

Washington River Protection Solutions
EVENT SUMMARY

Check PART 1 box to hide that section of the form. Check PART 2 box it will show that section.

PART 1 (hide)* **PART 2 (show)***

NOTE: This form provides timely notification to management and documents preliminary information of an event that may require a more formal investigation. Details may change upon further examination and analysis. The following is a current status of available information:

Project: Retrieval/Construction Date: 05/19/2023

Area/Building/Location: 200E/AY Change Tent Approximate Time of Event: 1408 Hours

AR Number: WRPS-AR-2023-1589 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-034 Event Investigator: [REDACTED]

EVENT SUMMARY PART 1

Activity in Progress (What activity was under way, include procedures and work order numbers, as applicable):

Workers supporting Work Order (WO) #948109, "Reconstruct Work Deck at A-102 C Pit," work evolution were with the AY Change Tent taking a break/rest period, cooling off, and re-hydrating.

Personnel Involved (Job positions, number of personnel, identify any support organizations or subcontractors directly involved):

- 3 Health Physics Technicians (WRPS)
- 2 Industrial Hygiene Technicians (WRPS)
- 1 Electrician (AEI)
- 7 Labors (AEI)

What Happened (Provide a short discussion of what happened):

On 05/19/2023, at approximately 1408 hours, a Retrieval Construction work crew performing work activities associated with the WO #948109, "Reconstruct Work Deck at A-102 C Pit," work evolution had entered the AY Change Tent to take a needed break/rest period to cool off and re-hydrate when a worker's Ventis Pro personal ammonia monitor "Response Level" alarm initiated. The Ventis Pro personal ammonia monitor displayed an ammonia concentration of 6 parts per million (ppm) at the time of the instrument alarm. 12 additional workers were in the immediate area of the individual when the Ventis Pro personal ammonia monitor alarmed. None of the other workers' Ventis Pro personal ammonia monitors alarmed or indicated elevated ammonia concentrations. Field response TF-AOP-015, "Response to Personal Ammonia Monitor Alarm," monitoring indicated a less than detectable concentration (< 1 ppm) for ammonia and a 0.1 ppm concentration for Volatile Organic Compounds (VOCs), which are below anticipated background levels, at the AY Change Tent.

The 13 workers reported no symptoms. All 13 workers declined to report to the onsite medical provider for precautionary medical surveillance.

Where Did It Happen (Description of work area and working conditions. Include information on weather conditions, PPE, Postings, etc.):

Workers had doffed their respiratory protection equipment upon entering the AY Change Tent.

Workers were within a posted radiological Contamination Area (CA) and were wearing anti-contamination clothing (Level B PPE). The workers did have Ventis Pros 5 when taking a break/rest period, cooling off, and re-hydrating. At the time of the event 1 Ventis Pro personal ammonia monitor alarmed.

The Hanford Site Meteorological Station #6 and Data Fusion and Advisory System (DFAS) application, powered by SmartSite™, were utilized for outdoor weather details at the of the Ventis Pro personal ammonia monitor alarm. The Hanford Site Meteorological Station #6 and DFAS dashboard indicated the following weather conditions at 1408 hours on 05/19/2023:

- . Wind Speed: 8 miles per hour (mph)
- . Wind Direction: 120 ° (out of South East)
- . Mixing Height: 4,921.26 feet above grade
- . Temperature: 93.5 ° F
- . Barometric Pressure: 29.282 inches Hg
- . Humidity: 21.7%

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EVENT SUMMARY (Continued)

Project: Retrieval/Construction Date: 05/19/2023

Area/Building/Location: 200E/AY Change Tent Approximate Time of Event: 1408 Hours

AR Number: WRPS-AR-2023-1589 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-034 Event Investigator: [REDACTED]

Impact to Facility (Caused by the event or a description of known consequences):

Access was restricted to the AY Change Tent for approximately 1 hour.

Immediate Actions Taken (List immediate actions taken to stabilize the scene or respond to the event):

- CSM initiated TF-AOP-015 and restricted access to AY Change Tent.
- CSM offered precautionary medical surveillance to workers. Workers declined medical surveillance.
- CSM requested Odor/Vapor Response Cards from affected workers.
- Production Operations shift Industrial Hygiene Technician (IHT) initiated TF-AOP-015 response actions and monitoring per IHP-09001. Direct reading instrument (DRI) area readings at AY Change Tent indicated a less than detectable (< 1 ppm) ammonia concentration.
- Event Investigation EIR-2023-034, "TF-AOP-015 AY Change Tent," was initiated.

Notifications Already Made (Time and personnel notified):

[1408 hours] - The Central Shift Manager (CSM) initiated TF-AOP-015, restricted access, provided radio announcement, and issued Shift Office Event Notification (SOEN), "Entered AOP-015 for personal ammonia monitor alarm at AY Change Tent. Access restricted to AY Change Tent."
[1412 hours] - CSM contacted SST R&C Safety & Health Industrial Hygienist to request support for TF-AOP-015 response actions.
[1429 hours] - CSM contacted the on-call DOE Facility Representative and informed them of TF-AOP-015 event initiation.
[1448 hours] - CSM provided TF-AOP-015, Attachment 1- Initial Communication Template to email to distribution list DL WRPS Odor/Vapor Event Notification."
[1503 hours] - CSM issued SOEN, "Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015."
[1529 hours] - CSM provided TF-AOP-015, Attachment 2- Follow-up Event Summary to email to distribution list DL WRPS Odor/Vapor Event Notification."

- This event does not merit an Event Investigation meeting
- This event merits an Event Investigation meeting

Basis for Determination:

Information gathered from interviews and documentation reviews have provided sufficient information regarding this event.

Responsible Manager:

[REDACTED] _____ Date: 2023.05.22 15:43:53 -0700
Print First and Last Name Signature / Date

CAS Manager:

[REDACTED] _____
Print First and Last Name Signature / Date

EVENT SUMMARY PART 2

Key Elements of the Investigation (Key investigation points):

Additions/corrections to the Event Summary Part 1 information includes the following:

WHAT HAPPEN:
- Ventis Pro personal ammonia monitor alarmed at approximately 1339 hours and not at 1408 hours.

WHERE DID IT HAPPEN:
The Hanford Site Meteorological Station #6 and DFAS dashboard indicated the following weather

Washington River Protection Solutions
EVENT SUMMARY (Continued)

Project: Retrieval/Construction

Date: 05/19/2023

Area/Building/Location: 200E/AY Change Tent

Approximate Time of Event: 1408 Hours

AR Number: WRPS-AR-2023-1589

Responsible Manager: [REDACTED]

EIR Number: EIR-2023-034

Event Investigator: [REDACTED]

Key Elements of the Investigation (Key investigation points):

conditions at 1339 hours on 05/19/2023:

- . Wind Speed: 6.1 miles per hour (mph)
- . Wind Direction: 200 ° (out of South-South West)
- . Mixing Height: 400 feet above grade
- . Stability Class: D (neutral conditions)

EVENT SUMMARY PART 2 KEY ELEMENT OF THE INVESTIGATION:

To summarize the conclusions of the Industrial Hygiene Event Investigation Report, IHIR-00068 "TF-AOP-015 Entry at AY-1 Change Tent," the Ventis Pro personal ammonia monitor alarm was likely not indicative of an employee chemical exposure event or changing Tank Farm conditions related to Tank Farm vapors.

The following considerations support the IHIR-00068 conclusion:

(1) 12 additional workers were in the immediate area of the individual when the Ventis Pro personal ammonia monitor alarmed. None of the other workers' Ventis Pro personal ammonia monitors alarmed or indicated elevated ammonia concentrations.

(2) Ammonia is used as a sentinel tank waste chemical vapor for chemicals of potential concern (COPC), therefore, direct reading instruments (DRIs) equipped with an ammonia sensor are utilized at a minimum when monitoring for tank waste chemical vapors/COPCs. Field response DRI monitoring conducted by a shift IHT at the AY Change Tent, following initiation of TF-AOP-015, indicated a less than detectable ammonia concentration (< 1 ppm), which is below background levels. Providing additional indication the cause of the personal ammonia alarm was unlikely to be resultant of Tank Farms exhauster emissions.

(3) The Tank Farm Exhauster's ammonia concentrations were significantly less than the high level alarm set point at the time of the personal ammonia monitor alarm. Memo WRPS-1904672.1, "TANK FARM EXHAUST STACK CONCENTRATION ALARM/ACTION LEVELS FOR AMMONIA" establishes ammonia concentration stack alarm/action set points for tank farm exhausters based on the predicated ammonia concentration at unspecified ground receptors utilizing the Quantitative Risk Assessment (QRA) model. The exhauster high level alarm was established at concentrations where the predicted ground receptor ammonia concentration of 2.5 ppm (or 10% of the established Occupational Exposure Limit for ammonia) could be observed.

The exhauster high level alarm conservatively established for A Complex (excluding A farm) is 460 ppm. According to the Vapor Monitoring and Detection System (VMDS), the ammonia concentration observed at the time of event occurrence was 0 ppm at the AW exhauster, and 17.6 ppm at the POR-127 exhauster. The AP exhauster is not currently connected to VMDS and issues have been identified with the 702-AZ exhauster VMDS in addition to the POR-126 VMDS being "down" at the time of the event occurrence; therefore, readings are acquired once per calendar day in accordance with TF-OPS-IHT-037 when ammonia stack monitoring via VMDS is unavailable. The highest ammonia concentrations observed on 05/19/2023 was 1.0 ppm at the AP Exhauster, 19 ppm at the 702-AZ Exhauster, and 0 ppm at the POR-126. Conservatively utilizing the highest ammonia concentration observed in the 702-AZ exhauster, a predicted ground receptor ammonia concentration of 0.103 ppm (or 0.413% of the established Occupational Exposure Limit for ammonia) would be expected if AY/AZ, AW, AP, or AX tank farm exhauster emissions were present.

The exhauster high level alarm conservatively established for A farm is 160 ppm. According to VMDS, the ammonia concentration observed at the time of event occurrence was 2.0 ppm at the POR-518 exhauster and 1.1 ppm at the POR-519 exhauster. Conservatively utilizing the higher ammonia concentration observed in the POR-518 exhauster, a predicted ground receptor ammonia concentration of 0.031 ppm (or 0.125% of the established Occupational Exposure Limit for ammonia) would be expected if A tank farm exhauster emissions were present.

Washington River Protection Solutions
EVENT SUMMARY (Continued)

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AR Number: WRPS-AR-2023-1589 Responsible Manager: [REDACTED]

EIR Number: EIR-2023-034 Event Investigator: [REDACTED]

The predicated ammonia concentrations at unspecified ground receptors provides further justification the odor source was unlikely to be resultant of Tank Farms exhauster emissions.

(4) The DFAS dashboard provides a Exhauster Potential Exposure Zone (PEZ) Model of the exhaust plumes at the reported time of the event based on wind speed, wind direction, mixing height, and stability class. Evaluation of the PEZ Model indicates exhaust plumes of the 702-AZ Exhauster, AP Exhauster, POR-126 Exhauster, POR-127 Exhauster, POR-518 Exhauster, and POR-519 Exhauster were not within the work area location at the reported time of the event. Thus, determining the cause of the personal ammonia alarm was unlikely to be resultant of 702-AZ Exhauster, AP Exhauster, POR-126 Exhauster, POR-127 Exhauster, POR-518 Exhauster, and POR-519 Exhauster emissions (Refer to Attachment 1 for DFAS PEZ Model).

While the AY-1 Change Tent appeared to be within the Potential Exposure Zone of the AW Exhauster emission plume, the approximate distance of AY Change Tent from the AW Exhauster Exhauster is approximately 1,000 feet. Thus, determining the cause of the observed odors was unlikely to be resultant of POR-126 exhauster emissions (Refer to Attachment 1).

Additional Compensatory/Remedial Measures (any additional measures taken if different from immediate actions):

None.

Lessons Learned or Information That the Work Force Needs Immediately:

None. Per TFC-OPS-OPER-C-28, "Operating Experience/Lessons Learned," this event did not meet the criteria requiring generation of a Lessons Learned.

- An Event Investigation will be completed per [TFC-OPS-OPER-C-14](#)
- This event will be managed by another process, i.e., Operability Evaluation, Engineering Technical Evaluation, etc.
- This event does not require continuation of the Event Investigation process

Basis for Determination:

This event does not require continuation of the event investigation process under TFC-OPS-OPER-C-14, "Event Investigation Process". The facts, findings, and comprehensive account captured under this Event Summary and the Industrial Hygiene Event Investigation Report, IHIR-00068 "TF-AOP-015 Entry at AY-1 Change Tent," form the basis that further investigation will provide no additional information or operational benefit.

Responsible Manager:

[REDACTED] Signature / Date

CAS Manager:

[REDACTED] Digitally signed by [REDACTED]
Date: 2023.05.25 14:18:17 -07'00'
Signature / Date

Attachment 1 - DFAS PEZ Model

DFAS Exhauster Potential Exposure Zone Model
Actual conditions on 05/19/2023 @ 1339 hours:
• Wind Speed: 6.1 miles per hour (mph)
• Wind Direction: 200 ° (out of South-South West)
• Mixing Height: 400 feet above grade
• Stability Class: D (neutral conditions)

702-AZ Exhauster

POR-127 Exhauster

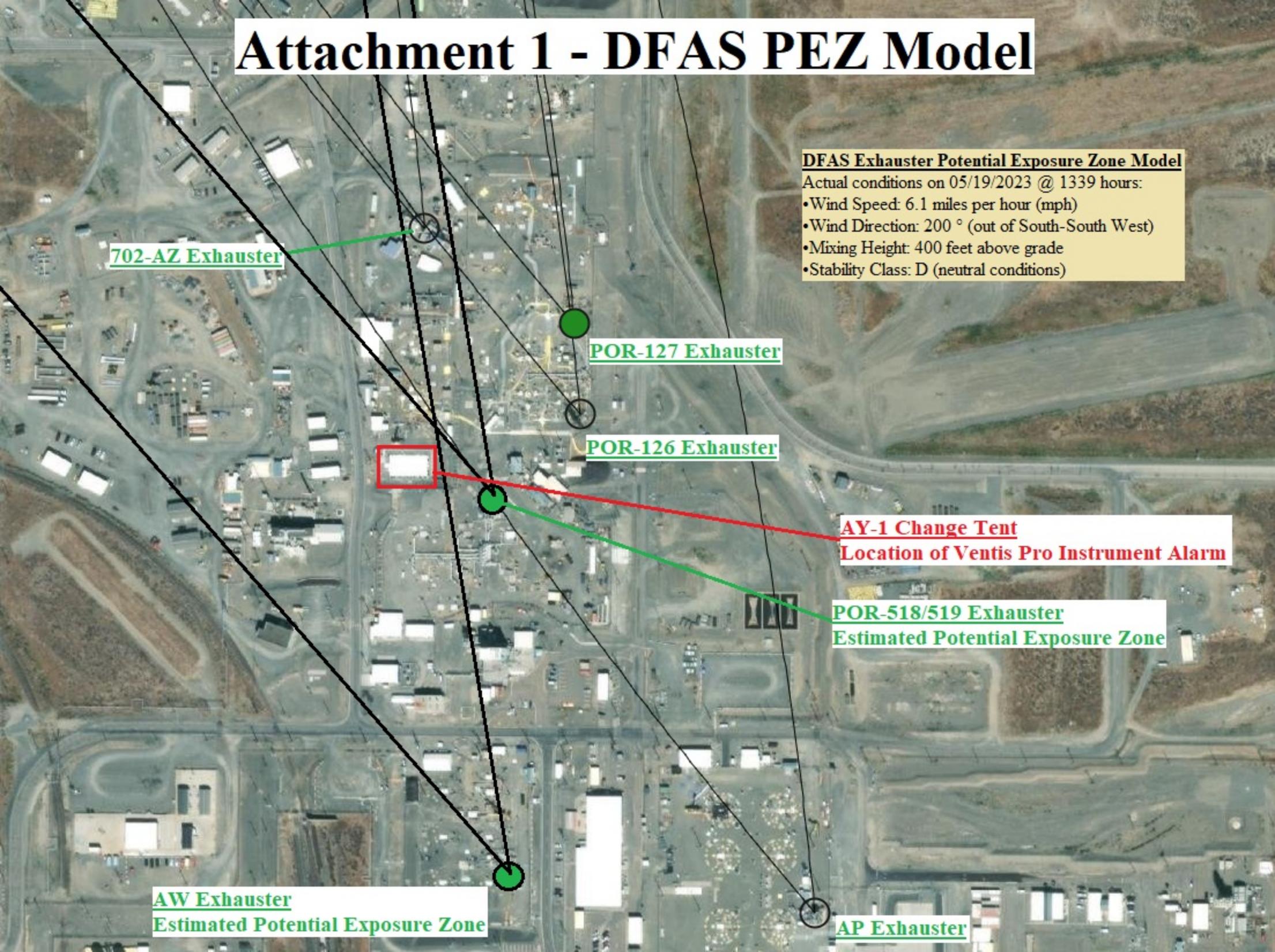
POR-126 Exhauster

AY-1 Change Tent
Location of Ventis Pro Instrument Alarm

POR-518/519 Exhauster
Estimated Potential Exposure Zone

AW Exhauster
Estimated Potential Exposure Zone

AP Exhauster



Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT

Event Title: TF-AOP-015 Entry at AY-1 Change Tent	PER Number: N/A
	IHIR Number: IHIR-00068

Date: 05/19/2023	Time: 14:30	Location: AY-1 Change Tent
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Event Summary and Timeline:

Event Summary:
A Personal Ammonia Monitor (PAM) alarmed and indicated 6 ppm ammonia inside of AY-1 Change Tent. There were 13 workers present at the time of the PAM alarm. Workers immediately exited AY-1 Change Tent.

Field Response Timeline:

1339 Approximate time of event - PAM alarm
1431 TF-AOP-015 is entered.
1503 Production Operations East shift Industrial Hygiene Technicians (IHTs) perform direct reading instrument monitoring of the change tent, reporting ammonia concentrations less than detectable.
TF-AOP-15 is exited.

Sampling/Monitoring Results:

Field Response area readings:

- Ammonia: Less than Detectable (< 1 ppm)

Ventis Pro V 004656 (Event Initiating PAM):

- 5/19/2023 13:33 0 ppm ammonia
- 5/19/2023 13:36 2 ppm ammonia
- 5/19/2023 13:37 4 ppm ammonia
- 5/19/2023 13:39 6 ppm ammonia
- 5/19/2023 13:40 3 ppm ammonia
- 5/19/2023 13:41 0 ppm ammonia

Readings before 13:33 and after 13:41 were below detectable ammonia concentrations.

SWIHD References:

- Event Response Site Wide Industrial Hygiene Database Direct Reading Instrument Survey #23-03059

Additional Information:

At the time of the initiating event, the employee wearing the PAM that alarmed was taking a break in AY-1 Change Tent after exiting A Farm. At the time of the alarm, workers were not located in an area requiring use of respiratory protection.

Additional Information on the PAM (Ventis Pro V):

Ventis Pro V 004656 (event initiating instrument):

- Put into service on 04/18/2022
- Sensor ID: 210700Z033
- Unit Serial Number (SN): 21091UB-090
- User ID: [REDACTED]
- Datalog Interval: 10 seconds
- Passed Daily Function Test for Ammonia (Bump Test): 5/19/2023
- Last Successful Calibration of Unit for Ammonia: 5/4/2023

Review of the Data Fusion and Advisor System (DFAS) application, powered by SmartSite™, Weather Details and Chemical Details dashboards around the reported time of the event indicate the cause of the PAM alarm is unlikely to be from Tank Farm Exhauster emissions based on:

Washington River Protection Solutions
INDUSTRIAL HYGIENE EVENT INVESTIGATION REPORT(Continued)

Additional Information:

05/19/2023 @ 1339

- Wind Speed: 6.1 mph
- Wind Direction: 200 (SSW)
- Mixing Height: 400 feet above grade
- Stability Class: D (neutral conditions)

05/19/2023 @ 1339 Vapor Monitoring Data System ammonia readings:

- POR 518: 2.0 ppm ammonia
- POR 519: 1.1 ppm ammonia
- POR 127: 17.6 ppm ammonia

VMDS at POR 126 and 702 AZ were not recording stack ammonia concentrations at time of event.

Memo WRPS-1904672.1, TANK FARM EXHAUST STACK CONCENTRATION ALARM/ ACTION LEVELS FOR AMMONIA establishes stack alarm/action set points for Tank Farm Exhausters. The alarm/action set points are based on a linear extrapolation of the Quantitative Risk Assessment model prediction resulting in various ammonia concentrations at an unspecified ground receptor.

- 241-A:
 - o High Alarm was conservatively established at 160 ppm Ammonia
 - Ammonia concentration of 2.5 ppm at an unspecified ground receptor
 - o High High Alarm was conservatively established at 320 ppm Ammonia
 - Ammonia concentration of 5 ppm at an unspecified ground receptor

Recommendations/Conclusions:

Recommendations:

N/A

Conclusions:

Washington River Protection Solutions Industrial Hygiene Department has established a conservative, reasonable, and data-derived response level of 6 ppm for PAM concentrations associated with tank waste gases/vapors in the Hanford Tank Farms. The intent of this response level is to enhance the safety of Hanford Tank Farm workers by establishing a conservative and timely indicator of potential changing conditions in Tank Farm gas/vapor conditions, at which prudent and protective investigative measures may be taken.

The cause of the PAM alarm is unknown. However, review of the stack emissions using the DFAS application, field readings, weather details, and chemical details dashboards for the reported time of the event indicate the cause of the PAM alarm is unlikely to be from Tank Farm exhauster emissions. Monitoring via direct reading instrumentation and observations made by the IHTs during the event response demonstrated conditions which caused the alarm were no longer present, allowing the exit of TF-AOP-015.

Other:

Event Investigation Report # EIR-2023-034

Industrial Hygienist:

██████████

Print First and Last Name

████████████████████

Digitally signed by ██████████
Date: 2023.05.25 09:29:36 -0700

Signature / Date

Industrial Hygiene Level 2 Manager:

██████████

Print First and Last Name

████████████████████

25 MAY 2023

Signature / Date

ODOR/VAPOR RESPONSE CARD - 241 AY FARM

1. Complete below information and map (Page 1).

- Date and time of event: 5-19-23
- Check Applicable:
 Odor Ammonia Alarm (6 ppm) Ammonia Alarm (12 ppm) Alarm (other - describe): _____
- Your name and the work you were performing:
[REDACTED] on break in change trailer. Laborer
- Other Work Underway? Describe: _____
- Location of event (mark area on map and wind direction): _____
- Name(s) of others in or near the affected area: I was by myself.
- Was Industrial Hygiene present, who? Yes.
- Describe the odor:

<input type="checkbox"/> Sweet	<input type="checkbox"/> Sour	<input type="checkbox"/> Smoky	<input type="checkbox"/> Septic/Sewer	<input type="checkbox"/> Musty	<input type="checkbox"/> Rotten
<input type="checkbox"/> Metallic	<input type="checkbox"/> Onion	<input type="checkbox"/> Earthy	<input type="checkbox"/> Ammonia	<input type="checkbox"/> Citrus	<input type="checkbox"/> Solvent
<input type="checkbox"/> Other (describe): <u>I did not smell an odor.</u>					
- Is source known/likely? Describe: _____
- Your symptoms? None

<input type="checkbox"/> Headache	<input type="checkbox"/> Dizziness	<input type="checkbox"/> Nausea	<input type="checkbox"/> Cough	<input type="checkbox"/> Fatigue
<input type="checkbox"/> Weakness	<input type="checkbox"/> Sore Throat	<input type="checkbox"/> Difficulty Breathing	<input type="checkbox"/> Eye Irritation	<input type="checkbox"/> Rash
<input type="checkbox"/> Itch	<input type="checkbox"/> Tingling	<input type="checkbox"/> Numbness	<input type="checkbox"/> Taste	
<input type="checkbox"/> Other (describe): _____				

2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM. If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

5-19-23

ODOR/VAPOR RESPONSE CARD - 241 AY FARM

Instructions:

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager (CSM), at [REDACTED].
3. Complete both pages of this form and include as many details as possible, including:
 - a. Approximate location, see map at right;
 - N/A* b. Wind direction, speed and description, such as stable or gusty wind;
 - N/A* c. Environmental conditions, such as hot, cold, windy, rainy;
 - d. Other work or contractors in the area;
 - e. Anything else you think is relevant.
4. Provide the completed card to your Supervisor*, Industrial Hygiene*, Union Safety Representative* or the CSM.

* If received by Supervisor, IH, or Union Safety Representative, the Supervisor/IH/ Union-SR will ensure card it is provided to the CSM.

AY FARM

