Event Investigation Report
EIR-2018-020
"Investigation of 242-A Pump Storage Room and Airlock AOP-015 Entry"
Executive Summary

At approximately 2130 hours on Friday June 15, 2018, two Nuclear Chemical Operators (NCOs) were preparing for the upcoming campaign in the 242-A load-out and hot equipment storage room and associated airlock when NCO1 detected an ammonia type odor which caused them to feel light headed. NCO2 did not smell the odor and experienced no symptoms. The NCOs contacted their supervisor, 242-A Shift Manager (SM), at approximately 2136 who instructed the employees to leave the area of concern and instruct anyone else in the area to do the same. At 2138 242-A SM contacted the Central Shift Manager (CSM) reporting the odor and TF-AOP-015, “Response to Reported Odors or Unexpected Changes to Vapor Conditions”, was entered. Access was restricted to the air lock room, connecting loading room, and load-out and hot equipment storage room. Shift Industrial Hygiene Technicians (IHTs) were dispatched to collect Direct Reading Instrument (DRI) and bag samples, and odor response cards were requested by the CSM. NCO3 was the control room NCO at 242-A controlling access to the restricted area.

At approximately 2215 NCO 1 was directed and NCO 2 voluntarily taken to the Hanford Site medical provider (HPMC), by their supervisor. The on-call Office of River Protection Facility Representative (ORPFR) was notified of the TF-AOP-015 entry at 2215. At 2235 IHTs reported DRI results showing no elevated readings for ammonia (NH3) or Volatile Organic Compounds (VOCs), and that they were taking bag samples to 2704HV to be analyzed. At 2306 242-A SM reported to the CSM that NCO2 was released back to work without restrictions, they did not seek medical treatment and were not evaluated. At 2315 IHTs reported Lumex results showing no elevated readings.

At 0008 on Saturday June 16, 2018 NCO1 left site via personal vehicle, instead of taking an ambulance, to drive to Kadlec and receive a cardiopulmonary test and chest x-ray. Prior to leaving site NCO1 was evaluated by Hanford Fire Department Paramedics and was cleared to drive. At 0251 on June 16, 2018 NCO1 was released from Kadlec with no restrictions. On June 16, 2018 Event Investigation EIR-2018-020, “Investigation of 242-A Pump Storage Room and Airlock AOP-015 Entry” was initiated. On June 16, 2018 at 1912 IHTs reported DRI and bag samples results were at or below background levels and TF-AOP-015 was exited for odors reported at the 242-A Evaporator. WRPS-PER-2018-020, 242-A Pump Storage Room and Airlock AOP-015 Entry, was generated to document the event.

During interviews for this event it was established that a Health Physics Technician (HPT) performed routine surveys of the step off pad in the airlock room in question at approximately 2115, acknowledging that they did not notice any odors or anything unusual.

Personnel interviews were conducted in lieu of a fact finding meeting for this event. On-call ORPFR and Safety Program Services Representative were notified of all actions taking place throughout this event.
Event Timeline

June 15, 2018
2115: HPT performed routine surveys of the step off pad in the airlock room.
2130: NCOs began pre-valving inspections for the upcoming campaign in the 242-A load-out and hot equipment storage room and associated airlock.
2136: NCOs notified 242-A SM of the odor, who instructed the employees to leave the area of concern and instruct anyone else in the area to do the same.
2138: 242-A SM contacted the CSM reporting the odor and TF-AOP-015 was entered, access was restricted to the airlock room, connecting loading room, and load-out and hot equipment storage room, shift IHTs were dispatched to collect DRI and bag samples, and odor response cards were requested by the CSM. NCO3 was the control room NCO at 242-A controlling access to the restricted area.
2151: Shift Office Event Notification (SOEN) sent, “Entering AOP-015, access restricted to 242-A pump storage room airlock unless authorized by Shift Manager.”
2215: NCOs taken to HPMC by their supervisor. On-call ORPFR was notified of the TF-AOP-015 entry.
2235: IHTs reported DRI results showing no elevated readings for NH3 and VOCs, and that they were taking bag samples to 2704HV to be analyzed.
2306: 242-A SM reported to the CSM that NCO2 was released back to work without restrictions, they did not seek medical treatment and were not evaluated.
2315: IHTs reported Lumex results showing no elevated readings.

June 16, 2018
0008: NCO1 left site via self-vehicle, instead of taking an ambulance, to drive to Kadlec and receive a cardiopulmonary test and chest x-ray. Prior to leaving site NCO1 was evaluated by Hanford Fire Department Paramedics and was cleared to drive.
0251: NCO1 was released from Kadlec with no restrictions.
1912: IHTs reported DRI and bag samples results were at or below background levels and TF-AOP-015 was exited for odors reported at the 242-A loadout and hot equipment storage room and associated air lock.
1924: SOEN sent, “Sample analysis for the TF-AOP-015 event has been completed and the results are at or below background.”

June 17, 2018
1419: WRPS-PER-2018-020, 242-A Pump Storage Room and Airlock AOP-015 Entry, was generated to document the event.

End of event timeline
**Event Details**

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<th>Event</th>
<th>Investigation of 242-A Pump Storage Room Airlock AOP-015 Entry</th>
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<td>Location</td>
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<td>Personnel affected</td>
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<td>Odor/taste</td>
<td>Ammonia, cleaning agent</td>
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<td>Symptoms</td>
<td>Dizziness/light-headed</td>
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<td>DRI results during event</td>
<td>Less than LOD for NH3 and VOCs on sweep of reported odor location</td>
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<td>IH investigative monitoring/sampling</td>
<td>Readings from bag samples: Mercury (Hg) less than LOD and Nitrous Oxide (N2O) less than LOD</td>
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| Possible source(s) | • Outside air filtered through 10’ X 5’ supply vent inlet and drawn through a preheat coil, roll filter and bag filter into the suction of the supply fan and discharged through an electric heater into two headers one being in the condenser and loading rooms. The loading rooms and associated airlock, where the odor was identified are ventilated at a rate of 800 ft^3/min (CFM).  
• Outside air filtered in under rollup door in loading room.  
• AP4-AW6 transfer took place from Thursday 6/14/18 at approximately 1700 – Monday 6/18/18.  
• 241-AX excavation and installation of electrical conduit and hand dug holes completed during day shift hours on Friday 6/15/18. |

**Weather conditions on June 15, 2018**

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*Hanford Meteorological Station (HMS)*
### Waste disturbing or tank work in adjacent area

- TO-230-360, AP4-AW6 transfer taking place from Thursday 6/14/18 at approximately 1700 – Monday 6/18/18 at 0430 and then starting again on Monday 6/18/18 from approximately 1645 – Tuesday 6/19/18 at 0430.
- TO-060-126 & TO-060-127, Activity release sheet for AX farm on Friday June 15, 2018 listed operate portable exhauster systems 126 and 127 on the activity sheet, however review of AX Farm shift log show that the portable exhausters POR167 and POR127 were both shut down and secured on Thursday June 14, 2018.

### Other work in adjacent area

- WO-396992, 241-AX excavation and installation of electrical conduit/hand holes in spill area north of 801A slab, completed during day shift hours.
- WO-349638, 241-AX excavation and installation of conduits and hand holes for main north to south Truck line, completed during day shift hours.
- WO-380030, 241-A POR518-519 Excavation, backfill and conduit site restoration, completed during day shift hours.

(See attached release sheets for activity details)

### Preliminary Extent of Condition Review

This TF-AOP-015 entry is specific to 242-A loadout and hot equipment storage room and associated airlock. Given the potential source and associated potential causes, the preliminary extent of condition is bound to the immediate area.

### Discussion of Potential Causes

- Outside air is supplied to this area, filtered through 10’ X 5’ supply vent inlet and drawn through a preheat coil, roll filter and bag filter into the suction of the supply fan and discharged through an electric heater into two headers one being in the condenser and loading rooms. The loading rooms and associated airlock, where the odor was identified get 800 CFM. The weather data recorded at the time of the event at station 32 shows a wind direction range of 279-295.2 degrees between the hours of 2130-2145 and station 6 shows a wind direction range of 280.6-292.3 from 2130-2145, both indicating the wind was coming from the west/northwest at an average of ~14 miles per hour (MPH). The ventilation inlet on the 242-A evaporator is on the east wall approximately 22 feet above ground.
• AP4-AW6 transfer took place from Thursday 6/14/18 at approximately 1700 – Monday 6/18/18 at 0430 and then started again on Monday 6/18/18 from approximately 1645 – Tuesday 6/19/18 at 0430. The facts gathered during this investigation do not support this activity as a potential cause as AW farm and exhauster are south of the evaporator and the air inlet, by approximately a quarter mile. As mentioned before the air inlet at the 242-A evaporator is approximately 22’ above ground and the AW exhauster is 27’ 10.5” tall. AW farm is recessed approximately 8 feet beneath ground level which does put the 242-A air inlet and AW exhauster at approximately the same height. The wind direction does not support that as a probable cause as it was coming from the northwest. There were also eight areaRAE monitors running during this transfer, four stationed at AW farm and four stationed at AP farm, monitoring for NH3 and VOCs and detected nothing above the action limits, 2.0 Part per Million (PPM) for VOCs and 12.0 PPM for NH3.

• Outside air filtered in under rollup door in loading room was investigated as a potential route for odors. This door faces west and adjoins to the loadout and hot equipment storage room where the odor was identified as being the strongest. The loading room has a draft curtain or mesh fabric roof that can be moved operating a manual chain in order to operate cranes between the loading and loadout and hot equipment storage room. However, even when closed the draft curtain could allow air flow coming in from under the rollup door. Wind direction does support this as a potential cause.

• 241-AX excavation and installation of electrical conduit and hand dug holes completed during day shift hours on Friday 6/15/18 could have contributed to or cause odors to arise. No odors were reported during day shift activities at this location on Friday 6/15/18.

Discussion of Potential Barriers

• The 242-A evaporator has an ammonia monitor in the facility that was not in operation during this time as it is only run during campaigns.

Immediate Actions Taken

1. Odor reported to 242-A SM
2. 242-A SM contacted CSM for odor report
3. TF-AOP-015 entered for report of odors
4. Area in question was secured and access to the area controlled
5. Employees were taken to HPMC for medical evaluation and odor response cards were requested
6. CSM contacted on-call ORPFR, Safety Program Manager and Production Operations Level 2 Manager
7. IHTs deployed to retrieve direct readiness and sample analysis
8. SOEN sent notifying of AOP-015 entry and restricted access to area in question

History/PER Search

• A Problem Evaluation Request (PER) and AOP-015 search in areas surrounding the evaporator resulted in 28 AOP-015 odor reports in AY/AZ/AX/A farms, 5 in AW farm and 10 in AP farm from January of 2014 until June of 2018.
• The weather history for stations 6 and 32 on June 15th in years 2013-2018 between the times of 2030 and 2045 show an approximate range between 285-346, west/northwest and consistent with this AOP-015’s wind direction. 2017 was an exception ranging 116-147 or east/southeast.

Recommendations/Proposed Corrective Actions/Lessons Learned

• Recommend IH develop a sampling plan to periodically sample air quality on the backside of 242-A.

Documents Reviewed

1. Odor Response Plan and Follow-Up Event Summary
2. TF-AOP-015, Response to Reported Odors or Unexpected Changes to Vapor Conditions
3. Daily release sheet for June 15th & 18th 2018
4. CSM log entries for, Investigation of 242-A Pump Storage Room Airlock AOP-015
5. WRPS-PER-2018-020, Investigation of 242-A Pump Storage Room Airlock AOP-015 Entry
7. Odor response cards
8. 242-A Evaporator Systems Training & HVAC K1 System
9. Production Operations Release sheets on June 15, 2018 for teams EV, AZ and AP
10. Team AZ’s Shift Log entries on June 15, 2018
11. TF-AOP-015 odor report list from 2013-2017
12. TF-AOP-015 PERs for 2013-2018
13. AreaRAE and associated SWIHD survey 18-05323 for AP4-AW6 transfer
14. TO-230-360, AP4-AW6 transfer
15. TO-060-126 & TO-060-127, Operate portable exhauster systems 126 and 127
16. WO-396992, 241-AX excavation and installation of electrical conduit/hand holes in spill area north of 801A slab
17. WO-349638, 241-AX excavation and installation of conduits and hand holes for main north to south Truck line
18. WO-380030, 241-A POR518-519 Excavation, backfill and conduit site restoration
19. WO-384665, Removing High Resolution Resistivity (HRR) Leak Detection Monitoring (LDM) cable from C farm (Post C-105)
20. WO-377378, Disconnecting electrical to PO365, 368 and 369 HPU’s and sluicer HYD manifolds WO-389181, 241-C-105 Lay Up and disconnect electrical skids
21. As built drawing of 242-A evaporator
22. AW241-VTP Exhauster Train A Assembly
23. TO-060-126, Operate POR126 Portable Exhaust Ventilation System
24. TO-060-127, Operate POR127 Portable Exhaust Ventilation System

Attachments

1. Odor Response Plan and Follow-Up Event Summary, 4 pages
2. IH Investigation Report for survey ID number 18-05354 and sampling plan IHP-09001 with Hapsite chromatogram attached, 17 pages
3. Odor response cards, 4 pages
4. Production Operations Release sheets on June 15, 2018 for teams EV, AZ and AP, 3 pages
5. Team AZ’s Shift Log entries on June 15, 2018, 1 page
**Attachment 1, Odor Response Plan and Follow-Up Event Summary**

**5.0 RECORDS**

5.1.1 **PERFORM** the following for records identified within this procedure.

5.1.1.1 **RECORD** the number of times the record was generated in applicable column.

**OR**

PLACE a check mark (✓) in the N/A column.

5.1.1.2 **SUBMIT** the package to the central shift office.

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<td>Attachment 2 - Communication Template (Printed copy of electronic version)</td>
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<td>Attachment 3 - Follow-Up Event Summary (Printed copy of electronic version)</td>
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The record custodian identified in the company-level Records Retention and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM DC-C-02.
### Response to Reported Odors or Unexpected Changes to Vapor Conditions

**Attachment 1 – Odor Response Plan**

**DESCRIPTION OF EVENT**

Individual reported ammonia odor in the 242-A pump storage room airlock and became light-headed. Other individual accompanying did not detect odor or have symptoms. Event occurred at 2:38 hours, on 6/14/18.

**RESPONSE STEPS**

Attach additional pages as needed.

Separated access team, emergency personal from outside, respond per SWP and obtain readings.

One reading has been validated by TH professional, and exiting the AOP may be determined at that point.

**IH Sampling Plan #**  
**RWP #**

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**Odor Response Plan Notes**

Data readings and bag sample results were analyzed and below action levels.

Date: 05/03/18

Oils analyzed by TH professional.

**RESPONSE PLAN COMPLETED:**

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**Type** | **Document No.** | **Rev/Mod** | **Release Date** | **Page**
---|------------------|------------|-----------------|-----
REFERENCE | TF-AOP-015 | G-4 | 03/22/2018 | 8 of 10
1 Hanford worker was taken to HPMC for medical evaluation due to reporting an odor in the 242-A pump storage room airlock with a symptom. A second Hanford worker who was in the area requested a precautionary evaluation at HPMC and did not report any odors or symptoms.

The employees were performing valve line up pre-requisites for the upcoming 242-A Evaporator campaign, and were or were not in an area that requires use of a supplied air respirator.

Workers were instructed to leave the area, and access to the area has been restricted.

**NOTE -** This communication template is to be completed as soon as enough information is available.

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</thead>
<tbody>
<tr>
<td>[Redacted]</td>
<td>[Redacted]</td>
<td>[Redacted/Redacted]</td>
<td>[Redacted]</td>
</tr>
</tbody>
</table>
Response to Reported Odors or Unexpected Changes to Vapor Conditions

Attachment 3 - Follow-Up Event Summary

The following is an example of detail to provide in the electronic form of Follow-Up Event Summary.

<table>
<thead>
<tr>
<th>TF-AOP-015 Initial Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: 6/15/18</td>
</tr>
<tr>
<td>Time: 2138 hours</td>
</tr>
<tr>
<td>Location: 242-A</td>
</tr>
<tr>
<td>Number of Workers Involved: 2</td>
</tr>
<tr>
<td>Sampling Results #: DRI Survey # 18-05354</td>
</tr>
</tbody>
</table>

**Event Summary**

At approximately 2138 hours on 6/15/18, 2 workers were in the 242-A Pump Storage Room and associated Airlock with one detecting an ammonia type odor which caused them to feel light headed. The second individual did not smell the odor and experienced no symptoms. They were taken to HPMC for evaluation. The individual who did not exhibit symptoms was released to return to work. The individual with symptoms was evaluated at HPMC and sent to Kadlec via private transport for further evaluation. They were later released from Kadlec with no restrictions.

At the time odors were reported, the individuals were not working in an area requiring use of supplied-air respiratory protection. All workers were instructed to leave the area. Access to the area was restricted.

IHTs responded to the area and took DRI readings and a bag sample. DRI instrument readings were below action levels. Bag samples have been analyzed and were also below action levels. The results allowed the restricted area to be down posted.

An event investigation has been initiated. EIR-2018-020

**Return to Work Status**

| Number of workers returned to work without restriction | 2 |
| Number of workers returned to work with restriction | N/A |
| Number of workers referred for further evaluation | N/A |

NOTE - Complete once event is stabilized and all details are known.


Central Shift Manager: [Redacted]

[Redacted]

PRINT (First and Last) Date

[Redacted] 03/22/2018

Page 10 of 10
**Attachment 2, IH Investigation Report for survey ID number 18-05354 and sampling plan IHP-09001 with Hapsite chromatogram attached**

### 1. Event Summary (including number of workers involved and activity in progress):

Two operators working in the 242-A pump storage room airlock. One employee detected an ammonia-like odor. It caused the employee to feel light headed. Both workers went to MPMC for medical evaluation. One was transported via ambulance to Kadlec for additional testing. Both employees were released to return to work without restriction.

- Was an IH present during initiating event? [ ] Yes [x] No

### IH Monitoring/Sample Survey Reports:

18-05354 242-A pump storage airlock (See Attachment 1)

### Weather Conditions at Time of Event:

- Weather Station: Hanford Met Station
- Wind Direction and Speed: North at 4 mph
- Barometric Pressure (steady/rising/falling): 29.17
- Temperature (°F): 67.8

### Field Response Timeline:

See Attachment 2

### IH Author:

[Redacted information]

---

### 2. GCMS Sample Results:

For Blank results (Attachment 3) - Sample 1 Results (Attachment 4) - Sample 2 Results (See Attachment 5)

Three Hapsite GC-MS analyses were conducted on Saturday, June 16, 2018 at eh IH Laboratory in 2704 RV.

The first analysis conducted was a clean air blank, room air collected through a clean charcoal tube. No compounds, other than the two internal standards, were found.

The second analysis conducted was the sample from the AOP event. No compounds, other than the two internal standards, were found.

The third analysis was a replicate of the sample from the AOP event, a second sample from the bag. No compounds, other than the internal standards, were found.

No compounds were found at concentrations of concern in either replicate of the sample.

### IH Author:

[Redacted information]

---

### 3. Additional Information:

- Odor Response Cards received: None
- Summary of IH Monitoring and Sampling Data: No detection above background
  - Monitoring: See survey 18-05354 - attached
4. **Summary of Employee Reported Information (e.g., symptoms):**
Ammonia odor - 1 employee experienced light headedness. Other employee detected no odor and did not have symptoms.

5. **Recommendations/Conclusions:**
Identification of Source of Concern: [ ] Yes [x] No
Neither the direct-reading instruments nor the Hapsite analysis exceeded the action level for any chemical.

6. **Other:**

   N/A

**S&H Program Management:**

Print First and Last Name:

Signature:

Phone No.:

Date: 3/19/2018
Attachment 1

SWIHD Survey Number 18-05354

AOP-015

242-A

June 15, 2018
**Survey ID**: 18-05354 - AOP-15 242-A pump storage room

**Survey Date**: 06/15/2018

**Survey Status**: Complete

**Survey Title**: AOP-15 242-A pump storage room

**Sample Plan**: IHF-09001 - AOP-015

**WO/Procedure**: N/A

**Requestor**: Prod Ops Shift Office

**Surveyor**: [Name Redacted]

**Job Contact**: [Name Redacted]

**Contact Phone**: [Number Redacted]

**Administrative Contact**: [Name Redacted]

**Engineering Cont’s**: Mechanical Ventilation (Fixed)

---

### Meteorology Data

- **Standard Conditions**: Yes
- **Weather Date**: [Date]
- **Time**: [Time]
- **Pressure**: [Value]
- **Humidity**: [Value]
- **Wind Direction**: [Value]
- **Temperature**: [Value]
- **Wind Speed**: [Value]

---

### Comments

IH1’s entered 242-A Evaporator pump storage room at 2215 to obtain direct readings with multirae. A bag sample was also collected while direct readings were being obtained. IH1’s performed a sweep of the room and did not have any abnormal readings or notice any sources correlating to NH3, which was the identified odor from the individual. Additional readings for N20 and Hg were obtained from the bag sample.
### Calibration

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Pre Use Function Test</th>
<th>Post Use Function Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID: 000797</td>
<td>Date: 06/15/2018</td>
<td>Date: 06/15/2018</td>
</tr>
<tr>
<td>Type: MIRAN 205B TEI</td>
<td>Time: 22:50</td>
<td>Time: 23:45</td>
</tr>
<tr>
<td>Serial Number: 2058-79384-398</td>
<td>Flow/Fault Check: Yes</td>
<td>By: [Redacted]</td>
</tr>
<tr>
<td>Last Cal Date: 12/16/2017</td>
<td>Battery Check: Yes</td>
<td>Location: Office</td>
</tr>
<tr>
<td>Next Due Cal Date: 12/16/2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lamp: No</td>
<td>Location: Office</td>
<td></td>
</tr>
</tbody>
</table>

### Sensor(s)

<table>
<thead>
<tr>
<th>Sensor: MIRAN 205B TEI</th>
<th>Pre Use Function Test</th>
<th>Post Use Function Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration Source: Nitrous Oxide</td>
<td>As Found: 24 ppm</td>
<td>As Left: 25 ppm</td>
</tr>
<tr>
<td>Lot Number: 6-050-205</td>
<td>Adjusted To: N/A</td>
<td></td>
</tr>
</tbody>
</table>
## SWIHED - DRI Completed Survey

### Washington River Protection Solutions

*Survey ID: 18-05354 - AOP-15 242-A pump storage room*

*Survey Date: 08/15/2018*

<table>
<thead>
<tr>
<th>Calibration</th>
<th>Pre Use Function Test</th>
<th>Post Use Function Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ID:</strong> 002270</td>
<td>Date: 06/15/2018</td>
<td>Date: 06/15/2018</td>
</tr>
<tr>
<td><strong>Type:</strong> RA 915M Ohio Lumex</td>
<td>Time: 2245</td>
<td>Time: 2345</td>
</tr>
<tr>
<td><strong>Serial Number:</strong> 2264</td>
<td>Flow/Fault Check: No</td>
<td>By:</td>
</tr>
<tr>
<td><strong>Last Due Cal Date:</strong> 07/24/2017</td>
<td>Battery Check: Yes</td>
<td>Location: Office</td>
</tr>
<tr>
<td><strong>Next Due Cal Date:</strong> 07/24/2018</td>
<td>Location: Office</td>
<td></td>
</tr>
<tr>
<td><strong>Lamp:</strong> N/A</td>
<td><strong>Sensor(s):</strong></td>
<td><strong>As Found:</strong> 0%</td>
</tr>
</tbody>
</table>

<p>| <strong>Sensor:</strong> RA 915M Ohio Lumex mercury | <strong>Pre Use Function Test</strong> | <strong>Post Use Function Test</strong> |
| <strong>Calibration Source:</strong> Mercury | <strong>As Found:</strong> 0% | <strong>As Left:</strong> 0% |
| <strong>Lot Number:</strong> Internal-2018 | <strong>Adjusted To:</strong> N/A | |
| <strong>Manufacture Date:</strong> 01/01/2018 | | |
| <strong>Expiration Date:</strong> 12/31/2018 | | |
| <strong>Cal Source Value:</strong> &lt;25% | | |</p>
<table>
<thead>
<tr>
<th>Sensor</th>
<th>Pre Use Function Test</th>
<th>Post Use Function Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>MultiRAE Pro RAE CO</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>MultiRAE Pro RAE LEL</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>MultiRAE Pro RAE NH3</td>
<td>As Found: 25 ppm</td>
<td>As Left: 24 ppm</td>
</tr>
<tr>
<td>Calibration Source: Ammonia</td>
<td>Adjusted To: N/A</td>
<td></td>
</tr>
<tr>
<td>Lot Number: 7-331-103-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture Date: 12/01/2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expiration Date: 12/01/2019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cal Source Value: 25.7 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MultiRAE Pro RAE O2</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>MultiRAE Pro RAE ppb PID</td>
<td>As Found: 10.1 ppm</td>
<td>As Left: 10 ppm</td>
</tr>
<tr>
<td>Calibration Source: Isobutylene</td>
<td>Adjusted To: N/A</td>
<td></td>
</tr>
<tr>
<td>Lot Number: 7-331-201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture Date: 11/28/2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expiration Date: 11/28/2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cal Source Value: 10.0 ppm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SWIHD - DRI Completed Survey

**Survey ID:** 18-05354 - AOP-15 242-A pump storage room  
**Survey Date:** 06/15/2018

#### Readings

<table>
<thead>
<tr>
<th>Device</th>
<th>Agent</th>
<th>Range</th>
<th>Result</th>
<th>Action Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inst-000797 - IR</td>
<td>Nitrous Oxide</td>
<td>N/A</td>
<td>25 ppm</td>
<td></td>
</tr>
<tr>
<td>Inst-001799 - NH3</td>
<td>Ammonia</td>
<td>0.000 ppm</td>
<td>12 ppm</td>
<td></td>
</tr>
<tr>
<td>Inst-001799 - ppb</td>
<td>Volatile Organic Compound</td>
<td>0.000 ppb</td>
<td>2 ppm</td>
<td></td>
</tr>
<tr>
<td>PID</td>
<td>Mercury</td>
<td>N/A</td>
<td>0.01 mg/m3</td>
<td></td>
</tr>
</tbody>
</table>

**Reading Details:** N/A

---

#### Field Information

**Verified By:** [Redacted]  
**Date:** June 16, 2018

**Approved By:** [Redacted]  
**Date:** July 11, 2018

(The electronic approval indicated above acts as the authentication of this record on the above date)
Attachment 2

Time Line

AOP-015

242-A

June 15, 2018
242-A Pump Storage Room Airlock AOP-015

06/15/2018 -- 21:38 Logbook

- Entered TF-AOP-015 Response to Reported Odors or Unexpected Changes to Vapor Conditions. 242-A SM reported that 2 ea 242-A NCO's were in the Pump Storage Room Airlock and one operator detected an ammonia type odor which caused him to feel light headed. He is transporting them both to HPMC for evaluation. Access is currently restricted to the airlock and Shift IHT's are in route to collect samples. [Redacted] the Control Room NCO and is controlling access to the area. Requested [Redacted] have the employees fill out odor response cards as soon as possible.

06/15/2018 21:51 SOEN

- Entering AOP-015, access restricted to 242-A pump storage room airlock unless authorized by Shift Manager.

06/15/2018 -- 22:15 Logbook

- Notified Everyone for First Aid and Injury, at 06/15/2018 22:15

06/15/2018 -- 22:15 Logbook

- First Aid and Injury
  - 2 operators (voluntary) are being taken to HPMC for evaluation due to AOP-015 entry at 242-A. Notified [Redacted] left voicemail for [Redacted]

06/15/2018 -- 22:35 Logbook First Aid and Injury

- IHT's reported direct readings were obtained and showed no elevated readings. Taking bag samples to 2704HV to be analyzed.

06/15/2018 -- 23:00 Logbook First Aid and Injury

- [Redacted] reported that 1 operator is being transported to Kadlec via ambulance due to HPMC requesting to obtain a cardiopulmonary test and chest x-ray. Notified [Redacted] (EOC Shift Office), voicemail for [Redacted]

- [Redacted] reported that [Redacted] was released to return to work without restriction. Notified [Redacted] (voicemail).

06/15/2018 -- 23:15 AOP

- IHT's reported the Lumex results showed no elevated readings. Waiting on HAPSITE results to be analyzed once a determination is made by IH Management to call someone out over the weekend to support.
06/16/2018 -- First Aid and Injury
00:08

[Redacted] reported that one operator was evaluated by HFD Paramedics and the HPMC Physician, and is being permitted to drive to Kadlec instead of by ambulance. Notified [Redacted] [EOC Shift Office].

06/16/2018 -- First Aid and Injury
02:51

[Redacted] reported that one operator was released from Kadlec with no restriction and will be required to check back in through HPMC on Monday. Notified EOC Shift Office.

06/16/2018 14:57 SOEN

- Initiated EIR-2018-020 "242-A Pump Storage Room Airlock AOP-015 Entry" PO

06/16/2018 AOP - 19:12

Closing TF-AOP-015. Information gathered from iHT's confirmed the DRI results and bag samples that were obtained included the airlock, loadout room, and pump storage room. Based on all of the readings obtained and results from the HAPSITE, all concentrations were at or below background levels. Discussed with [Redacted] (CIH), and concurred that AOP-015 exit criteria has been met. Notified [Redacted]

06/16/2018 -- 19:12 Logbook

- Closing TF-AOP-015. Information gathered from iHT's confirmed the DRI results and bag samples that were obtained included the airlock, loadout room, and pump storage room. Based on all of the readings obtained and results from the HAPSITE, all concentrations were at or below background levels. Discussed with [Redacted] (CIH), and concurred that AOP-015 exit criteria has been met. Notified [Redacted]

06/16/2018 19:24 SOEN

Sample analysis for the TF-AOP-015 event has been completed and the results are at or below background
Attachment 3
Results of HAPSITE Blank Sample Analysis
AOP-015
242-A
June 15, 2018
Attachment 4
Results of HAPSITE Sample 1 Analysis
AOP-015
242-A
June 15, 2018
Attachment 5

Results of HAPSITE Sample 2 Analysis

AOP-015

242-A

June 15, 2018
Attachment 3, Odor Response Cards

ODOR RESPONSE CARD - 242-A

1. Contact CSM, Complete below bulleted information and map.

- Date and time odor was noticed: 6-15-18 / 2115
- Your name and the work you were performing: [redacted]
- Location of odors (mark area on map and wind direction): pump storage room / load out room
- Name(s) of others in or near the affected area: [redacted]
- Was an IHT present? No
- Describe the odor: Cleaning Solution
- Possible Source: Down wind of A Complex
- Your symptoms (if any): N/A

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

1. Contact CSM, Complete below bulleted information and map.
   • Date and time odor was noticed: 06/15/18
   • Your name and the work you were performing: [Redacted]
   • Location of odors (mark area on map and wind direction): East of 242A Facility, Outside Wind Out of North West.
   • 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: [Redacted]
   • Possible Source: Unknown, 242 A is downwind from 211-A
   • 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: [Redacted]

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.
Attachment 4, Production Operations Release sheets on June 15, 2018 for teams EV, AZ and AP

<table>
<thead>
<tr>
<th>Line</th>
<th>Facility</th>
<th>EAM</th>
<th>Activity</th>
<th>Supervisor</th>
<th>POO Comments</th>
<th>Release Authority Comments</th>
<th>Tag Out NFR</th>
<th>Fac Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AW</td>
<td>AP104</td>
<td>To-230-360 AP104 to AW106 Transfer</td>
<td>CSM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td>Facility</td>
<td>EAM</td>
<td>Activity</td>
<td>Supervisor</td>
<td>HOD Comments</td>
<td>Release Activity Comments</td>
<td>Tag Del RPM</td>
<td>Fax No</td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------------------------------</td>
<td>------------</td>
<td>--------------</td>
<td>---------------------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>WO 900492</td>
<td>Disconnect POR104 / POR105 Host Trance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>C</td>
<td>WO 384085</td>
<td>Remove HRR LDM Cable from C Farm (Post C-105)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>WO 377378</td>
<td>Disconnect Electrical to POR366, 368, and 369 HPU's and Stucer HYD Manifolds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>WO 389181</td>
<td>241-C-105 Lay Up and Disconnect Electrical Shide</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Line</td>
<td>Facility</td>
<td>Activity Description</td>
<td>Previous</td>
<td>PCG Comments</td>
<td>Release Authority Comments</td>
<td>Tag Out RFR</td>
<td>Fac Rel</td>
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<tr>
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<td>----------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------------</td>
<td>---------------------------</td>
<td>-------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>AX</td>
<td>Operate POR126/127 Exhaustor</td>
<td>AX, Farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>AX</td>
<td>241-AX Excavate &amp; Install Conduit &amp; Hand Holes in Sill Area North of 801A Slab</td>
<td></td>
<td></td>
<td>Afternoon Pre Job @ 1500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AX</td>
<td>241-AX Excavate &amp; Install - Conduits &amp; Hand Holes for Main (N-S) Trunk Line</td>
<td></td>
<td></td>
<td>Afternoon Pre Job @ 1500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>241-A POR518-519 Excavation, Backfill, Conduit, Site Restoration</td>
<td></td>
<td></td>
<td>Afternoon Pre Job @ 1500</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Attachment 5, Team AZ’s Shift Log entries on June 15, 2018

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event Description</th>
<th>Approved by</th>
<th>Approved Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/26/2018</td>
<td>10:07</td>
<td>Shutdown POR126 Exhauster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/26/2018</td>
<td>09:46</td>
<td>Started POR127 exhauster on AX101, AX102, AX103 and AX104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/19/2018</td>
<td>08:40</td>
<td>Shutdown POR127 exhauster for instrument calibrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/14/2018</td>
<td>14:32</td>
<td>Shutdown POR127 Exhauster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/18/2018</td>
<td>09:23</td>
<td>POR-127 Exhauster started at 0911, ventilating AX-101, AX102, AX103, &amp; AX-104.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/14/2018</td>
<td>15:05</td>
<td>Shutdown POR-126.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/08/2018</td>
<td>13:53</td>
<td>Secured POR-127 on a planned shutdown, constructions is complete for the day. Demisters are starting to plug.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>