring indicates a grab sample using a Kemmerer or rosette (Niskin bottle) sampler is required then a sample will be collected for further onboard or fixed laboratory analyses.</p>

STEP 6. SPECIFY LIMITS ON DECISION ERRORS	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from 0 µg/L water to greater than the EPA Screening Levels.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<p><u>Type I Error</u>: Deciding that the specified area represented by the water sample does not exceed the screening levels when, in truth, the water concentration of the contaminant exceeds the EPA Saltwater Aquatic Life Criteria. The consequence of this decision error is that contaminated water will remain in place, possibly endangering human health and the environment. This decision error is more severe.</p> <p><u>Type II Error</u>: Deciding that the specified area represented by the water sample does exceed the screening levels when, in truth, it does not. The consequences of this decision error are that remediation of the water will continue and unnecessary costs will be incurred.</p>
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	<p>The true state of nature when the water is decided to be below the screening levels when in fact, it is not below the screening levels, is that the water does need remedial action.</p> <p>The true state of nature when the water is decided to be above the EPA Saltwater Aquatic Life Criteria when in fact, it is not above the screening criteria, is that the water does not need remedial action.</p>
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H <sub>0</sub> ) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H <sub>a</sub> ).	<p>H<sub>0</sub>: The water represented by the sample is above the EPA Saltwater Aquatic Life Criteria</p> <p>H<sub>a</sub>: The water represented by the sample is below above the EPA Saltwater Aquatic Life Criteria.</p>
ASSIGN THE TERMS “FALSE POSITIVE” AND “FALSE NEGATIVE” TO THE PROPER DECISION ERRORS.	<ul style="list-style-type: none"> <li>• False Positive Error = Type I</li> <li>• False Negative Error = Type II</li> </ul>
ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.	The assignment of probability values is not applicable to these DQOs because a non-probabilistic (judgment-based) process has been specified.

<b>STEP 7. OPTIMIZE THE DESIGN</b>	
REVIEW THE DQOs.	The shoreline and near shore water sample locations were selected based on target locations of likely to have oil and/or dispersant contamination and on the Visual Sampling Plan (VSP) software, and the offshore water sample locations will be selected based on the criteria presented in Section 3.2.1.
<b>DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN.</b> A total of 11 nearshore sample locations have been selected based on VSP along the Louisiana coast line. Grab water samples will be collected at each of these locations for laboratory analytical testing for VOCs, SVOCs, alkyl PAHs, dispersant chemicals, COD, BOD, DO; Std Methods 410.3, 5210B; 360.1; and E353.2 and E445.0. Additionally eco toxicity testing will also be performed on a subset of the grab samples. Off shore samples collection will be based on visual observation and fluorometer monitoring. Grab samples may be collected for additional on board or laboratory testing.	