

**OFFICE OF RIVER PROTECTION**

P.O. Box 450, MSIN H6-60  
Richland, Washington 99352

13-HAB-0025  
REISSUE

APR 18 2013

Mr. S. E. Hudson, Chair  
Hanford Advisory Board  
Enviroissues Hanford Project Office  
713 Jadwin Avenue, Suite 4  
Richland, Washington 99352

Mr. Hudson:

REISSUE - HANFORD ADVISORY BOARD (HAB) FEBRUARY 8, 2013, CONSENSUS ADVICE #265, "INDEPENDENT EVALUATION OF PROCEDURES AND INDUSTRIAL HYGIENE EQUIPMENT USED TO MONITOR TANK VAPORS AND FLAMMABLE GAS"

Thank you for advice #265 regarding an independent evaluation of tank farm vapors and flammable gas monitoring practices by the National Institute for Occupational Safety and Health (NIOSH) (enclosed). The U.S. Department of Energy (DOE) Office of River Protection (ORP) appreciates the effort and dedication of the Health, Safety and Environmental Protection committee to discuss, draft, and present this advice to the full HAB and ORP. ORP remains committed in our support of a robust occupational health program on behalf of all ORP operations. Protecting our workers, the public, and the environment is a top priority for the Department.

Below is ORP's response to the HAB's advice.

**Advice Point:** The Board advises DOE to continue its efforts to secure an independent evaluation by NIOSH of procedures and industrial hygiene equipment used to monitor tank vapors and flammable gas in conditions outside of the manufacturer's technical operating specifications and procedures.

**Response:** ORP recognizes and acknowledges the benefits of an independent evaluation by NIOSH and has initiated requests which have included telephone conversations, submittals of background information for review, and a formal request for a NIOSH Health Hazard Evaluation (HHE) via the NIOSH HHE online request form. The completed request form and confirmation of receipt are enclosed. NIOSH has also been in contact with the Washington River Protection Solutions (WRPS) Health and Safety management team for the purpose of acquiring additional information.

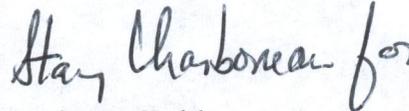
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The ORP Safety and Health Division has conducted a technical review of related subject matter, to further facilitate an understanding of the issues and provide NIOSH an opportunity to comment. That document, entitled "Tank Farms Industrial Hygiene Exposure Monitoring and Screening Practices Relative to Instrumentation Specifications," was provided to NIOSH, as was the WRPS Industrial Hygiene Instrumentation Root Cause Analysis draft report. Both final reports and the requested written response from NIOSH will be shared with the HAB, following receipt.

Thank you for your continued interest and if you have additional comments or questions, please contact Carrie Meyer at (509) 372-0810.



Kevin W. Smith  
Manager

HAB:TLN

Enclosures:

1. HAB Advice letter #265
2. NIOSH HHE Online Request Form
3. Confirmation Receipt

cc w/encls: See page 3

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cc w/encls:

C. B. Alexander, EM-3.2  
D. A. Faulk, EPA  
J. A. Frey, RL/ORP DDFO  
M. A. Gilbertson, EM-10  
J. Harney, NIOSH  
S. Hayman, Enviroissues  
J. Hedges, Ecology  
W. M. Levitan, EM-10  
T. L. Sturdevant, Ecology  
Administrative Record  
Environmental Portal  
The Oregon and Washington  
Congressional Delegations

U.S. Senators (OR)

J. Merkley  
R. Wyden

U.S. Senators (WA)

M. Cantwell  
P. Murray

U.S. Representatives (WA)

N. Dicks  
R. Hastings  
J. Herrera Beutler  
R. Larsen  
J. McDermott  
C. McMorris Rodgers  
D. Reichert  
A. Smith

State Senators (WA)

J. Delvin  
M. Hewitt

State Representatives (WA)

L. Haler  
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## Summary

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Dear Brian Harkins,

The following information has been submitted to NIOSH Health Hazard Evaluation Program:

### Workplace Name

Hanford Nuclear Site: Tank Farms Facility

### Workplace Address

US Department of Energy (DOE) Hanford Site Tank Farms Operations, Richland, Washington 99352

### What type of work is done at this location?

The facility is a mixed hazardous waste Treatment, Storage and Disposal Facility involving 177 underground tanks, transfer lines & associated infrastructure. The total volume of waste is approximately 53 million gallons. Older single shelled tanks are undergoing retrieval & transfers of content to designated double shell tanks for feed to a waste treatment plant under construction and ultimate closure of all tanks. Workers support these activities through construction, maintenance, transfer operations and supporting tasks such as radiological and industrial hygiene monitoring.

### How many people work at this location?

250 or more

### Who is responsible for employee health and safety in this workplace?

#### Name

Brian Harkins( in behalf of Kevin Smith, Manager, US DOE Office of River Protection)

#### Title

DOE ORP Director of Health and Safety

#### Phone number

509 376-3567

**What hazardous substances, agents, or work conditions are of concern?  
If known, please include chemical names, trade names, manufacturer names,  
or other identifying information.**

A screening process and headspace characterization serves as the technical basis for the sampling strategy in place at tank farms. This process resulted in the identification of 59 chemicals of potential concern (COPCs) listed below. The site has the ability to screen grab samples for all 59 COPCs, in addition to application of NIOSH methods for sampling and analysis. The primary COPCs subject to routine sampling for similar exposure groups include: 1-Butanol, 2,4-Dimethylpyridine, 3-Buten-2-one, Ammonia, Butyl nitrite, Formaldehyde, Mercury, Methyl nitrite, Nitrosodiethylamine, Nitrosodimethylamine, Nitrosomethylethylamine and Nitrous Oxide. Chemicals of Potential Concern from all Tanks Agent List CAS # OEL Units Inorganic Compounds 1 Ammonia 7664-41-7 25 ppm 2 Nitrous Oxide 10024-97-2 50 ppm 3 Mercury 7439-97-6 25 ug/m3 Hydrocarbons 4 1,3-Butadiene 106-99-0 1 ppm 5 Benzene 71-43-2 0.5 ppm 6 Biphenyl 92-52-4 0.2 ppm Alcohols 7 1-Butanol 71-36-3 20 ppm 8 Methanol 67-56-1 200 ppm Ketones 9 2-Hexanone 591-78-6 5 ppm 10 3-Methyl-3-butene-2-one 814-78-8 0.02 ppm 11 4-Methyl-2-hexanone 105-42-0 0.5 ppm 12 6-Methyl-2-heptanone 928-68-7 8 ppm 13 3-Buten-2-one 78-94-4 0.2 ppm Aldehydes 14 Formaldehyde 50-00-0 0.3 ppm 15 Acetaldehyde 75-07-0 25 ppm 16 Butanal 123-72-8 25 ppm 17 2-Methyl-2-butenal 1115-11-3 0.03 ppm 18 2-Ethyl-hex-2-enal 645-62-5 0.10 ppm Furans and Substituted Furans 19 Furan 110-00-9 1 ppb 20 2,3-Dihydrofuran 1191-99-7 1 ppb 21 2,5-Dihydrofuran 1708-29-8 1 ppb 22 2-Methylfuran 534-22-5 1 ppb 23 2,5-Dimethylfuran 625-86-5 1 ppb 24 2-Ethyl-5-methylfuran 1703-52-2 1 ppb 25 4-(1-Methylpropyl)-2,3-dihydrofuran 34379-54-9 1 ppb 26 3-(1,1-Dimethylethyl)-2,3-dihydrofuran 34314-82-4 1 ppb 27 2-Pentylfuran 3777-69-3 1 ppb 28 2-Heptylfuran 3777-71-7 1 ppb 29 2-Propylfuran 4229-91-8 1 ppb 30 2-Octylfuran 4179-38-8 1 ppb 31 2-(3-Oxo-3-phenylprop-1-enyl)furan 717-21-5 1 ppb 32 2-(2-Methyl-6-oxoheptyl)furan 51595-87-0 1 ppb Phthalates 33 Diethyl Phthalate 84-66-2 5 mg/m3 Nitriles 34 Acetonitrile 75-05-8 20 ppm 35 Propanenitrile 107-12-0 6 ppm 36 Butanenitrile 109-74-0 8 ppm 37 Pentanenitrile 110-59-8 6 ppm 38 Hexanenitrile 628-73-9 6 ppm 39 Heptanenitrile 629-08-3 6 ppm 40 2-Methylene butanenitrile 1647-11-6 0.3 ppm 41 2,4-Pentadienenitrile 1615-70-9 0.3 ppm Amines 42 Ethylamine 75-04-7 5 ppm 1 of 2 12/03/2008 Nitrosamines 43 N-Nitrosodimethylamine 62-75-9 0.3 ppb 44 N-Nitrosodiethylamine 55-18-5 0.1 ppb 45 N-Nitrosomethylethylamine 10595-95-6 0.3 ppb 46 N-Nitrosomorpholine 59-89-2 0.6 ppb Organophosphates and Organophosphonates 47 Tributylphosphate 126-73-8 0.2 ppm 48 Dibutylbutylphosphonate 78-46-6 0.007 ppm Halogenated Hydrocarbons 49 Chlorinated Biphenyls Varies 1 mg/m3 50 2-Fluoropropene 1184-60-7 0.1 ppm Pyridines 51 Pyridine 110-86-1 1 ppm 52 2,4-Dimethylpyridine 108-47-4 0.5 ppm Organonitriles 53 Methyl nitrite 624-91-9 0.1 ppm 54 Butyl nitrite 544-16-1 0.1 ppm Organonitrates 55 Butyl nitrate 928-45-0 2.5 ppm 56 1,4-Butanediol, dinitrate 3457-91-8 0.05 ppm 57 2-Nitro-2-methylpropane 594-70-7 0.30 ppm 58 1,2,3-Propanetriol, 1,3-dinitrate 623-87-0 0.05 ppm Isocyanates 59 Methyl Isocyanate 624-83-9 20 pp

**How are employees exposed?**

Breathing, Skin Contact

**In what work area, such as a building or department, is the hazard?**

Odors may be present within each of the tank farms and surrounding operations.

**How many people work in this area?**

250 or more

**Describe the work people do in this area.**

Construction, maintenance, equipment testing, transfer operations, environmental support, industrial hygiene and radiological monitoring.

**What health concerns do people in this work area have?**

Some workers are quite concerned that fugitive vapor emissions are not conducive to characterization by an IH monitoring program and the unrecognized constituents of the vapors are adversely affecting their health. This request has been previously provided and discussed between DOE ORP and NIOSH representatives, via email correspondence and telephone conversations. Please provide written verification of receipt and basis for NIOSH's response regarding this request by DOE for purposes of documentation.

**Information about you**

**Name:**

Brian Harkins

**Address where we can send you information:**

U.S. Department of Energy, Office of River Protection (ORP) 2440 Stevens Center MSIN H6-60 Richland, WA 99352

**Phone number where you would like to be called:**

509 376-3567 (O) 509 438-0483 ( c)

**Best time to call:**

0700 - 1700 hours, PST

**Email address where you would like to be contacted:**

[Brian\\_A\\_Harkins@ORP.doe.gov](mailto:Brian_A_Harkins@ORP.doe.gov)

**Can NIOSH reveal your name to the employer?**

N/A

**Please check one:**

Other: ORP Provides oversight of the Project

**Second employee**

**Name:**

N/A

**Address where we can send you information:**

N/A

**Phone number where you would like to be called:**

N/A

**Best time to call:**

N/A

**Email address where you would like to be contacted:**

N/A

**Can NIOSH reveal this name to the employer?**

N/A

**Third employee**

**Name:**

N/A

**Address where we can send you information:**

N/A

**Phone number where you would like to be called:**

N/A

**Best time to call:**

N/A

**Email address where you would like to be contacted:**

N/A

**Can NIOSH reveal this name to the employer?**

N/A

**Complete this section if you are a union representative**

**Name of union:**

N/A

**Address:**

N/A

**What is your position in the union?**

N/A

**Complete this section if you are an employer representative**

**Name:**

N/A

**What is your position in the company, agency, or organization?**

N/A

**For everyone**

**Has another government agency evaluated this workplace?**

Yes

**If yes:**

**What agency?**

DOE provides on-going health and safety oversight

**What year was the evaluation done?**

NIOSH performed an HHE in 2004 time frame

**Check here if this evaluation is underway now**

BLANK

**Is a request for the hazard being filed with another agency?**

No

**If yes:**

**What agency?**

N/A

**How did you learn about the NIOSH Health Hazard Evaluation Program?**

Other: Professional experience

**Thank you for submitting this form. You will get a response within 10 days.**



DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

Centers for Disease Control and Prevention  
National Institute for Occupational  
Safety and Health

Robert A. Taft Laboratories  
4676 Columbia Parkway  
Cincinnati OH 45226-1998

February 25, 2013

HETA: 20130088

Brian Harkins  
U.S. Department of Energy, Office of River Protection  
2440 Stevens Center, MSIN H6-60  
Richland, WA 99352

Dear Requestor:

The National Institute for Occupational Safety and Health (NIOSH) has received your request for a health hazard evaluation. The information below explains how we review requests and describes how we respond.

Each year, we receive about 400 health hazard evaluation requests. Our senior staff of occupational safety and health experts reviews each request. We discuss the severity and extent of the problem, our experience with similar problems, the availability of written materials that address the concerns, and whether we believe a field evaluation by NIOSH would be helpful in addressing your concerns. Our response to you may be an informational letter, a telephone consultation, referral to another agency (if you requested confidentiality, we will not reveal your identity to another agency without your consent), or an on-site evaluation.

Once your request has been reviewed, it will be assigned for response. You can expect to hear from us again by letter or telephone within 30 days. If you have any questions or concerns before then, please call me at (513) 841-4382 or [ATEpper@cdc.gov](mailto:ATEpper@cdc.gov).

Sincerely,

/Allison Tepper, PhD/

Allison Tepper, Ph.D  
Chief  
Hazard Evaluations and Technical Assistance Branch  
Division of Surveillance, Hazard Evaluations and Field Studies