EVENT INVESTIGATION REPORT

AOP-015 for Odor at Gate 8 Corridor
EIR-2016-022

PER Responsible Manager

06/08/2016

PER No. WRPS-PER-2016-0865
Investigation Summary

On May 3, 2016, at approximately 1330 hours, a Waste Services Health Physics Technicians (HPT 1) performing a radiation survey on a flatbed truck in the parking lot at the Gate 8 Corridor, between AN/AZ farms (~20ft from 217AZ Tent), reported smelling a “musty odor” and experienced symptoms of “irritation in nasal passage.” The work crew completed delivery of empty waste boxes and reported back to building 616. At this point, the HPT 1 notified management they had encountered a musty odor and was now experiencing a burning sensation in their nasal passage. The Waste Supervisor contacted the shift office at ~1430 hours to report the odor and notified the Central Shift Manager (CSM) that HPT 1 was being taken to HPMC for evaluation. HPT 1 was released from HPMC without restriction. The work crew was comprised of five members: two HPTs, two Nuclear Chemical Operators (NCOs), and one Teamster. Only the two HPTs experienced the odors. The second HPT did not notice any odors until being asked if they smelled it by HPT 1, HPT 2 described the musty odor as faint and reported no symptoms.

No Fact Finding Meeting was held in support of this event investigation report.

Weather Information

| Weather Conditions at Time of Event: | 1330 reported from Station 6 |
| Wind Direction & Speed:             | Out of the East @ 5mph |
| Barometric Pressure (steady/rising/falling): | 29.24in Hg and falling |
| Temperature:                        | 86 F |
| Humidity:                           | 16% |

Area Map and Worker Locations
Summary of IH Monitoring and Sampling Data:

Industrial Hygiene Technicians (IHTs) direct reading instrumentation (DRI) of the external area of Gate 8 while the second IHT pulled two Tedlar bag samples. The readings from field instrumentation for Bag 1, which was pulled at the GATE 8 corridor, were 0.4 ppm Nitrous, 40 ppb Volatile Organic Compounds (VOCs), 12 ng/m3 Mercury (Hg), and 0 ppm Ammonia (NH3). Bag 2 was pulled in the general area of the gravel parking lot near AN and AY/AZ Farms, 0.30 ppm Nitrous, 130ppb VOCs, 9 ng/m3 Hg, and 0 ppm NH3.

<table>
<thead>
<tr>
<th>AGENT</th>
<th>@ODOR</th>
<th>@SOURCE</th>
<th>EXPOSURE LIMIT</th>
<th>REPORTING LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>0ppm</td>
<td>ppm</td>
<td>25ppm OEL/35ppm</td>
<td>&gt;0 ppm</td>
</tr>
<tr>
<td>Total VOCs</td>
<td>0ppm</td>
<td>ppm</td>
<td>2 ppm AL</td>
<td>&gt;0 ppm</td>
</tr>
<tr>
<td>Mercury</td>
<td>N/A</td>
<td>mg/m3</td>
<td>0.025 mg/m3 OEL</td>
<td>0.000016 mg/m3</td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>N/A</td>
<td>ppm</td>
<td>25 ppm AL</td>
<td>&gt;0 ppm</td>
</tr>
</tbody>
</table>

Event Timeline

05/03/2016

1330: HPT with Waste Services experienced: “musty odor with burning nostrils”

1425: Waste Services workers complete work and return to Building 616

1425: HPT reports slight burning in nasal passage to supervisor. Supervisor escorted HPT to HPMC and begins notifying Central Shift Office.

1430: Central Shift Office (CSO) notified of odor event.

1510: Shift Office Event Notification (SOEN) message sent: Entering AOP-15 for odor at gate 8 corridor

1514: Central Operations & Maintenance Services (COMS), Industrial Hygiene (IH), IH, Health and Safety Manager, IHT Supervisor arrive at CSO.

1517: Briefed by CSO: 1 Waste Services HPT reported symptoms occurring at ~1330 hours at gate 8 corridor with delayed response to shift office.

1521: Shift NCO reports to CSO: Road blocks in place.

1528: PO IHTs report to CSO. Deployed by CSM to obtain SCBA and then monitor the area near gate 8 corridor and collect minimum of one bag sample. Concentrate efforts near the Satellite Accumulation Area (SAA).

1534: IH programs supervisor contacted S&H manager to confirm technician available to run HAPSITE after hours.

1535: CSO and S&H personnel arrange overtime for IHT coverage.
1536: CSO request odor response card be sent to CSO.

1544: Odor response card arrives at CSO.

1550: IHTs call IHT lead to request direction to get through barricades from previous AOP-015 event. Directed to traverse around the barricades.

1615: HPT from 1330 released from HPMC without restriction.

17:20 IHTs completed field DRIs and transporting Tedlar bags to central IH lab for HAPSITE analysis.

Compensatory Measures

No compensatory measures were identified.

Preliminary Extent of Condition Review

With no fugitive emission sources detectible and the potential cause being unknown, the preliminary extent of conditions is bound to the area outside of the Gate 8 corridor. Earlier in the day, a separate AOP-015 was entered at 0849 hours in the area of 4th and buffalo. The description of odors in that event were described as “body odors,” “chlorine,” and “sharp and pungent.” No fugitive emissions were identified in this event and the IH readings came back at or below background levels.

Discussion of Potential Causes

Based on a review of the initial information, the source of the odors encountered was not able to be definitively determined.

1. Review of information and investigative IH monitoring and sampling of the area. All readings were reported as below action limits.
2. DRI reported 0 ppm ammonia, 0 ppm VOCs.
3. Two bag samples were brought to 2704HV/H104 for Hapsite Screening as part of an AOP-015 response. One sample was taken along the fence line of the Gate 8 Corridor. The other was taken from the parking area.
4. Workers interviewed believe the “musty” smell was coming from AX-Farm and are potentially the result of tank waste vapors.
5. Bag samples showed evidence of trace amounts of diesel components. (See Attachment 4)
6. Herbicide spraying was taking place directly East of AX farm from 1245 to 1400 hours and could have contributed to odors in the area.

Discussion of Barriers That Could Have Impacted the Cause

Impacting barriers are an unknown because the cause of the odors were not able to be definitively determined.

Recommendations/Proposed Corrective Actions
There are no proposed corrective actions as the cause of the odors was not able to be definitively determined.

Attachments (as they apply):

1. Odor Response Cards
2. Personal Statements
3. GCMS Readings and IH Synopsis.
4. Supervisor Event Report
Attachment 1: Odor Response Cards

ODOR RESPONSE CARD - 241-AN FARM

1. Contact CSM, Complete below bulleted information and map.
   - Date and time odor was noticed: 5/3/16
   - Your name and the work you were performing:
   - Location of odor (mark area on map and wind direction): Northside of 70282-corridor & could get a whiff from main.
   - Name(s) of others in or near the affected area:
   - Was an HFT present? No
   - Describe the odor: (Sweet, Sour, Musty, Earthy, Metallic, Smoky, Rotten, Onion, Cleaning Solution, Ammonia, Other:)
   - Possible Source: Don't know
   - Your symptoms (if any): Headache, Dizziness/Light-Headed, Nausea, Cough, Fatigue/Weakness/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.
1. Contact CSM. Complete below bulleted information and map.
   - Date and time odor was noticed: 5/3/16 @ 1:30 pm
   - Your name and the work you were performing: [Surveying Flattened Truck]
   - Location of odors (mark area on map and wind direction): Between AN-102 and AN-101
   - Name(s) of others in or near the affected area: [No]
   - Was an HI present? [No]
   - Describe the odor: [Musty, Earthy, Metallic, Smoky, Rotten, Onion]
   - Cleaning Solution, Ammonia, or Other: [Other: ____________]
   - Possible Source: [Ax Farm]
   - Your symptoms (if any): Headache, Dizziness, Light Headed, Nausea, Cough, Fatigue, Drowsiness, Weakness, Sore, Burning Throat, Difficulty Breathing, Watery/Tired Eyes, Trouble with Vision, Tingling/Numbness/Paralysis, Rash, Itching, Irritation in Nasal Passage

2. Send this card to the Central Shift Office.

ODOR RESPONSE CARD - 241-AN FARM

Odors Detected with MIQ
   - Notify immediate Supervisor.
   - Contact Central Shift Manager, report the MIQ.
   - Complete map, return to Central Shift Office as soon as possible.
   - Odors Detected WITH Symptoms

4. Notify Immediate Supervisor.
   - Contact CSM, complete below bulleted information and map.
   - Your name and the work you were performing:
   - Date and time odor was noticed:
   - Location of odors (mark area on map and the wind direction):
   - Describe the odor:
   - Name(s) of others in or near the affected area:
   - Was an HI present?
   - Possible source

5. Provide information on the back of card.

6. Send this card immediately to the Central Shift Office.
Attachment 2: Personal Statements

INITIAL EVENT INVESTIGATION PERSONAL STATEMENT

Event/Subject: AOP-15 at Gate 8
PER Number (if known): Date of Event: 5/4/16

INSTRUCTIONS:
To be used for obtaining personal statements or interviews in support of investigation and analysis of abnormal events and issues. Personal statements and results of interviews will not be issued with the Investigation Report/PER.

✧ In your own words, write down the facts as you understand them about what happened during the issue/event/condition being evaluated.

We were bringing some waste boxes from building X to gate 8. Other HFT noticed odor before I did.

✧ Facility/Work Area conditions as you knew them prior to, during, and after the event/condition (e.g., weather, equipment malfunctions, alarms, other on-going work in the vicinity).

Normal conditions - gate 8 was posted as it always is - nothing stood out to me.

✧ What were you doing immediately prior to, during, and after the event/condition? Including your Action(s) in response.

Prior to the event - just surveying the trailer bed. Noticed a light - musty smell. Didn't take any actions. It smells over there sometimes!

✧ List any known concerns with procedures, practices, or training.

No concerns

✧ Names of others who may have additional information.

I'm sure that you will hear from the others

✧ Additional facts you wish to provide.

Note: If additional sheets are used, show date and record time on each page.

Name: (print/sign) 05/04/16 15:30

Page 1 of 1

Date & Time of Statement/Interview

A-6033-068 (REV 2)
INITIAL EVENT INVESTIGATION PERSONAL STATEMENT

Event/Subject: AOP-015 at Gate 8
PRE Number (if known):        Date of Event: 5/3/16

INSTRUCTIONS:
To be used for obtaining personal statements or interviews in support of investigation and analysis of abnormal events and issues. Personal statements and results of interviews will not be issued with the Investigation Report/PER.

✧ In your own words, write down the facts as you understand them about what happened during the issue/event/condition being evaluated.

Unknown

✧ Facilit/Work Area conditions as you knew them prior to, during, and after the event/condition (e.g., weather, equipment malfunctions, alarms, other on-going work in the vicinity).

Warm, no breeze, no alarms

✧ What were you doing immediately prior to, during, and after the event/condition? Including your Action(s) in response.

Working - driving forklift.

✧ List any known concerns with procedures, practices, or training.

None

✧ Names of others who may have additional information.


✧ Additional facts you wish to provide.

Note: If additional sheets are used, sign, date, and record time on each page.

5/3/16 1530
Date & Time of Statement/Interview
IN INITIAL EVENT INVESTIGATION PERSONAL STATEMENT

Event/Subject: AOP-015 AT GATE 8
PER Number (if known): Date of Event: 5/6/16

INSTRUCTIONS:
To be used for obtaining personal statements or interviews in support of investigation and analysis of abnormal events and issues. Personal statements and results of interviews will not be issued with the Investigation Report/PER.

1. In your own words, write down the facts as you understand them about what happened during the issue/event/condition being evaluated.
   - Unknown

2. Facility/Work Area conditions as you knew them prior to, during, and after the event/condition (e.g., weather, equipment malfunctions, alarms, other on-going work in the vicinity).
   - Wind, no breeze, no alarms.

3. What were you doing immediately prior to, during, and after the event/condition? Including your Action(s) in response.
   - Delivered (2) empty 9' x 5' x 5' boxes to Gate 8 area. As far as I'm concerned - nothing abnormal to report.

4. List any known concerns with procedures, practices, or training.
   - None

5. Names of others who may have additional information.
   -

6. Additional facts you wish to provide.
   - None

Note: If additional sheets are used, sign, date, and record time on each page.

Page 1 of 1

Date & Time of Statement/Interview: 05-03-16 1530 hrs.
INITIAL EVENT INVESTIGATION PERSONAL STATEMENT

Event/Subject: Gate 8 Delivery
PER Number (if known): Date of Event: 5-3-16

INSTRUCTIONS:
To be used for obtaining personal statements or interviews in support of investigation and analysis of abnormal events and issues. Personal statements and results of interviews will not be issued with the Investigation Report/PER.

✧ In your own words, write down the facts as you understand them about what happened during the issue/event/condition being evaluated:

I was with the 616 NCD for the delivery of two 9x5x5 waste boxes to Gate 8. We arrived about 5 am before the truck. When the truck arrived each box was removed with the pallets labeled and loaded inside Gate 8. We closed the gate and left.

Responsibility/Work Area conditions as you knew them prior to, during, and after the event/condition (e.g., weather, equipment malfunctions, alarms, other on-going work in the vicinity):
Sunny, no wind, no other activities, no alarms.

✧ What were you doing immediately prior to, during, and after the event/condition? Including your Action(s) in response. I was unaware of anyone noticing an odor or anything unusually.

✧ List any known concerns with procedures, practices, or training.

None.

✧ Names of others who may have additional information.

None.

✧ Additional facts you wish to provide.

None.

Note: If additional sheets are used, sign, date, and record time on each page.

Name: [signature]
Date & Time of Statement/Interview: 5/3/16 16:18

Page 1 of 1
**INITIAL EVENT INVESTIGATION PERSONAL STATEMENT**

**Event/Subject:**  AOP 15  Gate #8

**PER Number (if known):**

**Date of Event:** 5-3-16

**INSTRUCTIONS:**

To be used for obtaining personal statements or interviews in support of investigation and analysis of abnormal events and issues. Personal statements and results of interviews will not be issued with the Investigation Report/PER.

- In your own words, write down the facts as you understand them about what happened during the issue/event/condition being evaluated:

  unloaded 2 Boxes outside Gate #8

- Facility/Work Area conditions as you knew them prior to, during, and after the event/condition (e.g., weather, equipment malfunctions, plumes, other on-going work in the vicinity):

  Delivered Boxes from north so not to use Buffalo St.

- What were you doing immediately prior to, during, and after the event/condition? Including your Action(s) in response:

  Driving truck with boxes to Gate #8 after unloading. Turned boxes over to 6/6 operators to put them down Gate #8 corridor.

- List any known concerns with procedures, practices, or training:

  None

- Names of others who may have additional information:

  None

- Additional facts you wish to provide:

  Someone said something about a smell. I could smell something but it was light.

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**Note:** If additional sheets are used, sign, date, and record time on each page.

**Date & Time of Statement/Interview:** 5-3-16 15:45
INITIAL EVENT INVESTIGATION PERSONAL STATEMENT

Event/Subject: AOP-015 at GATE 8
Per Number (if known): Date of Event: 5/16/16

Instructions:
To be used for obtaining personal statements or interviews in support of investigation and analysis of abnormal events and issues. Personal statements and results of interviews will not be issued with the Investigation Report/PER.

• In your own words, write down the facts as you understand them about what happened during the issue/event/condition being evaluated.
  I was supporting delivery of empty waste containers to Gate 8 Corridor. I was located between AX Farm outside Gate 8 Corridor. At this location a nauseous odor from the farm was noticed. The anobstetrician stated that caused me nasal irritation and decided to go to HPMC for check up.
• Facility/Work Area conditions as you knew them prior to, during, and after the event/condition (e.g., weather, equipment malfunctions, alarms, other on-going work in the vicinity).
  I noticed people working in AX Farm. Not sure what the work included.
• What were you doing immediately prior to, during, and after the event/condition? Including your Action(s) in response.
  I was waiting to survey a flatbed truck parked outside Gate 8 Corridor. Exposure happened at this time. I moved away from odor and questioned others around me. If they noticed it, they either said they did or left the area.
  NONE
• List any known concerns with procedures, practices, or training. Initially said no
  Individual said they did notice it. She had no symptoms. Did not go to HPMC.
• Names of others who may have additional information.
  NONE
• Additional facts you wish to provide.
  NONE

Note: If additional sheets are used, sign, date, and record time on each page.
“Both chromatograms are overlaid along with a blank pure N2 bag blank to differentiate the bag outgassing peaks. The odor reported was ‘musty’. Upon inspection it is clear that there is evidence of diesel fuel spills/drips in this area. The heavy hydrocarbon background is shifted much to the C-14 and C-16 peaks. Other differences from the bag peaks include a change in the methyl methacrylate content. While normally present from the bag alone, there was a doubling or tripling of the <1ppb background. The ACGIH TLV is 50 ppm for methyl methacrylate. Methyl methacrylate has a moderately strong odor. It is irritating to eyes and mucous membranes at >OEL concentrations. It is a monomeric constituent of many acrylic plastics. One of the compounds identified, Octanal, does have a slight waxy musty odor. At higher concentrations the more citrus/floral components dominate. It can be used as a food additive up to 1% (10,000 ppm). The sample results are non-ambiguous only for the diesel components.”
**Event Report**

**Due to Safety within 48 hours of reported event.**

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury/illness</td>
<td>Spill</td>
</tr>
<tr>
<td>Property Exposure</td>
<td>Fire</td>
</tr>
<tr>
<td>Near Miss</td>
<td>Excavation</td>
</tr>
<tr>
<td>Lock and Tag</td>
<td>Radiation Contamination</td>
</tr>
<tr>
<td>Electrical</td>
<td>Operator of Equipment/Vehicle</td>
</tr>
<tr>
<td>Other Odor</td>
<td></td>
</tr>
</tbody>
</table>

**Waste Operations personnel** were delivering empty containers to gate 8 area. RCT was performing surveys.

**Events - Describe the event sequentially, beginning with initiating events and ending with nature, extent of injury/damage (i.e., lecrotia and index finger), and treatment provided.** (Attach separate sheet for any additional information.)

During the delivery of empty waste boxes to gate 8, RCT 1 smelled a musty smell as described by them. RCT 2 stated that they could smell a light musty smell. After completing the delivery all personnel reported back to building 616. At -143 RCT 1 their nose had a slight burning/coughing sensation. Supervisor escorted RCT 1 to HPMC for evaluation and RCT 1 was returned to work with out restrictions.

**INJURY/ILLNESS ONLY**

Was a work restriction placed on employee as a result of this incident?  Yes  No

Does the work restriction preclude the employee from work activities he/she regularly performs at least once a week?  Yes  No

Was employee wearing PPE?  Yes  No  What Type? GHA PPE

Was a JHA performed on this job?  Yes  No

If vehicle accident, was the employee wearing seat belt?  Yes  No

Did the injury/illness require additional medical treatment beyond that provided by HPMC?  Yes  No

If yes, name and address of medical provider (i.e., physician's or chiropractor's name) N/A

If hospitalized overnight, name and address of hospital N/A

**OFFICIAL USE ONLY (when filled in)**
<table>
<thead>
<tr>
<th>EVENT REPORT (continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>23. Accident Causes</strong></td>
</tr>
<tr>
<td>A. Conditions (Causing and/or Contributing to Event)</td>
</tr>
<tr>
<td>Warm, No Breeze, and No alarms</td>
</tr>
<tr>
<td><strong>B. Employee Actions (Contributing to Event)</strong></td>
</tr>
<tr>
<td>Dropping off waste container at gate 8</td>
</tr>
<tr>
<td><strong>C. Factors Influencing A. or B.</strong></td>
</tr>
<tr>
<td>None at this time</td>
</tr>
<tr>
<td><strong>D. Apparent Cause Code</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>24. Prevention - Actions Taken (Describe measures taken to prevent a similar event. See instructions for further guidance.)</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td><strong>25. Prevention - Actions Recommended (Describe corrective actions that are planned. See instructions for further guidance.)</strong></td>
</tr>
<tr>
<td>Developing a plan to deliver waste containers to RMA 158 instead of gate 8 and also pickup containers from RMA 158.</td>
</tr>
<tr>
<td>PEN #: N/A</td>
</tr>
<tr>
<td>Planned Completion Date: N/A</td>
</tr>
<tr>
<td><strong>26. In detail explain what happened</strong></td>
</tr>
<tr>
<td>See attached personal statement (Site Form # A-6003-096).</td>
</tr>
<tr>
<td><strong>27. Any recommendations on how to prevent this type of event?</strong></td>
</tr>
<tr>
<td>Look at an alternate place to pick up and deliver waste containers for AK farm.</td>
</tr>
<tr>
<td><strong>28. Safety Professional</strong></td>
</tr>
<tr>
<td>☑ The corrective actions identified in this event report are appropriate to prevent recurrence.</td>
</tr>
<tr>
<td>Corrective actions are completed or tracked to closure in ESTARS.</td>
</tr>
<tr>
<td><strong>Comments:</strong></td>
</tr>
<tr>
<td>Work being performed was determined to fall under the GHA.</td>
</tr>
<tr>
<td><strong>29. I wish to file a worker’s compensation claim for this event at this time.</strong></td>
</tr>
<tr>
<td>Employee initials</td>
</tr>
</tbody>
</table>

At this time, I do not wish to file a worker's compensation claim for this event. I understand I can change my mind and complete an application for benefits for this event within the limitations below:
- Within one year and a day from the date of injury
- Within two years of the medical diagnosis of an occupational illness

**30. Notifications**

**Manager/Supervisor:**

Date: 5/4/16

Employee:

Date: 5/4/16

**Injury & Illness Coordinator:**

Date: 5/4/16

**Level 2 Manager:**

Date: 5/4/16

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A-6003-580 (REV 8)