



From: Chau, May T

Sent: Thu Sep 16 19:33:56 2010

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Cc: Benko, Brittany D; West, Mike; Flynn, Steve A; Heron, Richard; Pickett, James; Germany, Ruth A; Rainey, David I; Utsler, Michael J

Subject: Health Monitoring Summary Report – 15th September 2010

Importance: Normal

Attachments: Health Monitoring Summary Report 15 September 2010.DOC

Hello everyone,

The September 15th Health Monitoring Summary Report and the Detailed Data Report are now available on [REDACTED] The summary report is attached here for your interest. The next reports will be published in two weeks.

The Master Data Report prepared for OSHA and other agencies has also been posted on the Safety and Health Information sharepoint.

The summary report was written and reviewed by Fred Tremmel, Stan Burt, Jim Pickett and May Chau.

Thank you all for your continuous support of the IH program in this MC252 Response.

Regards,
May

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Personal Exposure Monitoring Results Summary

BACKGROUND - Since the tragic Deepwater Horizon Incident on 20th April 2010, BP has participated in a major multi-agency effort to control the release and mitigate effects of the related Mississippi Canyon 252 (MC252) oil leak.

From the beginning, Unified Area Command (UAC) and associated Incident Management Teams (IMTs) have worked diligently to protect response personnel. On 15th July 2010, the well was capped. As of 15th September 2010, the relief well drilling operation is in progress. More than 19,000 people from BP staff, contractors, governmental and industry employees and volunteers are at sites providing ongoing response.

Regarding worker health, it is important to recognize that potential oil and dispersant exposure risks have been considered when selecting work methods to address the spill. For example, engineering and administrative controls have been considered the preferred method in reducing worker and public exposures. However, in cases where additional protection may be needed, personal protective equipment has been employed. As a result, health risks associated with spill response have been mitigated to a significant extent. Additionally, to assure that potential risks are not having a harmful effect on workers; BP has coordinated with the UAC to implement a comprehensive industrial hygiene monitoring program.

MONITORING PROGRAM - Areas where response workers perform their activities have been characterized into three general types:

1. **Offshore** - includes people on vessels operating near the leak source.
2. **Near shore** - includes people operating or working on vessels closer to shore (typically involved in oil spill boom handling, oil skimming, oil clean-up, etc.)
3. **Beach** - includes people performing land based clean-up.

After considering the nature of the crude oil, weathered crude oil, dispersants, and mixtures of those components, BP and the UAC selected methods and chemical constituents to be monitored. BP, as part of its industrial hygiene program, has engaged more than 200 industrial hygienists and technicians to monitor area and personal exposures within the three work areas. As a result of the capping of the well, reduction of oil in the environment, and a commensurate reduction in the workforce, as of 15th September 2010, approximately 50 industrial hygienists and technicians are at sites providing ongoing response.

BP's air monitoring program includes the collection of both personal samples and "real time" measurements. Personal samples, collected on individual workers and used to assess potential exposures to targeted chemicals, require subsequent laboratory analysis. "Real-time" measurements, collected using instruments that sample air within a given area instantaneously, provide immediate concentrations of targeted chemicals. These results can be used to trigger mitigation actions (such as engineering, administrative controls and/or respiratory protective equipment to protect workers.)

Regarding personal samples, individuals selected for monitoring are typically selected because their work is representative of workers in the same area performing similar tasks. After a personal sample has been collected, it is promptly sent to a certified laboratory for analysis. Samples and analyses undergo quality control and quality assurance. Sample results must then be validated. Validated results are then uploaded into appropriate databases. Although the entire process can take a couple of weeks, it is important to follow these procedures carefully to assure the results are correct and accurate.

RESULTS AND LIMITS - BP continues to provide regular result summaries from validated personal monitoring in each of the three work areas. There are a small number of non-

validated samples (less than 0.2% of the total number) not included in the current summary that are being investigated or validated to assure the integrity of the sampling result. In cases where a sample is ultimately determined not to have been collected in a manner consistent with accepted industrial hygiene practice, the associated sample result may be rejected and consequently not included in the data summary. To date, there has only been one validated sample collected that was in excess of the OSHA PEL. In that case the exposure was attributed to an unusual, nonrecurring event and this instance was not representative of daily exposures associated with that task.

As of 15th September 2010, more than 18,000 personal samples have been collected on workers involved in the response. Personal monitoring results (shown graphically below) indicate that in the vast majority of cases there are no significant exposures to airborne concentrations of chemicals of interest. This is consistent with analyses at the leak source which indicate that, by the time crude oil reaches the water's surface, constituents of most concern (e.g., benzene, toluene, ethylbenzene, and xylenes) are not present in concentrations known to be harmful. This is also consistent with results obtained by governmental agencies such as OSHA and NIOSH that have conducted their own industrial hygiene monitoring of response workers. Some of the terminology referenced in graphical summaries is explained below:

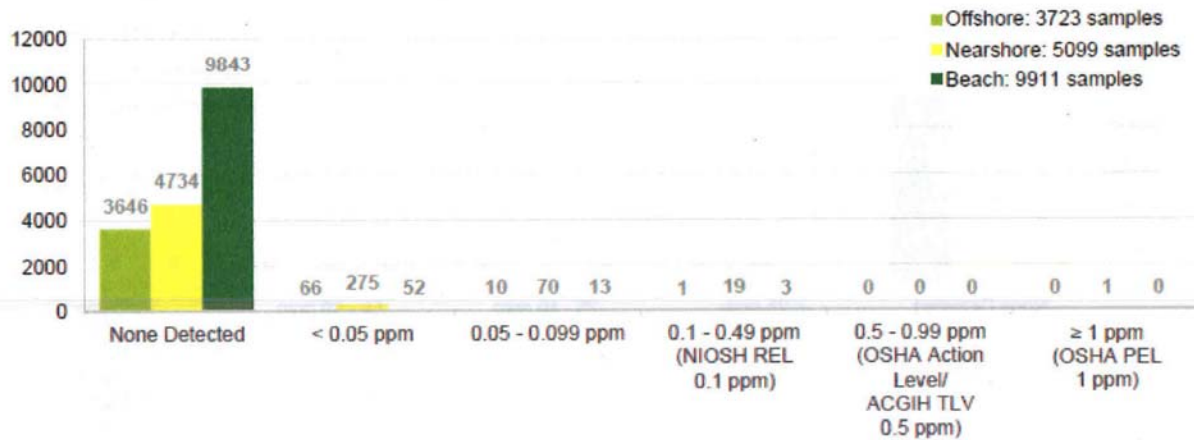
- OSHA Occupational Permissible Exposure Limits (PELs) are the permissible concentrations in air of substances to which nearly all workers may be repeatedly exposed 8 hours a day, 40 hours a week, for 30 years without adverse effects (ref. OSHA 29 CFR:1910.1000)
- NIOSH Recommended Exposure Limits (RELs) provide time weighted average concentrations for certain chemical constituents for up to a 10 hour workday during a 40 hour work week (ref. NIOSH Pocket Guide to Chemical Hazards). Although they do not constitute a legal requirement, they are often more stringent than the OSHA corresponding permissible exposure limit for that chemical.
- ACGIH Threshold Limit Values (TLVs®) refer to airborne concentrations of chemical substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effect(ref. ACGIH TLVs® and BEIs® for Chemicals Substances and Physical Agents). Although they do not constitute a legal requirement, ACGIH TLVs® are often more stringent than the OSHA corresponding permissible exposure limit for that chemical.

FINAL NOTES - Fresh and weathered crude oil are comprised of a wide range of hydrocarbons including aliphatic and aromatic hydrocarbons. These hydrocarbon combinations, when sampled together, are referred to as "total hydrocarbons". When "total hydrocarbons" are monitored, associated results provide an indication of whether one or more particular hydrocarbon constituents may be elevated. Correspondingly, if a total hydrocarbon sampling result is sufficiently low, that provides assurance that the individual constituents are also present at only low levels. Although there is no regulatory or recommended occupational exposure limit for total hydrocarbons in crude oil vapors, BP has adopted an internal guideline of 100 ppm as an action level. This guideline has been adopted after considering existing TLVs® for other complex hydrocarbon mixtures (gasoline, naphtha, diesel fuels, Stoddard solvent and aliphatic hydrocarbons gases) that contain many of the light components found in crude oil vapors. This action level is believed to adequately protect against potential health effects commonly associated with the inhalation of crude oil vapors.

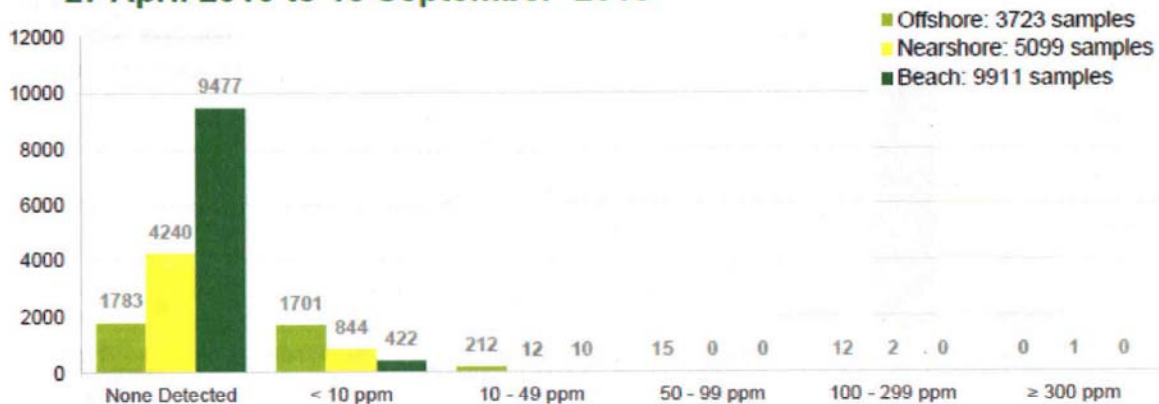
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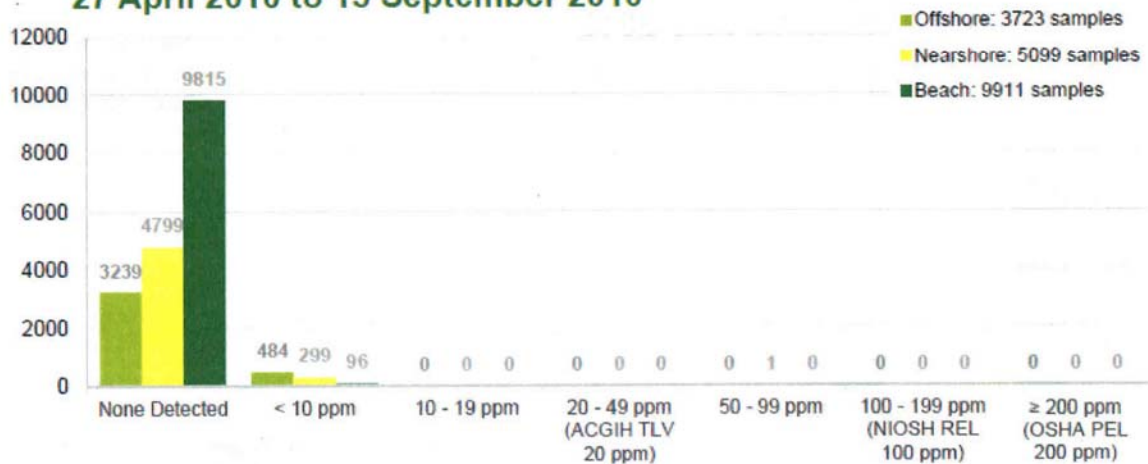
MC252 Benzene Personal Sample Results 27 April 2010 to 15 September 2010



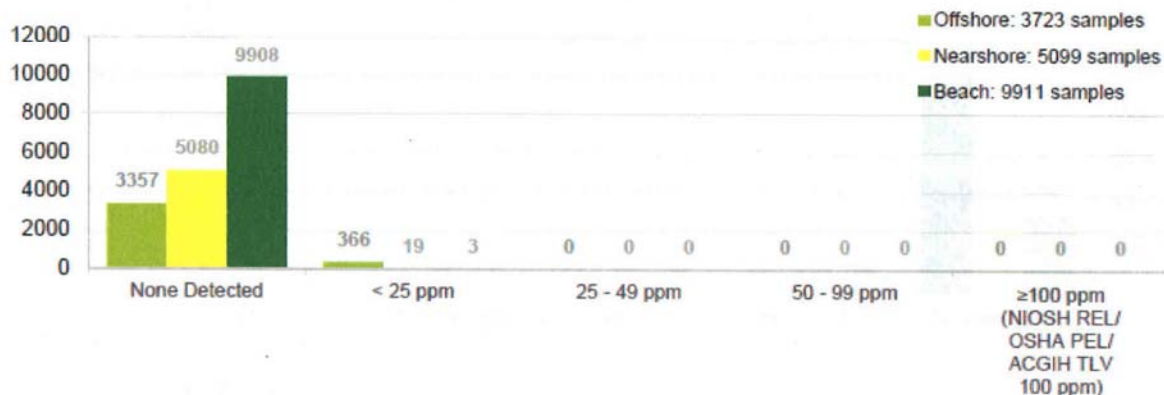
MC252 Total Hydrocarbon Personal Sample Results 27 April 2010 to 15 September 2010



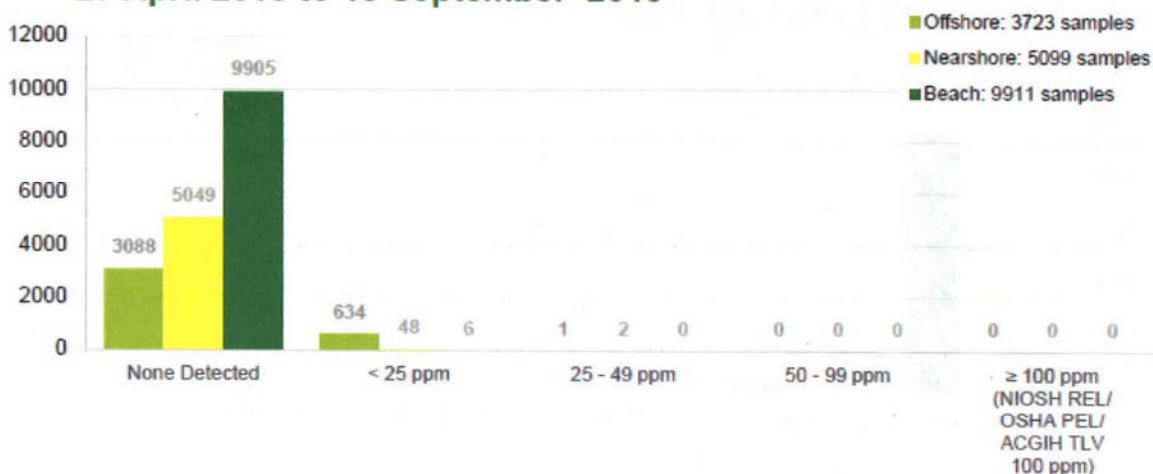
MC252 Toluene Personal Sample Results 27 April 2010 to 15 September 2010



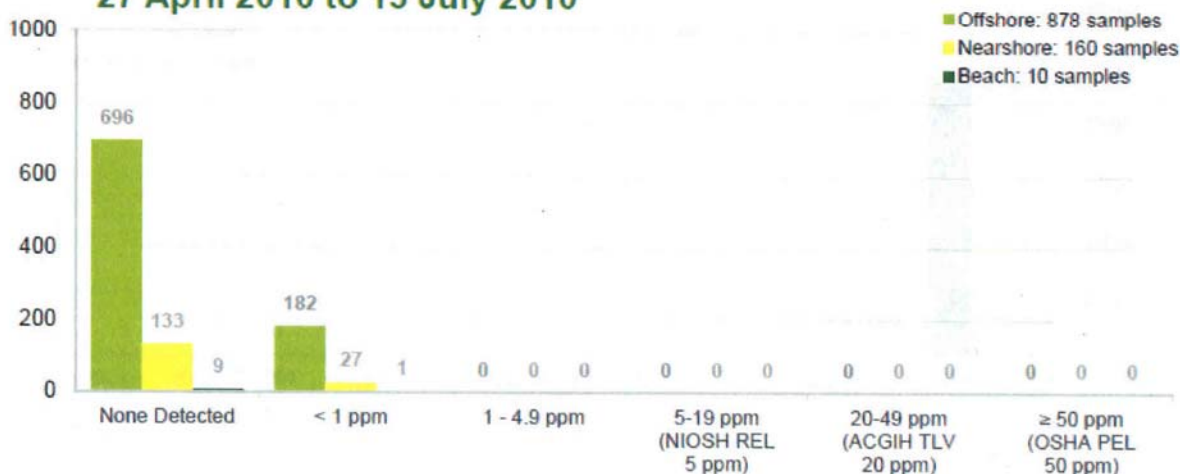
MC252 Ethylbenzene Personal Sample Results 27 April 2010 to 15 September 2010



MC252 Xylene Personal Sample Results 27 April 2010 to 15 September 2010



MC252 2-Butoxyethanol Personal Sample Results 27 April 2010 to 15 July 2010



Note:

The use of Corexit 9527, the dispersant which contains 2-Butoxyethanol, ceased 22 May 2010.