CH2M HILL Hanford Group, Inc.	**Manual**	**ESHQ**
	Document	**TFC-ESHQ-IH-STD-12, REV A**
INDUSTRIAL HYGIENE EXPOSURE MONITORING AND CONTROL STRATEGIES DURING TANK RETRIEVAL AND TRANSFERS	**Page**	**1 of 7**
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1.0 PURPOSE AND SCOPE

(5.1.1, 5.1.3)

This standard provides requirements for collection of data on tank waste emissions during waste-disturbing activities that increase the potential of worker exposure to tank waste emissions as required by RPP-20949, "Data Quality Objectives For The Evaluation of Tank Chemical Emission For Industrial Hygiene Technical Basis" (under development) and by TFC-PLN-34. Data collection during static conditions is covered under RPP-PLAN-23384, "Tank Sampling and Analysis Plan for Vapor in Single-Shell Tanks Headspace," and associated procedures and is not governed by this standard. The Data Quality Objectives (DQO) process is iterative. Therefore, changes in this DQO will be made during implementation when data are obtained that indicate changes in the requirements are needed. This standard will be updated as requirements are updated in the DQO.

Full implementation of this standard and DQO may not be possible immediately upon release. Capabilities for continuous monitoring of exhaust stacks, the logistics involved in obtaining multiple sets of vapor samples during waste disturbing activities, and analytical methods for certain chemicals have not been established. However, these issues are being addressed and will be implemented when the issues are resolved. TFC-PLN-66 is under development to address implementation of the DQO document requirements that cannot be implemented when the DQO document is released. While not all of the DQO requirements can presently be executed, the portions of the document that can be executed will be required on release. The DQO requirements that are not ready for implementation are noted in the attached table. This table will be updated as capabilities become available in accordance with the TFC-PLN-66.

This standard applies to all Tank Farm Contractor (TFC) personnel and subcontractors doing work in the 200 East Area and 200 West Area controlled by the TFC.

2.0 IMPLEMENTATION

This standard is effective on the date shown in the header.

3.0 STANDARD

3.1 Vapor Exposure Controls and Exposure Evaluation

For waste tank retrieval operations, conservative vapor exposure controls requiring respiratory protection and industrial hygiene exposure monitoring will be established at the retrieval and receiver tanks prior to initiating retrieval activities. Frequent in-process field measurements of source and breathing zone vapor concentrations will be taken. Exposure monitoring and control strategies will be developed using historical tank data and vapor exposure data for similar activities. Additional pre-evolution tank gas sampling will be required if existing historical tank data is not sufficient to develop exposure control strategies. If existing historical exposure data for the tank and its associated planned activity is not sufficient to estimate exposures with confidence, personal exposure data will be collected in accordance with TFC-PLN-34. Refer to

TFC-ESHQ-S_IH-D-35, for requirements on managing vapor control areas known as air monitoring zones (AMZs).

3.2 Sampling

The attached table provides the location and timing of samples. All tank and exhauster sample collection will be governed by a Tank Sampling and Analysis Plan (TSAP) or letter of instruction (LOI).

Personal and area sampling for activities covered by this standard will be governed by an IH exposure monitoring plan and will implement TFC-PLN-34. IH exposure monitoring plans will be written following the example in TFC-ESHQ-IH-STD-03 and monitoring results will be communicated in accordance with TFC-ESHQ-IH-STD-03.

Direct reading surveys are typically performed in accordance with TFC-ESHQ-S_IH-D-35 and TFC-ESHQ-S_IH-D-22. The Industrial Hygienist (IH) may require additional direct reading surveys that will be included in the industrial hygiene exposure monitoring plan. Continuous monitoring at exhausters is driven by environmental requirements stated in the Notice of Construction (NOC) and/or the need for data to determine source concentrations prior to establishing or managing vapor exposure controls. The industrial hygiene exposure monitoring plan will provide direction for industrial hygiene technicians collecting stack monitoring data for either environmental or industrial hygiene purposes.

3.3 Waste Transfer Administrative controls
(5.1.2)

Other controls may be required for the following conditions:

- Waste transfer-associated structure covers are not in place when a structure is physically disconnected by two closed waste transfer system valves from an active waste transfer pump not under administrative lock or from the 242-A Evaporator vessel when the vessel contains waste.

- The RCSTS Diversion Box 6241-A and Vent Station 6241-V entry doors are not closed when they are physically disconnected by two closed WASTE transfer system valves from an active waste transfer pump not under administrative lock.

- Covers are not in place over unburied (i.e., excavated) sections of encased or un-encased waste transfer piping when the piping is physically disconnected by two closed waste transfer system valves from an active waste transfer pump not under administrative lock or from the 242-A Evaporator vessel when the vessel contains waste.

Under these conditions, the responsible IH is required to consider additional controls and/or exposure monitoring, as necessary, to protect facility workers from potential hazards (i.e., waste leaks) from the small amount of waste leakage that may occur through the two closed waste transfer system valves. Directions for these controls and/or exposure monitoring activities will be addressed in the applicable work documents (e.g., Lock and Tag forms, confined space permit, job hazard analysis).

4.0 DEFINITIONS

No terms or phrases unique to this standard are used.

5.0 SOURCES

5.1 Requirements

1. DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees."

2. HNF-1266, "Tank Farms Operations Administrative Controls," Section 5.11, "Waste Transfer Controls."

3. PER-2004-3245.

5.2 References

1. RPP-20949, "Data Quality Objectives For The Evaluation of Tank Chemical Emission For Industrial Hygiene Technical Basis" (under development).

2. RPP-PLAN-23384, "Tank Sampling and Analysis Plan For Vapor in Single-Shell Tanks Headspace."

3. TFC-AOP-015, "Response to Reported Odors or Vapor Exposures."

4. TFC-ESHQ-IH-STD-03, "Exposure Monitoring, Reporting, and Records Management."

5. TFC-ESHQ-S_IH-D-22, "Using Direct Reading Instruments."

6. TFC-ESHQ-S_IH-D-35, "Managing Air Monitoring Zones."

7. TFC-ESHQ-IH-STD-09, "Industrial Hygiene Response to Vapor Concerns."

8. TFC-PLN-34, "Industrial Hygiene Exposure Assessment Strategy."

9. TFC-PLN-66, "Industrial Hygiene Data Quality Objectives Implementation Plan," (under development).

ATTACHMENT A - GUIDE FOR PROPER LOCATION AND TIMING OF SAMPLES.

Note: For definitions of abbreviations used in this chart, refer to list below this table.

Static Sampling	Globally Waste Disturbing Activity Sampling	Post Globally Waste Disturbing Activity Sampling	Vapor Incident Sampling	IH Sampling
Static tank sampling. Tanks are prioritized according to operational needs and requirements to strengthen the chemical vapor technical basis. Obtain samples from SST headspace and DST ventilation stacks per TSAP or LOI.*	**Vapor sampling during waste retrieval activities.** **Source Tanks** **Samples will be obtained** Before exhauster startup. Obtain sample from the headspace prior to activity start per TSAP or LOI.* Exhauster startup Continuous monitoring of VOC from exhauster stack per NOC or IH exposure monitoring plan. Monitoring will start prior to starting the exhauster. Obtain sample from exhauster stack after monitoring indicates exhauster stack emissions have stabilized per TSAP or LOI.* During waste disturbing activity. Obtain sample per TSAP or LOI* from exhauster stack after VOC monitor reaches 100 ppm or 5 times the stabilized baseline (a drift of ≤2 ppm over 15 minutes), whichever is higher. Additional samples will be taken after each excursion (100 ppm or 5 times the baseline) in accordance with TSAP or LOI* and IH exposure monitoring plans (e.g., Direct reading surveys, personal or area samples). If the monitors do not reach the action limit for sampling, samples will be obtained after approximately 1/3 and 2/3 of the tank are retrieved per TSAP or LOI.*	**Vapor sampling after waste retrieval activities.** **Source Tanks** **Samples will be obtained** Timing of samples will be based on analysis of data obtained during event sampling in support of establishing exposure controls. **Receiver Tanks** **Samples will be obtained** Timing of samples will be based on data obtained during event sampling. Obtain samples from exhauster stack or the headspace per TSAP or LOI.* Samples will be obtained within 15 to 45 days. Vapor samples will not be required if samples are obtained for other receiving activities.	**Vapor sampling after a vapor incident.** Obtain samples according to TFC-AOP-015 and TFC-ESHQ_IH_STD-09.	**Work zone sampling** Personal vapor sampling and any other work zone samples are covered by IH Exposure monitoring Plans developed in compliance with TFC-PLN-34.

ATTACHMENT A - GUIDE FOR PROPER LOCATION AND TIMING OF SAMPLES. (cont.)

Static Sampling	Globally Waste Disturbing Activity Sampling	Post Globally Waste Disturbing Activity Sampling	Vapor Incident Sampling	IH Sampling
	Receiver Tanks **Sampling will be performed:** During activity. Continuous VOC monitoring from exhauster stack per NOC or IH exposure monitoring plan. Monitoring will start just prior to the start of the transfer. Obtain sample from exhauster stack after VOC monitor reaches 100 ppm or 5 times the stabilized baseline (a drift of ≤2 ppm over 15 minutes), whichever is higher, per TSAP or LOI.* **Vapor sampling during DST to DST transfers.** **Source Tanks** **Samples will be obtained:** During activity. Continuous monitoring of VOC from exhauster stack per NOC or IH exposure monitoring plan. Obtain sample from exhauster stack after VOC monitor reaches 100 ppm or 5 times the stabilized baseline (a drift of ≤2 ppm over 15 minutes), whichever is higher per TSAP or LOI.*	**Vapor sampling after DST to DST transfers.** **Source Tanks** No samples will be obtained **Receiver Tanks** **Samples will be obtained** Timing of samples will be based on data obtained during event sampling. Obtain samples from exhauster stack or the headspace per TSAP or LOI.* Samples will be obtained within 15 to 45 days. Vapor samples will not be required if samples are obtained for other receiving activities.		

ATTACHMENT A - GUIDE FOR PROPER LOCATION AND TIMING OF SAMPLES. (cont.)

Static Sampling	Globally Waste Disturbing Activity Sampling	Post Globally Waste Disturbing Activity Sampling	Vapor Incident Sampling	IH Sampling
	Vapor sampling during DCRT and catch tank transfers to DST. No samples will be required for routine DCRT and catch tank transfers. Sampling for non routine transfers will be evaluated on a case by case basis. **Vapor sampling during waste mixing activities including the addition of chemicals or other waste.** (Activities include such things as recirculation pump operations, mixer pump operations, caustic additions, acid additions, etc.) **Source Tank Samples will be obtained** During activity. Continuous monitoring from exhauster stack per NOC or IH exposure monitoring plan. Obtain sample from exhauster stack after VOC monitor reaches 100 ppm or 5 times the stabilized baseline (a drift of ≤2 ppm over 15 minutes), whichever is higher, per TSAP or LOI.*	**Vapor sampling after DCRT and catch tank transfers.** **Source Tanks** No samples will be obtained. **Receiver Tanks** No samples will be required for routine DCRT and catch tank transfers. Sampling for non routine transfers will be evaluated on a case by case basis.		

ATTACHMENT A - GUIDE FOR PROPER LOCATION AND TIMING OF SAMPLES. (cont.)

Static Sampling	Globally Waste Disturbing Activity Sampling	Post Globally Waste Disturbing Activity Sampling	Vapor Incident Sampling	IH Sampling
	Vapor samples during liquid or solid waste sampling activities. Samples will not be obtained. Job specific exposure monitoring will continue. .			

Notes:

* = Activities with an asterisk are not required until the capability is fully implementable. For example, analytical methods are in development for certain chemicals in headspace samples. Refer to TFC-PLN-66.

Definitions:

DCRT = Double-contained receiver tank
DST = Double-shell tank
IH = Industrial Hygiene
SST = Single-shell tank
VOC = Total organic compounds
TSAP = Tank Sampling and Analysis Plan
LOI = Letter of instruction
NOC = Notice of Construction