

C-67 Event Investigation Reports (Redacted) EIR-2024-035 C-67 (04/08/2024)

(Settlement Agreement Deliverable)

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC27-08RV14800



**P.O. Box 850
Richland, Washington 99352**

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Washington River Protection Solutions

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WRPS

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APPROVED

By Lynn M Ayers at 8:21 am, Apr 18, 2024

Release Approval

Date

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Washington River Protection Solutions
EVENT SUMMARY

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:

1. Project: Construction 2. Report Date: 04/10/2024

3. Investigation Title: C-67 Odor Response NE Exterior Corner of A-Farm

4. Investigation Report Number: EIR-2024-035

5. Responsible Manager: [REDACTED]

6. Event Investigator: [REDACTED]

7. Area / Building / Location: 200East/241A-Farm/NE CORNER OF A-FARM

8. Date and Approximate Time of Event: Date: 04/08/2024 Time (military): 0930 hours

9. Associated Action Request (AR) Number: WRPS-AR-2024-1385

10. Associated Occurrence Report Number (if applicable): NA

11. Event Investigation Meeting Held: Yes [] or No [X] Date: NA Time (military): NA

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

Two workers were performing Work Order (WO)# 990016, step 5.4.3. The work step was to field locate yellow jacket/line backer with spacing. The workers were pushing cable through the cyclone fence of A-Farm to a group pulling the cable inside the fence in the NE corner of the farm.

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

2 Electricians - AEI

1 Field Work Supervisor (FWS) - AEI

1 Industrial Hygiene Technician (IHT) - WRPS

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

On 04/08/2024 at approximately 0930 hours, two workers were pulling wire/cable up the hill at the NE corner of A-Farm. When they reached the top of the hill, they smelled a stronger than normal odor the workers described as like propane. One worker described it as the same smell when a barbeque is about to be ignited. None of the workers reported any symptoms and they all declined medical evaluation.

Both workers left the area immediately and notified their FWS. The odor was reported to the Central Shift Manager (CSM) at 0958 hours. The workers were instructed to come to the Central Shift Office (CSO) and fill out odor response cards. An IHT responded to the odor event and took Direct Reading Instrument (DRI) readings of the area. None of the readings were at action levels. The workers and the IHT could smell the same odor, but the DRI did not register any action levels.

Washington River Protection Solutions
EVENT SUMMARY

A-Farm Complex

NORTH ↑



Figure 1: Area of odor

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

Location

The Odor was detected at the NE corner of the A-Farm Complex. The workers were outside of the CA/RA fence, and North of the yellow vent pipe.

Personal Protective Equipment (PPE)

Workers were wearing PRO TECH clothing. Workers were performing work outside of Tank Farm boundaries; thus, Respiratory Protective Equipment (RPE) and Portable Alpha Meter (PAMS) were not required.

Workers were not in areas posted as a radiologically controlled area (therefore, not required to wear anti-contamination clothing) and were not in areas requiring the use of respiratory protection or a personal ammonia monitor (e.g., ToxiRAE or VentisPro).

Weather Conditions

Wind speed: 4 Miles Per Hour (MPH)
Wind direction: out of the Southeast degrees 130
Temperature: 50 degrees
Barometric Pressure: 29.467 HG
Humidity: 48%
Mixing height: 500 meters

Vapor Monitoring and Detection System (VMDS)

Readings at the approximate time of the odor event were:

- POR518 (241-A): 0 ppm
- POR519 (241-A): 0.311 ppm
- POR126 (241-AX): 0 ppm
- POR127 (241-AX): 34.659 ppm
- 702AZ (241-AY/AZ): 18.077 ppm

Washington River Protection Solutions
EVENT SUMMARY

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

None.

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

- [0930 hours] - Odor reported to FWS.
- [0958 hours] - CSM notified of the odor.
- [1007 hours] - The CSM entered TFC-OPS-OPER-C-67, and restricted access to the NE corner of A-Farm.
- [1008 hours] - The CSM made the required TFC-OPS-OPER-C-67 notifications.
- [1008 hours] - Shift Office Emergency Notification (SOEN) sent.
- [~1020 hours] - IHT monitoring the area with Direct Reading Instrument (DRI).
- [1100 hours] - CSM confirms with Hanford Mission Integrations Solutions (HMIS) that no water/sewer utility work was occurring nearby.
- [~1130 hours] - No actionable levels found by the IHT.
- [1150 hours] - Access to NE corner of A-Farm restored.

18. Compensatory Actions Taken:

None.

19. Remedial Actions Taken:

None.

20. Key Elements of the Investigation: *(Key investigation points)*

To summarize the conclusions of the Industrial Hygiene Event Investigation Report (IHIR-00093) for EIR-2024-035, *C-67 Odor Response NE Exterior Corner of A-Farm*, investigation and DRI monitoring, all readings were below DRI detection levels.

The IHT performed monitoring in and around areas where individuals experienced odors. The results of this monitoring on the IHIR-00093 report are as follows:

During the response, R/C IH and Level 2 IHM accompanied IHT using a slow approach from upwind to perform DRI monitoring near the following areas:

- Sewer/septic system at the corner of 4th St and Canton Pl - no odors
- Lift station 216A1A SE of work area - no odors
- Porta potties adjacent to work area - no odors
- Idling truck had departed
- Work area boundary - no odors
- Old AX Change Tent location west adjacent to work area - no odors
- 701AZ/VMDS bottles west adjacent to work area - no odors

DRI monitoring readings:

- Ammonia: less than 1 ppm
- Volatile Organic Compounds: less than 0.010 ppm
- Hydrogen sulphide: less than 0.1 ppm

At the time of the odor event, winds were coming from the Southeast, ruling out tank farm vapors.

Washington River Protection Solutions
EVENT SUMMARY

DRI monitoring performed during TFC-OPS-OPER-C-67 response actions did not indicate further actions were necessary from a worker safety and health occupational exposure standpoint. As a result, the area was released from restricted access at 1150 hours.

21. Positive Aspects Identified:

All workers left the area of the odor immediately.

The IHT performed a thorough evaluation of the area for odors.

No actionable levels were identified.

22. Key Take Aways / Learning Opportunities:

- Identification of all potential hazards should be part of the pre-job meeting.
- Unmarked equipment should be identified for workers. The NE corner of A-Farm has an abandoned sewer system that has a yellow pipe for venting. The vent pipe is unmarked. (See Picture 1) The CSM said that some people know of the sewer vent pipe, and some do not. The CSM also said that several workers in that area have talked about the same odor, but they knew what it was, so it was not reported.



Picture 1: the yellow sewer vent pipe and location the workers were.

Washington River Protection Solutions
EVENT SUMMARY

23. Event Investigation:

- ☐ 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.

Responsible Manager Approval:

<i>Name (First, Middle Initial, Last)</i>	<i>Signature / Date</i>
--	--

Digitally signed by [REDACTED]
Date: 2024.04.10 14:38:55 -07'00'

CAS Manager Approval:

<i>Name (First, Middle Initial, Last)</i>	<i>Signature / Date</i>
--	--

Digitally signed by [REDACTED]
Date: 2024.04.10 15:01:12 -07'00'

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

Event Title: TF-OPS-OPER-C-67 Odor Response NE Exterior Corner of A-Farm	IHIR Number: IHIR-00093
	IHEI Number: N/A

Date: 4/8/2024	Time: 0958	Location: NE Exterior of A-Farm
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Event Summary and Timeline:

Event Summary:

- Around 1000 on 4/8/2024, two American Electric electricians encountered a propane odor while working outside the NE corner of A-Farm. CSM and R/C IH were notified of the odor. No symptoms were experienced by any of the individuals and all declined precautionary medical surveillance.
- Access was restricted to area at 1007 and a response plan generated, results below.
- Sweeps were conducted along Canton Place, with a focus on the septic system at the corner of Canton Pl and 4th St, the lift station (216A1A), and the work area where the odor was observed.
- Results of DRI Monitoring:
 - Ammonia - Less than detectable (<1 ppm)
 - Volatile Organic Compounds (10.6 eV PID) - Less than detectable (<0.01ppm)
 - Hydrogen Sulfide - Less than detectable (<0.1 ppm)
 - Post use function test completed at 1144 4/8/2024
- At the time of the odor event, winds were coming from the Southeast, ruling out tank farm vapors.
- Access to area was restored at 1150.

Field Response Timeline:

0958 Workers notify Central Shift Manager (CSM) of propane odors on the NE exterior of A-Farm
 1003 Industrial Hygiene Technician (IHT) notifies Retrieval/Closure Industrial Hygienist (R/C IH) of odors and that odor has been reported to CSM
 1008 Production Operations East (POE) IH-1 arrives at Central Shift Office (CSO)
 1010 Data Fusion Advisory System (DFAS) checked for current weather conditions:

- Stability Class - D (neutral conditions)
- Wind Speed - 3.3 miles per hour (mph)
- Mixing Height - 500 feet above grade

1016 POE IHT contacts POE IH-1, POE IHT instructed to prepare direct reading instrument (DRI) for Ammonia (NH3), volatile organic compounds (VOC), and hydrogen sulfide (H2S), then report to CSO
 1016 Affected workers arrive at CSO to complete Odor Vapor Response Cards (OVRC)
 1016 POE IH-2 arrives at CSO
 1017 Operations Engineer (OE) reports to CSM that access has been restricted to the affected area on Canton Place
 1020 IHT Shift Supervisor arrives at CSO
 1022 OVRC completed by affected workers
 1026 R/C IH arrives at CSO
 1028 Vapor Monitoring Detection System (VMDS) data pulled for 0930 (see Additional Information)
 1032 Affected IHT arrives at CSO and fills out OVRC, informs CSM that they monitored for NH3 and VOC at time of event and all readings less than detection; affected IHT smelled exhaust odor, noted that a truck was idling nearby
 1043 Responding IHT arrives at CSO
 1047 CSM and POE IH-1 sign Attachment A Sheet 1 of 2
 1051 Level 2 Industrial Hygiene Manager (IHM) arrives at CSO
 1052 POE IH-1 briefs responding crew, consisting of responding IHT, R/C IH, and Level 2 IHM

- Location
- Sample plan
- RPE
- Noise

1100 CSM confirms with Hanford Mission Integration Solutions (HMIS) that no water/sewer utility work was occurring nearby
 1123 Responding crew arrives back at CSO - all readings at background or less than detection
 1126 Responding IHT departs CSO to post-function check DRI
 1144 Responding IHT informs IHT Shift Supervisor that DRI passed post-function check

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

Event Summary and Timeline:

1146 CSM and POE IH-1 sign TFC-OPS-OPER-C-67 Attachment A Sheet 2 of 2, Response Plan

1150 Exit C-67 and access is restored

- SOEN: "Exiting response per TFC-OPS-OPER-C-67 for odors identified as propane on the northeast corner of A-Farm exterior. IHT readings were at or below background. Access has been restored to the area. CSM"

Electricians were performing work outside of Tank Farm boundaries, thus RPE and PAMs were not required.

Sampling/Monitoring Results:

DRI Monitoring Results in and around area where individuals experienced odors:

During the response, R/C IH and Level 2 IHM accompanied IHT using a slow approach from upwind to perform DRI monitoring near the following areas:

- Sewer/septic system at the corner of 4th St and Canton Pl - no odors
- Lift station 216A1A SE of work area - no odors
- Porta potties adjacent to work area - no odors
- Idling truck had departed
- Work area boundary - no odors
- Old AX Change Tent location west adjacent to work area - no odors
- 701AZ/VMDS bottles west adjacent to work area - no odors

DRI monitoring readings:

- Ammonia: less than 1 ppm
- Volatile Organic Compounds: less than 0.010 ppm
- Hydrogen sulfide: less than 0.1 ppm

*All readings were below DRI detection levels

SWIHD References:

SWIHD DRI Survey:

- 24-02561, "TFC-OPS-OPER-67 response at 241-A Farm"

Additional Information:

These results along with the review of the atmospheric conditions outside of the area where individuals experienced odors around the reported time of the event indicate the cause of the odor is unlikely to be from Tank Farm emissions. Below are the DFAS and VMDS data:

Review of DFAS at the approximate time of odor event on 04/08/2024 @ 0930:

- Wind Speed: 3.1 mph
- Wind Direction: 181° (out of South)
- Mixing Height: 500 feet above grade
- Stability Class: D (neutral conditions)

VMDS exhaustor ammonia readings at the approximate time of odor event on 04/08/2024 @ 0930:

- POR518 (241-A): 0 ppm
- POR519 (241-A): 0.311 ppm
- POR126 (241-AX): 0 ppm
- POR127 (241-AX): 34.659 ppm
- 702AZ (241-AY/AZ): 18.077 ppm

Exhaustor stacks have enhanced monitoring, VMDS, that can be used to detect elevated readings and provide further warnings of unexpected conditions. As a more conservative approach, Memo WRPS-1904672.1, TANK FARM EXHAUST STACK CONCENTRATION ALARM/ACTION LEVELS FOR AMMONIA establishes stack alarm/action set points for Tank Farm Exhaustors. 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.

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

Additional Information:

241-A:

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

241-A Complex:

- High Alarm was conservatively established at 460 ppm Ammonia
 - Ammonia concentration of 2.5 ppm at an unspecified ground receptor
- High High Alarm was conservatively established at 920 ppm Ammonia
 - Ammonia concentration of 5 ppm at an unspecified ground receptor

Furthermore, the review of VMDS data concludes that there was very low potential for ground level exposure from exhausters.

Nearby potential odor sources:

- 2607-E12: Septic system for several surrounding facilities; pumps, piping, and other associated structures removed to 2ft below grade and filled with Controlled Density Fill (CDF), one existing tank remains in place for emergency storage; located on the NE corner of Canton Pl and 4th St.
- 200-E-320: Sample Pit #3; used to send start up waste from PUREX to 216-A-1 crib in 1955; not currently active; located E of Canton Pl, W of 216-A-1 crib.
- A pair of porta-potties are located across Canton Pl from the work area; at the time of the event, it had been approximately one week since last service date.

Recommendations/Conclusions:

Recommendations:

It is recommended that the Event Investigator and the IH review results of the investigation report with the work crew.

Conclusions:

Based on the event investigation and reviewing environmental conditions related to worker location, wind direction, and available monitoring data when the odors were reported, it is unlikely that the odors reported by the workers were caused by Tank Farm vapors. DRI monitoring and observations made by R/C IH, Level 2 IHM, and IHT demonstrated conditions which caused the experienced odors were no longer present. As a result the area where odors were reported was released from restricted access and work was allowed to continue. This general area has been the location of several odor incidents in the past with varying odor descriptors used. The investigation was not able to determine the source of the reported odors.

Others:

Event Investigation Report:

- EIR-2024-035, "C-67 Odor Response NE Exterior Corner of A-Farm"

Associated Documents:

iCAS Number: N/A

EIR Number: EIR-2024-035

Industrial Hygienist:

Print First and Last Name

Digitally signed by _____
A
Date: 2024.04.10 13:42:26 -07'00'

Signature / Date

Industrial Hygiene Level 3 Manager

Print First and Last Name

Digitally signed by _____
A
Date: 2024.04.10 13:38:01 -07'00'

Signature / Date

Industrial Hygiene Level 2 Manager:

Print First and Last Name

Digitally signed by _____
A
Date: 2024.04.11 06:39:50 -07'00'

Signature / Date

Additional Information



Figure 1. 200-East Area with exhaustor plume models for 241-A, 241-AX, 241-AP, and 241-AW 0930 on 04/08/2024 using DFAS (241-AW and 241-A Farm exhausters were drawn in based on other projections. Work area and potential nearby sources are indicated on map.

Additional Information



Figure 2. Photographs showing proximity of porta potties (A) and 216A1A (B) to affected work area.

Additional Information

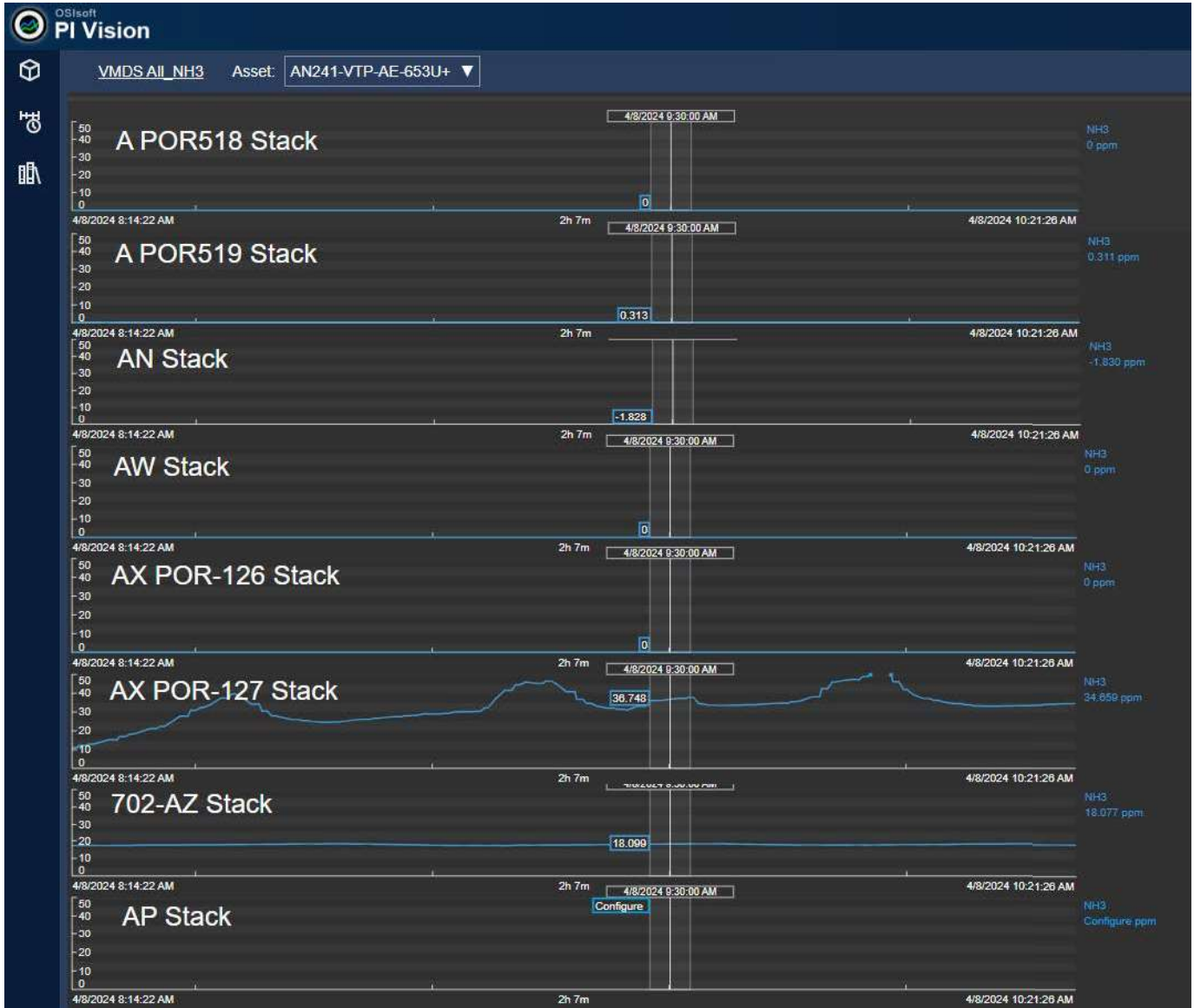


Figure 3. VMDS readings for ammonia at all exhausters in A Complex at the time of the odor.

ODOR/VAPOR RESPONSE CARD - 241 A FARM

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

- Date and time of event: 4.8.21 0958
- Check Applicable:

☒ Odor ☐ Ammonia Alarm (6 ppm) ☐ Ammonia Alarm (12 ppm) ☐ Alarm (other - describe):

- Your name and the work you were performing:

ITHT observing work

- Other Work Underway? Describe:

East A-farm service line outside at top of AX-hill

- Location of event (mark area on map and wind direction):

- Name(s) of others in or near the affected area:

- Was Industrial Hygiene present, who?

Yes

- Describe the odor:

- | | | | | | |
|---|--------------------------------|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|
| ☐ Sweet | ☐ Sour | ☐ Smoky | ☐ Septic/Sewer | ☐ Musty | ☐ Rotten |
| ☐ Metallic | ☐ Onion | ☐ Earthy | ☐ Ammonia | ☐ Citrus | ☐ Solvent |
| ☒ Other (describe): Smeared car exhaust | | | | | |

- Is source known/likely? Describe:

Yes

- Your symptoms? ☒ None

- | | | | | |
|--|--------------------------------------|---|---|----------------------------------|
| ☐ Headache | ☐ Dizziness | ☐ Nausea | ☐ Cough | ☐ Fatigue |
| ☐ Weakness | ☐ Sore Throat | ☐ Difficulty Breathing | ☐ Eye Irritation | ☐ Rash |
| ☐ Itch | ☐ Tingling | ☐ Numbness | ☐ Taste | |
| ☐ 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.

ODOR/VAPOR RESPONSE CARD - 241 A FARM

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

- Date and time of event: 4/8/24 9:30AM Apprentice Electrician
- Check Applicable:
 - ☒ Odor
 - ☐ Ammonia Alarm (6 ppm)
 - ☐ Ammonia Alarm (12 ppm)
 - ☐ Alarm (other - describe):

Your name and the work you were performing:

Other Work Underway? Describe: Pulling wire from out of fence through fence

Location of event (mark area on map and wind direction):

Name(s) of others in or near the affected area:

Was Industrial Hygiene present, who?

Describe the odor:

- | | | | | | |
|-----------------------------------|--------------------------------|---------------------------------|---------------------------------------|---------------------------------|----------------------------------|
| ☐ Sweet | ☐ Sour | ☐ Smoky | ☐ Septic/Sewer | ☐ Musty | ☐ Rotten |
| ☐ Metallic | ☐ Onion | ☐ Earthy | ☐ Ammonia | ☐ Citrus | ☐ Solvent |

Is source known/likely? Describe:

Your symptoms? ☒ None

- | | | | | |
|-----------------------------------|--------------------------------------|---|---|----------------------------------|
| ☐ Headache | ☐ Dizziness | ☐ Nausea | ☐ Cough | ☐ Fatigue |
| ☐ Weakness | ☐ Sore Throat | ☐ Difficulty Breathing | ☐ Eye Irritation | ☐ Rash |
| ☐ Itch | ☐ Tingling | ☐ Numbness | ☐ Taste | |

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.

ODOR/VAPOR RESPONSE CARD - 241 A FARM

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

- Date and time of event: 4-8-24 at 9:30 am Electrician
- Check Applicable:
 - ☒ Odor ☐ Ammonia Alarm (6 ppm) ☐ Ammonia Alarm (12 ppm) ☐ Alarm (other - describe):
- Your name and the work you were performing:
virt pull on air bill
- Other Work Underway? Describe:
N/A
- Location of event (mark area on map and wind direction):
Air bill by fence
- Name(s) of others in or near the affected area:
[redacted]
- Was Industrial Hygiene present, who? — IHA was
1st showed up after initial smell — 10 minutes later but odor was still present
- Describe the odor:
 - ☐ Sweet ☐ Sour ☐ Smoky ☐ Septic/Sewer ☐ Musty ☐ Rotten
 - ☐ Metallic ☐ Onion ☐ Earthy ☐ Ammonia ☐ Citrus ☐ Solvent
 - ☒ Other (describe): propane
- Is source known/likely? Describe:
N/A
- Your symptoms? ☒ None
 - ☐ Headache ☐ Dizziness ☐ Nausea ☐ Cough ☐ Fatigue
 - ☐ Weakness ☐ Sore Throat ☐ Difficulty Breathing ☐ Eye Irritation ☐ Rash
 - ☐ Itch ☐ Tingling ☐ Numbness ☐ Taste
 - ☐ Other (describe):

2. Provide this completed card (Page 1 & 2) to Supervisor, Industrial Hygiene, your Union Safety Representative or the CSM.

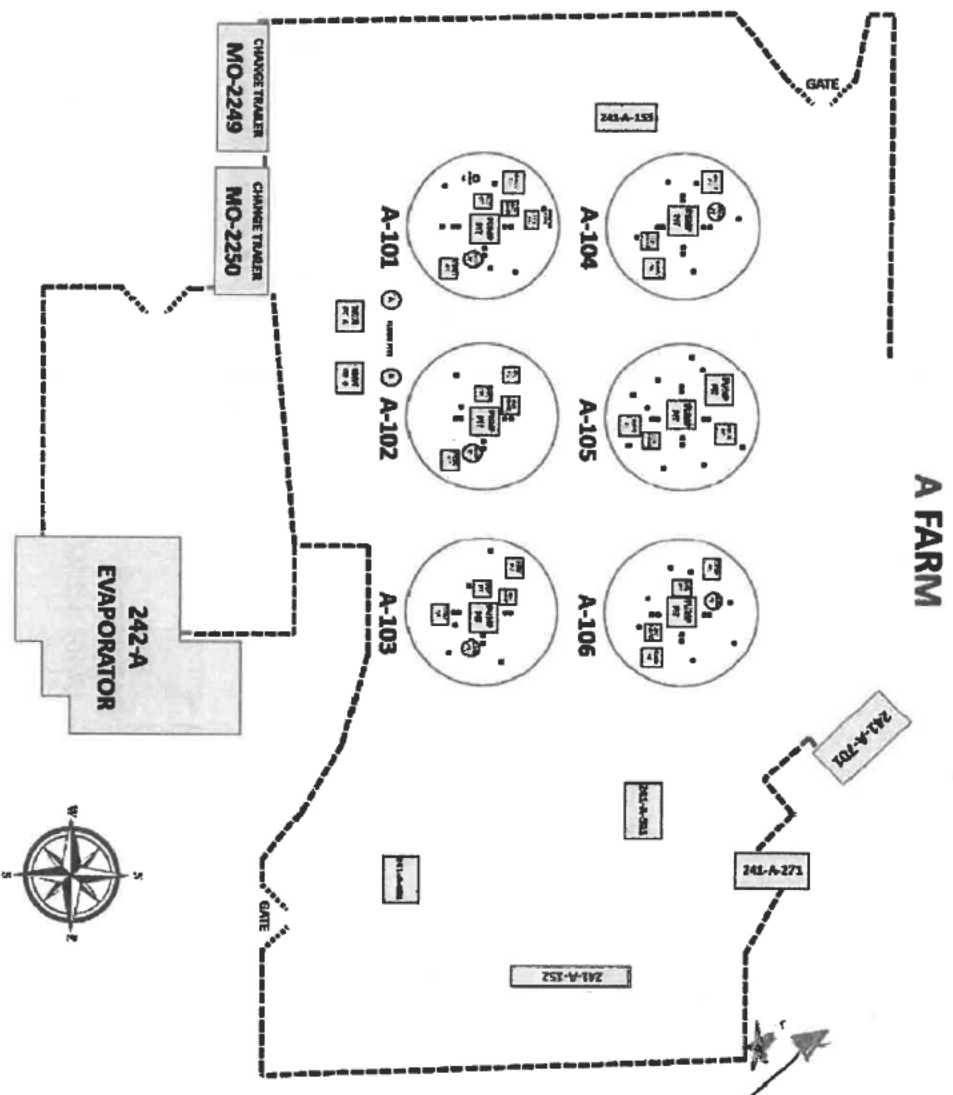
If received by Supervisor/IH/U-SR, Supervisor/IH/U-SR will ensure card is provided to the CSM.

ODOR/VAPOR RESPONSE CARD - 241 A 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;
 - b. Wind direction, speed and description, such as stable or gusty wind;
 - 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.

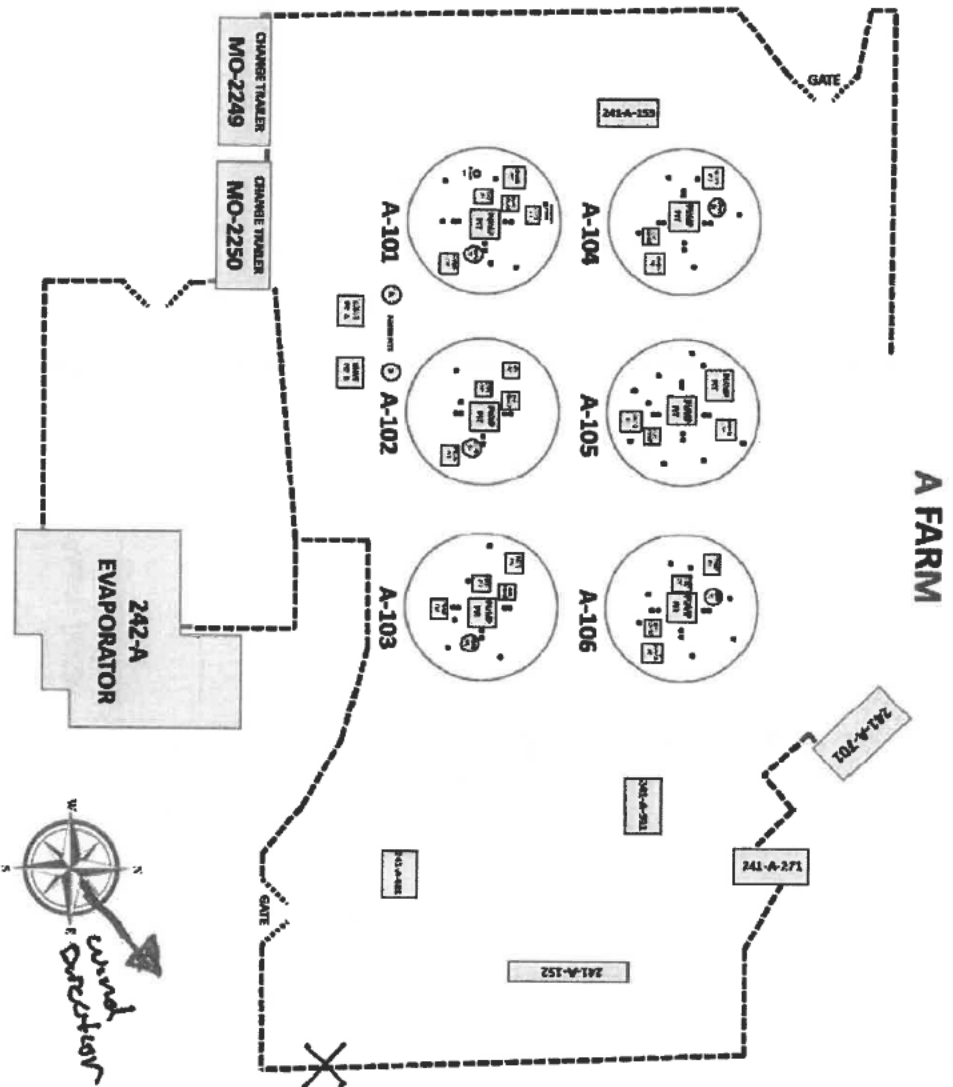


ODOR/VAPOR RESPONSE CARD - 241 A FARM

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;
 - b. Wind direction, speed and description, such as stable or gusty wind;
 - 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.



ODOR/VAPOR RESPONSE CARD - 241 A 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;
 - b. Wind direction, speed and description, such as stable or gusty wind;
 - c. Environmental conditions, such as hot, cold, windy, rainy;
 - d. Other work or contractors in the area;
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* If received by Supervisor, IH, or Union Safety Representative, the Supervisor/IH/ Union-SR will ensure card it is provided to the CSM.

