

## Personal Exposure Monitoring Results Summary

Since the tragic events involving the Deepwater Horizon on the 20th April 2010, BP has coordinated with a major multi-agency effort to control the release from, and mitigate the effects of the Mississippi Canyon (MC) 252 oil leak.

The Unified Area Command (UAC) has, from the very start, worked hard to ensure that the people involved in all the activities associated with the incident are protected. At this time more than 21,000 BP staff, contractors, governmental and industry employees and volunteers have been deployed.

It is important to recognise that the risks to the health of people from the chemicals associated with both the crude oil from the leak and the dispersants used to clean-up the oil have been carefully considered in the selection of the various methods employed in addressing this spill. Engineering and administrative controls have been considered as the preferred method in reducing worker and public exposures. In cases where additional protection may be needed, personal protective equipment has been used. As a result, the health risks associated with the spill and related response has been mitigated to a significant extent. To assure that these risks are not having a harmful effect on workers involved, BP has coordinated with the UAC to implement a comprehensive industrial hygiene monitoring program.

The areas where these people work have been characterized into three general types:

1. **Offshore** - this includes people on all the vessels operating at or near to the source of the leak.
2. **Near-shore** - this includes people operating or working on the vessels closer to the shore. Typically they are involved handling the oil spill booms, oil skimming, oil clean-up etc.
3. **Beach** - this is where most people are working on boom handling, oil spill clean-up, and similar activities.

Analyses of the crude oil, associated with the MC252 incident, have shown that by the time it reaches the water surface, the constituents of most concern such as benzene, toluene, ethylbenzene, and xylenes are not present in concentrations that are known to be harmful. After understanding the nature of the crude oil, weathered crude oil, dispersants, and mixtures of those components, BP, the UAC, and various government agencies selected monitoring methods to be used and chemical constituents that posed potential health risks to be monitored.

To assure everyone 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 each of the three work areas.

The air monitoring strategy includes both personal samples, and the use of real-time measurements to demonstrate that safety systems including respiratory protection usage remain effective at all times. The personal monitoring program described above has been phased in as potential inhalation exposures were anticipated.

To date, more than 7,000 personal samples have been taken of workers involved in source control activities, offshore and nearshore operations, beach cleanup, and other response activities. The individuals selected for monitoring are typically representative of other workers performing similar tasks and are selected for monitoring because they represent the highest potential exposure of their group.

This is a massive industrial hygiene monitoring response and has drawn industrial hygienists and technicians from all parts of BP and qualified third-party contractors. In addition, some governmental agencies such as OSHA and NIOSH have conducted their own industrial hygiene monitoring of response workers. There is a high degree of correlation between the monitoring results obtained by BP and its contractors and those government agencies.

After a personal sample has been collected, it is then promptly sent to a certified laboratory for analysis. The samples and analyses undergo quality control and quality assurance. The sample results must then be validated, and the validated data is uploaded to 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.

BP will be providing regular summaries, on this site, of the results from the validated personal monitoring in each of the three work areas. There are a small number of non-validated samples, less than 0.3% 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 some cases where the sample was improperly obtained or otherwise failed to satisfy quality assurance standards, the sample result may be rejected and consequently not included in the data summary.

The personal monitoring results shown graphically below indicate that in the vast majority of cases there are no significant exposures to airborne concentrations of benzene, total hydrocarbons or dispersant chemicals of interest. Some of the terminology referenced in those graphs is explained below:

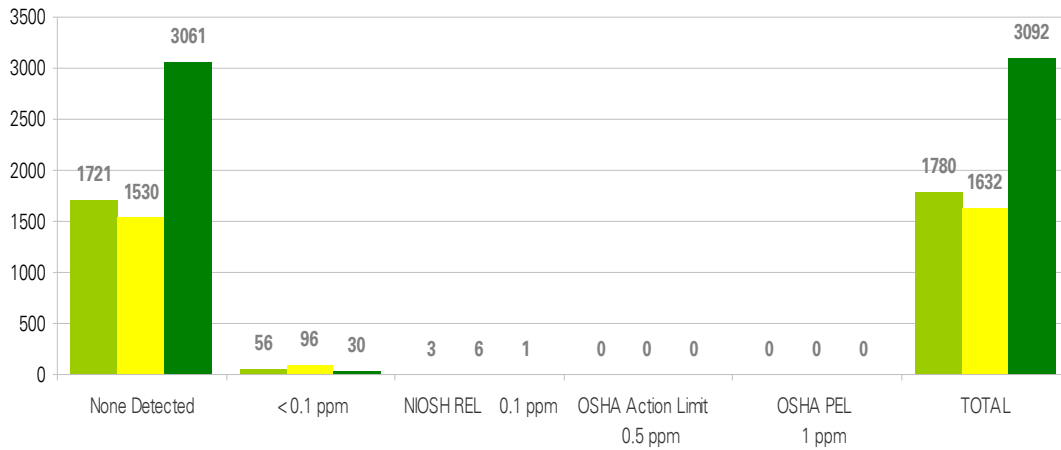
OSHA Occupational Permissible Exposure Limits (PELs) are the permissible concentrations in air of substances to which nearly all workers may be repeatedly exposed 8 hours a day, 40 hours a week, for 30 years without adverse effects (OSHA 29 CFR: 1910.1000).

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 (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.

Fresh crude oil and weathered crude oil are comprised of a wide range of hydrocarbons including aliphatic and aromatic hydrocarbons. These combinations of hydrocarbons when sampled together are referred to as "total hydrocarbons". When monitored in combination in this manner, this analysis provides an indication of whether one or more particular hydrocarbon constituents may be elevated. If the total hydrocarbon analytical result is sufficiently low, that provides assurance that the individual constituents are also present at only low levels. Although there is no official occupational exposure limit for total hydrocarbons, BP has adopted its own internal guideline of 100 ppm as a limit which is generally considered to be a conservative level by the industrial hygiene community.

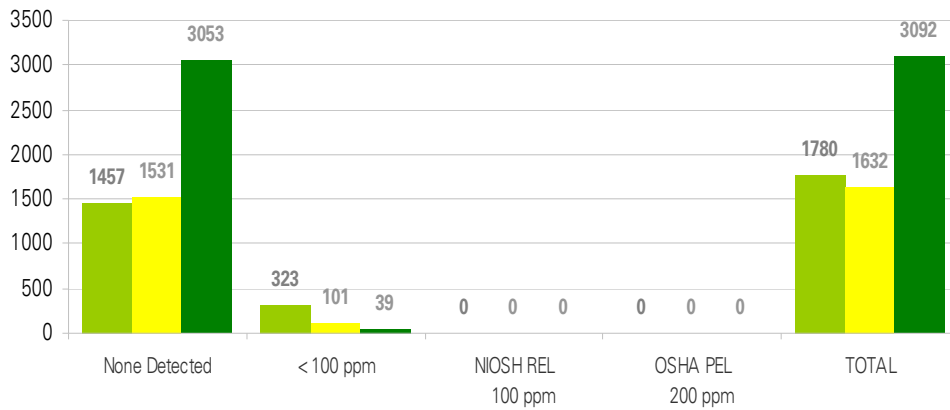
### MC252 Benzene Personal Sample Results 27 April 2010 to 29 June 2010

- Offshore
- Nearshore
- Beach



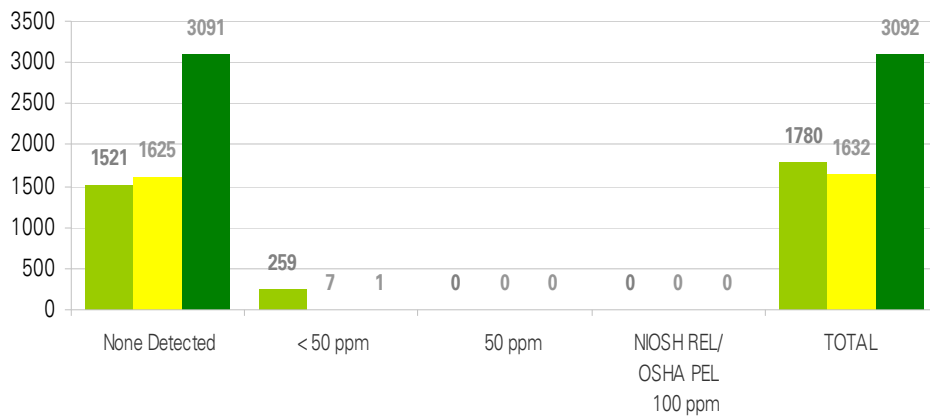
### MC252 Toluene Personal Sample Results 27 April 2010 to 29 June 2010

- Offshore
- Nearshore
- Beach



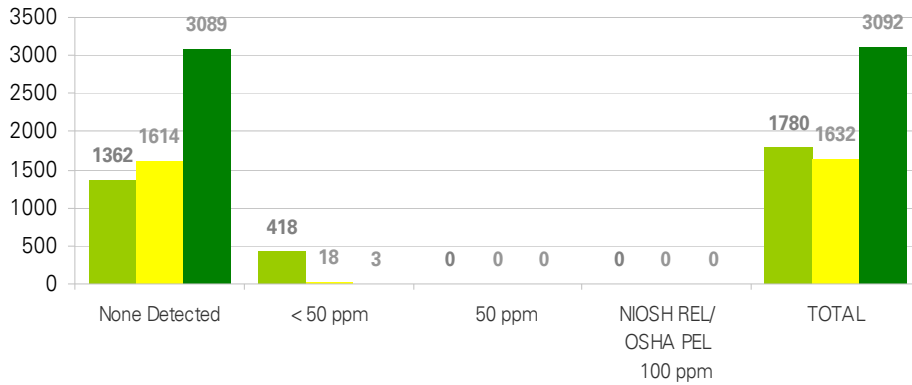
### MC252 Ethylbenzene Personal Sample Results 27 April 2010 to 29 June 2010

- Offshore
- Nearshore
- Beach



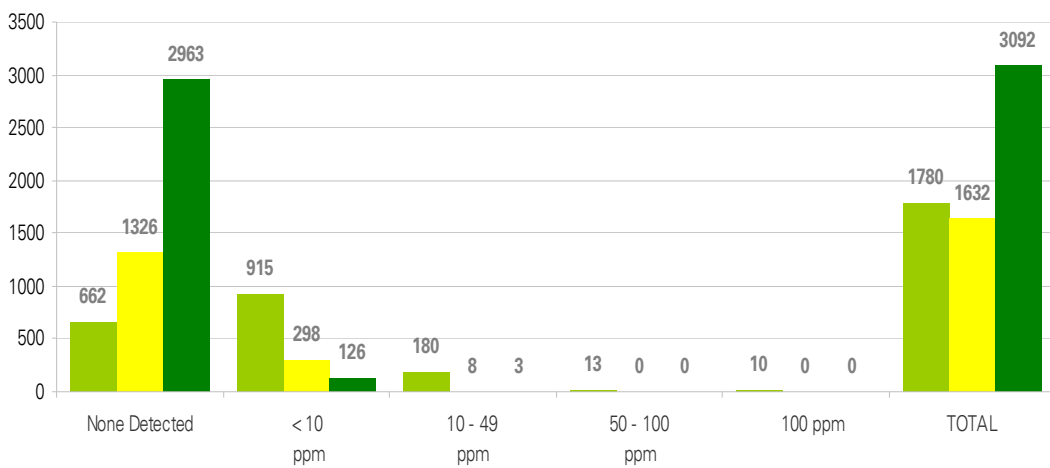
### MC252 Xylene Personal Sample Results 27 April 2010 to 29 June 2010

- Offshore
- Nearshore
- Beach



### MC252 Total Hydrocarbon Personal Sample Results 27 April 2010 to 29 June 2010

- Offshore
- Nearshore
- Beach



### MC252 2-Butoxyethanol Personal Sample Results 27 April 2010 to 29 June 2010

- Offshore
- Nearshore
- Beach

