COMBINED EVENT INVESTIGATION / CAUSE ANALYSIS REPORT

AOP-015 for Odors East of 241-AP Farm

EIR-2019-029
WRPS-PER-2019-1241

Figure 1. East of 241-AP Farm and approximate location of personnel when they experienced odors. Trailer in the distance is the Ultrasonic Testing Control Room Trailer.

Cause Analysis Type	Apparent Cause Analysis
Approving Manager	[redacted]
Cause Analyst	[redacted]
ORP Facility Representative	[redacted]
PER Discovery Date	June 19, 2019

Washington River Protection Solutions, LLC

Prepared for the U.S. Department of Energy
Office of River Protection

Contract No. DE-AC27-08RV14800

[redacted]
Event Investigator

7/8/19
Date

[redacted]
PER Responsible Manager

7/8/19
Date

[redacted]

AOP-015 for Odors East of 241-AP Farm

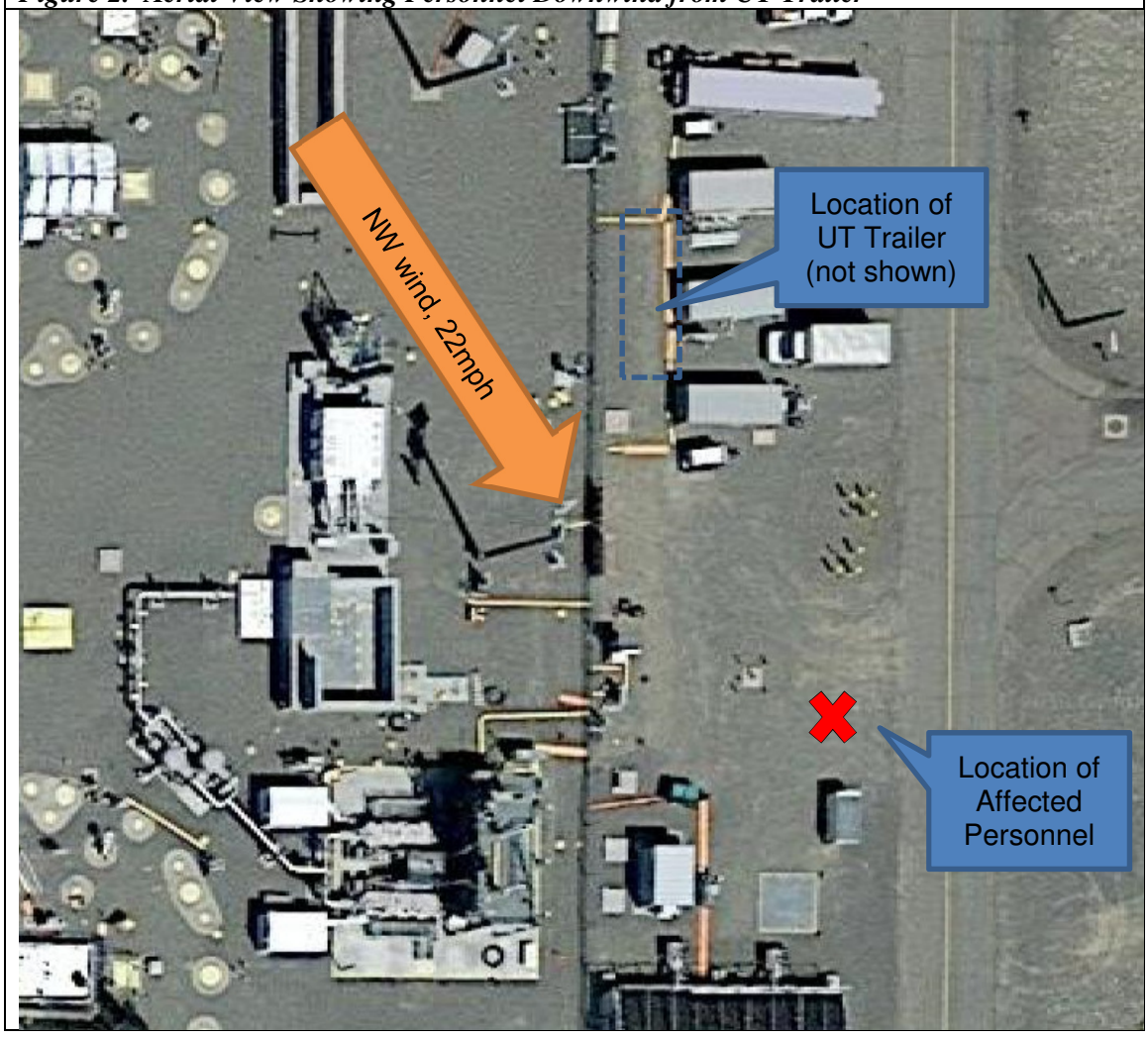
AOP-015 Odor Event Summary

Event	AOP-015 for Odors East of 241-AP Farm
PER	WRPS-PER-2019-1241
Date/Time of Event	• June 19, 2019 • 0930 hours
Location	• East of 241-AP Farm Near Change Trailer Tent
Personnel Affected	(4) Teamsters reported odors and having zero (0) symptoms. They elected not to receive a medical evaluation.
Odor / Taste	Personnel described odors as: • Musty • Rotten-egg
Industrial Hygiene (IH) Investigative Monitoring / Sampling	Monitoring and Sampling results: • Ammonia: <DL* • Total VOCs: <DL • Nitrous Oxide: 0.2 ppm • Mercury: 7 ng/m^3 (actionable hazard level for Mercury in 12,500 ng/ m^3)** • Hydrogen Sulfide: <DL *DL – detectable level **Odorless
Source	• Source of the odor was traced to two (2) corroding batteries emitting sulfuric acid vapors which were located inside the Ultrasonic Testing Control Room Trailer.
Wind Speed / Direction	NW @ 22mph, barometric pressure at 29.3”
Waste Disturbing or Tank Work in Adjacent Area	No waste disturbing activities were occurring at the time.
Other Work in Adjacent Area	No adjacent work was being performed at the time.

Executive Summary

On June 19, 2019, at 0930 hours, four (4) workers were removing scrap material from an area east of AP Farm when they noticed a rotten egg odor. The individuals reported to the Central Shift Office (CSO) and filled out odor response cards, reporting no symptoms. At 1024, entry was made into procedure TF-AOP-015, *Response to Reported Odors or Unexpected Changes to Vapor Conditions* (AOP-015) for odors near AP Farm. At 1106, the Industrial Hygiene sampling team began taking direct readings and grab samples of the area. The results came back showing airborne chemicals of concern to be below actionable or detectable levels. The AOP-015 was exited at 1207 hours. Mobile lab and WRPS fugitive emissions personnel continued to investigate and discovered the source to be two corroded portable batteries located within the Ultrasonic Testing Control Room Trailer outside of AP Farm. The presence of the degraded batteries was determined not to be a vapor concern. However, the batteries did exhibit exposed battery acid. The batteries were replaced the following day. A cause analysis revealed that the batteries had a history of having a short life span. A corrective action has been recommended to perform a mechanical inspection and repair.

Figure 2. Aerial View Showing Personnel Downwind from UT Trailer



Event Investigation and Analysis

On June 19, 2019, at 0930 hours, four (4) teamsters were removing scrap material from an area east of AP Farm when they noticed a rotten egg odor. They promptly left the area and reported the odors to the Field Work Supervisor (FWS) who then directed them to report to the Central Shift Office (CSO). The individuals reported to the Central Shift Manager (CSM) at 1014 hours and filled out odor response cards. The individuals reported they did not experience symptoms and all four (4) declined a medical evaluation. At 1024, the Central Shift Office (CSO) sent out a shift office event notification (SOEN) to announce entry into procedure TF-AOP-015, *Response to Reported Odors or Unexpected Changes to Vapor Conditions* (AOP-015) for odors near AP Farm.

At 1025 hours, Industrial Hygiene Professionals and Technician Supervisor arrived at the CSO and were briefed by the CSM. At 1031 hours, the CSM dispatched Production Operations Nuclear Chemical Operators (NCO) to begin restricting access to the area. Industrial Hygiene personnel gathered sampling and monitoring equipment and headed to the area of concern.

At 1046 hours, an NCO in charge of Ultrasonic Testing arrived at the CSO and informed the CSM that the malfunctioning diesel generator catalytic converter was the probable cause of the odor. It should be noted at ~0900 hours that day, similar odors had been encountered. At 1106, Industrial Hygiene Technicians (IHT) began performing response actions by acquiring two (2) grab samples: one from the area near the suspect generator and the other from the general area. Sampling was also gathered via the Terra Graphics Industrial Hygiene Response Van (TGIHRV). At 1117, an Event Investigation was initiated.

At 1128, IHTs reported to the CSM that direct reading instruments showed ammonia, volatile organic compounds (VOC), and hydrogen sulfide to be below detectable levels. At 1203, the CSM was informed that the survey on the grab samples had been completed and chemicals of concern were below actionable or detectable levels. At 1209, the AOP-015 was exited.

The TGIHRV (i.e., mobile lab) continued to investigate and discovered the source of the odors. Initially, the TGIHRV team had been focused on the diesel generators as the possible source, but new information led them to investigate the trailer just south of the generators, the Ultrasonic Testing Control Room Trailer (i.e., UT trailer). At ~1330, the Field Work Supervisor (FWS) from the Ultrasonic Testing Control Room Trailer opened the storage area at the front of the UT trailer and the investigating technicians immediately detected a strong sewer/rotten egg smell being emitted from two corroded lead batteries inside (Figure 2).

WRPS fugitive emissions personnel were also at the location investigating the incident. They detected the presence of sulfuric compounds using two Shinyei units coming from the opened storage area of the UT trailer. Both instruments reached maximum detection within a few feet of the batteries. The wind was moving at 22 mph that day and in a northwesterly direction which would have placed the affected individuals downwind from the UT Trailer; providing further evidence to support the theory that the batteries were the source.

_____

The event was concluded to be a low level hazard and an isolated incident. The chemicals of concern (e.g., hydrogen sulfide) were not detected in the airborne samples collected by Industrial Hygiene and the presence of the degraded batteries was determined not to be a vapor concern. However, the batteries did exhibit exposed battery acid.

Figure 3. Corroded Batteries Found in the UT Trailer

A Cause Analysis was performed to further explore the presence of the degraded batteries. The analysis discovered that the UT trailer had a recent history of batteries malfunctioning. In April 2018 and in August 2018, the batteries were replaced. Recently, on June 6, 2019, the UT trailer had been relocated from AN Farm to AP Farm. The DC batteries had been utilized and were functioning properly at the time. However, on June 19, 2019, the batteries were found to be in a state of corrosion with dried battery acid found on and around the batteries. The batteries had likely overcharged which resulted in the boiling off/over of battery acid. In the past, the UT crew had been manually disconnecting the battery from the generator-fed source to prevent the overcharging.

The cause of the overcharged/degraded batteries will require a mechanical inspection. Based on an interview with a mechanic from Mission Support Alliance (MSA) who is familiar with the battery issues of the UT trailer, the cause is likely a malfunctioning converter. Under normal conditions, the trailer would draw power from the AP Farm generator, and the converter would then convert the 110 volts from the generator to 12 volts for the DC battery. Under normal conditions, the converter would discontinue providing power to the battery when it reached the full 12 volts. However, in the instance of the UT trailer, it is likely that power continued to the battery causing it to become overcharged.

The cause analysis recommends conducting a mechanical inspection and then performing the necessary repairs to ensure that the batteries are not being overcharged.

Event Timeline

June 19, 2019

0930 Four (4) employees notice rotten egg odors east of AP Farm
0930 Affected employees leave area and return to MO733
0945 Employees inform FWS
0945 FWS prompts employees to report to CSO and fill out odor cards
1014 Affected employees report odors to CSM
1024 SOEN goes out announcing entry into TF-AOP-015
1025 Industrial Hygiene Professionals and Technician Supervisor arrive at CSO
1027 Industrial Hygiene Personnel begin gathering monitoring and sampling equipment
1031 CSM dispatches NCOs to perform access restriction
1035 Terra Graphics Industrial Hygiene Response Van (TGIHRV) team arrives at CSO
1046 Ultrasonic Testing NCO arrives at CSO and informs CSM that malfunctioning generator catalytic converter is likely cause of odors
1050 IHTs are briefed on response actions
1051 IHTs depart to begin monitoring and sampling response actions
1100 AY/AZ Field Industrial Hygiene Professional contacts AY/AZ Team Industrial Hygiene Technician in search of additional information on time and area of event
1100 AY/AZ IHT informs of similar odors encountered ~0900 hours but direct read instrumentation (DRI) did not detect hazardous airborne conditions
1106 IHTs enter restricted area and begin response actions
1117 Event Investigation (EIR-2019-029) is initiated
1128 IHTs report to CSO that ammonia, VOCs, and hydrogen sulfide are below detectable
1203 CSM is informed that survey on grab samples is complete and below detectable
1207 SOEN is issued to exit TF-AOP-015
1430 Data gathered by the TGIHRV team identify a positive source of the odors: corroded batteries in the Ultrasonic Testing Trailer

June 20, 2019

0930 Batteries are replaced in the Ultrasonic Testing Control Room Trailer

Immediate Actions Taken

On June 19, 2019, at 0930 hours, workers experience strong rotten egg odors and leave the area. Workers then reported the incident to the FWS. The workers then reported to the CSO and filled out odor response cards. At 1024, a SOEN announces entry into the TF-AOP-015 and personnel are directed to stay clear of AP Farm until further notice. Nuclear Chemical Operators (NCO) are directed to set up access restriction. At 1106, IHTs begin monitoring and sampling. By 1203 hours, the CSM is informed that chemicals of concern are at or below background levels. At 1209 hours, the TF-AOP-015 was exited and normal access is resumed.

Remedial Actions Taken

Source of the odors was identified to be corroded lead acid batteries located at the front of the nearby UT trailer. The batteries were replaced the next day on June 20, 2019.

Extent of Condition

The instance of the batteries being corroded due to overcharging appears to be an isolated incident as there is currently only one UT trailer located at the Tank Farms. The UT trailer is a temporary trailer unit (Figure 1) equipped with tank detection equipment used primarily for the inspection of the structural integrity of double-shell tanks (DST). It has been utilized at various DST farms since it was commissioned. Two additional UT trailers are to be added in the future.

Cause Analysis

A Cause Analysis was performed to further explore the presence of the degraded batteries. A Cause-Effect chart shows the process of analyzing the events leading up to the discovery (Figure 4). The analysis found that the UT trailer had a recent history of batteries malfunctioning. In April 2018 and in August 2018, the batteries had been replaced. Recently, on June 6, 2019, the UT trailer had been relocated from AN Farm to AP Farm. The DC batteries had been utilized and were functioning properly at that time. However, on June 19, 2019, the batteries were found to be in a state of corrosion with dried battery acid found on and around the batteries. The batteries had likely overcharged which resulted in the boiling off/over of battery acid. In the past, the UT crew had been manually disconnecting the battery from the generator-fed source to prevent the overcharging.

The cause of the overcharged/degraded batteries will require a mechanical inspection. Based on an interview with a mechanic from Mission Support Alliance (MSA) who is familiar with the battery issues of the UT trailer, the cause is likely a malfunctioning converter. Under normal conditions, the trailer would draw power from the AP Farm generator, and the converter would then convert the 110 volts from the generator to 12 volts for the DC battery. Under normal conditions, the converter would discontinue providing power to the battery when it reached the full 12 volts. However, in the instance of the UT trailer, it is likely that power continued to the battery causing it to become overcharged.

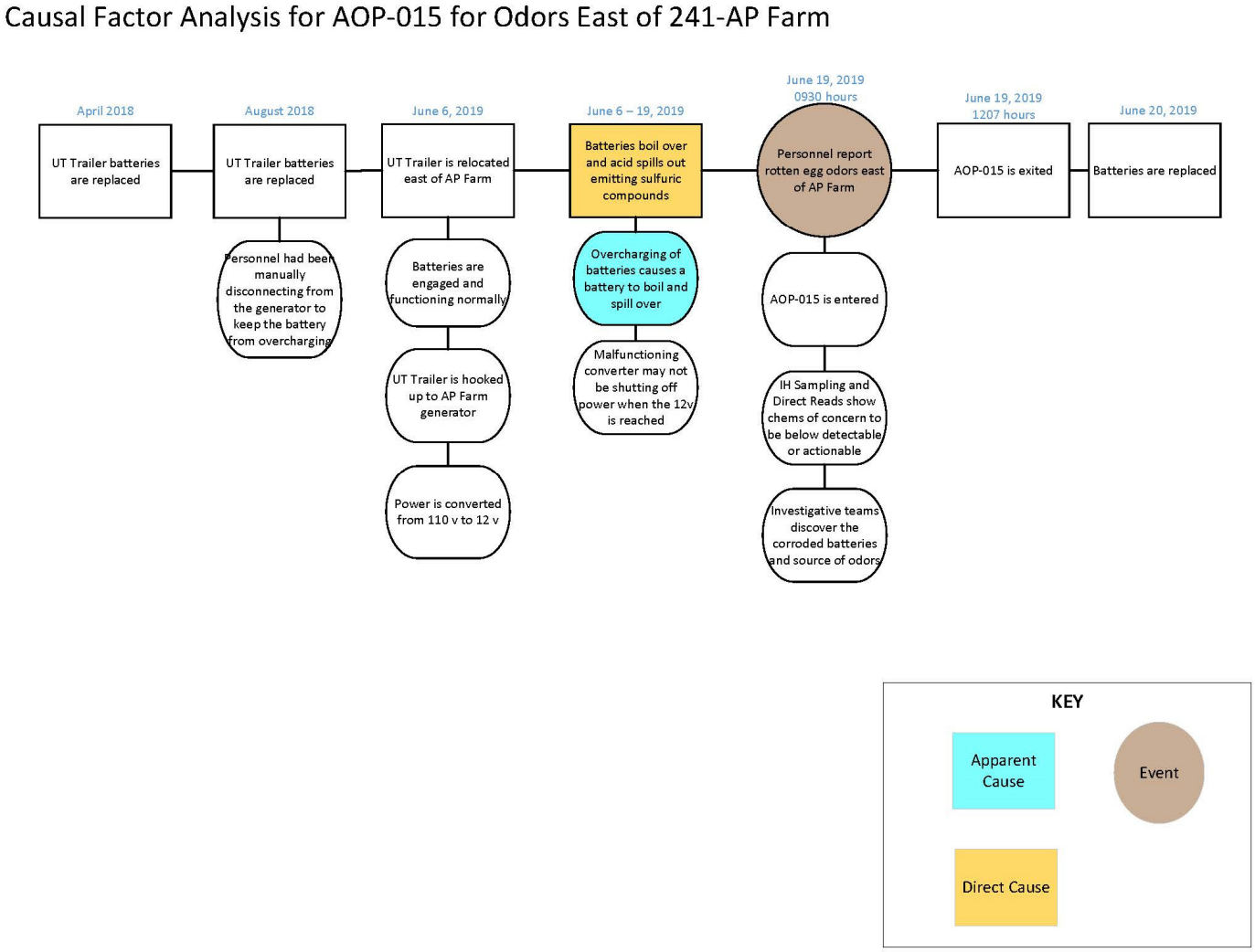
Corrective Action

1. **Equipment Malfunction**
    - **Cause Code:** A2B6C04 End of life failure
    - **ESTARS:** WRPS-PER-2019-1241.1
    - **Action:** Submit KSR to MSA for facility electricians to inspect and diagnose. Specify in the notes of the request that this is a mobile trailer but due to high voltage levels, the work needs to be assigned to facility electricians. Note to check the converter and recommend repairs.
    - **Deliverable:** Upload to ESTARS a copy of the inspection results and recommendations from the MSA facility electricians. If additional actions are recommended as a result of the MSA inspections, those actions will be added to this PER.
    - **Responsible Manager:** Mike Hay
    - **Due Date:** 9/30/2019

Attachments:

1. WRPS-PER-2019-1241
2. Industrial Hygiene Investigative Report

Figure 4. Cause Analysis



Attachment 1 – WRPS-PER-2019-1241

Save

Problem Evaluation Request (PER) **WRPS-PER-2019-1241**
In Process/Work

PER No	WRPS-PER-2019-1241		
Discovery Date/Time	06/19/2019 09:40		
Project	Maintenance		
Location	AP Farm		
How Discovered?	Self-Revealing (Event)		
Equipment ID Number	N/A		
Source Document	N/A		
PER Title			
Odor Event AP Farm			
Description of Concern or Problem			
Teamsters working outside AP change tent smelt a onion smell			
Immediate actions Taken			
left area called supervisor did not want to go to HPMC supervisor called shift office reported event AOP 15 intiated, went to shift office filled out odor response cards.			
Recommended Corrective Actions			
N/A			
Shift Office Contact	Originator indicates contact was made with the appropriate Shift Office.		
Originator Contact			
No			
Originators Name	**Originators ID**	**Originators Phone**	**Date Initiated**
[redacted]	[redacted]	[redacted]	06/19/2019
SHIFT OFFICE REVIEW			
Reportability	Non-Reportable		
SSC Operability	N/A		
Operability Review	N/A		
OSD Non-Compliance?	No		
Compensatory Actions Taken			
No compensatory measures implemented.			
Additional Actions Taken or Recommended			
Entered TF-AOP-015 Response to Reported Odors or Unexpected Changes to Vapor Conditions. Dispatched NCOs to restrict access to the east side of AP Farm by blocking 4th Street Loop. Dispatched IHTs to implement Tank Waste Odor Sample Plan IHP-09001 using TF-AOP-015 RPF Task 2. Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exited TF-AOP-015. Initiated Event Investigation EIR 2019-029 TF-AOP-015 Event East of AP Farm. Source of the TF-AOP-015 odors near AP Farm have been positively identified as corroded batteries in the UT Trailer.			
SO Reviewer Name	**SO Reviewer ID**	**SO Reviewer Phone**	**SO Review Date**
[redacted]	[redacted]	[redacted]	06/19/2019
SCREENING			
PER Significance Level	**Analysis Level**		**How Discovered**
Ind Assessment Rev	**Occurrence Rpt #**	**DOE CAP Required?**	
Assigned Responsible Manager	**Facilities Rep / SSO**	**Safety Mgmt Rep**	**Potentially Recurring Issue**
			No

[redacted] 6/20/2019

Program		Trend Codes	
PER Screening Comments			
ORPS Code	**Functional Area**	**Work Process**	**ISMS**
PER Screening Chair	**PER Screening Chair ID**	**PER Screening Chair Phone**	**PER Screening Date**
		() -	
PAAA REVIEW			
PAAA Screening	**PAAA Codes**	**Function Codes**	
PAAA Cause Analysis Review	**NTS Report Number**	**NTS Report Date**	
PAAA Screening Comments			
PAAA Reviewer Name	**PAAA Review Date**		
PAAA Approver Name	**PAAA Approve Date**		
ATTACHMENTS			
Link to PER			
AUDIT HISTORY			
Change Date	**Auditor**	**Comments**	
06/19/2019 14:44	[redacted]	Initiator Tab initial submission.	
06/19/2019 15:44	[redacted]	'PER Title' was changed to change "order" to "odor". 'Immediate actions Taken' was changed to change "order" to "odor".	
06/19/2019 16:50	[redacted]	SO Tab initial submission.	

-- End of Report --
06/20/2019 06:10 AM

[redacted] 6/20/2019

Attachment 2 – Industrial Hygiene Investigative Report

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

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

4 Maintenance Teamsters removing scrap wood E of 241-AP encountered "musty, rotten egg" odors. No affected employees reported symptoms.

- Was an IHT Present during initiating event? [ ] Yes [X] No

IH Monitoring/ Sample Survey Reports:

Event response: 19-04750 "AP Farm East Perimeter AOP 15 response"

Weather Conditions at Time of Event:

Ambient outside conditions:

- Weather station: Station 6 @ 0930
- Wind Direction and Speed: NW @ 22 mph, gusts to 34
- Barometric Pressure *(steady/rising/falling)*: 29.31"Hg and steady
- Temperature (F°): 70
- Humidity: 23%

Page 1 of 10

A-6005-744 (REV 5)

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

Field Response Timeline:

1014: Affected Employees report odors to Central Shift Manager (CSM)
1024: Shift Office Event Notification (SOEN): "Entered AOP-015 for odor near AP Farm. All personnel stay clear of AP Farm until further notice. CSM"
1025: AN Team Field Industrial Hygiene Professional (ANFIHP) , COMs Field Industrial Hygiene Professional (COMsFIHP), AY/AZ Field Industrial Hygiene Professional (AYAZFIHP), Production Operations Shift Industrial Hygiene Technician Supervisor (POSIHTS) arrive at Central Shift Office (CSO), acquire Odor Response Cards (ORCs) and are briefed by CSM
1027: COMsFIHP requests POSIHTS to acquire Hydrogen Sulfide (H_2S) sensor equipped MultiRAE
1030: Production Operations Shift Industrial Hygiene Technicians (POSIHTs) arrive at CSO
1030: Effluent Treatment Facility Industrial Hygiene Technician (ETFIHT) departs MO511 (Temporary PO IHT Lab) towards Effluent Treatment Facility (ETF) to acquire H_2S equipped MultiRAE
1031: CSM dispatches Production Operations Shift Nuclear Chemical Operators (POSNCOs) to perform access restriction
1032: Terra Graphics Engineering Technicians (TGETs) and Terra Graphics Industrial Hygiene Response Van (TGIHRV) are requested to CSO
1034: POSIHTS confirms Nucon HAPSITE® is warming up
1035: TGETs arrive at CSO
1036: ANFIHP briefs TGETs
1036: POSIHTs depart CSO to acquire Respiratory Protection Equipment (RPE)
1038: TGETs leave CSO
1046: Ultrasonic Testing Nuclear Chemical Operator Lead (UTNCOL) arrives at CSO to notify CSM that malfunctioning diesel generator catalytic converter is probable cause of odor
1047: POSIHTs return to CSO with RPE for briefing on response actions
1050: H_2S sensor equipped MultiRAE arrives at CSO
1050: COMsFIHP briefs POSIHTs on response actions:
- RPE as per RPF TF-AOP-015 Task 2
- Monitoring as per IHP-09001 R6
  - Monitor for VOCs, NH_3, H_2S
  - Acquire 2 grab samples
    - 1 grab sample form area near suspect generator
    - 1 grab sample form general area unless indication of possible source on Direct Reading Instrumentation (DRI)
    - Analyze grab samples with Miran SaphIRe, Ohio Lumex, Nucon HAPSITE®
- Support TGET by placing TGIHRV sampling hose as close to area of concern as possible

1051: POSIHTs depart CSO to perform response actions
1051: UTNCOL contacts CSM to update that contact has been made with generator contractor interface
1100: AYAZFIHP contacts AY/AZ Team Industrial Hygiene Technician (AYAZIHT) regarding Enhanced Monitoring Survey details from time and area of initiating event:
- Similar odors were encountered in area of concern at 0900, but no DRI readings were observed

1106: POSIHTs enter restricted access area to perform response actions
1010: Event Investigation Manager contacts CSM to assign Event Investigation Report Point Of Contact (EIR POC)
1128: POSIHTs return to CSO to report results:
- NH_3: <DL
- VOC: <DL
- H_2S: <DL
- Heading to MO511 (Temporary PO IHT Lab) to process grab samples and perform post-use-Function-checks

1209: SOEN "Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM"

Page 2 of 10 A-6005-744 (REV 5)

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

Glossary:

AOP	Abnormal Operating Procedure
ANFIHP	AN Team Field Industrial Hygiene Professional
AYAZFIHP	AY/AZ Team Field Industrial Hygiene Professional
ASAP	As Soon As Possible
COMs	Central Operations and Maintenance
COMsFIHP	Central Operations and Maintenance Field Industrial Hygiene Professional
CSM	Central Shift Manager
CSO	Central Shift Office (274AW Room 5)
CVST	Chemical Vapors Solutions Team
DL	Detection Limit
EIR	Event Investigation Report
ESH&Q	Environmental Safety Health and Quality
ETF	Effluent Treatment Facility
ETFIHT	Effluent Treatment Facility Industrial Hygiene Technician
EV	Evaporator
EVFIHP	EV Team Field Industrial Hygiene Professional
FEI	Fugitive Emissions Investigation
FEST	Fugitive Emissions Sub-Team
H_2S	Hydrogen Sulfide
Hg	Mercury
HPMC	Hollie P. Mooers Corporation
IH	Industrial Hygiene
IHP	Industrial Hygiene Plan
IHPIHTL	Industrial Hygiene Programs Industrial Hygiene Technician Lead
IHT	Industrial Hygiene Technician
MO	Mobile Office
N_2O	Nitrous Oxide
NH_3	Ammonia
OE	Operating Engineer
ORC	Odor Response Card
PNNL	Pacific Northwest National Laboratories
PO	Production Operations
POIHT	Production Operations Industrial Hygiene Technician
POIHTL	Production Operations Industrial Hygiene Technician Lead
POIHTS	Production Operations Industrial Hygiene Technician Supervisor
POSIHT	Production Operations Shift Industrial Hygiene Technician
POSIHTS	Production Operations Shift Industrial Hygiene Technician Supervisor
POWASHM	Production Operations West Area Safety and Health Manager
R/C	Retrieval and Closure
RPE	Respiratory Protection Equipment
RPF	Respiratory Protection Form
SM	Shift Manager
TF	Tank Farms
TGET	Terra Graphics Engineering Technician
TGIHRV	Terra Graphics Industrial Hygiene Response Van
TVA2020	Toxic Vapor Analyzer 2020

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

Glossary (cont.):

UTNCOL	Ultrasonic Testing Nuclear Control Operator Lead
VOC	Volatile Organic Compounds

Field IH Author:

[redacted] [redacted] [redacted] 06/25/2019

Print First and Last Name | Signature | Phone No. | Date

Page 4 of 10

A-6005-744 (REV 5)

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

2. **GCMS Sample Results:**

See Attachment A for HAPSITE (GCMS) Results

Washington River Protection Solutions

TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT

PER Number: WRPS-PER-2019-1241

Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm

EIR Number: EIR-2019-029

3. Additional Information:

- Odor Response Cards received:

[redacted]

ODOR RESPONSE CARD - 241-AP FARM

Complete map, return to Centre Shift Office as soon as practicable.

Odors Detected WITH S

Notify Immediate Supervisor

- Your name and the work you were performing
- the affected

N

241

Page 1 of 2

[redacted]

ODOR RESPONSE CARD - 241-AP FARM

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

- Your name and the work your were performing Removing Scrap wood.
- [redacted]
- Was an IHT present?
- Sweet ☐ Sour ☒ Smoky ☒
- ☐ Cleaning Solution
- ☐ Nausea ☐
- ☐ Fatigue/Drowsiness/Weakness ☐ Sore/Burning Throat ☐ Difficulty Breathing
- ☐ Watery/Irritated

N/A

Page 2 of 2

[redacted]

A-6005-744 (REV 5)

Washington River Protection Solutions

TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT

PER Number: WRPS-PER-2019-1241

Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm

EIR Number: EIR-2019-029 [redacted]

ODOR RESPONSE CARD - 241-AP FARM

Odo[illegible] th A[illegible]
Im[illegible]

1. Notify Immediate Supervisor
2. Contact Central Shift Manager [redacted]

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

Notify Immediate Supervisor

Contact CSM [redacted]

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

Page 1 of 2 [redacted]

ODOR RESPONSE CARD - 241-AP FARM

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

- Date and time odor was noticed
- Your name and the work you were performing [redacted]
- Location of odors *(mark area on map and wind direction)*
- Name(s) of others in or near the affected area [redacted]
- Was an IHT present?
- Describe the odor ☐ Sewer ☐ Sour ☒ Musty ☐ Earthy ☐ Metallic ☐ Smoky ☒ Rotten ☐ Chemical
  ☐ Cleaning Solution ☐ Ammonia ☐ Other [illegible]
- Possible Source [illegible]
- Your symptoms *(if any)* ☐ Headache ☐ [illegible] ☐ Nausea ☐ Cough
  ☐ Fatigue/Drowsiness/Dizziness ☐ Mouth Burning/Throat ☐ Difficulty Breathing
  ☐ Watery/Irritated Eyes/Trouble with Vision ☐ Tingling/Numbness/Paralysis ☐ Rash/Itching
  ☐ Other [illegible]

Page 2 of 2 [redacted] A-6005-929 (REV 1)

A-6005-744 (REV 5)

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

[redacted]

ODOR RESPONSE CARD - 241-AP FARM

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

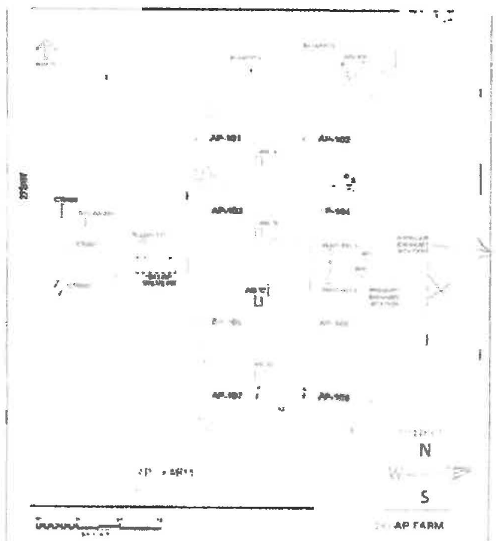
Odors Detected WITH Symptoms

Notify Immediate Supervisor

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 IH present?
- Possible source

of card



Page

[redacted]

A-6005-929 (REV 1)

ODOR RESPONSE CARD - 241-AP FARM

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

- Date and time odor was noticed
- Your name and the work your were performing [redacted]
- Location of odors (mark area on map and wind direction) AP
- Name(s) of others in or near the affected area [redacted]
- Was an IH present? NO
- Describe the odor ☐ Sweet ☐ Sour ☐ Musty ☐ Earthy ☐ Metallic ☐ Smoky ☐ Rotten ☐ Other ☐ 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 N/A

Page 2 of 2

[redacted]

A-6005-929 (REV 1)

Page 8 of 10

A-6005-744 (REV 5)

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

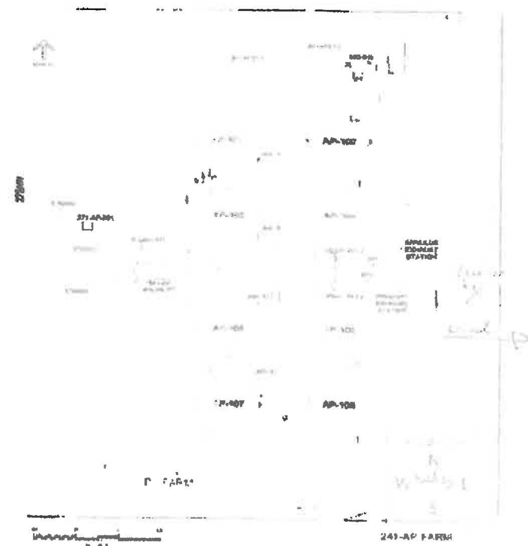
[redacted]

ODOR RESPONSE CARD - 241-AP FARM

Odors Detected with AP
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**

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**



of 2

[redacted]

ODOR RESPONSE CARD - 241-AP FARM

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

- Date and time odor was noticed
- **Your name and the work your were perfoming** [redacted]
- Location of odors (mark area on map and wind direction) AP East side
- Name(s) of others in or near the affected area [redacted] [redacted] [redacted]
- Was an IHT present?
- Describe the odor ☐ Sweet ☐ Sour ☐ Musty ☐ **Earthy** ☐ Metallic ☐ Smoky ☐ Rotten ☐ Onion
  ☐ Cleaning Solution ☐ Ammonia ☒ **Other.** Eggs
- 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

Page 2 of 2

[redacted]

A-6006-929 (REV ..)

A-6005-744 (REV 5)

Washington River Protection Solutions **TF-AOP-015 INDUSTRIAL HYGIENE INVESTIGATION REPORT**	**PER Number:** WRPS-PER-2019-1241
Time/Date & Event location: 0930 06/19/2019 East of 241-AP Farm	**EIR Number:** EIR-2019-029

- Summary of IH Monitoring and Sampling Data:

  a. Monitoring:

  Event Response: 19-04750 "AP Farm East Perimeter AOP 15 response"

  DRI field readings:

VOC:	<DL
NH_3:	<DL
H_2S:	<DL

  Grab samples:

VOC:	<DL
NH_3:	<DL
Hg:	7 ng/m^3
N_2O:	0.2 ppm
H_2S:	<DL

  b. Sampling:
  N/A

4. **Summary of Employee Reported Information** *(e.g., symptoms)*

   None of the employees reported experiencing symptoms

5. **Recommendations/Conclusions:**

   Identification of Source of the Concern: [X] Yes [ ] No
   Lead acid batteries located in the front of a nearby Ultrasonic Testing Control Room-Trailer is the likely the source of the reported odor. When the storage area containing the batteries is opened, the odor became stronger. The batteries appeared to be overcharged. (See Attachment B) Over charged lead acid batteries can generate odors similar to those reported during this AOP-015.

6. **Other:**

   The Terra Graphics Industrial Hygiene Response Van (TGIHRV) was deployed to collect data as part of the AOP-015 response (see Sec. 1 Field Response Timeline); however, no data collected during this event by the TGIHRV is reportable. The TGIHRV is still in the research and development phase and any analytical methods associated with the TGIHRV have yet to be accredited by any recognized organization (AIHA, etc.).

S&H Program Management:

[redacted] [redacted] [redacted] 6/25/19

Print First and Last Name — Phone No. — Date

Page 10 of 10

A-6005-744 (REV 5)

Attachment A

GCMS Laboratory Results

[redacted]

HAPSITE GC-MS Bag Sample Results Survey 19-004750, East of AP Tank Farm: (EIR-2019-029).

Two bag samples were collected in response to an odor reported east of AP Tank Farm. These samples were analyzed using an Inficon HAPSITE GC-MS on June 19, 2019. Data was interpreted on May 20, 2019, and reported the same day. Results for the Air Blank Sample were satisfactory. A Bag sample containing contaminant free Zero Air was analyzed. The compounds listed below were found in both samples and the zero air-sample bag blank at concentrations consistent with sample bag contaminants.

Compounds Found in Samples

Compound	Clean Air Blank	Zero Air-Bag Blank	Bag #1	Bag #2	Comments
Internal Standard #1	X	X	X	X	Added by instrument during analysis
Plasticizer (Methyl Methacrylate)		X	X	X	Typical sample bag component
Internal Standard #2	X	X	X	X	Added by instrument during analysis
C8 Aromatic Compound (Styrene)		X			Typical sample bag component
C10 Terpene (D-Limonene)		X	X	X	Typical sample bag component
Silane Compound (Tetramethylsilane)		X	X	X	Typical sample bag component
C9-15 Alkane Hydrocarbons		X	X	X	Not found above background

[redacted]

No compounds were found at concentrations above background.

[redacted]

If you have questions contac[redacted], CIH at [redacted]

[redacted]

[redacted]

Attachment B

Photo of Lead Acid batteries