RESPONSE TO JUNE 14, 2010 INFORMATION REQUEST FROM THE HONORABLE EDWARD J. MARKEY AND THE HONORABLE LOIS CAPPS CONCERNING ACTIVITIES RELATED TO ENVIRONMENTAL AND WORKER HEALTH IMPACTS

JULY 23, 2010

1. Please provide the coordinates for all ships used for sampling that have been funded by BP as a part of the cleanup effort, including all independent contractors and recruited locals, since April 20, 2010. Please provide all data collected by these ships, including but not limited to rotifer toxicity, dead or stranded wildlife, methodology and associated data for monitoring or calculating the total volume of oil leaked and oxygen concentration/sampling.

BP appreciates the importance of providing reliable and timely information regarding water quality and chemistry gathered in connection with the incident. Much of the data referred to in the request is already available on the BP website.[1]

Additional data from the Unified Command's water column sampling program (conducted by the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA) and BP scientists on the *R/V Brooks McCall*, the *R/V Ocean Veritas* and now the *R/V Ryan Chouest*) has recently been assembled, including data from NOAA and the EPA, and this data is now posted on the BP website consistent with the EPA monitoring directive and efforts to bring greater transparency to the monitoring process.[2] This information and the analytical data and sampling plans from the other types of water, air, and sediment monitoring conducted by BP or its contractors is available from the "Monitoring and Sampling Information" page of the BP website.[3] New or additional monitoring data from the continuing sampling programs will similarly be released as they become available for posting. Please note that these results do not include data from samples collected by government agencies or other researchers not directed by the company. With regard to your request for ship locations, sampling location information is included with analytical results where applicable.

Finally, although BP is not currently collecting data on dead or stranded wildlife, the Unified Command has a program for reporting and collecting information at its website.[4]

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[1] *See* http://www.bp.com/sectiongenericarticle.do?categoryId=9033821&contentId=7062498.

[2] *See* http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062604.

[3] *See* http://www.bp.com/sectiongenericarticle.do?categoryId=9033821&contentId=7062498.

[4] *See* http://www.deepwaterhorizonresponse.com/go/doctype/2931/55963.

2. Has BP sampled air and water to monitor for the presence of ingredients of the dispersants Corexit 9500 and 9527? If yes, what are the results of this sampling? If not, why not? Please provide all data relating to the air and monitoring data, including the date the sample was taken, coordinates of sampling location, sampling equipment used and the limit of detection.

The EPA and BP are involved in monitoring the air and water around worksites and along the shoreline for dispersant components. BP is working with the EPA to test air and water samples and track any potential effects of dispersants, and to ensure that protective measures are adequate. To the best of our knowledge, the samples taken so far have shown very low to non-detectable levels of dispersant ingredients. Monitoring data is posted at http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062604 and http://www.epa.gov/bpspill/dispersants.html#bpdata.

BP in coordination with the Unified Area Command (UAC) is working closely with the Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) in conducting industrial hygiene monitoring of the response workers. These monitoring results have shown that worker exposure levels to dispersant ingredients are usually below the detection level and when detected, significantly below occupational exposure limits. We have provided below a link to BP's detailed industrial hygiene monitoring data and summaries of that data presented in a chart format. http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062609.

In particular, the following monitoring studies have been performed:

Monitoring studies to test for the presence of 2-butoxy-1-ethanol, a component of Corexit EC9527A but not EC9500:

- Monitoring by BP in select industrial hygiene samples. Results are posted on the BP web site at http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062609.
- Monitoring by BP in coastal and near shore water and sediment. Results and sampling locations are posted on the BP web site at http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062586.
- Monitoring by the OSHA of worker air samples. Results and work activities are posted on the OSHA web site at http://www.osha.gov/oilspills/index_sampling.html.
- Monitoring by the or EPA of shoreline air using mobile analytical methods. Results are posted on the EPA web site at http://www.epa.gov/bpspill/taga.html.
- Monitoring by the EPA in shoreline water. Results are posted on the EPA web site at http://www.epa.gov/bpspill/water.html#cumulative.

Monitoring studies to test for the presence of 1,2-propanediol (propylene glycol), a component of both Corexit EC9527A and EC9500:

- Monitoring by BP in coastal and near shore water and sediment. Results and sampling locations are posted on the BP web site at http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062586.
- Monitoring by OSHA of worker air samples. Results and work activities are posted on the OSHA web site at http://www.osha.gov/oilspills/index_sampling.html.
- Monitoring by the EPA in shoreline water. Results are posted on the EPA web site at http://www.epa.gov/bpspill/water.html#cumulative.

Monitoring studies to test for the presence of 2-sulfo-butanedioic acid, 1,4-bis(2-ethylhexyl) ester (dioctyl sulfosuccinate), a component of both Corexit EC9527A and EC9500:

- Monitoring by the EPA in shoreline water. Results are posted on the EPA web site at http://www.epa.gov/bpspill/water.html#cumulative.

Monitoring studies have been performed to test for the presence of 1-(2-butoxy-1-methylethoxy)-2-propanol (dipropylene glycol monobutyl ether), a component of Corexit EC9500A:

- Monitoring by the EPA of shoreline air using mobile analytical methods. Results are posted on the EPA web site at http://www.epa.gov/bpspill/taga.html.

3. **It is my understanding that 30,000 gallons of drilling mud was used in the failed "top kill" procedure and much of that found its way out of the pipes and into the ocean. It is my understanding, for example, that in addition to the synthetic oils and other chemicals that are used to make drilling mud, that BP may have included as much as 30% ethylene glycol, which is a common antifreeze, to ensure that methane hydrates didn't form during the procedure. Ethylene glycol is also toxic. To understand the potential effect the drilling mud may be having on the marine ecosystem, please list all ingredients that made up the drilling mud used in the failed "top kill" procedure.**

The U.S. Coast Guard and the Minerals Management Service approved the top kill procedure, including the ingredients for the drilling mud. The ingredients used in the procedure were: fresh water (which, as used, contained a sodium chloride brine solution), caustic soda, DUOVIS (which consists of xantham gum and Glyoxal), ethylene glycol, and MI BAR (which consists of Barite and Crystalline Silica Quartz). The ethylene glycol used was a 30% solution, meaning that it was diluted with water at 30% concentration. That solution is what was added to the mud. BP used approximately 30,000 barrels of drilling mud in the top kill procedure.

4. **How much methanol has BP pumped into the ocean as a part of the mitigation efforts? Is BP continuing to use methanol to prevent the formation of hydrates? If**

so, how much methanol is currently being used and how is that figure determined? If not, when did BP start and stop discharging methanol into the ocean? Please provide all measurements and data that pertain to methanol used in the mitigation effort.

As of July 1, 2010, BP had pumped approximately 11,330 gallons of methanol in direct connection to the operations at the wellhead. BP is continuing to use methanol to mitigate hydrate formation at a rate of about 2-8 gallons/minute, depending on the mitigation operation. While the test facility is in recovery mode, the methanol is returned to the surface along with the captured oil and gas. At this time, both the oil and methanol are stored on the Enterprise.

The spreadsheet being produced at BP-HZN-CEC0079795 through BP-HZN-CEC0079798 tracks the amount of methanol being pumped as part of the mitigation effort. As for total methanol used during the mitigation effort, which includes pumped amounts and amounts used in other service, BP has used more than 168,000 gallons since the start of the mitigation effort.

5. **What are the methane concentration measurements for the area surrounding the leak site? Please provide the date of measurement, sampling equipment used, coordinates for sample location, and limit of detection of the equipment.**

BP monitors the air quality on the vessels that operate at the leak site in order to protect worker health and to help prevent potential fire hazards associated with exposure to methane and other crude oil constituents. The monitoring is conducted pursuant to the Offshore Air Monitoring Strategy.

Fire and explosion hazards and controls are assessed using handheld or stationary direct reading instruments with catalytic bead sensors for 0-100% Lower Explosive Limit (LEL). LEL sensors are not substance-specific. These sensors measure methane and other combustible gases present in the environment. The limit of detection or resolution for the LEL sensor is 1.0%. Monitoring data for vessels located at the leak site is available beginning on April 27, 2010. As of June 28, 2010, the average LEL concentration is 0.1% over an average of 16,239 measurements collected.

6. **Has BP been collecting monitoring data in accordance with OSHA standard 1910.120(h)(1)(i) regarding employee exposure to hazardous concentrations of hazardous substances? Please describe the methodology used to collect this data. What actions has BP taken in response to air quality measurements that exceeded the levels of concern or NIOSH recommended exposure limits?**

Monitoring for environmental and public health impacts is a joint effort among BP and several governmental agencies (*i.e.,* OSHA, the EPA, the Centers for Disease Control (CDC), NIOSH, and State Health Organizations (SHOs)). Results are posted on BP's website for daily air monitoring and sampling, water sampling, and health monitoring, and the Unified Area Command updates results on the Deepwater Horizon Response

website for air quality monitoring and water and sediment testing. The EPA also monitors and posts on its website air quality and water monitoring results.

In response to your question about air quality monitoring in particular, BP conducts air monitoring in accordance with air monitoring plans that have been approved by the Unified Area Command and are in compliance with 29 C.F.R. § 1910.120(h)(1)(i). They are designed to ensure selection of proper engineering controls, work practices, and personal protective equipment so that workers are not exposed to hazardous-substance levels in excess of the Permissible Exposure Limits (PEL) set by OSHA, the Threshold Limit Values (TLV) set by the American Conference of Governmental Industrial Hygienists (ACGIH), and/or the Recommended Exposure Limits (RELs) set by NIOSH.

To ensure that safety measures, designed to protect the workforce, remain effective, BP as part of its industrial hygiene program has engaged approximately 100 industrial hygienists and technicians to monitor area and personal exposures at the offshore, near-shore, and beach work areas. The air monitoring strategy includes both the use of real-time measurements and personal samples to demonstrate that safety systems including respiratory protection usage remain effective.

In particular, the technicians are using direct-reading instruments to conduct real-time monitoring for lower explosive limits for chemicals, and they monitor for exceedances of safe occupational exposure thresholds for benzene, hydrogen sulfide, carbon monoxide, oxygen, and other volatile organic compounds. The technicians in the offshore source-control area also monitor for sulfur dioxide and particulate matter. This real-time monitoring allows personnel to respond quickly to prevent over-exposure, provide necessary respiratory protection, or take any additional precautions.

Site action levels are set for the airborne hazards referred to above, and when an air-monitoring technician confirms a consistent reading above these action levels, they immediately inform the appropriate personnel—the vessel captain, in the case of offshore operations, or the site officials, in the case of onshore or near-shore operations. Work is then restricted in that area to workers wearing appropriate respiratory protection or else they must leave the area of exposure. It should be noted that in the case of vessel workers working offshore, they must first undergo the vessel's respiratory protection program that includes training, medical certification, and appropriate fit-testing for the respirator(s) that may be utilized for specific activities.

In addition to the real-time monitoring described above, Organic Vapor Monitor (OVM) badges are used to assess any personnel exposures to benzene, ethyl benzene, toluene, xylene and total hydrocarbons. In offshore operations, OVM badges are placed on personnel identified as having the highest potential for exposure, and monitoring is conducted on workers who spend the most time on the deck each day. For onshore and near-shore operations, the objective is to sample 10% of the representative population. The number of samples taken is based on an analysis of similar exposure groups, which consist of workers having the same general exposure profile based on, for example, the similarities of the tasks they perform and the materials with which they work.

OVM badges are analyzed pursuant to OSHA-approved methodologies by a laboratory accredited by the American Industrial Hygiene Association. The laboratory results are reviewed by a certified industrial hygienist who investigates any exposures above OSHA PELs, ACGIH TLVs, or NIOSH RELs to determine whether the proper workplace controls were in place or whether they need to be modified.

To date, more than 9,000 personal samples have been taken of workers involved in source control activities, offshore and near-shore operations, beach cleanup, and other response activities. In the vast majority of cases, there have been no significant exposures to airborne concentrations of benzene, total hydrocarbons or dispersant chemicals of interest. In the small number of cases where exposure data was slightly above the applicable limit, the issue was investigated and has usually been attributable to an unusual, nonrecurring event (e.g., a marine vessel fuel or hydraulic leak).

As sample results are validated, personal exposure data are shared with OSHA, NIOSH, the CDC and the EPA. Sample results are also published on the BP website at http://www.bp.com/genericarticle.do?categoryId=9033821&contentId=7062609.

7. There have been numerous reports of illness experienced by those responding to the BP spill, and given both the short-term and potential long-term health effects of exposure to oil, gas and dispersants, it may be important to monitor the health of these individuals well into the future. What procedures are you taking to maintain records of all BP workers, contractors and recruited local residents that are assisting in the cleanup of the oil spill? Do you maintain records of their contact information, dates that each individual worked, and how many hours were logged? Do you also maintain records of what type of cleanup activities each individual partook in and the type of personal protective equipment they were given (i.e. respirators, gloves, hazmat suits)?

BP takes very seriously the health and safety of every individual involved in the response effort. BP provides identity badges for most of the workers assisting in the cleanup, and the computer system for the badges tracks contact information of the workers. The workers without badges include those who are assisting with the skimming efforts and BP's Vessels of Opportunity program, since badges are a means of security and those particular workers generally do not enter the Incident Command Post sites or staging areas.

All workers assisting in the effort, including those without identity badges, must undergo training, which covers, among other things, any hazards associated with their assignments. To complete the training, individuals must provide their contact information, which is kept in a database maintained by a BP contractor. In addition, individuals assisting in the response effort have the opportunity to provide contact and other personal information to NIOSH as part of its rostering study. BP and the Unified Area Command support the rostering study and the goal of identifying all workers, including volunteers, involved in all response and cleanup activities. The NIOSH

rostering effort should be useful for short-term and long-term response worker health studies.

Given the massive number of volunteers and contractors, BP does not currently maintain records specifying for each individual worker the actual number of hours worked, the specific tasks conducted, and the type of personal protective equipment used. However, BP is cooperating with NIOSH in that agency's rostering program, described above, which will provide that information for the workers who agree to participate in the program. It is our understanding that worker participation in the NIOSH rostering has been very good.