

**UNITED STATES DISTRICT OF COURT
EASTERN DISTRICT OF LOUISIANA**

**IN RE: OIL SPILL BY THE OIL
RIG "DEEPWATER HORIZON"
IN THE GULF OF MEXICO,
ON APRIL 20, 2010**

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MDL No. 2179

SECTION: J

**JUDGE BARBIER
MAG. JUDGE SHUSHAN**

THIS DOCUMENT RELATES TO ALL CASES

ORDER

CONSIDERING the Consent Motion of the United States of America, appearing on behalf of the Joint Investigation of the United States Coast Guard and the Bureau of Ocean Energy Management, Regulation and Enforcement (JIT), seeking an order permitting the JIT, through the United States Geological Survey (USGS), to conduct testing of the rock and drill cuttings in accordance with certain protocols as set forth in its motion and otherwise relieving the United States from any contrary obligations as may be set forth in Paragraph 14 of the Court's Pretrial Order No. 1, as amended,

IT IS ORDERED that the JIT be and is hereby permitted to conduct the following destructive testing:


1. Rock sample: A carbon isotope analysis on one of the rock samples in the custody of the USGS. This analysis will destroy about 0.3 grams of the sample. The 0.3

grams will be taken from the half of the sample that the USGS originally prepared for testing. The remaining half will not be affected.

2. Drill cuttings: Destructive testing as set forth in the attached 2-page protocol titled Drill Cuttings Protocol.

IT IS FURTHER ORDERED that Paragraph 14 of the Court's Pretrial Order No. 1, as amended, be and is hereby amended to the extent necessary to permit the foregoing testing.

New Orleans, Louisiana, this 25th day of February, 2011.


United States District Judge

Drill Cuttings Protocol

Initial analyses proposed for USGS Denver laboratories. Subsequent analyses will depend on results from these analyses.*

Representative portions of each sample will be kept for the record. No sample will be completely consumed during analyses. Some samples may be too small to perform all tests or analyses.

order	Analysis	Results	Purpose	Sample amount required	Sample requirements	Comment
1	Photograph and weigh	digital images - weight of sample	documentation	N/A	non-destructive	
2	Macro photography - Stereo microscopy	digital images - higher magnification	documentation - identify features for further analyses	N/A	non-destructive	
3	Visible-infrared reflectance spectroscopy	wavelength spectra	phase/component/contaminant identification	N/A	non-destructive	Using handheld reflectance spectrometer
4	Variable pressure SEM w/ x-ray microanalysis	high magnification images - chemical data - phase identification	determine components, structure, texture	N/A	non-destructive	Phase chemistry less accurate than 5. Resolution for x-ray analysis not optimum. Larger samples may not fit into the analysis chamber.
5	SEM and x-ray microanalysis - high vacuum mode. Optical petrography.	high magnification images - chemical data - phase identification	Determine components, structure, texture. Determine accurate phase chemistry. Identify trace phases. Identify and document distinctive textures and morphology	Portion of sample. Depends on sample homogeneity and grain/feature size.	Requires portion of sample to be removed and processed for analysis. Polished section and/or grain mount(s). Processed sample can be preserved for future analysis and for the record.	More accurate and precise phase chemistry. Ability to analyze grain texture. Ability to do fully quantitative analysis of textures and phase chemistry to the limits of the technique. Optical petrography can be done on same polished sections and grain mounts.
6	X-ray diffraction analysis (XRD)	x-ray diffractogram for phase identification of crystalline materials	Identify major and minor phases. Confirm SEM identification. Provide estimate of relative proportions of phases	0.1 - 3 grams	Requires grinding of a portion of the sample. Prepared sample can be preserved for future analysis.	Some samples may be too small for this analysis or results may be less accurate if sample weight is not optimum. Results and time required for analysis will depend on amount of sample used.
7	Bulk chemistry - XRF and/or ICPMS	major and trace element bulk chemistry	Obtain accurate and precise bulk chemistry of sample	0.5 grams	Requires dissolution of portion of sample.	Results will depend on homogeneity of sample. Some samples may be too small for this analysis.

* Results from the above will allow us to determine if the samples are rock, cement (and possibly type), or other material. The results will also provide quantitative information on phases present, phase chemistry (major and trace), textures, grain size, and contaminants. Additional analyses required such as microprobe, hydrocarbon, compressive strength, density, etc. can then be determined as appropriate based on results from above. All of the above may not be needed for each sample.

Cuttings protocol page 2 of 2. Cuttings analysis will follow the process outlined below as previously submitted to the Joint Investigation for the 40 "rock" samples.

Initial analyses to be conducted by USGS Denver laboratories on the Deepwater Horizon samples. Subsequent analyses will depend on results from these initial analyses.

Forty samples were obtained under chain-of-custody from BOEM (formerly MMS) and Phillip Brickman; from the law firm of Fowler, Rodriguez, Valdes-Fauli. The samples are currently undergoing non-destructive analyses to begin addressing the following three questions posed by BOE;

1. Are the samples from the Deepwater Horizon (MC-252 G32306 1) well?
2. Are the samples rock, cement or some other material?
3. If the samples are from the MC-252 G32306 1 well, at what depth did the samples originate?

The USGS plans to take a stepwise approach to answer as many of the above questions as possible. The USGS is beginning with nondestructive characterization of the samples. The samples will be photographed, described by petrologists, and weighed. Following this initial examination the samples will be analyzed as described in the attached spreadsheet. Initially, only the non-destructive techniques will be employed (1 through 4). The results from these analyses will be evaluated prior to any destructive testing. No destructive analyses will begin until permission is received in writing from BOEM and DOI.

Unless otherwise instructed from BOEM and DOI, a representative portion of each sample will be left for the record. At this time USGS plans to use no more than one half of each sample for analyses. It must be understood that in any destructive procedure, it is not always possible to preserve the intended amount of sample, however, every effort will be made to do so. Many of the analyses will require preparation of sub-samples, such as petrographic thin sections, polished grain mounts, and x-ray diffraction powder mounts, that will be analyzed by non-destructive methods and will be available for future analyses and for the record. Some samples may be too small to perform all analyses. The attached spreadsheet describes the initial proposed analyses, the amount of sample required, and the expected results.

During sample preparation, all processes requiring modification of samples will be thoroughly documented with photographs and a description of the preparation procedure. This documentation will become part of the final report prepared by USGS. After initial analysis of a sample it may be determined that further analyses would best be done by a certified laboratory specializing in a specific type of analysis such as compressive strength. If such an analysis is required, the sample will be shipped to the certified laboratory for testing under chain-of-custody and the laboratory will need to be unbiased and independent of the parties related to the investigation. Results of any outside analyses will be incorporated into the final USGS report.