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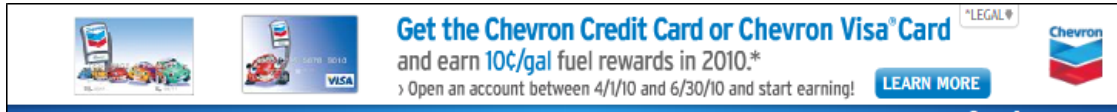
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Liz Borkowski is a Research Associate at the George Washington University School of Public Health's Department of Environmental and Occupational Health. She lives in Washington, DC and loves public transportation and pumpkin empanadas.



Celeste Monforton, DrPH, MPH is an Assistant Research Professor at the George Washington University School of Public Health's Department of Environmental and Occupational Health. She also spent a decade working for the US Department of Labor, served on the team investigating the Sago Mine Disaster for the state of West Virginia, and is currently on the state's team investigating the Upper Big Branch Mine Disaster.

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Tell Organic Valley To Lift Its Raw Milk Ban

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117 People

The image shows a petition banner with a green header 'TOP ACTIONS' and a photo of cows in a field. Below the photo is the text 'Tell Organic Valley To Lift Its Raw Milk Ban' and a red 'SIGN PETITION' button. At the bottom, it says '117 People'.



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Posted on: June 7, 2010 1:06 PM, by [The Pump Handle](#)

By Elizabeth Grossman

Expressions of concern for oil spill response workers' health and safety grew this past week as reports arrived by way of the [Louisiana Environmental Action Network](#) that BP was denying workers' requests for respirators. On June 4th, the [Wall Street Journal](#) reported that Representatives Jerrold Nadler (D-NY) and James Oberstar (D-Minn) had written to the EPA and Department of Labor demanding that all response workers be provided with "proper protective equipment, including respirators."

Anna Hrybyk, program manager of the [Louisiana Bucket Brigade](#), also reports that in three days 17 workers were treated at the West Jefferson Center Medical tent in Grand Isle for headaches, respiratory problems, abrasions, infections, and insect bites. None had been wearing gloves or respirators.

Six weeks into this disaster we still don't know precisely what workers out on the water are being exposed to - particularly those working where controlled burns of surface oil are being conducted and chemical dispersants being applied. Between June 6th and April 28th, 125 controlled burns of surface oil have been conducted and more than 1.08 million gallons of chemical dispersant applied, nearly 800,000 of that on the surface.

OSHA, EPA, and NOAA have all released some air quality information, but it doesn't give a complete picture of airborne exposures for cleanup workers who are out on the water.

OSHA releases air monitoring data from three work sites

Yesterday evening, [OSHA posted the results of its air monitoring from three work sites](#). This is the first such data from oil spill worker breathing zones conducted by a federal agency to be made publicly available.

The data are from two beach cleanup sites and one on-vessel site, and OSHA says that its interpretation of the results obtained for the operations sampled "does not indicate workers" at any of these sites "are being exposed to hazardous levels of substances or agents."

This OSHA data was taken on Elmer's Island and Grand Isle State Park on May 25 and 27, and from on board the vessel Kimi Alayna on May 24. OSHA does not say where the vessel was when samples were taken, so it's impossible to know from the data if the vessel was in the vicinity of controlled burns or where dispersants are being applied.

Substances sampled were benzene, carbon monoxide, hydrogen sulfide, oxygen, petroleum hydrocarbons, volatile organic compounds (VOCs), and combustible gases.

No samples at any site showed hydrogen sulfide, carbon monoxide, or combustible gases. VOCs were found only in samples where boat decks had been cleaned with a citrus-based cleaning product. Beach bagging samples at Grand Isle State Park showed levels of benzene at less than 0.2 parts per million (ppm) and petroleum hydrocarbons at less than 100 ppm. Absorbent boom work areas tested on Elmer's Island showed benzene at less than 0.2 ppm and petroleum hydrocarbons at less than 20 ppm.

The Kimi Alayna data set includes no benzene or petroleum hydrocarbon samples. None of the samples include particulate matter.

EPA and NOAA information leaves many questions

Meanwhile, neither EPA nor NOAA has answered my question asking if air monitoring and contaminant sampling is being done off shore to assess air quality response workers are encountering. Nor do we yet have a publicly available chemical analysis of the various forms of oil being encountered.

Of its on-shore air monitoring to date, [EPA says via its BP spill response page](#): "EPA's air monitoring conducted through June 5, 2010, has found that air quality levels for ozone and particulates are normal on the Gulf coastline for this time of year." But it goes on to say, "EPA has observed odor-causing pollutants associated with petroleum products along the coastline at low levels. Some of these chemicals may cause short-lived effects like headache, eye, nose and throat irritation, or nausea. People may be able to smell some of these chemicals at levels well below those that would cause short-term health problems."

On-shore monitoring tests for VOCs, particulate matter, hydrogen sulfide, semi-volatile organic compounds and "air toxics." VOCs include benzene, ethyl benzene, naphthalene, toluene, and xylenes.

[Additional EPA air monitoring data](#) comes from flights conducted over the spill area through EPA's ASPECT program. These ASPECT flights were conducted at an altitude of 2800 feet. Chemicals tested for include hydrogen sulfide but not benzene, toluene, xylenes, naphthalene, ethyl benzene or particulate matter. Thus far these flights have detected only traces of methanol.

Curious about the ASPECT flight air monitoring data, I spoke to Staci Simonich, associate professor of chemistry at Oregon State University whose research focuses on the atmospheric transport of VOCs. Samples taken at 2800 feet, she explained, would be useful for predicting what contaminants might be transported over distances but not for capturing a picture of the near-surface air quality to which people are being exposed.

To understand potential health impacts of contaminants resulting from the surface oil burning, a chemical analysis of particulate matter is needed, said Simonich. Volatile and semivolatile compounds - many of which are carcinogenic - can become attached to and travel with particulates. If the particulates carrying VOCs are very small - such as the PM 2.5 EPA has recently begun to regulate - they can enter lung tissue, creating the potential for serious adverse health effects.

A NOAA report on the "[Health and Safety Aspects of In-situ Burning of Oil](#)" says, "Response personnel working close to the burn may be exposed to levels of gases and particulates that would require them to use personal protective equipment." It also explains that "Particulates, mostly soot, comprise ten to fifteen percent of the smoke plume. Small amounts of toxic gases are emitted as well....In addition, small amounts of polynuclear aromatic hydrocarbons (PAHs) are emitted from the fire, mostly as residues attached to the particulates."

The report cites research that suggests that large particulate (PM 10) and VOC concentrations beneath a burn plume are relatively low and thus present relatively low health risks to response personnel or downwind. However, the report does not discuss [small particulates \(PM 2.5\) that we now know to be problematic](#). Nor does it consider long-term health effects of which the World Trade Center 9/11 experience has made us all too well aware.

Concerns Persist

The situation described by John Sullivan, co-director Public Forum and Toxic Assistance at the NIEHS Center in Environmental Toxicology of University of Texas Medical Branch, last week in Dulac, Lafitte, and Grand Isle, Louisiana, does not mirror the generally clean bill of health suggested by the latest EPA and OSHA - or [BP](#) - data. "There are approximately 15 workers out of commission," wrote Sullivan, "mostly from direct respiratory /dermal exposure to the crude slick (and possibly Corexit 9500 surfactant), or oil laden debris."

And behind the scenes, OSHA Assistant Secretary David Michaels has written to BP criticizing BP for "not being forthcoming with basic, but critical safety and health information on injuries and exposures."

Meanwhile OSHA has not yet responded to my questions about response worker exposures asked over ten days ago. On June 4, I was told answers were still being vetted. The data posted on the 6th answers some questions but raises still more.

UPDATE, 6/8: Since this post was published on June 7th, both OSHA and BP have updated their information. The OSHA spill site now links to [this BP page](#), and the OSHA page with the monitoring data no longer states that the results do not indicate workers "are being exposed to hazardous levels of substances or agents."

Elizabeth Grossman is the author of [Chasing Molecules: Poisonous Products, Human Health, and the Promise of Green Chemistry](#), [High Tech Trash: Digital Devices, Hidden Toxics, and Human Health](#), and other books. Her work has appeared in a variety of publications including Scientific American, Salon, The Washington Post, The Nation, Mother Jones, Grist, and the Huffington Post. Chasing Molecules was chosen by Booklist as one of the Top 10 Science & Technology Books of 2009 and won a 2010 Gold Nautilus Award for investigative journalism.

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1

Great -- first it was "Gulf War Syndrome" and since I haven't seen anyone else propose it, I offer y'all "Gulf Spill Syndrome:" a whole

laundry list of long-term health outcomes from exposure to a soup of petroleum-origin chemicals.

Just one more reason for BP stockholders to be grateful for a \$75 million damages cap.

Posted by: D. C. Sessions | [June 7, 2010 3:24 PM](#)

2

A step in the right direction but modern OSHA really needs to lead the way on transparency. The more transparent their testing is the more we can hold them up against companies who refuse to share data with workers.

Posted by: [BrettB](#) | [June 7, 2010 6:09 PM](#)

3

One, excellent points but keep in mind the whole environment including physical hazards and heat. If workers have to wear respirators, factor in the added heat burden. Might be necessary but nothing exists by itself.

Two, this is pitiful meager data. The highest concentrations should be around the well head and we have samples from ONE BOAT; on ONE day; and only 5 samples per substance!! Looks suspiciously like short term samples to me. Where's the back up info let alone the time period? Grab samples?

We need a reasonable data set to draw conclusions and in the mean time workers need protection. Which of course BP must provide and adequately train all workers on.

Posted by: JohnSM | [June 7, 2010 10:35 PM](#)

4

I recently found my way to the blog and find it really interesting. I am a petroleum spill response engineer. It looks to be good news that they are now sending out a health and safety boat and sampling with the boat crews - but what are they sampling for? Most of the OSHA data reported in the link is from "direct read" instruments - so I would say PIDs and multimeters, not the best way to characterize the sites, when you really don't know what the weathered crude oil looks like. Then the salt lake testing lab analysis is very limited - mostly propylene glycol. Their proposed sampling plan is a little more thorough, but where is that data?

Also from everything I've seen on the EPA sampling site - the sampling is for a very limited set of VOCs and SVOCs I guess considered to be representative. However, between the physical conditions surrounding the discharge and the use of dispersants I don't believe in my experience with weathered (naturally or through remedial processes) petroleum analysis can rely on that limited data. I have sites that would pass for those parameters but stink to high heaven and contain product on groundwater. I rely on getting data on Tentatively Identified Compounds. As far as I can tell they have never actually characterized the oil on air at different locations along the spill plume, what the water or air actually looks like (then maybe you have a basis to create a short list unique to your site and conditions). I'm afraid they are missing the targets and workers are suffering as a result.

From what I've run across in my work they should really be using canister sampling and the Mass APH method if they really want to start off with what the actual contaminants of concern really are. Then maybe they can work on target lists - but they should be looking at a thorough TPH and comparing worker exposure against that standard.

Posted by: AndyF | [June 7, 2010 10:49 PM](#)

5

The EPA and OSHA are not particularly used to thinking about things on this scale. Every toxic event is different... there are no routine disasters... and this one is huge.

In addition to primary toxins (e.g. BTEX compounds), there are secondary impacts: how will this spill will impact air quality, as the VOCs can react to form ozone and particles. These processes occur with VOCs at ppbv-pptv levels. ppm is off the charts.

Unfortunately the EPA appears to be deploying instrumentation that is ill-suited to the task of establishing air quality measurements from a photochemical perspective. (Although, from what I can tell, most of the information about what they are doing is not public due to it's technical nature. It is entirely possible that they are and just haven't mentioned it.)

The mobile TAGA systems appear to have LODs in the PPB range, which is not suitable for atmospheric trace analysis.

Annoyingly, the spill happened during a major air quality study, Calnex, occurring a thousand miles away on another coast, so much of the NOAA, DOE, and other national resources for this are tied down. There are university labs that can do these measurements too, but

the phones at the ones I know of have been silent.

Posted by: [Holstien](#) | [June 7, 2010 11:39 PM](#)

6

I'm sure none of these workers are even properly trained in how to use a respirator or medically cleared to use one. The vast majority I'm sure are not properly trained in hazardous waste operations. The chemical hazards obviously are not being communicated to the workers. In short, OSHA regulations are being violated. There's no enforcement. Nice to see that benzene concentrations are virtually non-detectable as one would expect in crude oil. Plenty of carcinogenic PAHs to go around. I see worker class action law suits down the road, but get in line.

Posted by: [DudeDiligence](#) | [June 8, 2010 12:10 AM](#)

7

BP and OSHA are monitoring for hydrogen sulfide and carbon monoxide because they can both kill you outright and there is no filtering respirator that works for them, only supplied air. They are monitoring for benzene because there is a relatively strong OSHA Standard, 1910.1028. Where things get really "iffy" is in their monitoring for Volatile Organic Compounds (VOCs), which is the predominant exposure. This term covers a multitude of chemicals of varying toxicities. To lump them all together is not acceptable, except for screening purposes followed by substance-specific characterizations. Lumping all VOCs together without doing this allows BP to keep operating without putting everyone in supplied air respirators. It is their attempt to manage the chaos they have created. With 100 ppm as their criteria for evaluating these VOC samples, it allows too much VOC exposure so the cleanup work can go on.

Posted by: [Eileen Senn](#) | [June 8, 2010 8:18 AM](#)

8

In the meantime, here's what those-who-know-better (than the fishermen) are doing. From the scientists monitoring the underground plumes <http://gulfblog.uga.edu/2010/06/how-things-change/>

The EPA provided us with a meter to measure the concentration VOCs (volatile organic carbon) in the air outside the ship (and inside too). We are monitoring VOCs and if necessary are wearing respirators and TYVEC suits. Most of the time, however, we move away from the sampling site so that we can sample the bottles while breathing fresh air. I think anyone working in the area of this spill should be doing the same – monitoring the air quality with a VOC meter constantly, wearing gloves all the time when handling plume samples, and wearing respirators when necessary.

Note that cleanup workers by definition are likely to spend much more time in waters that contain exposed surface oil, as opposed to scientists monitoring subsurface plumes.

Posted by: [SusanC](#) | [June 8, 2010 11:20 AM](#)

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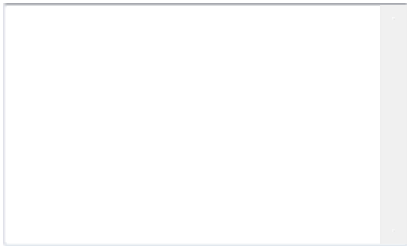
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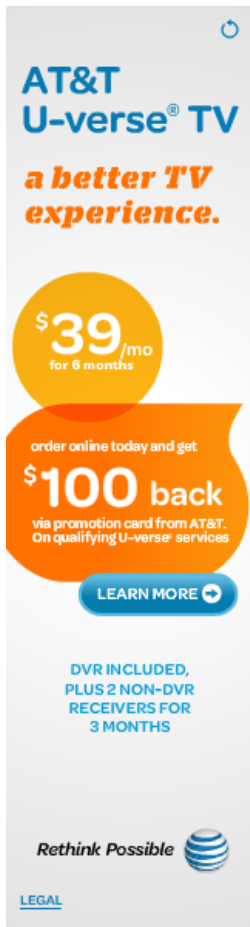
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