EVENT INVESTIGATION REPORT

TF-AOP-15 Event 242-A Condenser Room 12/03/2019

EIR-2019-050

12/23/2019

Date

12/23/2019

Date
Executive Summary

On Tuesday, December 3, 2019 at 1230, two work crews consisting of seven total workers reported unknown odors while performing work in the 242-A Condenser Room. Work was being performed under work order #381785, PSL-1A-2 air pressure switch calibration and work order #511835, 242-A FL5 annual fixed ladder inspection. After attempting to locate the source of the odor, the crews evacuated the Condenser Room at 1320. The 242-A Shift Manager (SM) was notified, and access was restricted to the Condenser Room. The Central Shift Manager (CSM) was notified, and TF-AOP-015 Response to Reported Odors or Unexpected Changes to Vapor Conditions was entered. Industrial Hygiene obtained direct readings and three bag samples from the Condenser Room and found no actionable levels of ammonia, hydrogen sulfide, nitrous oxide, mercury or other Volatile Organic Compounds (VOC).

Six of the seven workers did not experience any related symptoms, and declined medical evaluation at HPMC. One worker reported feeling dizziness/light-headed after evacuating the Condenser Room. The worker was transported to HPMC, assessed by HPMC professionals, and released to return to work without restrictions.

EIR-2019-050 was initiated and WRPS-PER-2019-2378 was written to document the issue. No conclusive evidence to the source of the odors was identified.

Investigation Summary

On Tuesday, December 3, 2019 at 1230, two work crews reported encountering unknown odors while performing work in the 242-A Condenser Room. Crew-1 consisted of one Nuclear Control Operator (NCO-1), two Health Physics Technicians (HPT), and two Instrument Technicians, who were performing a calibration of PSL-1A-2 Air Pressure Switch per work order #381785 on level 5 of the Condenser Room. Crew-2, consisted of one NCO (NCO-2) and one HPT, who were waiting for riggers to arrive to perform ladder inspections per work order #511835 on level 2 of the Condenser Room.

Initially, the odor, which was described as burnt rubber, was believed to be the result of equipment failure. NCO-2 attempted to locate the source of the odor by traversing up and down all five levels of the Condenser Room several times. When unable to locate the source of the odor, NCO-2 asked the remaining workers if they smelled anything. They all agreed that there was an odor present, and that it smelled like burnt rubber, burnt ballast, or burnt solder. NCO-1 informed the A1 Board Operator of the odor. As the source of the odor was unknown, the A1 Board Operator instructed the crews to evacuate the Condenser Room immediately. The A1 Board Operator then notified the SM. The SM sent an NCO (NCO-3) up to the K1-5-1 ventilation system room to investigate the potential source of the odor. No odors were detected in or around K1-5-1. The 242A SM posted the Condenser Room as Restricted Access and notified the CSM of the odor event.

The CSM declared an AOP-015 event per SOEN notification, contacted the On-Call Facility Representative and initiated an Event Investigation. See WRPS-PER-2019-2378. Industrial Hygiene technicians (IHT) arrived at 242A Evaporator entered the Condenser Room wearing self-contained breathing apparatus (SCBA). See attached respiratory Protection Form. The IHTs performed direct readings on each level of the Condenser Room, but found no detectable levels of VOC, Ammonia, or Mercury. Oxygen levels were 20.9%. The IHT also obtained three grab bag samples from Condenser Room at levels 5, 3, and between levels 1 and 2. The grab
bag samples were analyzed for VOCs, Ammonia, and Mercury with the results well below actionable levels. See the IH Response Team Sample Results in the table below. At 1530, the CSM exited TF-AOP-015 and the 242-A Shift Manager later restored access to the 242-A Condenser Room.

Six of the seven workers declined medical evaluation at HPMC. NCO-2 reported feeling dizziness/light-headed after evacuating the Condenser Room. NCO-2 was transported to HPMC, assessed by HPMC professionals, and released to return to work without restrictions.

The event investigation identified three potential sources of the odors encountered. The Condenser Room system was not breached during the scheduled calibrations; therefore, it is likely that the odor came through the K1 ventilation system. The K1 ventilation enters through a vent that is located on the east side of 242-A and deploys inside the Condenser Room one foot below the grating of level 5 on the south wall. The ventilation exhaust is located on the northwest side of 242-A and is pulled from 5 feet above the floor on level 1 of the Condenser Room, north wall.

Potential source 1: Production Operations was performing a waste disturbing activity (241-AP-106 was in recirculation mode) in proximity to the 242-A ventilation intake. AP-106 is located south-east of 242-A approximately two hundred yards away. Based on meteorological data at the time of the event, when the crews entered the Condenser Room, wind was blowing from west to east (away from 242-A) at approximately 3 miles per hour. The AP Farm Manager was contacted to verify the presence of odors, but no odors were reported in AP farm on December 03, 2019. Vapors from the recirculation of AP-106 does not appear to be a likely source.

Potential source 2: At the time of the event a water tender vehicle was operating in A-farm, just north of 242-A. The exhaust from the vehicle could have created vapor/odors that had the potential to reach the Condenser Room through the K-1 ventilation, but the description of the odor as burnt rubber or burnt ballast does not match the odor profile of diesel exhaust.

Potential source 3: On 12/02/2019, the day prior to the Condenser Room odor event, a work crew was removing rubber matting from the work deck of 241-AX-103 when they encountered a burning smell near the tank. The result was a TF-AOP-015 event (WRPS-PER-2370), which resulted in EIR-2019-049. The investigation found that the odors were the result of burnt wiring on a job box heating element. The box was removed from the farm. While the odor created by the electrical event was similar in profile to the odors encountered in the Condenser Room, it is unlikely that the odors created would have lingered until the following day.

No conclusive evidence to the source of the odors was identified.

**Event Timeline**

12/03/2019

1230: Two work crews entered 242-A Condenser Room (entrance is on level 2) and noticed a faint odor—burnt rubber. Crew 1 (1 NCO, 2 HPT, and 2 Instrument Techs) entered to perform instrument calibrations (WO# 381785). Crew 2 (1 NCO, 1 HPT) entered to perform ladder inspections (WO# 511835).

1240: NCO-2 investigates location of odor by traversing from level 5 to level 1 several times

1310: NCO-1 reported burning rubber smell in Condenser Room to A1 Board Operator
1320: The workers evacuated the Condenser Room and notified the SM of the odor. The SM restricted access to the Condenser Room and notified CSM.

1325: CSM entered TF-AOP-015 Response to Reported Odors or Unexpected Changes to Vapor Conditions.

1325: CSM notified On-Call Facility Rep of AOP-015 event at 242-A.

1347: NCO 2 reported dizziness/light headed to 242A SM. NCO-2 was transported to HPMC. 242A SM notified CSM.

1350: 242A SM instructs NCO-3 to inspect K1-5-1 supply system in HVAC room for potential source of odor. No potential sources of odors found.

1419: IH Techs report to 242A to perform sampling in Condenser Room. Direct Reading monitoring was performed on levels 1-5 of the Condenser Room using a MultiRAE Pro RAE. NH3, VOC, LEL, O2, and CO were monitored for; all direct readings were less than detectible for NH3, VOC, LEL and CO. O2 levels were 20.9%. Grab bag samples were taken on levels 5, 3 and 1.


1530: CSM response actions for the TF-AOP-015 event at 242-A condenser room have been completed and the results are at or below background levels. Exiting TF-AOP-015.

1530: NCO-2 released by HPMC to return to work without restriction.


1610: Condenser Room access restored.

**Meteorological Data**

<table>
<thead>
<tr>
<th>Event</th>
<th>TF-AOP-015 242-A Condenser Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date/Time of event</td>
<td>12/03/2019 @ 1230</td>
</tr>
<tr>
<td>Location</td>
<td>242-A Condenser Room</td>
</tr>
<tr>
<td>Odor</td>
<td>Burnt rubber, burnt ballast, solder</td>
</tr>
<tr>
<td>Symptoms</td>
<td>One of seven workers reported dizziness/light headed after evacuating area</td>
</tr>
<tr>
<td>DRI results during event</td>
<td>All direct readings were less than detectible for NH3, VOC, LEL and CO. O2 levels were 20.9%.</td>
</tr>
</tbody>
</table>
| Possible source(s) | - AP-106 recirculation  
- Water tender vehicle  
- A Farm electrical box |
IH Response Team Sample Results (242A Condenser Room)

<table>
<thead>
<tr>
<th>Agent</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH₃</td>
<td>&lt; 1 ppm (actionable hazard level 12 ppm)</td>
</tr>
<tr>
<td>H₂S</td>
<td>&lt; IDL</td>
</tr>
<tr>
<td>N₂O</td>
<td>&lt; IDL</td>
</tr>
<tr>
<td>Hg</td>
<td>&lt; 20 ng/m³ (actionable hazard level 12,500 ng/m³)</td>
</tr>
<tr>
<td>VOC</td>
<td>&lt; 10 ppb (actionable hazard level 2 ppm)</td>
</tr>
</tbody>
</table>

*Instrument Detection Limit (IDL)*

**Actions Taken**
- HVAC room investigated for potential source of the odor.
- The CSM made SOEN notifications and contacted On-Call Facility Representative
- IH performed Direct Readings for VOC, LEL, NA3, CO, and O₂ throughout Condenser Room and obtained Grab Bag samples at multiple levels.

**Preliminary Extent of Condition Review**
- No extent of condition exists for this investigation since the event was isolated to the Condenser Room at 242-A.

**Facility Impact**
- Condenser Room was posted as Restricted Access.
- All work in the condenser room was suspended upon worker evacuation and continued on 12/04/2019.
Discussion of Potential Causes

- AP-106 was in recirculation mode. AP-106 is located south-east of 242-A.
- A water tender vehicle was operating in A-farm, just north of 242-A.
- Burnt electrical boxes were removed from A farm the previous day.

Discussion of Positive Aspects of the Event

- Appropriate safety measures were taken immediately.
- Event response was well coordinated from the CSO.

Recommendations/Proposed Corrective Actions

- No recommendations or proposed corrective actions

Attachments:

1. Industrial Hygiene Investigation Report
2. Respiratory Protection Form
Attachment 1
Industrial Hygiene Investigation Report
## Attachment 1 – Odor Response Plan

**DESCRIPTION OF EVENT** (date/time & description of odors detected, location, symptoms, etc):
12/03/2019 at approximately 1250 seven Hanford workers reported odors at 242A on all floors of the condenser room while performing instrument calibrations. Odors were reported to the Central Shift Office (CSO) at 1325. Odors detected included burnt rubber, electrical burn, metallic, musty, smoky, and something burning. Workers listed the possible source as “unknown” and “ventilation”. Six workers experienced no symptoms and declined precautionary medical evaluations. One worker reported experiencing “dizziness/light-headed” and was taken to HPMC for a precautionary medical evaluation.

**RESPONSE STEPS:** Attach additional pages as needed
Industrial Hygiene Technicians (IHTs) monitor their way into 242A Condenser Room using direct reading instrumentation following IH Sampling Plan. Perform DRI monitoring for VOCs on all floors of the condenser room. Collect three (3) grab air samples, one grab air sample on floors 1, 3, and 5. Collect an additional grab air sample if DRI monitoring indicates a possible source. Send grab air samples for HAPsite analysis.

<table>
<thead>
<tr>
<th>IH Sampling Plan #</th>
<th>RWP #</th>
<th>TF-102</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHP-09001</td>
<td>Other</td>
<td>TF-AOP-015 RPF Task 3 (TF-AOP-015 3.1.13)</td>
</tr>
</tbody>
</table>

### REQUIRED APPROVAL SIGNATURES

<table>
<thead>
<tr>
<th>Role</th>
<th>Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Hygiene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shift Manager</td>
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</tbody>
</table>

### ADDITIONAL SIGNATURES (as determined by Shift Manager or Safety & Health Rep; N/A if not applicable)

<table>
<thead>
<tr>
<th>Role</th>
<th>Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>RadCon</td>
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<tr>
<td>Environmental</td>
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<tr>
<td>Engineer</td>
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<tr>
<td>Industrial Safety</td>
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</table>

**Odor Response Plan Notes** (monitoring data, results of actions taken, etc. Use more sheets as necessary)
Refer to SW1HD # 19-1148.

**DE1 Monitoring Results:** VOCs < Detection Limit (< 10 ppm)

**DE1 Monitoring on Grab Air Samples**
- VOC < 10 ppm
- Ammonia < 1 ppm
- Mercury < 20 ng/m³

**All DE1 passed post-use Function Test.**

**RESPONSE PLAN COMPLETED:**

<table>
<thead>
<tr>
<th>Safety &amp; Health Rep</th>
<th>Signature</th>
<th>Print (First &amp; Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>
ODOR RESPONSE CARDS

EIR-2019-050
1. Contact CSM, Complete below bulleted information and map.
   - Date and time odor was noticed: 12/03/19
   - Your name and the work you were performing: [Redacted]
   - Location of odors (mark area on map and wind direction): Indors / Condenser Room
   - Name(s) of others in or near the affected area: [Redacted]
   - Was an IHT present? No
   - Describe the odor: □ Sweet  □ Sour  □ Musty  □ Earthy  □ Metallic  □ Smoky  □ Rotten  □ Onion
     □ Cleaning Solution  □ Ammonia  □ Other: Electrical Burn?
   - Possible Source: Unknown
   - Your symptoms (if any): □ Headache  □ Dizziness/Light-Headed  □ Nausea  □ Cough
     □ Fatigue/Drowsiness/Weakness  □ Sore/Burning Throat  □ Difficulty Breathing
     □ Watery/Irritated Eyes/Trouble with Vision  □ Tingling/Numbness/Paralysis  □ Rash/Itching
     □ Other: Not at this time

2. Send this card to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager. Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected WITH Symptoms

4. Notify Immediate Supervisor.

5. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. Send this card immediately to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

1. Contact CSM, Complete below bulleted information and map.
   - Date and time odor was noticed: 2.3.2019
   - Your name and the work your were performing: [Redacted]
   - Location of odors (mark area on map and wind direction): 292-A Everest
   - Name(s) of others in or near the affected area: [Redacted]
   - Was an IHT present? No
   - Describe the odor: [Select options: □ Sweet □ Sour □ Musty □ Earthy □ Metallic □ Smoky □ Rotten □ Onion □ Cleaning Solution □ Ammonia □ Other: Burnt Rubber]
   - Possible Source: [Redacted]
   - Your symptoms (if any): [Select options: □ Headache □ Dizziness/Light-Headed □ Nausea □ Cough □ Fatigue/Drowsiness/Weakness □ Sore/Burning Throat □ Difficulty Breathing □ Watery/Irritated Eyes/Trouble with Vision □ Tingling/Numbness/Paralysis □ Rash/Itching □ Other: ]

2. Send this card to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager. Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected **WITH** Symptoms

4. Notify Immediate Supervisor.

5. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. Send this card immediately to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

1. Contact CSM, Complete below bulleted information and map.
   - Date and time odor was noticed: 12/3/18 APPROX 1250
   - Your name and the work you were performing: [Redacted]
   - Location of odor(s) (mark area on map and wind direction): 242-A (ALL CONDENSER ROOM FLOORS)
   - Name(s) of others in or near the affected area: [Redacted]
   - Was an IHT present? NO
   - Describe the odor: ☑ Musty ☑ Metallic ☑ Other: SOMETHING BURNING SMELL
   - Possible Source: UNKNOWN
   - Your symptoms (if any): ☑ Headache ☑ Dizziness/Light-Headed ☑ Nausea ☑ Cough
     ☑ Fatigue/Drowsiness/Weakness ☑ Sore/Burning Throat ☑ Difficulty Breathing
     ☑ Watery/Irritated Eyes/Trouble with Vision ☑ Tingling/Numbness/Paralysis ☑ Rash/Itching
     ☑ Other: NONE.

2. Send this card to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

Odors Detected with **NO** Immediate symptoms

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager.
   Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected **WITH** Symptoms


5. Contact CSM,
   complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. Send this card immediately to the Central Shift Office.
1. **Contact CSM, Complete below bulleted information and map.**
   - Date and time odor was noticed: 12/3/19 13:30
   - Your name and the work you were performing: [redacted]
   - Location of odors (mark area on map and wind direction): Condenser Room
   - Name(s) of others in or near the affected area: [redacted]
   - Was an IHT present? No
   - Describe the odor: □ Sweet □ Sour □ Musty □ Earthy □ Metallic □ Smoky □ Rotten □ Onion □ Cleaning Solution □ Ammonia □ Other: __________
   - Possible Source: Unknown
   - Your symptoms (if any): □ Headache □ Dizziness/Light-Headed □ Nausea □ Cough □ Fatigue/Drowsiness/Weakness □ Sore/Burning Throat □ Difficulty Breathing □ Watery/Irritated Eyes/Trouble with Vision □ Tingling/Numbness/Paralysis □ Rash/Itching □ Other: __________

2. **Send this card to the Central Shift Office.**
ODOR RESPONSE CARD - 242-A

Odors Detected with **NO** Immediate symptoms

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager. Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

   **Odors Detected WITH** Symptoms

4. Notify Immediate Supervisor.

5. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. Send this card immediately to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

1. Contact CSM, Complete below bulleted information and map.
   - Date and time odor was noticed: 12.3.19 @ 13:30
   - Your name and the work you were performing: [Name Redacted] - Instrument Cal's
   - Location of odors (mark area on map and wind direction): Condenser Room
   - Name(s) of others in or near the affected area: [Name Redacted]
   - Was an IHT present? No
   - Describe the odor: Smoky
   - Cleaning Solution, Ammonia, Other: Burnt Rubber
   - Possible Source: Unknown
   - Your symptoms (if any): Headache, Dizziness/Light-Headed, Nausea, Cough, Fatigue/Drowsiness/Weakness, Sore/Burning Throat, Difficulty Breathing, Watery/Irritated Eyes/Trouble with Vision, Tingling/Numbness/Paralysis, Rash/Itching
   - Other: 

2. Send this card to the Central Shift Office.
Odors Detected with NO Immediate symptoms

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager. Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

Odors Detected WITH Symptoms

4. Notify Immediate Supervisor.

5. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. Send this card immediately to the Central Shift Office.
ODOR RESPONSE CARD - 242-A

1. Contact CSM, Complete below bulleted information and map.
   - Date and time odor was noticed: 12-3-19 1330
   - Your name and the work you were performing: Job covering in Instrument Techs
   - Location of odors (mark area on map and wind direction): Multiple Floors of Condensers Z1-Z4, F1/2/3/4, 7/8/PD
   - Name(s) of others in or near the affected area: [redacted]
   - Was an IHT present? No
   - Describe the odor: Sweet, Sour, Musty, Earthy, Metallic, Smoky, Rotten, Onion, Cleaning Solution, Ammonia, Other: BURNT RUBBER
   - Possible Source: UNKNOWN
   - Your symptoms (if any): Headache, Dizziness/Light-Headed, Nausea, Cough, Fatigue/Drowsiness/Weakness, Sore/Burning Throat, Difficulty Breathing, Watery/Irritated Eyes/Trouble with Vision, Tingling/Numbness/Paralysis, Rash/Itching
     Other: NOT AT THIS TIME.

2. Send this card to the Central Shift Office.
Odors Detected with **NO** Immediate symptoms

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager. Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

**Odors Detected WITH Symptoms**

4. Notify Immediate Supervisor.

5. Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. Send this card immediately to the Central Shift Office.
1. **Contact CSM, Complete below bulleted information and map.**
   - Date and time odor was noticed: 
     - 12-3-19 1330
   - Your name and the work you were performing: [Redacted]
   - Location of odors (mark area on map and wind direction): Indoors condenser room
   - Name(s) of others in or near the affected area: [Redacted]
   - Was an IHT present? No
   - Describe the odor: 
     - Sweet
     - Sour
     - Musty
     - Earthy
     - Metallic
     - Smoky
     - Rotten
     - Onion
     - Cleaning Solution
     - Ammonia
     - Other: Burning
   - Possible Source: 

2. **Send this card to the Central Shift Office.**
ODOR RESPONSE CARD - 242-A

Odors Detected with **NO**
Immediate symptoms

1. Notify Immediate Supervisor.

2. Contact Central Shift Manager [Redacted]
   Provide the bulleted information below.

3. Complete map, return to Central Shift Office as soon as practicable.

   Odors Detected **WITH** Symptoms

4. Notify Immediate Supervisor.

5. Contact CSM, [Redacted]
   complete below bulleted information and map.
   - Your name and the work you were performing
   - Your symptoms (if any)
   - Date and time odor was noticed
   - Location of odors (mark area on map and the wind direction)
   - Describe the odor
   - Name of other in or near the affected area
   - Was an IHT present?
   - Possible source

6. Provide information on the back of card.

7. **Send this card immediately to the Central Shift Office.**
HAPSITE/GC-MS Results
12-03-2019
EIR-2019-050
HAPSITE GC-MS Bag Sample Results Survey 19-11152, 242-A Evaporator Condenser Room:

Three bag samples were collected in response to odors reported in the 242-A Evaporator Condenser Room. These samples were collected on December 3, 2019 and analyzed that December 4, 2019 using an Inficon HAPSITE GC-MS. Sample data was interpreted on December 9, 2019, and reported the same day. The sample collection bag matrix typically contains methyl methacrylate, toluene, xylenes, D-Limonene, C9 – C15 alkane hydrocarbons, and silicone compounds. Results for the System and Bag Blank Samples were satisfactory.

Traces of compounds typical of the sample bag matrix were detected in all three bag samples, but no other compounds were detected above background concentrations in any sample.

If you have questions contact [redacted] CIH at [redacted]
Attachment 2
Respiratory Protection Form
**RESPIRATORY PROTECTION FORM**

1. Work Control Document: TF-AOP-015

2. RPF No.: ☒ N/A

3. Form Rev No.: 6

4. Form Expiration Date: 05/08/2020

5. Work Location:
   200 East Area, 200 West Area, and 600 Areas controlled by WRP5 except at the 222-S Laboratory Complex

6. Task Description:
   Task 1: *Minimum required respiratory protection* Response to reported odors or unexpected changes to vapor conditions INSIDE OF TANK FARM BOUNDARIES when odor is suggested to originate FROM TANK WASTE. (TF-AOP-015 3.1.11.9)

7. Select ONLY One:
   - ☐ Radiological
   - ☒ Industrial Hygiene/Chemical
   - ☐ Radiological and Industrial Hygiene/Chemical

8. Select Appropriate Respirator(s):
   - ☐ 1/2-APR
   - ☐ FF-APR
   - ☐ FF-PAPR
   - ☐ PAFR-HOOD
   - ☐ E-Z Flo Airline SAR
   - ☐ SKA-PAK SAR
   - ☐ Carri-Air
   - ☒ SCBA
   - ☐ PremAire SAR w/Vortex Cooler
   - ☐ Other: N/A

9. Required Cartridge(s) (if applicable)
   - ☐ P100/HE
   - ☐ Other
   - ☒ N/A

10. Cartridge Change Out Schedule(s):
    - ☒ N/A

11. Special Instruction(s):
    - ☒ N/A

6. Task Description:
   Task 2: *Respiratory protection use when required* Response to reported odors or unexpected changes to vapor conditions OUTSIDE OF TANK FARM BOUNDARIES when odor is suspected to originate FROM TANK WASTE. (TF-AOP-015 3.1.12.3)

7. Select ONLY One:
   - ☐ Radiological
   - ☒ Industrial Hygiene/Chemical
   - ☐ Radiological and Industrial Hygiene/Chemical

8. Select Appropriate Respirator(s):
   - ☐ 1/2-APR
   - ☐ FF-APR
   - ☐ FF-PAPR
   - ☐ PAFR-HOOD
   - ☐ E-Z Flo Airline SAR
   - ☐ SKA-PAK SAR
   - ☐ Carri-Air
   - ☒ SCBA
   - ☐ PremAire SAR w/Vortex Cooler
   - ☐ Other: N/A

9. Required Cartridge(s) (if applicable)
   - ☐ P100/HE
   - ☐ Other
   - ☒ N/A

10. Cartridge Change Out Schedule(s):
    - ☒ N/A

11. Special Instruction(s):
    - ☒ N/A

6. Task Description:
   Task 3: *Respiratory protection use when required by management* Response to reported odors or unexpected changes to vapor conditions OUTSIDE OF TANK FARM BOUNDARIES when odor is NOT suspected to originate FROM TANK WASTE. (TF-AOP-015 3.1.13.3)

7. Select ONLY One:
   - ☐ Radiological
   - ☒ Industrial Hygiene/Chemical
   - ☐ Radiological and Industrial Hygiene/Chemical
### RESPIRATORY PROTECTION FORM (Continued)

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8. Select Appropriate Respirator(s):
   - ☐ 1/2-APR
   - ☐ FF-APR
   - ☐ FF-PAPR
   - ☐ PAPR-HOOD
   - ☐ E-Z Flo Airline SAR
   - ☐ SKA-PAK SAR
   - ☑ Carri-Air
   - ☐ SCBA
   - ☐ PremAire SAR w/Vortex Cooler
   - ☐ Other: N/A

9. Required Cartridge(s) (if applicable):
   - ☑ P100HE
   - ☐ Other: N/A

10. Cartridge Change Out Schedule(s):
    - ☑ N/A

11. Special Instruction(s):
    - ☑ N/A

6. Task Description:
   Task 4: *Voluntary Use* Response to reported odors or unexpected changes to vapor conditions OUTSIDE OF TANK FARM BOUNDARIES. (TF-AOP-015 3.1.14.3)

7. Select ONLY One:
   - ☐ Radiological
   - ☑ Industrial Hygiene/Chemical
   - ☐ Radiological and Industrial Hygiene/Chemical

8. Select Appropriate Respirator(s):
   - ☐ 1/2-APR
   - ☐ FF-APR
   - ☑ FF-PAPR
   - ☑ PAPR-HOOD
   - ☐ E-Z Flo Airline SAR
   - ☐ SKA-PAK SAR
   - ☐ Carri-Air
   - ☐ SCBA
   - ☐ PremAire SAR w/Vortex Cooler
   - ☑ Other: N-95

9. Required Cartridge(s) (if applicable):
   - ☑ P100HE
   - ☑ Other: N/A

   N-95 nuisance dust
   - 815394
   - 818357
   - 818346
   - 818347

   N-95 nuisance level dust w/nuisance Level OV removal
   - 818354

   P-95 for low level dust
   - 818355

   P-95 for low level dust w/nuisance level OV removal
   - 818355

   P-100 for particulate
   - 818342
   - 818369
   - 10123079
   - 1014939

   P-100 for particulate w/nuisance level OV and C3 removal
   - 818343

   P-100 for particulate w/nuisance level AG, HF removal
   - 818344

   GMA for organic vapor
   - 815355

   GMA/P-100 for particulate and organic vapor
   - 815362
   - (P-100,OV)

   GMB for acid gas
   - 813536
   - (CL,SD,CO,H,C,H,S)

   GMB/P-100 for particulate and acid gas
   - 815363
   - (P-100,CL,SD,CO,H,C,H,S)

   GMC for organic vapor and acid gas
   - 815357
   - (OV,CL,SD,CO,H,C,H,S)
| 3M FF-APR: | P-100 for particulate (P-100) Organic Vapor (OV) Acid Gases (CL,HC,SD,CD,HS) Organic Vapor/Acid Gases (OV,CL,HC,SD,CD,RS,RF) Ammonia/Methylamine (AM,MA) Formaldehyde/Organic Vapor (OV,FM) Multi-Gas/Vapor (OV,CL,HC,SD,CD,RF,AM,MA,FN) Mercury Vapor/Chlorine Gas (MV,CL,SD) Organic vapor and particulates (P-100,OV) Organic vapor, acid gases and particulates (OV,CL,HC,SD,CD,HS,RF) particulate and chemical vapor (P-100,OV,CL,HC,SD,CD,HS,RF,AM,MA,FN) |
|---|---|---|---|---|---|
| MSA FF-APR: | R95 for Oil Aerosols | P-100 for particulate (P-100) GMA for Organic vapor (OV) GMA/P-100 for particulate and organic vapor (P-100,OV) GMB for Acid Gas (CL,SD,CD,HC,HS) GMB/P-100 for particulate and Acid Gas (P-100,CL,SD,CD,HC,HS) GMC for acid gas and organic vapor (OV,CL,SD,CD,HC,HS) GMC/P-100 for particulate, acid gas, and organic vapor |

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RESPIRATORY PROTECTION FORM (Continued)

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(F=100, OV, CL, SD, CE, RC, ES)
GMD for ammonia and methylene
(AM, MA) 815188
GMD/F=100 for particulate ammonia and methylene
(F=100, AM, MA) 815181
GME for chemical vapor
(OC, CL, SD, CD, HC, HS, AM, NA, PM, HF) 492790
GME/F=100 for particulate and chemical vapor
(F=100, OC, CL, SD, CD, HC, HS, AM, NA, PM, HF) 815182
GMI/F=100 for particulate and iodine vapor
(F=100, OV) 815184
Merocel for particulate and mercury vapor
(F=100, CL, MY) 815186
SCOFF FF-APR:F-100 for particulate
(F=100) 7422-FP1
Particulate and Mercury Vapor
(F=100, CL, MY) 7422-MB1

MSA FF-PAPR: OptiFilter HE
(F=100) 10080455
OptiFilter OV/CL/CD/HC/HS/SD/HE/RF
(F=100, OV, CL, CD, HC, HS, SD, HE, RF) 10080454
OptiFilter AM/CL/CD/PM/HC/HS/MA/SD/HE/RF
(F=100, AM, CL, CD, PM, HC, HS, MA, SD, HE, RF) 10080456

MSA Optimair TL PAPR-HOOD:
OptiFilter HE
(F=100) 10080455
OptiFilter OV/CL/CD/HC/HS/SD/HE/RF
(F=100, OV, CL, CD, HC, HS, SD, HE, RF) 10080454
OptiFilter AM/CL/CD/PM/HC/HS/MA/SD/HE/RF
(F=100, AM, CL, CD, PM, HC, HS, MA, SD, HE, RF) 10080456

3M Breathe Easy PAPR-HOOD:
HE/P3
(F=100) 450-00-01R12
OV/HE (P3) 450-00-01R06
(F=100, OV) 450-03-01R06
OV/AG/HE (PAP3)
(F=100, OV, CL, HC, SD) 453-07-01R06
OV/AG/HE/HE (ALP3)
(F=100, OV, SD, HF) 453-01-01R06
AG/FORM/HE (EP3)
(F=100, CL, HC, SD, SD, FM) 453-02-01R06
AMM/HE (KP3)
(F=100, AM, MA) 453-03-02R06
FR-57
(F=100, OV, SD, CL, HC, AM, MA, HF, CD, FN) 453-03-02R06

10. Cartridge Change Out Schedule(s): [N/A]
**RESPIRATORY PROTECTION FORM (Continued)**

1. Work Control Document: **TF-AOP-015**

2. RFP No.: N/A

3. Form Rev No.: 6

4. Form Expiration Date: 05/08/2020

3 HOURS

11. Special Instruction(s):

Voluntary use is NOT prescribed, only approved. Be cognizant of physical limitations, visibility limitations, and communication limitations created by respirator use. Voluntary respiratory use is appropriate for most activities. When a job, task or work assignment includes scaffolding, hoisting and rigging, ladders, or use of personal fall protection equipment, arc-flash protection equipment, and/or limited work space: a safety evaluation and approval is needed before issuance.

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<th>12. Radiological Engineer/Radiological Work Planner:</th>
<th>8/12/19</th>
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<th>13. Industrial Hygienist:</th>
<th>5/08/2019</th>
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*Both signatures are required for form to be valid*