

INTEROFFICE MEMORANDUM



WRPS-1601934

Date: April 25, 2016

To: [REDACTED] Manager
AN/B/BX/BY/C Farm Team

From: [REDACTED]
instruction), Production Operations Technical Support

Subject: EVENT INVESTIGATION REPORT, "AOP-015 ENTRY WITH ODORS NEAR EXHAUSTER AND TANK AP-107," EIR-2016-014

Submitted for your information and use is the event investigation report "AOP-015 Entry with Odors near Exhauster and Tank AP-107," EIR-2016-014. The enclosed report contains the information obtained during the investigation but does not necessarily cover an exhaustive investigation of all issues.

As the responsible manager, resolution of problem evaluation request WRPS-PER-2016-0634 should include consideration of this report in the identification of the cause(s) of the event and the development and implementation of the corrective actions.

Should you have any questions or need additional information regarding this report, please contact me at [REDACTED]

[REDACTED]

Enclosure: EIR-2016-014, "AOP-015 Entry with Odors near Exhauster and Tank AP-107" (13 Pages)

[REDACTED]

From: [REDACTED]
Sent: Monday, April 25, 2016 11:17 AM
To: [REDACTED]
Cc: [REDACTED]
Subject: EIR-2016-014 - Ready for Distribution
Attachments: Interoffice Correspondence (WRPS-1601934).dot; EIR-2016-014 Odors near Exhauster and TK AP-107 (FINAL).docx

[REDACTED]

The attached EIR, with cover letter, is ready for distribution. Please look it over and if you have any comments, please call me at [REDACTED] You may Sign for me on the Cover Page per this e-mail.

Thanks for your Help!!

[REDACTED]

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author



Addressee

Distribution

Correspondence No.

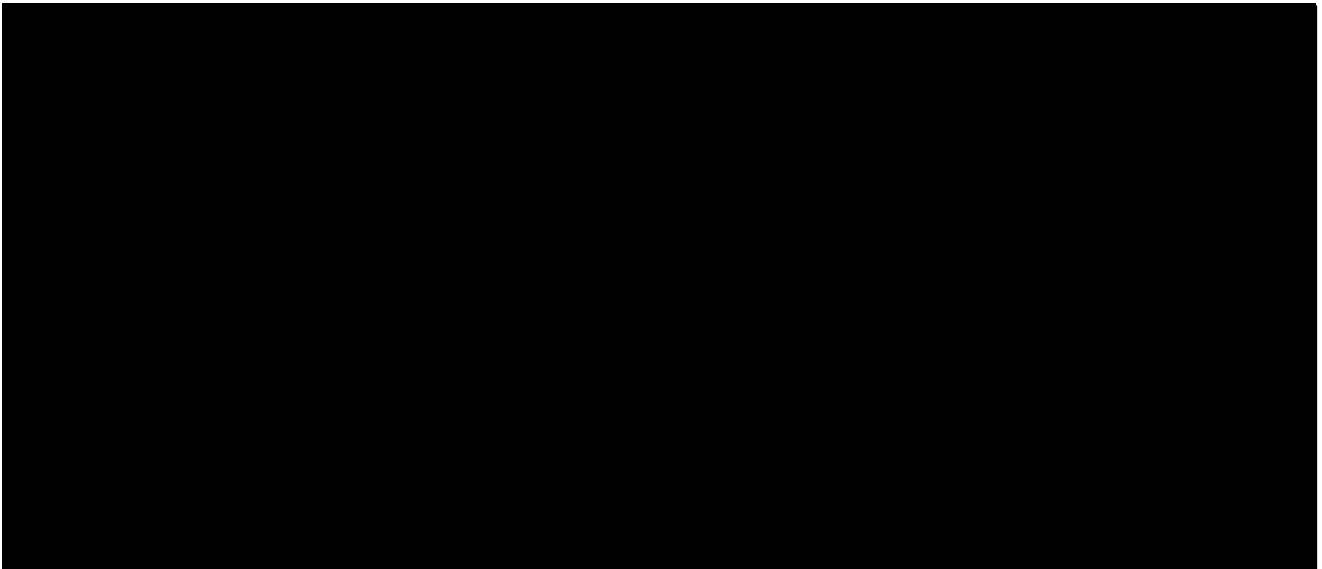
WRPS-1601934

Subject:

Event Investigation Report, EIR-2016-014, "*AOP-015 Entry with Odors near Exhauster and Tank AP-101*"

DISTRIBUTION

WRPS Correspondence
Washington River Protection Solutions LLC (WRPS)



EVENT INVESTIGATION REPORT

AOP-015 Entry with Odors near Exhauster and Tank AP-107

Event Investigation Report Number: EIR-2016-014



Event Investigation Team Lead

4/22/16

Date



PER Responsible Manager

4/25/16

Date

PER No. WRPS-PER-2016-0634

EIR-2016-014, “AOP-015 Entry with Odors near Exhauster and Tank AP-107”**Investigation Summary**

On Wednesday 4/6/16 at 0900 hours, two AN Team Electricians smelled a faint onion like odor when arriving at the 241-AP Farm change trailer (MO-815) to enter AP Tank Farm for the performance of various de-winterization tasks per Work Order #170209. After entering AP farm they smelled strong onion/rotten/metallic/earthy/musty odors near Tank AP-107 and North of a crane that was staged to perform core-sampling set up activities. They also smelled a more metallic/earthy version of the same odor near the 241-AP-VTP (primary ventilation exhauster). One electrician experienced fatigue/drowsiness/weakness and the other experienced a metallic taste. The Electricians were transported to the HPMC by their supervisor. Weather conditions were fairly calm at 5-6 mph (gusts to 10 mph) from East to Northeast (E-NE) wind direction per the Hanford MET station.

The Central Shift Manager (CSM) entered AOP-015 due to reported odors that caused symptoms of exposure (e.g. headaches, irritation of the skin, eyes, nose, or lungs, nausea, difficulty breathing, metallic taste in mouth). The AP Tank Farm was posted access restricted and was cleared.

The Industrial Health Technicians (IHT) responded to AP Farm and took sampling bags (Bag Sample #1: change trailer to exhauster; Bag Sample #2: exhauster to AP-107; Bag Sample #3: AP-107 crane and AP-107; and Bag Sample #4: AP-107 to change trailer). All readings from DRI instruments showed no detectable readings for Volatile Organic Compounds (VOCs) or Ammonia. Results from the bag samples were provided to the CSM at 1603 hours. All results were at or below background levels, therefore, the CSM exited AOP-015; notified the Senior On-Call Manager and ORP; and issued a Shift Office Event Notification (SOEN) message.

Weather Information

At the time the odors were detected, wind speeds were approximately 5-6 mph blowing from an E-NE direction. The following data was provided by the Hanford Weather Station for Wednesday, April 6, 2016:

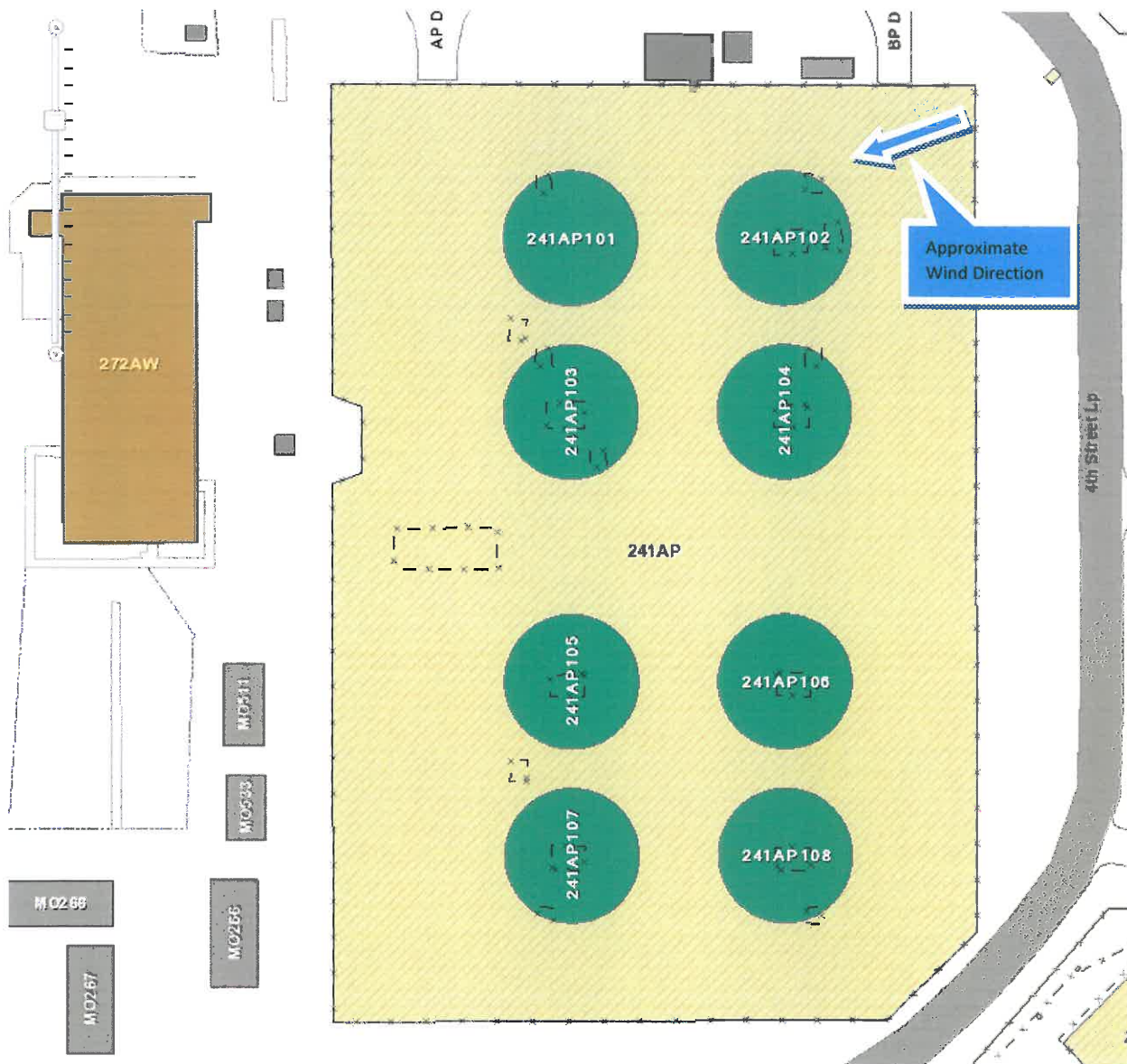
200E/Station 6 Weather Data for April 6, 2016

Time (PDT)	Direction (degrees)	Speed (mph)	Gust (mph)
5:00	166	2	3
6:00	255	2.5	4
7:00	218	3	5
8:00	110	5	8
9:00	66	5.5	9
10:00	94	6	9.5
11:00	126	3	6.5
12:00	92	6	11
13:00	104	6	15
14:00	89	9	14
15:00	123	7.5	14

EIR-2016-014, "AOP-015 Entry with Odors near Exhauster and Tank AP-107"

Map of Area

241-AP Tank Farm



EIR-2016-014, “AOP-015 Entry with Odors near Exhauster and Tank AP-107”

Photo of Area

241-AP Farm and Areas Where Odors Encountered



Event Timeline

4/05/16

1454 (SM Logbook) – AW-102 and PB-2 administrative locks have been removed for the 242-A EC4 Campaign. The facility is not yet in Operations Mode.

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- 0900 (Odor Response Card, Electricians) – While performing electrical testing and de-winterization activities in 241-AP Tank Farm, Electrician #1 and Electrician #2 smelled an odor (i.e., musty, metallic, rotten, onion) near the Primary Ventilation Exhauster and Tank AP-107. Electricians entered the farm from the change trailer and proceeded to check electrical boxes at each tank. They started at Tank AP-101, continued to AP-103, AP-105, AP-107, then over to AP-108, AP-106, AP-104, AP-102 and then back to the change trailer.
- 0910 (IH Report) – AN Team field IH hears radio announcement about entering AOP-015 in AP Farm. Shift IHT informs AN Team Field Industrial Hygienist (IH) that the other shift IHT is pre-disposed. AN Team Field IH asks shift IHT to collect instruments and supplies and to report to Central Shift Office (CSO).
- 0910 (IH Report) – AN Team Field IH arrives at MO-533 and asks for a volunteer IHT to support AOP-015 response. AN Team Field IH asks volunteer IHT to acquire instrumentation and report to CSO.
- 0912 (SM Logbook) – Entered AOP-015 for AP-Farm. Two AN Team electricians, Electrician #1 and Electrician #2, while performing de-winterization activities smelled onion like odors that caused a metallic taste in Electrician #1's mouth and light headedness/headache for Electrician #2. Farm has been cleared and accounted for and IHT's dispatched. Electricians #1 and #2 are being taken to HPMC by manager. Odors causing symptoms were received around the VTP (Ventilation Tank – Primary) and AP-107. SOEN sent; All-Call made; On-Call ORP Facility Representative, Safety & Health and WRPS On-Call Manager notified.
- 0913 (IH Report) – AN Team Field IH arrives at CSO and is briefed by affected personnel. Asks affected personnel to fill out odor response cards.
- 0915 (IH Report) – AY/AZ Team Field IH, EV Team Field IH and 2 IHTs arrive at CSO.
- 0916 (IH Report) – SOEN: "Entering AOP-015 for odors in AP-Farm. Exit farm in a controlled manner and report to CSM or AN ADM (Area Dayshift Manager). CSM".
- 0917 (IH Report) – AN team Field IH briefs IHTs on response plan:

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- Carry Lumex into field for response to hopefully get better area reading sensitivity.
 - Collect 3 grab samples beginning with area near 241-AP VTP, north of crane near 241-AP-107, and general area around 241-AP change trailer (MO-815).
- 0918 (IH Report) – Affected personnel’s supervisor arrives at CSO and also reports similar odor description without symptoms.
- 0919 (IH Report) – IHTs leave CSO to acquire RPE (Respiratory Protective Equipment).
- 0925 (IH Report) – AN Team Field IH leaves CSO headed to 241-AP Farm. Septic pumping is in progress north of 241-AP Farm. Septic pumping personnel notify AN Team Field IH that pumping began at about 0920. Odor around septic truck differs from affected personnel’s description.
- 0927 (IH Report) – AN Team Field IH asks work crew actively trenching in the parking lot north of the 241-AP-273 compressor building if they detected any odors. They said that they had not smelled anything but the diesel generator that was operating adjacent to their work area.
- 0931 (IH Report) – AN Team Field IH interviews AN Team operator monitoring tank pressures inside of 241-AP-271 building. AN Team operator reported no odors and all tank pressures were negative for the entire morning. No anomalies were noticed in VTP system.
- 0933 (IH Report) – AN Team Field IH notices faint but persistent barbequed onion odor outside of fence directly east of 241-AP VTP.
- 0936 (IH Report) – AN Team Field IH meets responding IHTs at 241-AP change trailer (MO-815) and re-briefs IHTs ensuring that they collect a grab sample near the 241-AP VTP. IHTs enter 241-AP to begin survey.
- 1018 (IH Report) – IHTs notify AN Team Field IH that they have exited 241-AP Farm and are in route to the 272-AW IHT lab to analyze grab samples with the Miran and then proceed to 2704-HV for Haplite analysis.
- 1030 (SM Logbook) – Initiated EIR-2016-014 for AOP-015 AP-Farm Entry. PER # is WRPS-PER-2016-0634. [REDACTED] SOEN sent and ORP notified.
- 1116 (SM Logbook) – 242-A is now in Operations Mode. Production Operations Transfer OE (Operation Engineer) notified.

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- 1127 (SM Logbook) – Waste feed pump (AW-102) has started for 242-A EC4 Campaign.
- 1200 (SM Logbook) – Update to 0912 Entry: DRI (Direct Reading Instrument) readings were normal and sample bags are being analyzed.
- 1315 (SM Logbook) – Approved AN Team to enter AP-Farm to perform TSR rounds as permitted by AOP-015.
- 1608 (SM Logbook) – Industrial Hygiene Program Manager contacted CSO and validated AP-Farm AOP-015 findings to be at or below background. Exited AOP-015 and farm has been down-posted. SOEN sent, All-Call made, On-Call ORP Facility Representative and WRPS On-Call Manager notified.
- 1609 (SM Logbook) – Two electricians from AOP-015 released to return to work with no restriction. SOEN sent, Safety & Health, and ORP notified.

Immediate Actions Taken

1. Electrician #1 and Electrician #2 voluntarily went to HPMC for evaluation.
2. 241-AP Tank Farm was posted as access restricted and farm cleared.
3. SOEN message was sent and On-Call personnel notified.
4. Initiated EIR-2016-014.
5. IHTs responded and took sampling bags (Bag Sample #1: Change trailer to exhauster; Bag Sample #2: Exhauster to TK-AP-107; Bag Sample #3: TK-AP-107 Crane and TK-AP-107; Bag Sample #4: TK-AP-107 to change trailer). All readings from DRI instruments showed no detectable readings for VOC's or Ammonia.
6. IHTs reported that DRI and Hapsite readings were below action levels.

Compensatory Measures

1. Prior to allowing AN Team to enter AP-Farm to perform TSR rounds as permitted by AOP-015, the CSM verified DRI readings were normal and sample bags were being analyzed.
2. Prior to exiting AOP-015, the CSM validated with the IH Program Manager that readings were at or below background prior to down-posting the farm.

Discussion of Potential Causes

Based on a review of the following, the source of the odors encountered by the two Electricians was not able to be definitively determined.

1. Review of information and investigative IH monitoring and sampling of the area. All samples came back at or below background.
2. No fugitive emissions were identified.

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3. Input from affected workers described the odor as musty, metallic, rotten, and onion smelling and also a “chemical odor” near the Primary Ventilation Exhauster.
4. The AY-102 to AP-102 Retrieval transfer was not in progress during this event.
5. The 242-A Evaporator Campaign EC4 had been initiated prior to this event and the Administrative Lock on the PB-2 slurry pump had been removed. However, slurry out from 242-A to TK-AP-103 had not been initiated.

Preliminary Extent of Condition Review

The AOP-015 entry was specific to the areas near Tank AP-107 and the Primary Ventilation Exhauster. However, odors, depending on wind direction and speed, have the potential to be detected near any tank and/or ventilation system.

Discussion of Barriers That Could Have Impacted the Cause

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

Conditions Adverse to Quality

None.

Recommendations/Proposed Corrective Actions

There are no proposed corrective actions as the cause of the odors was not able to be definitively determined.

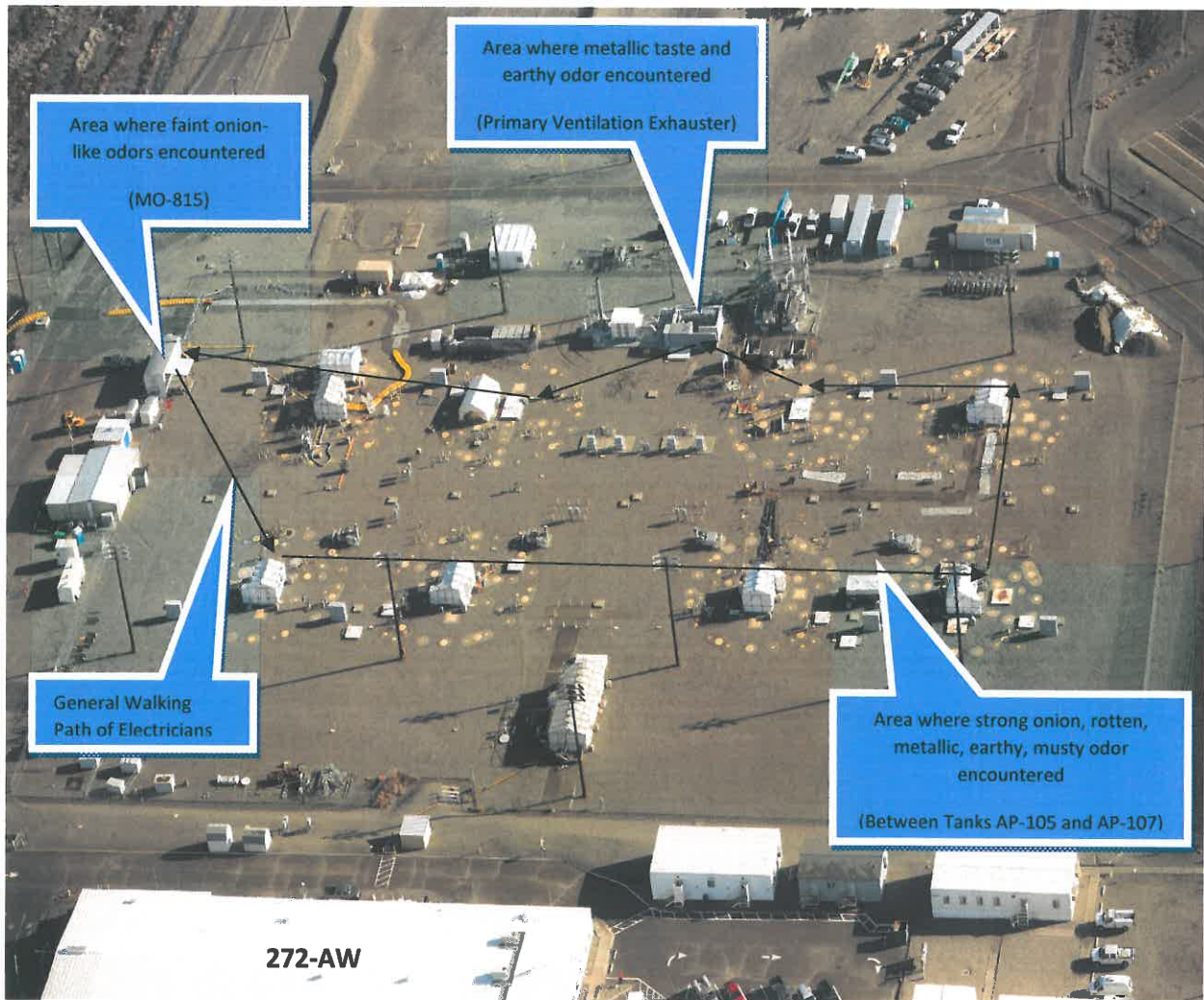
Attachments (As they apply):

1. Photos
2. Odor Response Card
3. Industrial Hygiene GCMS Sample Results

EIR-2016-014, "AOP-015 Entry with Odors near Exhauster and Tank AP-107"

Attachment 1
Photos

241-AP Farm and Areas Where Odors Encountered



EIR-2016-014, "AOP-015 Entry with Odors near Exhauster and Tank AP-107"

**Attachment 2
Odor Response Cards**

Odor Response Card

1. Contact CSM, [REDACTED] complete below bulleted information and map.

- Date and time odor was noticed 9:00 am
- Your name and the work you were performing de winterization
- Location of odors (mark area on map and wind direction) _____
- Name 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 _____
- 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.

Revised 2/9/15

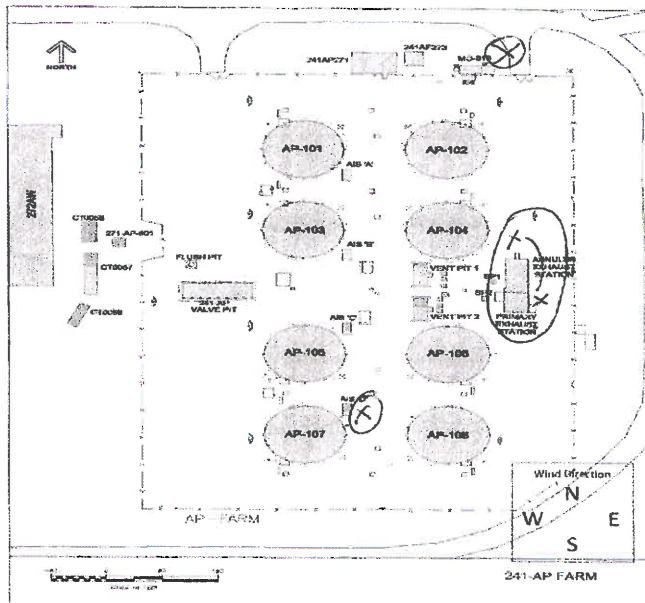
Odor Response Card

Odors Detected with NO Immediate symptoms

1. Notify Immediate Supervisor.
2. Contact Central Shift Manager, [REDACTED] Provide below bulleted information.
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 wind direction)
 - Describe the odor
 - Name of others 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.



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Odor Response Card

1. Contact CSM, [redacted] complete below bulleted information and map.

- Date and time odor was noticed 4-6-16 9:00 AM
- Your name and the work you were performing [redacted] electrical testing
- Location of odors (mark area on map and wind direction) AP Tank
- Name 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 exhausters
- 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 metallic taste in mouth

2. Send this card to the Central Shift Office.

Revised 2/9/15

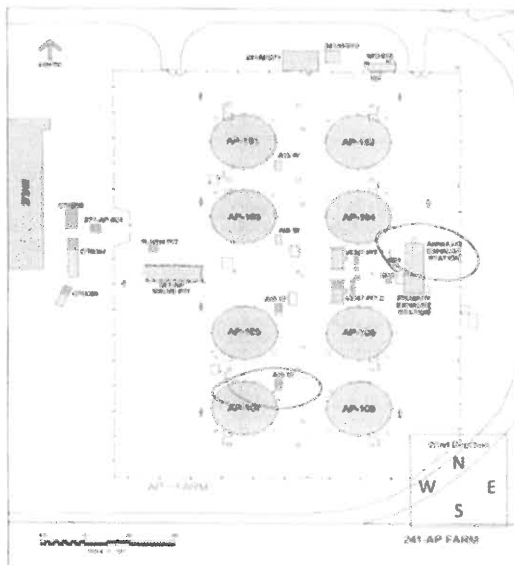
Odor Response Card

Odors Detected with immediate symptoms

1. Notify Immediate Supervisor
2. Contact Central Shift Manager, [redacted] Provide below bulleted information.
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 wind direction)
 - Describe the odor
 - Name of others 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.

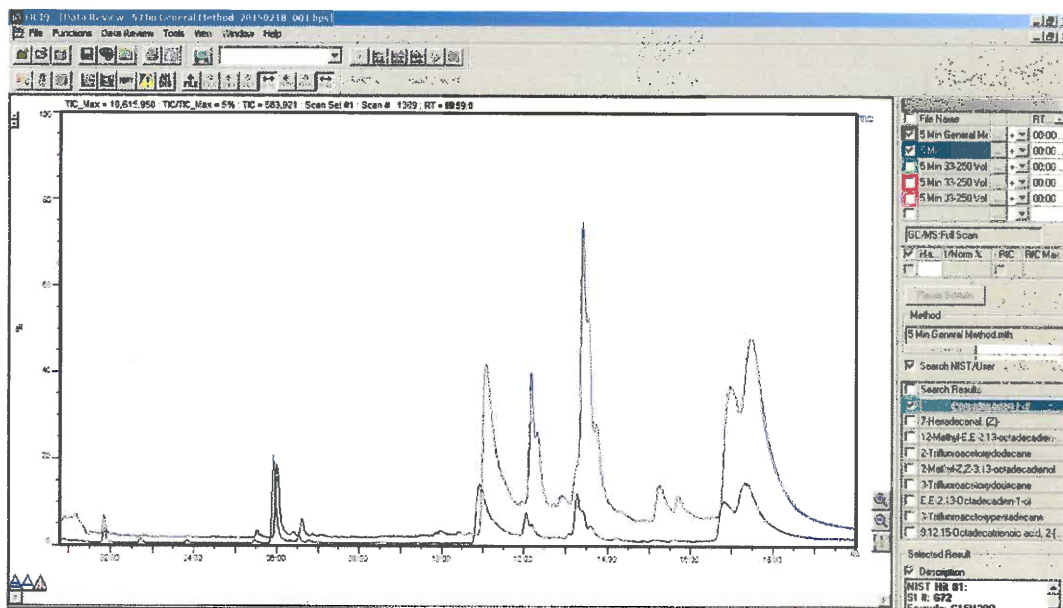


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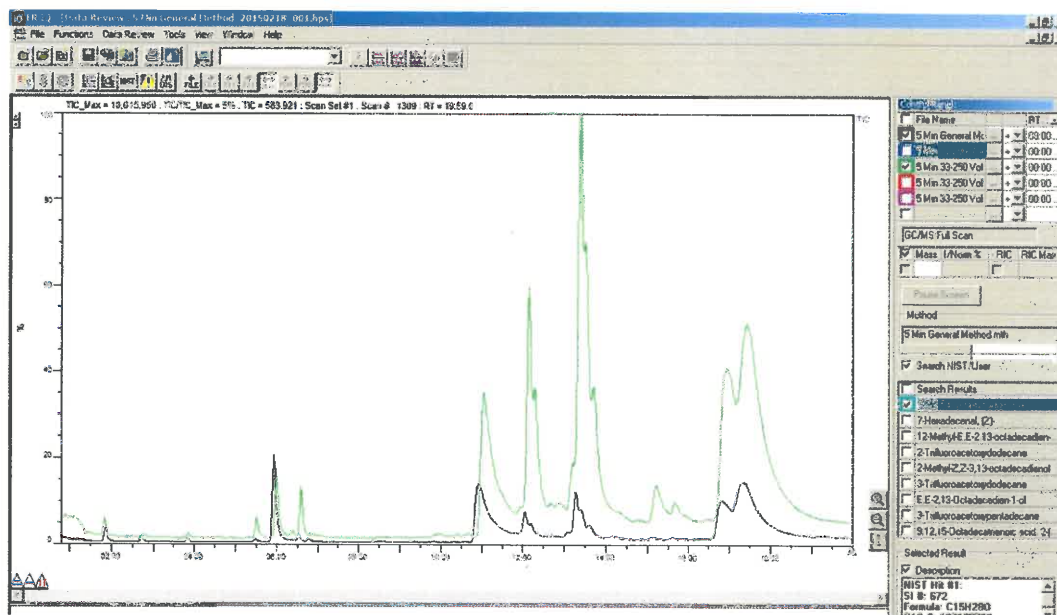
Attachment 3

Industrial Hygiene GCMS Sample Results

Bag 1 – Change trailer to exhauster. In this picture the blank is black and the sample is blue. Basically the sample is a match to the blank. The higher peaks past to 10:00 mark are due to the extended sample time. The high peaks before 10:00 mark are internal standards.

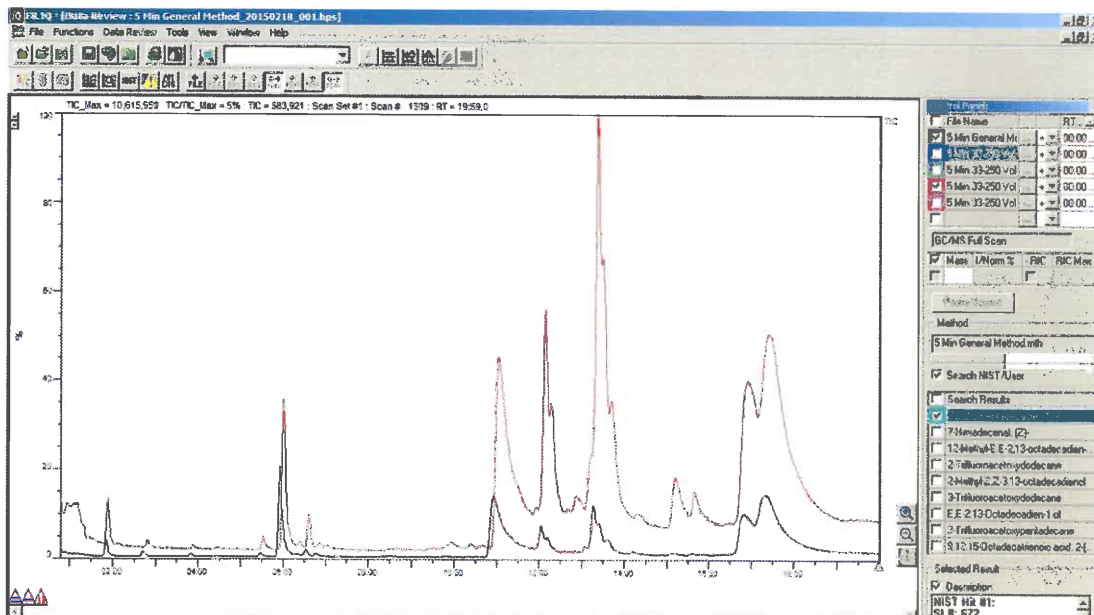


Bag 2 – Exhauster to AP-107. The blank is in black, the sample is green. Again, the sample is a basic match with higher peaks due to extended sample time.

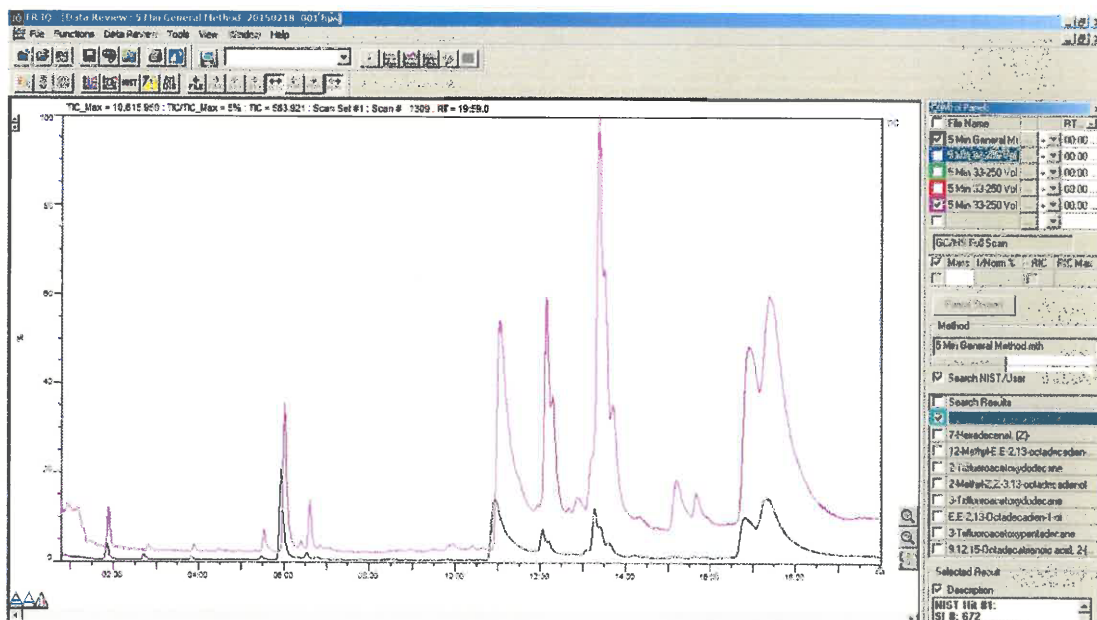


EIR-2016-014, "AOP-015 Entry with Odors near Exhauster and Tank AP-107"

Bag 3 – AP-107 crane and AP-107. The same explanation as above applies to this sample as well.



Bag 4 – AP-107 to change trailer. The same explanation as above applies to this sample as well.



Bottom line: All 4 bags closely align with the blank sample.

Each of the 4 bags had no initial VOC readings. Consequently, each was run using a 5-min method to allow bag air extra time to volatilize. This method is common with extremely low initial VOC measurement. Hapsite analysis provided by [REDACTED]