

**GOMRI Quality Assurance/Quality Control for Petroleum Compounds
and Related Compounds Meeting
January 26, 2014
Summary Report**

The session was introduced by Chuck Wilson, Chief Scientific Officer of GOMRI followed by presentations by John Farrington and Jürgen Rullkötter of the GOMRI Research Board and two GOMRI Investigators with biogeochemical and analytical chemistry experience related to petroleum hydrocarbons in marine ecosystems, Terry Wade of Texas A&M University and the GISR Consortium and Chris Reddy of Woods Hole Oceanographic Institution and the DEEP-C Consortium. Chris made a presentation on behalf of Steven Wise of the U. S. National Institute of Standards and Technology (NIST) and himself. The Power Point presentations are accessible through the 2014 Conference website

(<http://2014.gulfofmexicoconference.org/program/related-events/>)

The basic messages were the following:

First principles of good science and past experience support the need for individual laboratory QA/QC practice and for Interlaboratory QA/QC Intercomparison/Intercalibration exercises. This is fundamental to best scientific practice for assessment, improvement, and confirmation of the quality of data. This process establishes a framework for integrating sets of data from different laboratories to provide: (1) status and trends of data and fates of various chemical constituents of petroleum and dispersants and reaction and biodegradation products, (2) composition and concentration calibrations for biological effects research, (3) benchmarks for future inputs of petroleum chemicals and dispersants to the Gulf of Mexico, and meets the expectations of the legal system which may wish to use such data in the case of future oil spills.

Millions of individual organic chemicals are in oil contaminated samples and they have a range of chemical and physical properties. These complex mixtures may have been subjected to physical and chemical alteration processes such as evaporation, adsorption, photochemical oxidation, and biological processes such as biodegradation and transformations by microbes and metabolism by marine animals. They present a challenge for analyses.

Attention to procedural blanks, matrix duplicates, instrument calibration, recoveries of internal standard spiked to samples and ascertaining analytical precisions and reproducibility in each laboratory is part of expected good laboratory analysis practice. There are several guides or manuals for analyses of several of the constituents of crude oil and of crude oil chemicals in matrices such as sediments and tissues. These have been developed over many years. Examples of the application of such methods were provided.

However, the use of standard methods or recommended methods does not guarantee high quality data. Each laboratory must assure that the standard methods, or comparable methods, yield high quality results by using certified standards and round-robin Intercomparison exercises among laboratories.

Terry Wade shared the experience of his laboratory's experience in participation in several QA/QC Intercomparison exercises over the past thirty years. He noted that several programs had required participation of analytical laboratories in Intercomparison exercises early in the programs or even in a pre-contract award qualification period.

There are various appropriate Standard Reference Materials available from the U.S. National Institute of Standards and Technology (NIST) as noted in the presentation by Chris Reddy. A working reference material for weathered Gulf of Mexico oil is in process with the samples prepared in batch vials. Chris Reddy presented results of analyses of the weathered oil by his laboratory and explained that NIST was prepared to distribute the batch of vials to interested laboratories and would collate the data as a step toward preparation of SRM 2777 – Weathered Gulf of Mexico Oil. Chris invited those interested to contact Steve Wise at NIST (Contact info) or him. They are keen to move this important Intercalibration/Intercomparison exercise forward since several laboratories, including GOMRI funded laboratories, are analyzing samples from the Gulf of Mexico that are reported to contain weathered DWH MC252 crude oil.

General Discussion.

There were questions and comments from the audience related to the range of data reported for the putative MC252 oil from field samples that had a range of concentrations for various alkylated chrysenes. This spoke to the need for the type of intercomparison exercise suggested and follow-up activities to ascertain the source of the range of concentrations reported.

During the discussion, audience members made reference to the need for standards of individual alkylated PAH in addition to those now available from chemical supply laboratories.

There was a point made from the audience that perhaps the time had come to do away with people reporting total petroleum hydrocarbons (TPH) in samples since the methods used by people and the term meant different things to different analysts, and when reported in the literature seemed to contribute to some confusion. There was no consensus around this point, but again it illustrated the need for best practice in QA/QC.

Chuck Wilson asked for a sense of the meeting as to whether the specific offer by Chris Reddy and Steve Wise for distribution of the weathered crude oil sample for a GOMRI Intercalibration/Intercomparison exercise was recommended. Several audience members stated yes. There was a majority of heads nodding yes. No objections were noted or heard and

several people involved in analyses approached Chris Reddy and other speakers after the meeting to voice their individual support and strong interest.