

INTEROFFICE MEMORANDUM



WRPS-1203050

Date: July 31, 2012
To: M. W. Ellis
From: *NLP*
N. L. Peters, Initial Event Investigation Team Lead, Security Emergency Services□
Subject: INITIAL EVENT INVESTIGATION REPORT EIR 2012 011, C FARM
SATELLITE ACCUMULATION AREA ODOR EVENT□

Submitted for your information and use is the event investigation report EIR-2012-011, C Farm Satellite Accumulation Area Odor Event. The enclosed report contains the information obtained during the initial event investigation meeting, but does not necessarily cover an exhaustive investigation of all issues.

As the responsible manager, resolution of problem evaluation request WRPS-PER-2012-1050 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 373-2331.

NLP:LMN

Enclosure: Mid-Level/Initial Event Investigation Report, C Farm Satellite Accumulation Area (RMA-050) Odor Event, Event Investigation Report Number EIR 2012 011 (25 pages)□

M. W. Ellis
Page 2
July 31, 2012

WRPS-1203050

cc: WRPS Correspondence Control

L. J. Alcala
A. D. Basche
A. L. Beerman
C. Burrows
W. C. Clark
B. P. Crume
M. W. Ellis
R. A. Ennis
L. A. Flowers
M. M. Gallagher
J. G. Garcia
P. A. Gomez
R. E. Gregory
D. R. Harper
S. J. Henneman
R. L. Higgins
C. N. Hollis
J. N. Holloway
G. J. Johnson
E. E. Kennedy
S. H. Kent
T. A. Kenworthy
H. K. Lawrence
D. B. Little
C. M. Lowery

J. A. McDonald, Jr.
H. A. Mendoza
R. J. Moore
T. P. Morales
D. J. Mulderig
C. H. Mulkey
E. A. Norton
R. S. Page
G. A. Parkhurst
C. M. Reedy
D. L. Roberts
M. G. Robbert
J. S. Rodriguez
M. D. Schorzman
R. J. Skwarek
D. K. Smith
D. M. Slaugh
D. E. Swenson
B. R. Thomas
G. C. Triner
R. L. Urie
R. E. Wilkinson
D. E. Wolf
C. T. Wolfley
B. D. Wright



washington river
protection solutions

MID-LEVEL/INITIAL EVENT INVESTIGATION REPORT

**C Farm Satellite Accumulation Area (RMA-050) Odor Event
Event Investigation Report Number EIR-2012-011**

Nanci L. Peters *NLP*
Event Investigation Team Lead

Date *7/25/12*

Martin W. Ellis *MW Ellis*
PER Responsible Manager

Date *7/25/12*

PER No. WRPS-PER-2012-1050, 1051, 1067, 1072

C Farm Satellite Accumulation Area (RMA-050) Odor Event

Preface

The following initial event investigation report summary and timeline were developed utilizing signed personal statements and discussion/interviews during a formal "fact-finding" meeting. This "initial" report should be considered in resolution of the associated Problem Evaluation Request (PER) response but not interpreted as a "final" report and inclusive of all vital facts for closure.

Investigation Summary

On the morning of June 18, 2012, it was noted that the tamper seal had been broken on a drum in middle C Farm Satellite Accumulation Area (SAA); entry into the drum was scheduled with health physics technician (HPT) support the next day. The following day, June 19, 2012, Washington River Protection Solutions LLC (WRPS) Waste Operations performed an "Active Container Inspection" of the same SAA, RMA-050, and confirmed Drum WSO-12-060-05 had a broken seal and required further inspection of its contents. RMA-050 is located outside the tank farm fence, toward the middle entrance to C Farm, 200 East Area, Hanford Site. Recorded temperature for that date and time was 70 degrees Fahrenheit (°F), winds from the northwest (280°-290°), clear and sunny.

- (b)(6) The inspection team (team) consisted of two [redacted] and one [redacted] all were (b)(6)
qualified to perform this activity and had previous experience with the operation. The team was
following the procedure, as well as wearing all required personal protective equipment (PPE). [redacted] (b)(6)
had surveyed the same drum in April of 2012; at that time, a light smell of diesel was detected from the
diesel/dirt and gravel combination bagged and placed in the drum as documented on the inventory list.
- (b)(6) [redacted] completed a radiological/contamination survey of the exterior portion of the drum and entrance
into the SAA, (negative for contamination and expected dose levels) as required, per procedure, prior to
(b)(6) [redacted] removing the lid and setting it aside [redacted] began taking a survey sample smear inside the
drum to ensure no contamination was present before handling the contents (bags) within Drum WSO-12-
060-05 and to verify all inventory sheet entries matched the drum's bagged contents. While bending over
the opening of Drum WSO-12-060-05 to survey the package [redacted] inhaled a diesel-like (b)(6)
substance/odor. Standing upright, [redacted] experienced dizziness, watery eyes, and he felt like he was
(b)(6) spinning. [redacted] immediately backed away from the drum warning [redacted] #1 (located approximately 1 (b)(6)
foot away from drum) and [redacted] #2 (located at doorway of SAA, 2-3 feet away from drum) of the odor.
(b)(6) Simultaneously [redacted] #1 began detecting the strong odor and responded by placing the lid on top of the
(b)(6) drum and exiting the SAA, following behind [redacted] and [redacted] #2 at the doorway, who also was (b)(6)
verbalizing detection of the odor. Upon exiting the SAA, the doors were closed and secured with some
difficulty, due to a large wind dust devil striking the immediate area.
- (b)(6) [redacted] was disoriented and requested he be sat down; with the help of both [redacted] he sat down on the (b)(6)
wheel well of the adjacent "horse trailer" storage unit, also outside the fence of middle C Farm. [redacted] (b)(6)
called his immediate supervisor, by cell phone, informing him of the event and his current status and
(b)(6) location. [redacted] stated during the initial event investigation meeting he had slurred speech,
experienced difficulty in forming his words, and became nauseous. [redacted] contacted their Waste (b)(6)
Operations Supervisor and the Shift Operations Manager, informing them of the event, their current
(b)(6) status, and their location. [redacted] was transported to CSC Hanford Occupational Health Services
(b)(6) (CSC), 200 West Area, Hanford Site, by a co-worker [redacted] The Waste Operations Manager and the
Waste Operations Supervisor responded to the event scene, and [redacted] #1 explained the event and (b)(6)
(b)(6) informed them he was experiencing a headache. [redacted] #1 and [redacted] #2 were transported by government (b)(6)

vehicle to CSC, 200 West Area, Hanford Site, by the Waste Operations Supervisor. The Waste Operations Manager stayed at the event scene and, with the help of a Tank Farm Projects (TFP) NCO #3, individuals working in C Farm were communicated with directly to leave the farm due to the report of odors (this was followed by a Shift Office Event Notification (SOEN) on their tank farm radios and cell phones). The area was secured and access to the immediate area was restricted. The Central Shift Office was notified of the transport of three individuals [redacted] #1, and [redacted] #2) to CSC, the event, and the actions taken to secure the location and restrict access. (b)(6)

Upon notification of the odor event and personnel transport to CSC, the Central Shift Office, following Tank Farm Abnormal Operating Procedure, TF-AOP-015, "Response to Reported Odors or Unexpected Changes to Vapor Conditions," made appropriate notifications, issued a SOEN message, and made appropriate logbook entries. Management and responding staff of WRPS Industrial Hygiene and Safety and Health Programs met at the Central Shift Office to determine the path forward. The Central Industrial Hygiene (IH) Laboratory (2704-HV/200 East Area) was contacted to start the analytical equipment in preparation for sample analysis.

The event scene was controlled, the inventory sheet for the waste drum in question was secured, the SAA was locked and controlled, and C Farm was evacuated upon SOEN, radio, and phone notifications (approximately 50 individuals exited C Farm). The road to the SAA was blocked by [redacted] #3 (Government truck parked laterally in road upwind) with the assistance of another individual in the area who was also a qualified shift manager and Building Emergency Director (BED). The Central Shift Office called this other individual and when asked if he would assist at the scene, he replied "he would act as the Facility Operations Specialist (FOS)"; this was not communicated to the Waste Operations Manager already at the event scene. (b)(6)

The Industrial Safety (on-call) case manager confirmed he was in route to CSC to meet the three employees transported from the SAA event scene. The Material Safety Data Sheet (MSDS) for diesel was provided to CSC.

The three employees waited after completing the required paperwork from the CSC receptionist in the lobby of CSC to be examined. Multiple site employee physicals were being conducted at this time at CSC, resulting in a waiting period for the three employees before they were taken to an exam room.

It was noted by the Waste Operations Manager at the event scene that he could smell a pungent odor similar to diesel. Two IH technicians (IHT) responded to the scene in Self-Contained Breathing Apparatus (SCBA) due to the odor noted by the Waste Operations Manager and AOP-015 activation. The IHT was instructed to collect two tedlar bags for analysis, one from inside the structure housing the SAA and one from the direct source (drum). As planned, the IH samples were taken from the SAA and drum without disturbing the drum contents and delivered to the central IH Lab (2704-HV/200 East) for analysis. The results of this analysis were consistent with those items noted on the Inventory Sheet WSO-12-060-05. Utilizing the inventory sheet, the contents of the drum were established to be diesel, oil, and desiccant filter.

The C Farm road barrier was removed and access restored to C Farm. Restricted access to the SAA remained in place and the drum remained secured.

(b)(6) All three Waste Services employees transported earlier to CSC had been examined and were being released to return to work without restrictions. [redacted] was the first employee to be examined at CSC and was released to return to work without restriction. Upon returning to work [redacted] notified his manager he was still feeling quite ill. [redacted] was returned to CSC, 200 West Area, for re-evaluation. (b)(6)

(b)(6) [redacted] were preparing to leave CSC when [redacted] returned; all three WRPS employees requested a blood workup and urinalysis at this time. Resources were limited at CSC due to completion of normal day shift hours, primary provider availability, and the demand to connect with van pools. Upon further discussions, a determination was made to obtain blood and urine samples from the three WRPS employees. After providing the requested samples, all three individuals were released from CSC but did not receive additional paperwork after this second visit to CSC.

The SAA scene and drum were secured, the SAA lock was changed, with one-key controlled access by Waste Operations management. Waste Operations management and IH planned to meet and discuss a path forward for lifting AOP-015 from the SAA the following day: June 20, 2012.

On Wednesday morning, a second sampling of the SAA was completed without disturbing the drum contents. Samples were analyzed at the 2704-HV IH Laboratory, and the results were duplicative of the initial sampling from the day of the event and were consistent with entries listed on the inventory sheet from WSO-12-060-05. The SAA remains secured, and a stop work remained in place for all SAA locations within WRPS tank farm areas at the time of this initial event investigation.

Base Operations, in response to WRPS-PER-2012-1050, requested an Initial Event Investigation be conducted on Monday, June 25, 2012, when all directly involved individuals were available to participate. The following timeline and detailed report are a result of that investigation:

Event Timeline

06/18/2012

(b)(6) 0900 Waste Operations [redacted] notice a broken tamper seal at SAA (RMA-050), C Farm, 200 East, Hanford Site requiring a documented inspection. The inspection would, however, require the support of one [redacted] which is then scheduled the following day 06/19/2012.

06/19/2012

1330 A Waste Operations team began inspection of SAA (RMA-050), C Farm, 200 East, Hanford Site. Two drums are noted inside the SAA. One is labeled "diesel". The drum, to the right of the door to the SAA, has a broken tamper seal. [redacted] remembers from a past inspection (April 2012) that the drum contained some diesel rags. The other drum is sealed and is not part of the inspection. No odors were detected at this time. (b)(6)

(b)(6) Prior to allowing [redacted] #1 to open the drum, [redacted] completes a survey on the exterior of the drum and survey of the SAA verifying background radiation readings are within expectations for the area and no contamination is present. Upon completion of these verification surveys, [redacted] #1 opens the drum. (b)(6)

6/19/2012 Cont'd

- (b)(6) 1332 [] reaches into the drum to do a contamination smear survey prior to handling the inventory, and moves the liner bag to obtain smear sample and "gets hit" with a strong odor/fume. [] immediately backs away from drum while informing [] #1 (1' from drum) and [] #2 (2'-3' from drum) to back out of area. [] #1 places the lid back onto the drum as he exits the SAA. (b)(6)
- (b)(6) [] #1 and [] #2 verbalize they now smell the odor and are attempting to close the doors to the SAA as a large wind dust devil hits, causing the doors to swing upon closure. (b)(6)
- (b)(6) [] requests to be sat down and receives assistance by [] #1 and #2 to sit on the wheel well of the adjoining horse trailer storage unit. (b)(6)
- (b)(6) [] calls his supervisor and informs him of the event and his location. [] later documented he had difficulty forming his words to speak with his supervisor and his speech was slurred as noted and verified by [] #1 and #2. [] informs his supervisor he feels "fuzzy", has nausea, and has a headache. A co-worker [] arrives at the scene and transports [] to CSC. The Central Shift Office (CSO) is notified of the event and that the [] is being transported to CSC. (b)(6)
- (b)(6) [] arrives at CSC Lobby/Receptionist and is asked to fill out appropriate paperwork and wait in the waiting area. [] asks to lie down. [] is met by nurse and is provided ice for his headache. [] reports to nurse that the odors he inhaled smelled predominately of diesel. [] reports he feels extremely "high". CSC Nurse requested the CSC Physician's Assistant Certified (PAC) if she could administer oxygen, it was reported that the CSC PAC responded with "No, because that would put us into a recordable event." At this time the [] blood pressure, oxygen level, temperature, and pupils of each eye had been checked by the nurse and recorded as normal. [] was given Naproxen for his headache with water and was released back to work without restriction. (b)(6)
- (b)(6) Simultaneous to [] transport to CSC the following actions were being taken at the event scene:
- (b)(6) 1349 [] #1 and [] #2 supervisors arrive at the scene and notify the central shift office the two [] would be transported to CSC due to odor exposure upon opening waste drum and resulting nausea, feeling lightheaded/dizzy. AOP-015 was entered "Response to Reported Odors or Unexpected Changes to Vapor Conditions."
- (b)(6) [] #1 and [] #2 are transported by government vehicle to CSC by the Waste Operations supervisor.
- 1355 SOEN Notification made by Central Shift Office, "AOP-015 entered due to vapors/odors outside middle C Farm". A Tank Farm Projects NCO ([] #3) is in the area of concern (middle C Farm) and offers assistance in controlling access/road barriers and assist individuals exiting C Farm. Note: [] #3 attempted to contact [] with information on his actions; he was told [] was "too busy" and the Central Shift Office would handle the situation. (Note: Comment could not be confirmed on the date of this report. [] did not recall a conversation with [] #3.) (b)(6)

6/19/12 Cont'd

Personnel within C Farm (2 crews) proceed to exit to the East Staging Area. Personnel inside C Farm who were downwind of SAA-50 were moved to the parking lot on the west side of 8th street.

1356 Base Operations Industrial Hygienist (IH) meets with Safety and Health Manager and Industrial Hygienist Technologist (IHT) Supervisor in Central Shift Office. The Central IH Laboratory is contacted to start/warm up analytical equipment.

1358 IH contacts the Waste Operations Manager and confirms the scene is controlled. Waste Operations Manager confirms that the Waste Inventory Sheet for the drum in question is secured. Waste Operations Manager confirms the three employees have been transported to CSC.

1401 Industrial Safety Case Manager is notified of three individuals being transported to CSC and proceeds to travel to CSC to assist WRPS personnel.

(b)(6) 1410 [redacted] #1 and [redacted] #2 arrive at CSC, 200 West Area, Hanford Site. CSC Receptionist provides required paperwork for their completion prior to being examined. It is noted that the WRPS [redacted] transported separately is in the back with a nurse upon their arrival. (b)(6)
(b)(6) The same [redacted] arrives back at the Lobby and [redacted] #1 and #2 both comment he appears (b)(6)
(b)(6) "goofy" in his actions. [redacted] is released by CSC to return to work without restriction and is driven back to C Farm by his supervisor.

1415 IH contacted Waste Operations Manager to provide the contents listed on the tank farm waste inventory sheet (WSO-12-060-05). Established contents within waste drum were diesel, oil, and desiccant filter as documented on inventory sheet. Manager did note that he was standing away from the event scene by approximately 15', and still noted pungent odor that smelled like diesel.

(b)(6) [redacted] #3 puts road blocks into place on 8th street and the road running parallel to 8th street, upwind of the SAA (RMA-050), the wind direction, as shown by the wind sock, was out of the Northwest.

1416 After the contents within the drum were determined, IH instructed shift IHT to respond to scene wearing Self Contained Breathing Apparatus (SCBA) due to odor still noted by the Waste Operations Manager and AOP-015, and to perform monitoring for ammonia/VOCs. IH instructed IHT to collect two tedlar bags for analysis, one from the structure housing the SAA and one from the source (drum).

(b)(6) 1420 [redacted] #1 is now being examined by the CSC nurse (blood pressure, oxygen saturation, (b)(6)
(b)(6) vitals taken). [redacted] #1 returned to CSC Lobby while [redacted] #2 was examined by same CSC (b)(6)
nurse (blood pressure, oxygen saturation, vitals taken). [redacted] #2 returned to lobby to wait (b)(6)
to be seen by CSC PAC.

PAC calls Waste Operations Manager to get information on the drum – possible MSDS for contents. PAC was not familiar with SAA or drum configurations. PAC provided examination outlined for diesel contact only.

(b)(6) Note: Personal Statement by [redacted] #1 states he requests blood work be drawn, CSC PAC replies it wouldn't really do anything for them. CSC PAC asks "when is your next physical? If there is anything, we will find it then."

6/19/2012 Cont'd

1420 IHTs are briefed on response plan, obtained the proper respiratory equipment, and responded to event scene. Waste Operations Manager briefed IHTs on exact sample

locations at C Farm. Waste Operations Manager makes note that the wind is fluctuating from southeast and southwest. SAA (RMA-050) doors are shut and locked upon III's arrival. Upon entering and monitoring his way into the SAA the IHT notes the lid to the drum of concern is sitting loosely on top of the drum, not sealed.

IHT takes area and source samples. IHT relays reading levels, but doesn't know what's in the sample bag until it is analyzed. Background is approximately 11ppb, source reading 52ppm. Note: Action levels are applied to tank waste, action level numbers are different when it's a known source. No readings were relayed to CSC from the field per AOP-015. CSC will get the analyzed sample information once it's available from the Lab.

1430 A qualified shift manager who is also a qualified Building Emergency Director (BED) was inside C Farm and received a phone call from the Central Shift Office Manager requesting him to assist with notifying employees within C-Farm to leave the area upwind of the SAA. This individual agrees to help and replies he will act as the Facility Operations Specialist (FOS) at the scene. The "FOS" communicates with the IH, IHT, and Central Shift Office he will help support the entry into the SAA for sampling. The Waste Operations Manager on scene does not get this information.

1435 Samples are delivered to central IH Lab and analysis process started. Refer to DRI Survey #12-02311 (attached). Sample results look consistent with hydrocarbons (diesel).

(b)(6) 1530 [redacted] #1 and [redacted] #2 are released to return to work without restriction with their supervisor for transport back to 616, 600 Area.

(b)(6) [redacted] is being transported back to CSC by his supervisor, who determined [redacted] was (b)(6)
(b)(6) not able to drive, and upon receiving informal information that the III had found "high levels" which is causing [redacted] anxiety and prompts him to request a blood workup and urinalysis.

(b)(6) WRPS Industrial Safety Case Manager speaks with [redacted] and the increasing (b)(6)
(b)(6) anxiety of the affected workers ([redacted] #1, and [redacted] #2) and their requests for blood (b)(6)
work.

(b)(6) Upon return to 616, 600 Area, [redacted] #1 and [redacted] #2 become increasingly anxious about (b)(6)
(b)(6) the examination process at CSC. Upon further discussion with co-workers [redacted] #1 and (b)(6)
[redacted] #2 return to CSC for blood work and urinalysis.

1546 Waste Operations Manager and the "Acting FOS" place caution tape and "Do Not Enter" sign on SAA/RMA-050.

1615 The WRPS Industrial Safety Case Manager at CSC states, "The CSC providers were packing up for the day, and that they needed to be present for blood work to occur".

(b)(6) [redacted] #1 said the PAC relayed he did not know the purpose of the blood work, but that the phlebotomist would know the particulars.

6/19/2012 Cont'd

1645 CSC PAC leaves to catch van pool home. The CSC "phlebotomist" completes blood draws on all three CSC affected employees, [redacted] #1 and [redacted] #2. Note: Blood vials obtained were not initialed by affected employees, i.e., chain of command process, etc. No paperwork was seen or signed by employees on blood samples. Urine samples were provided by the [redacted] #1 and [redacted] #2. (b)(6)

(b)(6) 1707 Waste Operations employees were released from CSC. The employees were not handed paperwork to return to work. HPT reports hearing the CSC Physician Assistant (PA) telling his supervisor [redacted] should limit his duties; the same PA was not there on the return visit to CSC. Involved employees [redacted] #1, and [redacted] #2 leave for the day in personal vehicles. [redacted] drove, and as written in personal statement stated "he felt he was still feeling buzzed; and he was upset that no one seemed to care for his safety and others in getting home." (b)(6)

All involved employees were still exuding symptoms throughout the evening of the event into the following morning upon reporting to work.

1722 C Farm road and change trailer access restored, AOP-015 and restricted access to SAA remains in place.

6/20/2012, 616, 600 Area Morning Meeting

Note: The Technical Support Manager discussed his concern for the employees and the need to find out what happened in order to not have a repeat event. This manager was present (not normally in attendance at daily morning meeting) to show concern and support for his employees.

0730 Involved personnel attend routine morning meeting at the 616 Building, 600 Area.

Base Operations Technical Support Manager attends to discuss initial actions that will be taken after the SAA Odor Event: 1) An Initial Event Investigation is being coordinated with WRPS Security Emergency Services, Event Investigations Office. 2) A Problem Evaluation Request (PER) has been issued on same subject.

Union Steward states the involved personnel from the previous day's events are not feeling well and need to go to CSC for an additional examination.

(b)(6) [redacted] has blurred vision and is not feeling well. [redacted] #1 states he is feeling a little "woozy". He also comments that, "CSC did nothing for me." [redacted] states, "I asked for oxygen and was refused by (name withheld) at CSC who said, "It would be an OSHA Recordable for us if I gave you oxygen". (b)(6)

6/20/2012, 616, 600 Area Morning Meeting (Cont'd)

The Technical Support Manager directed the Waste Operations Manager to get [redacted] (b)(6) supervisor on the phone and in route to 616 so the individuals could be transported to the CSC, Richland Office location for follow-up exams.

(b)(6) 0740 The HAMTC Safety Representative present stopped all discussion to announce that he was concerned for [redacted] and recommended an ambulance be called to transport [redacted] (b)(6)
(b)(6) [redacted] to CSC downtown immediately. [redacted] quickly responded that would not be necessary and he didn't need an ambulance. (b)(6)

(b)(6) The HAMTC Safety Representative continued to press the individual to take the ambulance to town; again, [redacted] clearly stated that he was not going in an ambulance. The Technical Support Manager reassured the individual that it was his choice and that if they wanted an ambulance one would be requested [redacted] insisted (b)(6) he would go downtown in a Government vehicle.

(b)(6) [redacted] restates his vision is still blurred.

Technical Support Manager replies, "This is what they found at 1 hour after the event, a sniffer went in and found 11,000 parts per billion in housing structure of the SAA and 52,000 parts per billion in the drum. Today IH will count peaks to see limits".

(b)(6) [redacted] #1 states, "I felt like I was on an island over at CSC. I didn't know what to do and they didn't tell me anything. I was told to wait until my next company physical."

Technical Support Manager asks, "What steps were taken during yesterday's event"?

(b)(6) [redacted] #1 provided the following synopsis of a timeline:

6/19/2012

1330 "Went to check drum at C-Farm in SAA, took off bolt, pulled lid off. [redacted] (b)(6) smeared top of bag (liner), proceeded to bend down to take smear inside bag, smelled something, got dizzy then [redacted] #1 smelled it. [redacted] told [redacted] #1, "Put (b)(6) lid down and get out." [redacted] #2 verbalized she could smell something more intense in there than diesel. [redacted] sits down with assistance, SAA was closed.
(b)(6) [redacted] #2 calls dispatch who informed them to call Central Shift Office. Waste
(b)(6) Operations supervisor and manager head to C-Farm. [redacted] is transported to (b)(6) CSC; he stated he was feeling like he was going to "puke". [redacted] #1 and [redacted] #2 (b)(6)
(b)(6) get transported to CSC; [redacted] was already in the back with the nurse who had placed an oxygen saturation monitor on his finger.

(b)(6) [redacted] said the nurse asked him if he needed an aspirin, he replied, "I just want to know what they found inside that drum".

(b)(6) [redacted] #1 Provided Timeline Cont'd

(b)(6) [redacted] #1 and [redacted] #2 noted that when [redacted] came back to the lobby after being seen by the nurse he looked and acted "a little goofy". All were released to go back to work without restrictions. (b)(6)

(b)(6) 1630 [redacted] #1 came back to 616 Building, 600 Area and stated his concerns about the examination and no blood work, etc. to other co-workers. [redacted] #1 determines he needs to return to CSC for blood and urine testing. [redacted] #2 also returns to CSC for blood work and urinalysis. After obtaining blood and urine samples [redacted] (b)(6)

(b)(6) [redacted] #1 and [redacted] #2 return to their assigned work locations and leave work for the day." (b)(6)

6/20/2012, 616, 600 Area Morning Meeting (Cont'd)

(b)(6) 0800 It was decided because [redacted] had not shown up; the three individuals would be transported to the CSC, Richland by the Waste Operations Manager not waiting any longer for [redacted] arrived as the three (b)(6)

(b)(6) [redacted] were exiting the 616 Building. The three individuals remained with the Waste Operations Manager for transport to CSC.

(b)(6) 0851 Affected personnel [redacted] #1 and [redacted] #2 arrive at CSC Richland and are asked to fill out appropriate paperwork. Multiple site employees are in the process of company physicals. (b)(6)

(b)(6) Waste Operations Manager requests that [redacted] #1 be allowed to lay down in the back versus continue to wait (55-minues already) in the reception lobby with [redacted] and [redacted] #2. [redacted] #1 is taken into an exam room. (b)(6)

Each individual employee (3 affected) received examinations by a different doctor and nurse than the previous day at the 200W CSC facility. The employees state the exams were more thorough than the previous day.

(b)(6) Note: [redacted] #1 provided a statement that he recalled his conversation with the CSC physician who at that time stated he didn't want [redacted] #1 to return to regular duty, but no official restriction of duty paperwork was provided with that information to [redacted] #1. (b)(6)

Compensatory Measures

1. SAA (RMA-050) Middle C-Farm and Drum (WSO-12-060-05) secured, lock changed out, and single-key controlled.
2. Eight similar SAAs under a Stop Work Order and controlled by 616, 600 Area Waste Service Operations.
3. Initial Event Investigation Scheduled, Completed, and Report to follow.
4. PERs initiated: WRPS-PER-2012-1050, WRPS-PER-2012-1051, WRPS-PER-2012-1067, WRPS-PER-2012-1072, and WRPS-PER-2012-1144.

5. Industrial Safety Program Manager to coordinate a joint review of Occupational Health Service Procedures/Event Response Process with CSC Hanford Occupational Health Services (CSC).
6. CSC Hanford Occupational Health Services conducting internal Event Investigation on SAA Odor Event services provided to be shared with WRPS Event Investigation Office.

Good Practices

1. Stop, Warn, Isolate, Mitigate (SWIM) process was applied in a timely manner; C Farm was evacuated in a controlled manner in response to AOP-O15 by procedure.
2. Affected employees were taken to medical provider in a timely manner.
3. AOP-015 initiation and notifications made as required per procedure.
4. Qualified employees within vicinity of event responded as trained and provided assistance, improving response actions.
5. IH support timely, planned, and implemented, resulting in improved response time.

Extent of Condition Review

Eight similar SAAs existing within WRPS tank farm facilities have been placed under control of Waste Service Operations Management, and a Stop Work has been placed until further resolution of the Initial Event Investigation Report and subsequent PERs.

Discussion of Potential Causes

1. Inadequate/inaccurate inventory sheet (WSO-12-060-05)
2. Inadequate labeling of drum in SAA (RMA-050)
3. Improper storage of combustible/gaseous materials

Discussion of Barriers That Could Have Impacted the Cause

(See Causal Analysis Report attached to PER, WRPS-PER-2012-1050)

Recommendations/Proposed Corrective Actions

1. SAA (RMA-050) associated drum (WSO-12-060-05) to be analyzed by offsite, independent laboratory for analysis. Note: Split sampling was requested by #2. (b)(6)
2. Require SCBA to be worn upon opening any drum, barrel, or container within an SAA.
3. Consider IH-required support for all SAA breeched container inspections.
4. Review CSC Occupational Health Services process for work examinations as a result of an event or accident and priority between routine company physical exams and emergency exams.

5. Phone system installed in the 616, 600 Area Waste Operations Services facility inadequate; limited to one line, and in an emergency situation, delayed communication may affect field response.

Lessons Learned

(See Causal Analysis Report attached to PER, WRPS-PER-2012-1050)

Return to Work Plan

1. Conduct an Initial Event Investigation
2. Identify corrective actions of associated PERs
3. Determine path forward on SAA Stop Work
4. Determine path forward on analysis of SAA RMA-050, Drum WSO-12-060-05 analysis request

Attachments

1. Attendance Roster – Initial Event Investigation
2. Photo/sketch C-Farm
3. Log Book Entries
4. IHI Sample Analysis Report/Results (initial)

Attachment I
Attendance Roster – Initial Event Investigation

Date 6/25/12		EVENT INVESTIGATION/CRITIQUE ATTENDANCE FORM	
Critique Title <u>C-FARM SATELLITE ACCUMULATION AREA CACR EVENT</u>			
Critique Number <u>WRPS-2012-011</u>			
Print Name	Signature	Payroll Number/ SSN	Organization
Jose G. Garcia	<i>[Signature]</i>	(b)(6)	WRPS
Trace Kennedy	<i>[Signature]</i>		WRPS
Dave Mulderig	<i>[Signature]</i>		WRPS
Glen Triner	<i>[Signature]</i>		WRPS
Chris Hallis	<i>[Signature]</i>		WRPS
Heaven Mendoza	<i>[Signature]</i>		WRPS
T.P. Moore	<i>[Signature]</i>		WRPS
DE Swenson	<i>[Signature]</i>		WRPS
CH Mulhe	<i>[Signature]</i>		WRPS
Daniel A. Harper	<i>[Signature]</i>		WRPS
MOORE, Richard	<i>[Signature]</i>		WRPS
CONNOR, REEDY	<i>[Signature]</i>		WRPS
Don M. Sipe	<i>[Signature]</i>		WRPS/HATE
WILLIAMS, SHERIDAN	<i>[Signature]</i>		WRPS
Mike Loney	<i>[Signature]</i>		WRPS
BERT WRIGHT	<i>[Signature]</i>		WRPS
BRYAN CRUME	<i>[Signature]</i>		WRPS
Andrew McBurn	<i>[Signature]</i>		ORP
Richard Lee	<i>[Signature]</i>		ORP
Steven J. Henneman	<i>[Signature]</i>		WRPS
Mauro Fries	<i>[Signature]</i>		WRPS
Mike Gallagher	<i>[Signature]</i>		WRPS
DANIEL WILF	<i>[Signature]</i>		WRPS
Lennie Flowers	<i>[Signature]</i>		WRPS
Joe Rodriguez	<i>[Signature]</i>		WRPS
Rick Ennis	<i>[Signature]</i>		WRPS

A 0003-100 (2501)

Page 1 of 2

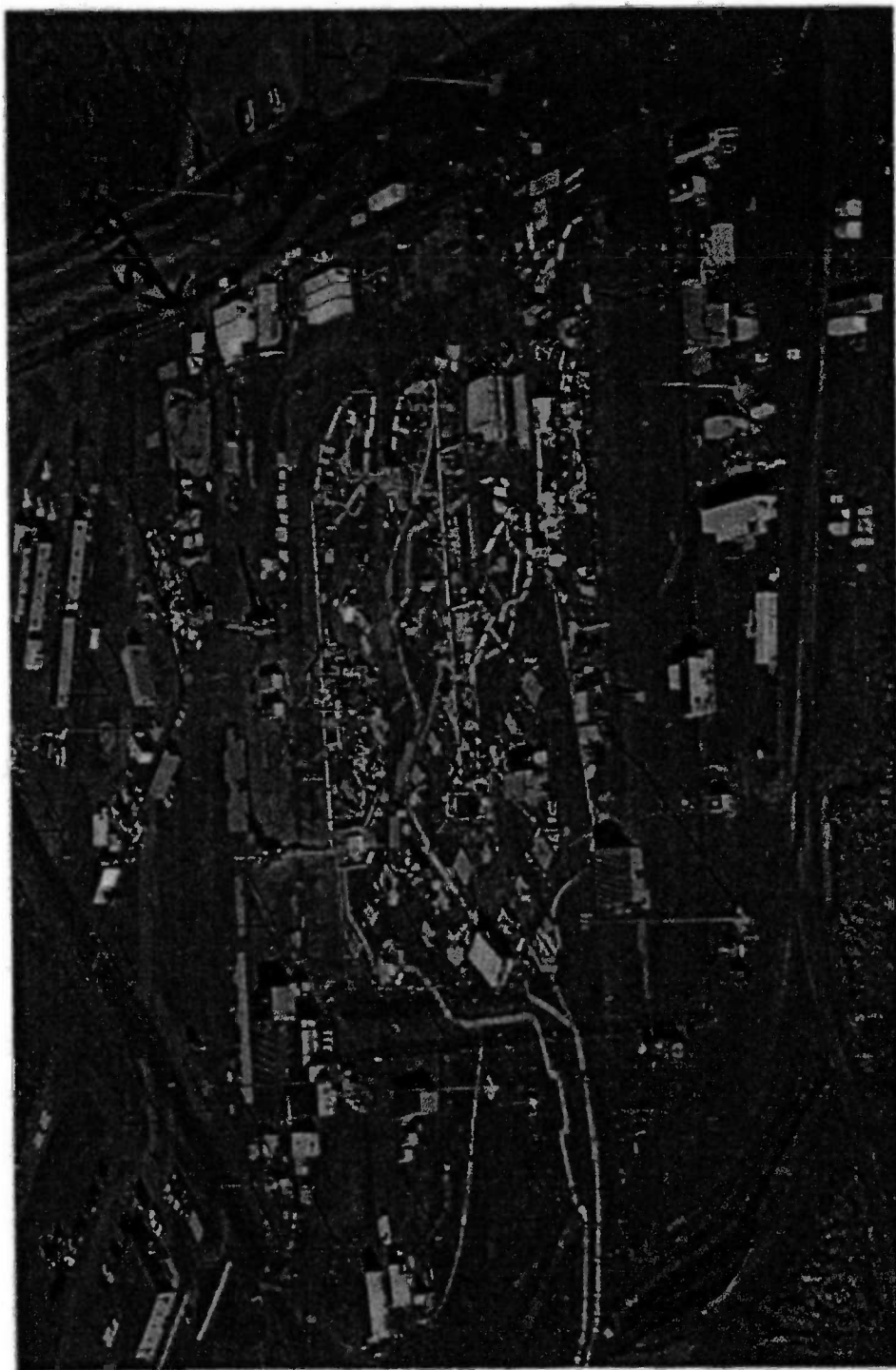
Attachment 1
Attendance Roster – Initial Event Investigation

[illegible]

4-8(72) 100 (0509)

Drage des 2.

Attachment 2
Photo/sketch C-Farm



Attachment 3
Log Book Entries

06/19/2012 D-Shift (b)(6)

(b)(6) 0455 - Relieved as CSM by (b)(6)

(b)(6) 0455 - Assumed duties as BASH OPS CSM, (b)(6) (b)(6)

0738 - Completed SHIFT BRIEF FOR PLANNED WORK AND ROUTINES, DISCUSSED LIT EVENT ON TRANSFER VALVING AND CONTINUOUS USE PROCEDURE.

0850 - CREW NOTIFIES OF CAM AND RECORD SAMPLE NOT WORKING AT AN-VTP, NOTIFIED AN-XLO AT AN-FARM HE WAS NOTIFYING AN SM.

(b)(6) 1307 (b)(6) Reports (b)(6) (b)(6)

Felt pop in back when putting on safety shoes taken to CSC, SOGW MESSAGE SENT.

(b)(6) FAC REP NOTIFIED (b)(6) (b)(6) (b)(6)

NOTIFIED (INDUSTRIAL SAFETY)

(b)(6) 1344 NOTIFIED BY (b)(6) OF ODOOR EVENT AT MIDDLE C-FARM SAA. 2 (b)(6) AND 1 (b)(6) transported to CSC for odor symptoms while opening a drum at C-FARM Middle SAA.

1345 Entry INTO AOP-DIS FOR EVENT AT C-FARM SOGW MESSAGE SENT, FAC REP AND SR MGT NOTIFIED, RADIO ANNOUNCEMENT MADE.

(b)(6) 1347 (b)(6) (b)(6) (b)(6) (b)(6)

(b)(6) (b)(6) Transported to CSC for odors. SOGW MESSAGE SENT, (b)(6) Reports to (b)(6) Report to (b)(6)

(b)(6) (b)(6) SOGW SENT, FAC REP T SR MGT NOTIFIED.

1350 C-FARM Middle tymler currently restricted access due to odors at RMA-OSO, All others directed to upwind of MIDDLE C TRAILER. Road blocked to middle, odors detected from 15' reported to FOS.

1422 TMAE'S REPORTS SWITCHING PRIMARY FANS AN-FARM DUE TO LOSS OF ^{OR FAN} VACUUM PUMP FOR STICK MONITORING. B-TEAM IS NOW ONLINE.

(b)(6) 1515 (b)(6) Reports, (b)(6) FROM 1347 HAS BEEN RELEASED TO RETURN TO WORK WITH NO RESTRICTIONS (b)(6)

(b)(6) (b)(6)

6-19-12 B-SHIFT [REDACTED] (b)(6)

1543 Completed OPS-5 FOR AN-VTP B-TRAIN

(b)(6) 1546 [REDACTED] and [REDACTED] at EVENT SCENE, both report SAE HAS BEEN SECURED. SAMPLING HAS BEEN COMPLETED [REDACTED], DOWNPOSTING AREA TO LHW CONTAINER, ACCESS IS RESTRICTED TO RMA-USO. REMAINING IN AOP-DIS AT SAA BOUNDARY. RESTRICTING ACCESS TO SAA KEYS AT CSO. SOEN SENT.

(b)(6) 1600 [REDACTED] FROM 1397 ENTRY HAS BEEN RETURNED TO CSC STILL UNDER SYMPTOMS FROM odors, MLE. (b)(6) WITH EMPLOYEES.

(b)(6) 1607 [REDACTED] REPORTS WASH NOTIFICATION FOR LOSS OF STACK MONITORING (VACUUM PUMP) AT AN VTP A TEN. SOEN SENT.

(b)(6) 1616 [REDACTED] RETURNED TO CSC WITH (b)(6) STILL FEEL SYMPTOMS FROM odors. Blood drawn.

(b)(6) 1636 [REDACTED] and [REDACTED] RETURNED TO WORK WITHOUT RESTRICTION FOLLOWING blood work FROM CSC. SOEN SENT.

(b)(6) 1735 Relieved by [REDACTED] AS CSM [REDACTED] (b)(6)

(b)(6) 1735 ASSIGNED DUTIES AT CSO [REDACTED]

(b)(6) 1750 [REDACTED] RE DL REPORTS AT 1715-H1 FINDS AROUND POSSIBLE EXHAUST SHUTDOWN. IT APPEARS THE A1000 AREA ZONE 1 (IMPEL) HAS TRIPPED.

(b)(6) 1805 NOTIFIED [REDACTED] KEY ON CAR OF FOL-008 FAN SHUT DOWN.

(b)(6) 1932 CONDUCTED PRE-SHIFT BRIEF WITH A-SHIFT CREW

(b)(6) 1948 [REDACTED] FWD REPORTS 242A VESSEL VENT 1ST SINCE H101 FILTER FC-51 FAILED AEROSOL TEST AT 19:00H. LIMIT IN A-05% SECURED VESSEL VENT.

(b)(6) 1952 NOTIFIED [REDACTED] FWD ON CAR OF [REDACTED] (b)(6)

BY TEAM AREA MANAGER OF 242A VESSEL VENT

2012 THE FIELD MONITORING & GROSS SAMPLE VALUES HAVE BEEN ANALYZED. TOTAL VENT IN THE CSO CURRENTLY IS 11 PPB @ 5.2 CFM AT THE SOURCE.

(b)(6) 2120 DISCUSSED SAMPLE RESULTS WITH MANAGER [REDACTED] (b)(6)

2120 [REDACTED] ALSO REVIEWED AROUND THE OCEAN

Attachment 3
Log Book Entries

2/26/12 0110L A-Shift [redacted] (b)(6)
 (CONF. 2120-2130L) - PROTOCOLS IF WITH THE CURRENT
 INFORMATION AVAILABLE IT DOES NOT MEET ANY
 CRITERIA. [redacted] (b)(6)
 2127 - Nothing [redacted] (b)(6)
 2120-2130L Log FORTH.

06/20/12 A-Shift MALHAN ROLAND (b)(6)
 0317 - [redacted] REFUEL MIDDLE C-TANK NORTH
 MILWAUKEE PLANT IN SERVICE
 0452 - E-1 COMPLETED PUMPING DOWN A7-301
 COLUMBIAN LEVEL IS 10".
 0453 - [redacted] (b)(6)
 0515 - ASSUMED DUTIES AS CEM. [redacted] (b)(6)
 0720 - COMPLETED SHIFT BRIEF FOR PLANNED WORK
 AND ROUTINES, FIAM GAS AY/AZ.
 0730 - [redacted] ENROUTE TO SHIFT OFFICE WITH
 STOP WORK ISSUE FROM C-EARM SAA EVENT.
 0849 - SOEN MESSAGE SENT FOR 0720 EVENT.
 STOP WORK INITIATED AND LISTED WITH
 AGREEMENT TO PERFORM FORMAL EVENT INVESTIGATION
 ON MONDAY 6/26 WITH REFERENCE TO EVENT
 RESPONSE AT C-EARM MIDDLE SAA.
 0911 [redacted] NOTIFIED AS A FOLLOW-UP
 FROM C-EARM SAA EVENT. [redacted] AND [redacted] (b)(6)
 HAVE GONE TO CSC IN TOWN FOR A FOLLOW-UP
 EVAL. SOEN MESSAGE SENT.
 0915 [redacted] NOTIFIED WDOH OF NOTIFICATIONS
 FOR 296-P-47 (POR-008) UNEXPECTED SHUTDOWN,
 AND VESSEL VENT. FAILED AUTOCLO TEST.
 0945 [redacted] REQUEST SOEN FOR EVENT
 INVESTIGATION, C-EARM SAA ODOX EVENT
 MONDAY 6/26.
 1040 U-EARM PCU-1B HAS BEEN RETURNED TO
 SERVICE, SOEN SENT.
 1115 [redacted] ILL MGR REPORTS REVIEW OF
 SAMPLING DATA VS TEC-OPS - C-24, RESULT
 IN "NOT REPORTABLE". DATA REVIEW DUE
 TO 10 CFR 85.41 LIMITS, SAFETY & HEALTH STANDARDS.
 6/26/12

Best Available Copy

Attachment 3
Log Book Entries

(b)(6)

(b)(6)

V-20-12

B-SHIFT

1130 IHT reports completed. Flow lines checked

in AY/12, all tanks read 0% LEL.

• Next AY from SR 3.1.1 DTK 4/28/12 @ 0744

• Next AZ from SR 3.1.1 DTK 4/28/12 @ 0748

1205 [redacted] assumed stop work on opening

containers in SPA's for waste addition or inspection until event investigation has been conducted and appropriate corrective actions have been implemented. At the following

SPA's: 241 SK (W50-10-201-12), 241 C (W50-12-044-02),

241 C (W50-12-040-03), 241 BY (W50-12-032-01),

241 SK (W50-10-207-02), 242A TF (W50-10-236-01),

241 AN (W50-10-222-02), 241 AW (W50-10-222-03).

1230 SOGN message sent, SR MGT.

Notified, FRC REP

Notified

1258 FWS (b)(6)

TAKING

(b)(6)

(b)(6) to CSC for lower leg injury.

1302 Relieved by [redacted] as CSM.

1302 Assumed CSM duties.

1320 - RE 1032 ENTRY. SOGN SENT. NOTIFIED ORP

1325 - NOTIFIED BY [redacted] THAT THE [redacted] TAKEN TO

CSC FOR FOLLOW UP EVAL FROM YESTERDAY'S C-FARM EVENT, HAVE BEEN RELEASED TO RETURN TO WORK WITH NO RESTRICTIONS SOGN SENT. NOTIFIED ORP.

1440 [redacted] REPORTED THAT (b)(6) WHO WAS TAKEN TO

CSC EARLIER TODAY, WAS RELEASED TO RETURN TO WORK WITH RESTRICTION. LIGHT DUTIES ONLY. FOLLOW UP EVAL ON 4/25/12.

SOGN SENT. NOTIFIED ORP.

1500 - RELIEVED BY [redacted] AS CSM

1500 - ASSUMED DUTIES AS BASE OPS

1508 - Relieved by [redacted] as CSM

1718 - ASSUMED DUTIES AS CSM

1716. (b)(6)

WAS TAKEN TO CSC THIS MORNING FOR A WORK-RELATED BURN INJURY. [redacted] SAFETY WAS NOTIFIED. (b)(6)

WAS RELEASED TO RETURN TO WORK WITH RESTRICTIONS.

1740 - (b)(6) SOGN SENT.

Attachment 3
Log Book Entries

0610 hr A-Shift [REDACTED] (b)(6)

(b)(6) 0738 [REDACTED] REPORTS FOR 107 STARTING ON HIGH VACUUM. SELLARD C-107 TO AN-106 RETURNED TRUCK RUMBLE. FOR 107 PORTABLE EXHAUSTION KIDS SIGHTED CARLTON FROM VENTURE. ^{Faint} THERE TANKS TO ONLY VENTING C-107 & STEEL FLOW WAS NOT ADJUSTED. WILL ADJUST STEEL & PRIOR TO ESTIMATING.

0743 - RESTRICTED FOR 107 PORTABLE EXHAUSTION & SINCE 110 LOWEST. FOR 107 IS ONLY VENTING C-107 (Faint)

0753 - RESTRICTED C-107 TO AN-106 RETURNED TRUCK.

(b)(6) 0807 - NOTIFIED [REDACTED] FOR 107 SINCE DEPT.

(b)(6) 0815 - RECEIVED AS COM BY [REDACTED]

(b)(6) [REDACTED] 0815 - ASSUMED DUTIES AS BASE OPS CSN. [REDACTED] (b)(6)

0820 - COMPLETED SHIFT BRIEF FOR PLANNED WORK AND ROUTINES.

(b)(6) 0829 [REDACTED] REPORTS OPERATOR (b)(6)

(b)(6) [REDACTED] TAKEN TO CSC FOR METALLIC TASTE IN MOUTH. (b)(6) WORKED REMOVING TUMBLE - WOODS IN C-FARM ON 4/20/12. SOEN MESSAGE SENT. FRC-REP [REDACTED], SAFELY [REDACTED] (b)(6)

(b)(6) [REDACTED] NOTIFIED.

(b)(6) 0830 - STOP WORK ISSUED BY [REDACTED] ON 1330 Faint, during prejob dealing with RWP HORD USAGE IN A CA WITH OVERHEAD WORK. ^{under} TFC WO-11-4

0845 - STOP WORK LISTED FOR WORK ON WORKPPE. TFC WO-11-4676 ISSUES IDENTIFIED DURING PROJ STOP WORK WAS LISTED UPON AGREEMENT TO MOD CA BOUNDARY AT WORK SITE.

0850 - SOEN MESSAGE SENT FOR ~~STOP~~ STOP WORK, FRC-REP [REDACTED] AND SR MGT. NOTIFIED

(b)(6) 0840 - BRIEFED WASTE SERVICES ENTRY TEAM, RNA-09 SLOPE: P-TRAIL WASTE TAG, SECURE CONTAINER, SAMPLE GREEN AND SOURCE, DEPOSIT FROM MOP-DIC, SECURE SAA, [REDACTED] FWS.

(b)(6) 0855 [REDACTED] FROM 0751 ENTRY HAS BEEN RELEASED

(b)(6) [REDACTED] FROM CSC TO RETURN TO WORK WITH NO WORK RESTRICTION, SOEN SENT.

Attachment 3
Log Book Entries

230 6-21-12 B-SHIFT [redacted] (b)(6)

(b)(6) 1115 - [redacted] Reports entry into SAA
to service container and complete sampling.
Went well, area secured, awaiting
sample results from IH, caution tape
remains at SAA.

(b)(6) 1706 - Relieved by [redacted] as LSM. (b)(6)

(b)(6) 1726 - Assumed duties of CSM. [redacted] (b)(6)

(b)(6) 1750 - [redacted] Safety IH Reports Sample Results
Analyzed Tool SAA outside C-Farm Middle Chamber
Trailer. No Hazards Identified. Emitted Aerosols
Access to [redacted]

(b)(6) 1800 - Notified [redacted] Out for Rep &
(b)(6) [redacted] SR on Log Number of 175041.
(b)(6) Log Entry.

6-22-12 2000 - While Notified Tool underwent Shutdown at Port 107
Port 107 Exhausted. Notified [redacted] (b)(6)
SOSM Sent.

(b)(6) 2044 - [redacted] Relays Shutdown Port 107 to Vent C-101
& C-104 Along with L-107. Second L-107 Relays
Transfer.

2101 - Residual Port 107 Venting C-101, C-104 & C-107

2111 - Residual C-107 Relays Transfer

2230 - Second C-101 Relays Transfer. Admin Log
Condition Affected. SOSM Sent.

(b)(6) 6/22/12 A-SHIFT [redacted] (b)(6)

(b)(6) 0954 - Relieved as CSM by [redacted]

0954 - Reviewed logbook, assumed duties of CSM. Log

(b)(6) 0727 - Completed Shift Brief with D-Shift.

(b)(6) 0945 - Per email from [redacted] Environmentally, closing
ATB-12-002, Restrictions of Use of APPE. ORP
transmitted an updated IQ RPE report in letter
12-TF-0025-1206150495.

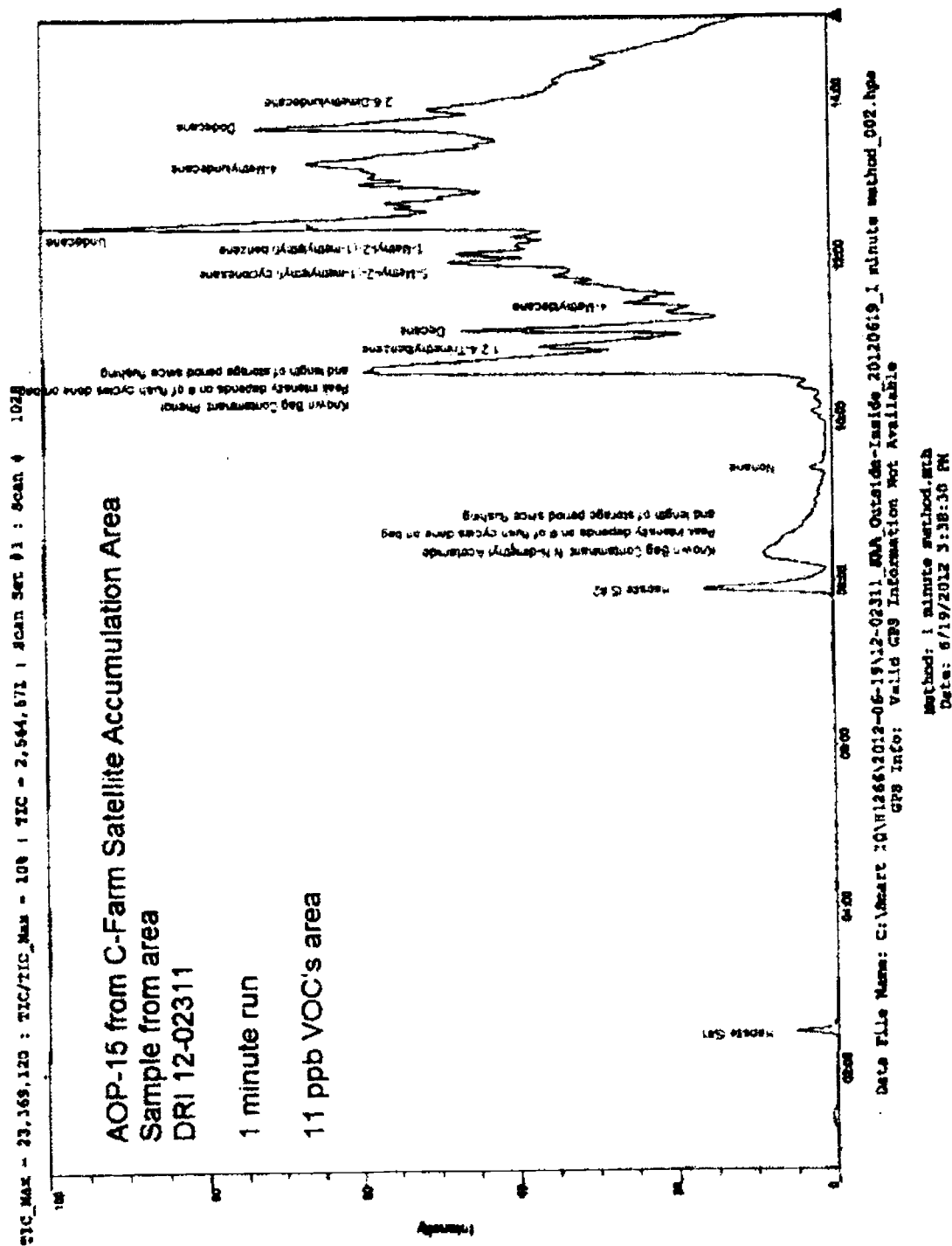
0948 - SOE reports, C Farm Emergency Shutter (007) is
de-energized and O/S. SOE complete.

(b)(6) 1001 - A-I reports, 242-A KI-5-3 fan secured for
(b)(6) planned work (TFC-12-2710).
[redacted] 6-22-12

Attachment 4
IH Sample Analysis Report/Results (initial)

Compound	Match Quality	Counts	Concentration ppb ± an order of magnitude
1 minute run, no dilution			
Hapsite IS #1	905	173603	5
Hapsite IS #2	903	1082233	20
Nonane	842	118965	19
1 ethyl 3-methyl Benzene	868	278452	19
Decane	895	1875635	20
1,2,4 trimethyl Benzene	802	877555	18
4-methyl Decane	856	913125	19
1-methyl-2-(1-methylethyl) Benzene	743	962164	16
5-methyl-2-(1-methylethyl) cyclohexan	690	1097020	15
Undecane	863	3694512	19
4-Methylundecane	580	835956	13
Dodecane	843	1599853	19
2,6-Dimethylundecane	605	941800	13
			215

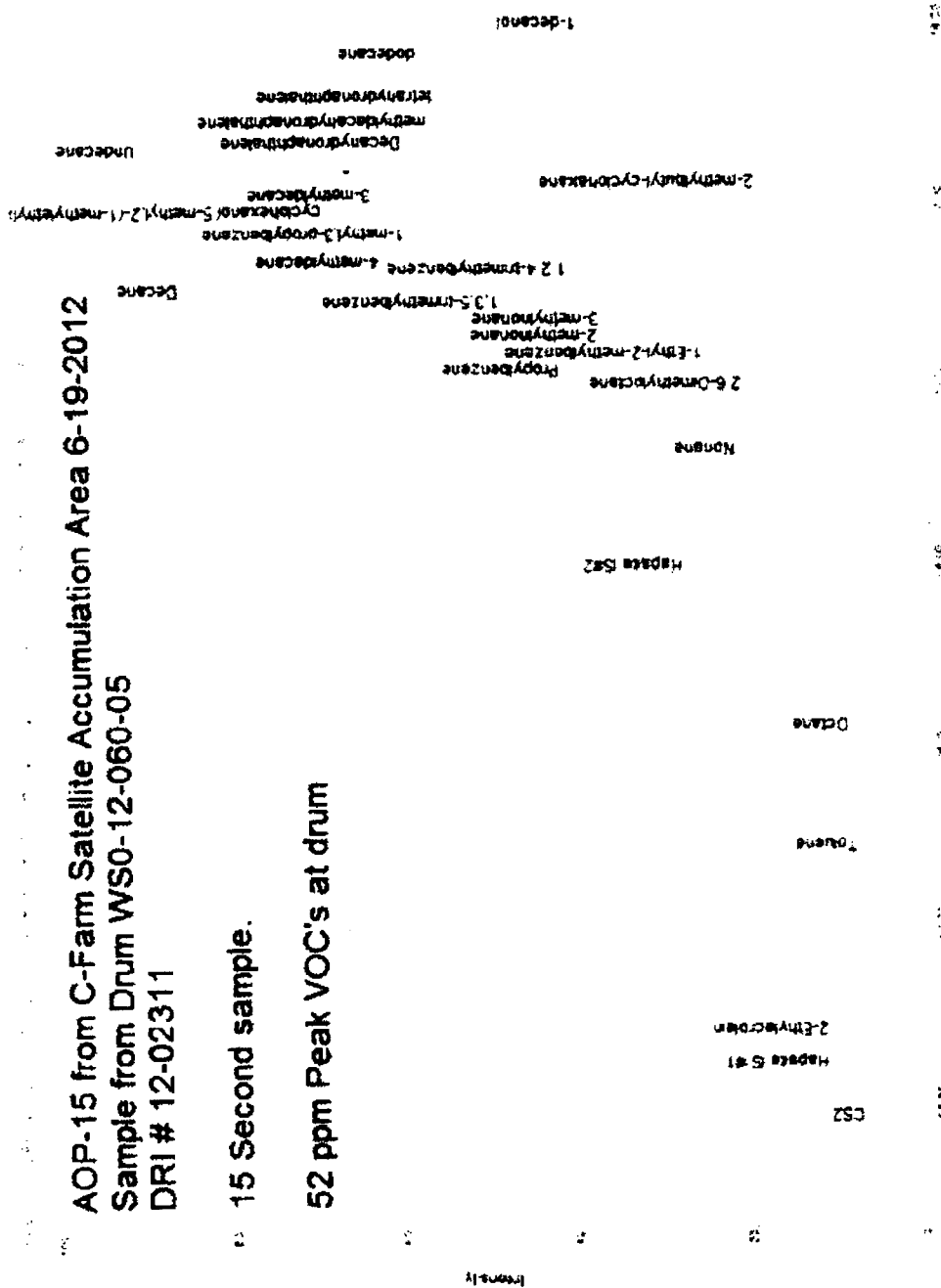
Attachment 4
III Sample Analysis Report/Results (initial)



Attachment 4
IH Sample Analysis Report/Results (initial)

Compound	Match Quality	Counts	Concentration ppb ± an order of magnitude
15 second sample ==> 4X dilution factor included			
Hapsite IS #1	199825	907	5
CS2	445944	914	25
2-ethyl Acrolein	468903	827	26
Toluene	220726	889	12
Octane	56817	763	3
Hapsite IS #2	1432807	916	20
Nonane	826086	883	46
2,6-dimethyl Octane	614862	842	34
1-ethyl-2-methyl Benzene	1100791	901	61
2-methyl Nonane	1379480	833	77
3-methyl Nonane	908654	638	51
1,3,5-trimethyl Benzene	1828125	837	102
Decane	3920765	931	219
1,2,4-trimethyl Benzene	922214	816	51
4-methyl Decane	1945950	855	109
1-methyl,3-propyl Benzene	1198524	806	67
1-ethyl,2,3-dimethyl Benzene	1042248	801	58
5-methyl-2-(1-methylethyl) cyclohexa	1075383	770	60
Undecane	3423325	866	191
Decahydronaphthalene	810013	804	45
Methyldecahydronaphthalene	851284	727	48
Tetrahydronaphthalene	678154	523	38
Dodecane	1138753	799	64
1-Decanol	713199	705	40
			1453

Attachment 4
IH Sample Analysis Report/Results (initial)



AOP-15 from C-Farm Satellite Accumulation Area 6-19-2012
Sample from Drum WS0-12-060-05
DRI # 12-02311

15 Second sample.

52 ppm Peak VOC's at drum

INTEROFFICE MEMORANDUM



WRPS-1304424

Date: October 17, 2013

To: R. E. Wilkinson, Manager
Base Operations

From: M. W. Ellis, Acting Manager
Technical Support
Base Operations

Subject: EVENT INVESTIGATION, "AOP-15 BY FARM MEDICAL RESPONSE COMMUNICATIONS," EIR-2013-035

[Handwritten signature: M. W. Ellis, dated 10/18/13]

Submitted for your information and use is the Event Investigation Report EIR-2013-035, "AOP-15 BY Farm Medical Response Communications." The enclosed report contains the information obtained during the investigation but does not necessarily cover an exhaustive investigation of all issues.

During an event at BY Farm in which AOP-15 was entered, two employees were transported to an off-site medical provider. During transport, the information exchanged between the employees and the Emergency medical technicians (EMT's) caused the EMT's to relay information to the Offsite Medical Provider that caused a shift in required medical response. This shift in medical response protocol was not communicated effectively to the Washington River Protection Solutions LLC, Mission Support Alliance, LLC or U.S. Department of Energy, Office of River Protection management team. Event Investigation 2013-035 was initiated and is attached.

Should you have any questions or need additional information regarding this report, please contact either Mr. W. E. Moore at 373-6223 or Mr. M. W. Ellis at 373-4696.

MWE:WEM:RDE

Enclosure: EIR-2013-035, "AOP 15 BY Farm Medical Response Communications."
(6 Pages)

cc: WRPS Correspondence Control
Distribution List

WASHINGTON RIVER PROTECTION SOLUTIONS

AOP-15 BY Farm Medical Response Communications

PER No. WRPS-PER-2013-1792

Wayne E. Moore II

10/9/2013

AOP-15 BY Farm Medical Response Communications

Investigation Summary

(b)(6) On September 19, 2013 an event occurred at BY Farm where two (b)(6)
(b)(6) were performing routine radiological surveys. (b)(6) experienced an odor described (b)(6)
(b)(6) as "dill pickles." Both (b)(6) reported having symptoms including dizziness, disorientation,
scratchy throat, nasal draining, coughing, and redness of the neck. This was determined by the
Central Shift Office (CSO), and project Industrial Hygienist (IH) as a vapor exposure.
Paramedics were called for the two employees and the CSO entered AOP-015.

(b)(6) Paramedics arrived and treated (b)(6) based on symptoms and it was determined treatment at
(b)(6) Kadlec Hospital was necessary. In transit, (b)(6) described the experience of the exposure
including a description of the environment changing from a dry air to moist, "like stepping into a
sauna." This further description triggered the paramedics and attending physician at Kadlec
Hospital to assume a whole body exposure. The new information initiated a different treatment
protocol at Kadlec Hospital which included a decontamination line and chemical contamination
control.

The shift in medical response protocol was not communicated effectively to the Washington
River Protection Solutions LLC (WRPS), Mission Support Alliance, LLC (MSA), or Department
of Energy, Office of River Protection management team.

No fact finding meeting for this event was determined to be necessary. The investigation
included personal interviews and document review.

Event Timeline For 9/19/2013 Event

9/19/2013

0859 hrs	242-A fire alarm reported
0907 hrs	Ambulance and Fire Truck arrived at 242-A
0912 hrs	Fire Alarm at 242-A determined by Hanford Fire Department to be a false alarm
1022 hrs	Operator in 241-C Farm reports odor (Freon like), taken to HPMC by supervisor
1025 hrs	AOP 15 entered for 241-C
1041 hrs	Industrial Hygiene (IH) completes TF-AOP-15, Attachment 1 ODOR RESPONSE PLAN for 241-C Farm.
1043 hrs	241-C Farm verified as cleared of personnel
1044 hrs	Case management representative notified of C Farm employee going to HPMC.

AOP-15 BY Farm Medical Response Communications

(b)(6) 1105 hrs Two [] working in 241-BY Farm report odors (dill pickle like), 911 called. Entered AOP-015 for 241-BY Farm.

(b)(6) 1112 hrs 241-BY Farm [] called CSO from change trailer.

1119 hrs IH called by IHT supervisor of second AOP-015 entry for 241-BY Farm, IH responds to CSO.

1120 hrs Ambulance at 241-BY Farm to meet [] in the MO-299 change trailer. (b)(6)

(b)(6) 1136 hrs Ambulance departs with two [] for Kadlec Hospital.

1138 hrs Case management representative notified.

1150 hrs IH completed TF-AOP-015, Attachment 1 ODOR RESPONSE PLAN for 241-BY Farm.

1230 hrs Employee from C Farm exposure is released from HPMC

1240 hrs Hanford Fire Department reports to CSO that Hanford Fire personnel and the ambulance were being decontaminated for possible chemical exposure.

1253 hrs WRPS IH receives phone call from MSA IH, updates WRPS IH on Kadlec Hospital response including decontamination line and ambulance quarantine. Excerpt from WRPS IH statement "Received phone call from MSA IH stating the ambulance crew had been quarantined because Kadlec was treating this event as if it was a chemical exposure and the ambulance crew would need to go through the decontamination process. The MSA IH was requesting additional information as to what chemical the employees were exposed to. Informed the MSA IH that we were responding to this AOP event as a potential vapor exposure and was unaware why it was being treated as a chemical exposure. MSA IH was insistent that a WRPS representative was not present. Received his contact information and told him I would call back after I do further investigation with our Central Shift Manager, (CSM), and the WRPS Case management representative that was present at Kadlec with the 2 WRPS employees, as this was the first I had heard about the quarantine or this event being treated as a chemical exposure."

1255 hrs WRPS IH reports to CSO the change in response by Kadlec Hospital, CSM attempts to contact WRPS Case management representative at Kadlec.

1315 hrs A second employee reports being in 241-C Farm and experiencing symptoms, taken to HPMC by Supervisor. WRPS Case management representative is contacted by WRPS IH. The Case management representative is updated as to the response by Kadlec and is unaware of the change of medical protocol for the Hanford Fire Department employees.

AOP-15 BY Farm Medical Response Communications

1318 hrs WRPS IH calls MSA IH and provides update.

1323 hrs WRPS IH contacts WRPS Case management representative and asks to meet MSA IH at ambulance drop off area.

1326 hrs WRPS IH contacts WRPS Industrial Safety Programs, (ISP), Manager to provide update to treatment protocols underway at Kadlec Hospital. ISP Manager was unaware of this response at this time.

1331 hrs WRPS Case management representative notified of second employee at HPMC due to 241-C farm exposure. WRPS Case management representative contacts Kadlec personnel and confirms exposure to be a vapor exposure, not a chemical exposure.

1520 hrs Employee transported by ambulance to Kadlec Hospital for chest pain, (not work related)

(b)(6) 1537 hrs First ☐ from 241-BY Farm exposure examined at HPMC.

1551 hrs Sample results for 241-BY Farm negative, AOP-015 exited for 241-BY Farm.

1555 hrs WRPS IH is asked by CSM to contact ambulance crew manager and provide update on sample results.

1602 hrs WRPS IH is called by HPMC IH for additional information, the ambulance crew had reported symptoms.

1610 hrs WRPS IH discusses with CSM ambulance crew symptoms. The CSM was unaware of any symptoms exhibited by the ambulance crew.

(b)(6) 1612 hrs Second ☐ from 241-BY Farm exposure examined at HPMC.

1624 hrs WRPS IH contacts the HPMC MD to discuss symptoms of ambulance crew and field sample results.

(b)(6) 1629 hrs First ☐ from 241-BY exposure released by HPMC, (return to work no restrictions).

1637 hrs Occurrence declared for 241-BY Farm AOP-015 response.

(b)(6) 1659 hrs Second ☐ from 241-BY exposure released by HPMC, (return to work no restrictions).

(b)(6) 1716 hrs ☐ from the 241-C Farm exposure are released by HPMC, (return to work no restrictions).

AOP-15 BY Farm Medical Response Communications

1810 hrs 241-C Farm IH sample results are negative, exit AOP-015.

HPMC Physician Assistant, (PA), contacted Kadlec during this response and faxed medical protocols to Kadlec Hospital. Two attending physicians at Kadlec were recent hires and not familiar with HPMC medical protocol. The HPMC PA reiterated to the Kadlec staff that there was no radiological contamination, the patients were surveyed, and it was a vapor exposure only.

The HPMC PA was contacted by the Hanford Fire Chief and told that the firemen were to return directly through HPMC and back to work once released from Kadlec Hospital. The Fire Chief stressed having the firemen back by 5:00 pm. The HPMC PA called the Kadlec attending physician and asked him to return the employees directly to HPMC, and to not even "stop for a hamburger". The employees were relayed this direction which caught some by surprise as the return to work examination by HPMC had never been an urgent exam in the past.

Compensatory Measures:

As this investigation process was utilized to examine communication weaknesses in response to an event, there are no immediate compensatory measures.

Preliminary Extent of Condition Review:

This communication process extends to all cases where employees are sent for medical attention.

Discussion of Potential Causes:

Potential causes to follow based on investigation, a formal causal analysis will be held to determine cause:

Unclear roles and responsibilities: When employees are transported to medical services, a member of the management team will be present. The expectations for this management team member are unclear. There is no training, briefing or documented expectations for this management member, therefore there is no established real time link between medical services and WRPS.

Unclear lines of communication: The expectations for field communication of conditions is not clear or unheeded. Personnel in this response called people they were familiar with rather than funneling through a central point of contact such as the shift office. This delayed response, in some cases, where individuals with response responsibilities were communicating with others outside the immediate event.

AOP-15 BY Farm Medical Response Communications

Discussion of barriers that could have impacted the cause:

A. Recommended/Proposed Corrective Actions

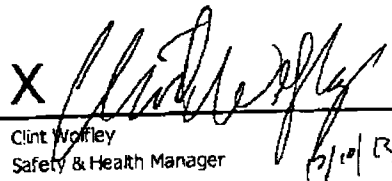
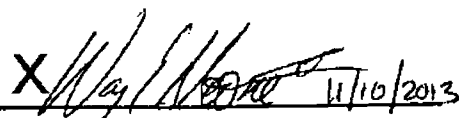
1. Define the role of the personnel responding to a medical provider and communicate the expectations. Conduct a training needs analysis to determine appropriate medium to ensure all appropriate personnel understand these expectations.
2. Establish a communication "hotline" in the shift office and communicate through Shift Office Event Notification the number established to address event questions. It is recommended this phone be manned by someone other than the Central Shift Office Manager.
3. Establish and reinforce a communication chain of command.
4. Communicate with other contractors or providers, (MSA, Hanford Fire Department, HPMC, and Kadlec), the establishment of items 1, 2, and 3.
5. Train responders to direct calls for information to the established hotline.
6. Kadlec Hospital operates to protocols developed in coordination with HPMC. These protocols should be available to the Central Shift Office so as situations evolve the response can be followed at the Central Shift Office.

B. Issues identified adverse to quality

None.

C. Lessons Learned

Lessons Learned should be developed and distributed following the actions to resolve the communication breakdown.

X  Clint Worley Safety & Health Manager 6/10/13	X  Wayne Moore II Base Operations Technical Support 11/10/2013
---	---

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author
M. W. Ellis

Addressee
Distribution

Correspondence No.
WRPS-1304424

Subject: AOP-15 BY FARM MEDICAL RESPONSE COMMUNICATIONS, EIR-2013-035

DISTRIBUTION

WRPS Correspondence
Washington River Protection Solutions LLC (WRPS)

A. L. Beerman	R. E. Gregory	J. A. McDonald	T. C. Synoground
W. C. Clark	D. M. Gutowski	W. E. Moore	C. B. Thom
K. C. Chase	G. N. Hanson	D. L. Olson	S. F. Waters
M. F. Diaz	A. C. Kunz	J. M. Sondag	R. E. Wilkinson
M. W. Ellis	H. K. Lawrence	D. K. Smith	B. L. Williamson
R. A. Ennis	K. J. Lloyd		C. T. Wolfley

INTEROFFICE MEMORANDUM



WRPS-1303742

Date: September 3, 2013

To: C. W. Peoples
Tank Farm Projects Field Crew

From: N. J. Milliken
Tank Farm Projects Contractor Assurance

Subject: REISSUED EVENT INVESTIGATION REPORT EIR-2013-031, "AOP-015 ODOR RESPONSE"

Reference: Interoffice Memorandum, WRPS-1303737, Event Investigation Report EIR-2013-031, "AOP-015 Odor Response"

This interoffice memorandum and enclosed report are being reissued to include additional wording relating to providing an opportunity for medical surveillance for the Quality Assurance technician. Submitted for your information and use is the Event Investigation Report EIR-2013-031, *AOP-015 Odor Response*. 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-2013-1549 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 376-7846.

NJM:PMH

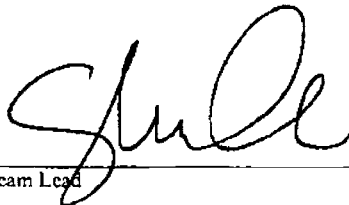
Enclosure: EIR-2013-031, "AOP-015 Odor Response" (20 pages)

cc:	WRPS Correspondence Control	R. A. Ennis	J. G. Recder
	R. J. Ciola, ORP	C. N. Evans	D. L. Robillard
	L. A. Domnoske-Rauch, ORP	M. S. Garrett	R. J. Skwarek
	R. M. Irwin, ORP	P. A. Gomez	D. M. Slaugh
	B. J. Stickney, ORP	R. E. Gregory	D. K. Smith
	D. M. Gutowski, DNFSB	D. R. Harper	S. H. Swenning
	E. Garza, MSA	K. L. Harris	T. C. Synoground
	P. A. Henderson, MSA	C. J. Henning	C. B. Thom
	B. K. Tank, MSA	M. D. Herman	B. R. Thomas
	S. J. Mcfadden, MSA	M. C. Jones	N. Townsend
	K. C. Sanders, MSA	D. J. Kuh	C. E. Upchurch
	N. T. Trahan, MSA	D. B. Little	J. S. Van Meighem
	M. L. Trusley, MSA	J. A. McDonald	S. F. Waters
	T. R. Ardarnica	N. J. Milliken	R. E. Wilkinson
	A. M. Chacon	W. E. Moore	S. R. Williams
	M. S. Cuttlers	D. H. Noland	K. W. Willoughby
	J. E. Crockett	L. D. Olson	D. E. Wolf
	D. D. Edwards	R. S. Page	M. T. Woodcock

EVENT INVESTIGATION REPORT

AOP-015 Odor Response
Event Investigation Report Number (EIR-2013-031)

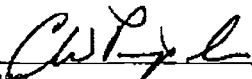
Nancy Milliken
Event Investigation Team Lead



9/3/13

Date

C. W. Peoples
PER Responsible Manager



9/3/13

Date

PER No. WRPS-PER-2013-1549

AOP-015 Odor Response

Investigation Summary

On August 14, 2013 during the performance of TFC-WO-13-3562, 200G Perform Testing of Cathodic System, while working in 241-AW Tank Farm at the southwest corner, a worker reported to the EV Team Shift Manager that he had a minor throat irritation and had smelled a "body" odor like smell low to the ground. Another worker supporting this same work scope also reported the odor, but did not report any symptoms. Both Washington River Protection Solutions (WRPS) employees were taken to the medical provider (HPMC) by the AN Team Maintenance Manager.

There were approximately thirty (30) other workers in AW Tank Farm at the time of the vapor exposure reporting. Most of these remaining workers were on the north end of AW Tank Farm supporting TFC-WO-11-5518, 241-AW-02E Replace Pump Pit Jumpers. These workers were installing a valve handle, disposing of waste, and diagraming the pump pit. Upon notification of TF-AOP-015, Response to Reported Odors or Unexpected Changes in Vapor Conditions, entry by the Central Shift Manager (CSM), operations were secured and a controlled exit from the tank farm was initiated. Some of the workers left immediately while others continued putting the work location in a safe configuration as directed by the AW-02E Field Work Supervisor (FWS) and approved by the CSM. Notifications were made and an event investigation Fact Finding meeting was held.

There were no unusual or abnormal farm configuration issues. The ventilation system was operating and no risers, pits, or nozzles were open to the environment.

Event Timeline

August 14, 2013

0700 AW-02E work crew entered AW Tank Farm to start work.

(b)(6) ~0800 [redacted] workers leave AW Tank Farm. Light wind reported from the south.

(b)(6) ~0815 [redacted] worker reported minor throat irritation and "body" odor smell to EV Team Shift Manager. EV Team Shift Manager contacted AN Team Maintenance Manager to escort workers to medical provider (HPMC). EV Team Shift Manager notified CSM (who was walking by).

0811 Central Shift Manager (CSM) enters TF-AOP-015 for AW Tank Farm. Access restricted to the tank farm.

Discussions were held between the EV Team Shift Manager and the CSM while outside of the AW change trailer and while the CSM was in transit back to the Central Shift Office. Official entry time was closer to 0825 when the EV Team Shift Manager and AW-02E Field Work Supervisor (FWS) heard the announcement from the CSM over the radio declaring entry into TF-AOP-015.

[Time lag would be due to transit back to the Shift Office, pulling out and reviewing TF-AOP-015 to ensure that entry conditions had been met, before officially entering TF-AOP-015 and making radio announcements.]

0820-0828

(b)(6)

Entered TF-AOP-015 for odors reported in AW Tank Farm, access is restricted. One (1) [redacted] and one (1) [redacted] sent to HPMC

(b)(6)

for reporting symptoms. Base Operations Safety and Health (S&H) Manager discussed with the CSM that the EV Team Industrial Hygiene Technician (IHT) would respond to the tank farm and collect samples. It was reported to the CSM that individuals were performing cathodic protection preventative maintenance (PM) work south of the crane and west of the exhauster. Base Operations S&H Manager discussed with the IHT an appropriate sampling plan and location(s) to collect samples.

- 0825 AW-02E Field Work Supervisor (FWS) received a telephone call from EV Team Shift Manager that a worker on the south end of AW Tank Farm had smelled an odor and left the tank farm. While discussing actions to take, the CSM made a radio announcement of entry into TF-AOP-015 and that all personnel were to exit the tank farm. Both the EV Team Shift Manager and the AW-02E FWS acknowledged the radio communication and began executing required actions (exiting and restricting access).

AW-02E FWS informed workers and notified them to start shutting down to get out of the tank farm. Tank Farm Projects IHT initiates general monitoring with direct reading instruments per the direction of the AW-02E FWS.

- 0828 Shift Office Event Notification (SOEN) sent. "Entering AOP-015 for AW Farm. Access restricted to AW Farm."
- 0830 Base Operations IHT gathered equipment and prepped Flexfilm bags in the Base Operations Industrial Hygiene Lab. EV Team Industrial Hygienist (IH), Base Operations S&H Manager, and IHT First Line Manager discussed farm entry and strategy for collecting samples.

0830-0848

Co-located work in AW Tank Farm included Tank Farm Project personnel performing demobilization with a large crew at 241-AW-02E pump pit (TFC-WO-11-5518). TFP IHT continuously monitored the work area while the workers performed an orderly exit of the area and placed the location in a safe configuration. Direct Reading Instrument (DRI) readings recorded during this evolution revealed that no detectable volatile organic chemical (VOC) or ammonia was present in the general work area (DRI Survey 13-02901).

- 0840 AW-02E FWS informed the CSM of status of the AW-02E work, received concurrence from CSM to close waste boxes using continuous IHT support. [Workers had to enter the Tank Farm from the change trailer to assist in putting lids on the waste boxes in the Contamination Area (CA). This also required the rigging crew to re-enter the tank farm to restart the crane and position the lids on the waste boxes.]
- 0840 Base Operations IHT and IH reported to the Central Shift Office for permission to enter the tank farm and obtain a radio, then they ACE'd under Radiological Work Permit (RWP) TF-102 and proceeded to AW Tank Farm. All employees had vacated the tank farm, with one operator in the change trailer to assist in restricting access.

0848 Base Operations IH contacted the Central IH programs group to inform them of TF-AOP-015 entry/response and to ensure that instrumentation would be available when the IHT arrived with bag samples. The IH relayed the information to them that the employee reported a "body odor" smell in AW Tank Farm.

0850 AW-02E FWS informed the CSM that all personnel had left the tank farm. [The AW-02E FWS had no reports of symptoms from his work crew at this time.]

0850-0908

Base Operations IHT and EV Team IH entered the tank farm to obtain samples and investigate the area of the reported concern. Several cathodic protection boxes were examined in the reported location as well as other potential sources in the vicinity. Results are recorded on DRI Survey #13-02897.

0858 Central Shift Manager's Log. Update - Both WRPS individuals experienced sore throats. Case Manager notified.

0945 IHT transported samples to 2704HV IH Lab for processing.

0950 Central Shift Manager's Log. AN Team Maintenance Manager reports that a [redacted] reported to HPMC from the AW-02E Jumper Replacement job in AW Tank Farm. [HPMC transported him to Kadlec via ambulance with difficulties breathing.]

1006 Tank Farm Projects reported to the CSM that an [redacted] working on their job requested medical surveillance. The employee was taken to HPMC. Base Operations S&H Manager was in contact with the Safety Program Case Manager to provide and get an update of the situation. (b)(6)

[AW-02E FWS received a telephone call from a [redacted] Supervisor notifying him that one of the [redacted] that had returned to the Rigging Loft was having trouble breathing and that they would accompany him to HPMC. The AW-02E FWS then called safety and his management. Safety called the CSM.] (b)(6)

1012 EV Team Shift Manager, AW-02E FWS, and Base Operations S&H Manager directed by the CSM to offer medical surveillance to all of employees in AW Tank Farm this morning.

1028-1050

IHT analyzed bag samples at 2704HV. Results are recorded on DRI Survey# 13-02897.

1025 Central Shift Manager's Log. Base Operations IHT and EV Team IH have declined medical surveillance.

1032 Employees transported to Kadlec after visit at HPMC (200 West).

1059 AW-02E FWS reports to CSM that all members of the AW-02E work crew have declined medical surveillance. [redacted] was not offered medical surveillance until the next day after the [redacted] supervisor was informed of the event and that other workers had been afforded the opportunity. [redacted] (b)(6)

[redacted] declined medical surveillance at the time.] [In addition, [redacted] (b)(6)

[redacted] was also not offered medical surveillance until August 15, 2013.] (b)(6)

- 1145 Contacted by HPMC for information to relay to the physicians concerning possible chemicals of potential concern (COPCs) to be aware of with regard to patient evaluation.
- 1152 EV Team Shift Manager reports that all EV Team personnel in AW Tank Farm this morning have declined medical surveillance.
- 1208 Base Operations S&H Manager briefed Base Operations Manager on current information and background on event.
- 1220 Base Operations S&H Manager talked to Program II and discussed preliminary results and was notified of small peak of "aldehydes" that was being re-analyzed on instrumentation.
- 1223 HPMC was contacted to discuss possible "aldehyde" scenario and gave them the Program III cellphone number for further information if needed.
- (b)(6) 1258 [redacted] released from HPMC to return to work.
- (b)(6) 1646 [redacted] released from Kadlec, will be returning to work through HPMC.
- 1737 Gas chromatograph/mass spectrometer (GC/MS) (HAPSITE) results completed. All COPCs less than 20ppb. Analysis had very low concentrations of low molecular weight aldehydes. [FTIR was run and no short chain aldehydes were observed, i.e. no formaldehyde, acetaldehyde, butanal, or other odorous compounds.] Based on the very low volatile organic compounds (VOCs) it is likely that sample was beneath the limits of detection.
- (b)(6) 1800 [redacted] released from Kadlec, will be returning to work through HPMC.
- 1816 SOEN sent. "Exiting AOP-015 for AW Farm. IH analysis completed, levels at or below background. Normal access restored to AW Farm."
- 1828 TF-AOP-015 exited for AW Tank Farm, IH analysis completed, levels at or below background. Normal access restored. [AOP-15 Vapor Exposure Communication Form]

August 15, 2013

- 0717 Stop Work initiated on TFC-WO-11-5518 until completion of event investigation for TF-AOP-015 response.
- 0731 SOEN sent. "Stop Work issued on TFC-WO-13-5518 until completion of the event investigation for AOP-015 response on August 14, 2013."
- 0733 SOEN sent. "New Red Arrow – Upon entry to AOP-015 all personnel are to immediately evacuate the farm, facility, and/or immediate area in an orderly fashion."
- 0812 Event investigation initiated. SOEN sent.
- 1300 Fact Finding meeting held.

Compensatory Measures

1. August 14, 2013. TF-AOP-015 entered for vapor exposure in AW Tank Farm.

2. August 15, 2013. New Red Arrow issued - "Upon entry to AOP-015 all personnel are to immediately evacuate the farm, facility, and/or immediate area in an orderly fashion."

Preliminary Extent of Condition Review

None. All work in AW Tank Farm during the time in question has been addressed.

Discussion of Potential Causes

Source of vapor exposure unknown. There were no unusual or abnormal farm configuration issues. The ventilation system was operating and no risers, pits, or nozzles were open to the environment.

Discussion of Barriers That Could Have Impacted the Cause

None. Source of vapor exposure unknown. There were no unusual or abnormal farm configuration issues. The ventilation system was operating and no risers, pits, or nozzles were open to the environment.

Recommendations/Proposed Corrective Actions

1. Consider issuing Just-in-Time Lessons Learned document to reinforce SWIM actions during event response ("stop work, warn others, isolate the area, and minimize exposure").
2. Consider reinforcing the requirement for pre-job briefings, especially when performing prior day pre-job briefings.
3. Verify that action to notify (b)(6) of potential worker exposures occurred. [See WRPS-PER-2013-1592.]
4. Verify that the process exists to ensure that work scope released for performance across multiple area teams is reflected on each affected area team release sheet to communicate the potential for co-located work to the impacted Shift Manager and Field Work Supervisors.

Lessons Learned

To be addressed by corrective action via WRPS-PER-2013-1549.

Attachments

- A. Event Investigation Fact Finding Meeting Attendance Attendees
- B. Logbook Entries
- C. Completed AOP-15 Vapor Exposure Communication Form.

ATTACHMENT A
Event Investigation Fact Finding Meeting Attendance Rosters

(b)(6)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

ATTACHMENT B
Logbook Entries

8/13/13

B-Shift

0840- SOEN complete for CSU entry. ORP On-call FR,

and WRPS On-call Senior Manager,

notified

1010- C-Farm Emergency Shower returned to service. SOEN Complete

1200- [redacted] reports that [redacted]

[redacted] reported having an upset stomach @ 2704 HV. Elected to self treat with management concurrence. This is a non-work related illness.

1325- [redacted] reports that light plant (40-74-5138) on the NW

corner of 2703E has a diesel fuel leak. There is ^{an} approximately 6' diameter ~~circle~~ ^{spill} ~~that is stained~~ ^{area} spill area below the light plant. The spill is on the concrete. A drip pan with absorbent material was placed under the light plant.

1338- Environmental On-call, [redacted] notified of 1325 entry.

[redacted] reported that absorbent needs to be placed on concrete pad ^{just} ~~and~~ to absorb any residual diesel fuel. Light plant is owned by [redacted] directed the garage to fix the light plant.

1358- [redacted] of Waste Services is dispatching [redacted] to clean up the diesel fuel spill @ 2703E

1400- The garage is replacing a fuel line and draining the diesel tank on the 2703E light plant.

1708- Relieved as CSM by [redacted]

1708- Assumed duties of CSM [redacted]

2240 C-101 Retrieval secured for the night, Admin Locks installed, SOEN sent.

8/14/12

A-Shift

0452 Relieved as CSM by [redacted]

0452 Assumed duties as CSM [redacted]

0811- Entering ADP-015 for AW Farm. Access restricted to AW Farm.

Two individuals, names unknown at this time, smelled odors in AW Farm while work cathodic protection. One individual experienced a sore throat, the other individual reported no symptoms. [redacted] is

taking both individuals to HFM. SOEN complete. Radio announcement

8/14/13

B-Shift

(b)(6)

(b)(6) DB35- DRP On-Call FR, [redacted] and WRRPS On-Call Senior Manager,

(b)(6) [redacted] notified of DB1 entry.

(b)(6) DB15- IHT, [redacted] directed to obtain IH sample data in AW Farm
per IHSP-09001.

(b)(6) DB38- [redacted] reports that the two individuals from the DB11 entry

(b)(6) are [redacted] and [redacted] (b)(6)

Both individuals experienced sore throats. [redacted] notified? (b)(6)

CRAC-IHT has completed sampling in AW Farm. Awaiting sample results.

IHT reported that direct reading instruments did not detect any
VOC's or ammonia while in AW Farm.

(b)(6) DB60- [redacted] reports that [redacted] was (b)(6)

working on the AWCAT jumper replacement during ADP-DIS entry,

has arrived at HPMU and is reporting difficulty breathing. HPMU

is transporting him to Kadlec via ambulance. This does not

trigger notification of EOC shift office due to an [redacted] (b)(6)

and the symptoms occurring while at an [redacted] notified (b)(6)

(b)(6) [redacted] DRP On-Call FR, [redacted] WRRPS (b)(6)

On-Call Sr Manager, [redacted] of (b)(6)

(b)(6) [redacted] also notified.

(b)(6) 1010- [redacted] reports that [redacted] is now experiencing a sore (b)(6)

throat, headache, dizziness, and difficulty breathing. HPMU

has called for ambulance to transport [redacted] to (b)(6)

(b)(6) Kadlec [redacted] advise [redacted] in reporting to Kadlec (b)(6)

(b)(6) 1012- [redacted] have been directed to
offer medical surveillance to all of the employees in
AW Farm this morning.

(b)(6) 1015- DRP On-Call FR, [redacted] notified of 1010 & 1012 entry

(b)(6) [redacted] notified [redacted] (b)(6)

(b)(6) 1018- [redacted] WRRPS On-Call Senior Manager, notified of 1010 &
1012 entries.

1023- EOC shift office notified of 1010 entry. EOC shift office

has requested results of bag sample as soon as they are

available. Notified EOC shift office that access is restricted to

8/14/13

B-Shift

(b)(6)

(b)(6) 1035- [redacted] reports that [redacted] (b)(6)

(b)(6) and [redacted] have declined medical surveillance.

(b)(6) [redacted] and [redacted] were in AW Farm to collect sample for ADP-015 response.

(b)(6) 1059- [redacted] reports that all members of the AWESE work crew have declined medical surveillance.

1101- Late Entry: 1005⁰³³ U-Farm PCM O/S. SOEN Complete

1102- Late Entry: 1032; SOEN complete for 1010 entry.

(b)(6) 1132- [redacted] reports that all EV Team personnel that were in AW Farm this morning have declined medical surveillance.

1133- Late Entry: 1000; EDC shift officer contacted CSM to receive more information about potential cause/exposure to [redacted] (b)(6)

(b)(6) [redacted]

(b)(6) 1200- [redacted] reports that

(b)(6) [redacted] has received a breathing treatment at Kadlec. Chest and stomach X-Rays scheduled for this afternoon.

1207- Safety and Health Manager, [redacted] is not requiring all personnel in AW Farm at time of ADP-015 entry to get medical surveillance at HPML. All personnel have been offered voluntary medical surveillance. (b)(6)

(b)(6) 1215- [redacted] was also working the cathodic protection job in AW Farm with [redacted] (b)(6)

(b)(6) [redacted] was voluntarily wearing an APR at the time while in AW Farm, has declined medical surveillance.

(b)(6) 1254- [redacted] reports that [redacted] has been released to return to work. SOEN Complete. (b)(6)

(b)(6) 1356- ADP On-call FR, [redacted] notified of 1254 entry.

1300- U-Farm PCM returned to service. SOEN complete.

1330- T-Farm PCM returned to service. SOEN complete.

1335- TFP 11T performed direct monitoring of the work area around AWESE pit from the time ^{8/14/13} ADP-015 was entered to 0848 while the work area was placed into a safe configuration.

All readings were less than detectable. (DRI # 13-0240)

8/14/13

B-Shift

(b)(6)

- (b)(6) 1353 - Believed as CSM by [redacted]
- (b)(6) 1553 - Assumed status as CSM. [redacted]
- 1411 - Confirmed with the EOC shift office that the OBU log entry does not meet the categorization criteria for an Abnormal Event or BPOE as specified in TFC-GPS-OPER-C-24.
- (b)(6) [redacted] from the EOC requested that any future information regarding the event be communicated to the EOC in case the event needs to be upgraded.
- (b)(6) 1435 - [redacted] reports C-110 to AN-106 retrieval has been secured, admin locks installed. SOEN sent.
- (b)(6) 1503 - [redacted] the West Area [redacted]
- (b)(6) [redacted] stated that he was calling to put in a stop work for electrical concerns at S and SY Farms. He states that the power pole that was leaning over in S Farm is still in an unsafe configuration, as well as the SY VTP electrical cabinets. He stated the cabinets need to be under a controlling organization lock ending before accessing them, and access within 50 feet of the power pole should be restricted. I called [redacted] the senior on-call manager and [redacted] to notify them.
- (b)(6) [redacted] stated the power pole of concern was removed, so he will be keeping [redacted]
- (b)(6) [redacted] Co-tact [redacted] to get a better idea of what the situation is before the stop work is initiated.
- (b)(6) 1527 - [redacted] called to notify that [redacted]
- (b)(6) [redacted] and [redacted] spoke to each other (cont)
- (b)(6)

8/14/13

DRS LIT

(b)(6)

(b)(6) (cont) and [redacted] will come to the Shift office in the morning tomorrow to discuss the stop work. No actions from the Central Shift Office required at this time.

(b)(6) 1646- [redacted] and [redacted] report (b)(6)
(b)(6) that [redacted] has been released from Kallie Hospital, will report to HPMC prior to returning to work. He was given a prescription medication from Kallie and the breathing complications may have been caused by the odor triggering

(b)(6) [redacted] It was also recommended that he sees his personal physician in the near future. SOEN sent, notified EOC shift officer, and senior on-call manager

(b)(6) [redacted] as well as DOE FACEP on-call

(b)(6) [redacted]

(b)(6) 1706- Relieved as CSN by [redacted] (b)(6)
(b)(6) [redacted] 1706 Assumed duties of CSN [redacted] (b)(6)

(b)(6) 1748 [redacted] from OES8 entry released to return to work through HPMC. SOEN sent, DOE FACEP [redacted] and Sr On Call [redacted] (b)(6)
(b)(6) Notified

(b)(6) 1816 Exiting AOP-OIS for AW Form IH analysis completed, levels at or below background. Normal access restored to AW Form. SOEN sent. DOE FACEP [redacted] and Sr. Man [redacted] (b)(6)
(b)(6) [redacted] Notified

1822 Updated the EOC on the injuries of the AOP-OIS. Concerned does not meet any reportable criteria in TFC-OPS-OPER-C-24 for [redacted] (b)(6)
to [redacted] and [redacted]

8/15/13 1851 STOP WORK - initiated by [redacted] (b)(6)

No entry into S Complex and danger taped off area West of 241-S Farm until a Lockout/Tagout is established controlling the hazards of removed pole W1584.

SOEN sent, DOE Fac Rep [redacted] and S Man [redacted] (b)(6)

(b)(6)

(b)(6)

[redacted] Noted [redacted] is to Generate the PER on the stop work Radio announcement made to restrict access into S Complex.

2228 C-101 Retrieval Secured. Admin locks in place. SOEN sent.

2300 AY-101 Recirculation Secured. Admin Locks in place SOEN sent.

7301 - Late Entry 1840 242-A Evaporator SM

(b)(6)

[redacted] went to HPMC with a pain in his left hand. Non work ^{work} related injury.

8/15/13 A-Shift [redacted] (b)(6)

(b)(6)

0500 Retrieved by [redacted] as CSM [redacted] (b)(6)

(b)(6)

0501 - Assumed the duties on CSM [redacted] (b)(6)

(b)(6)

0615 [redacted] reported a small cut to left forearm at 1700 268.

Does not know how the injury occurred. [redacted] has elected to self

(b)(6)

treat. SOEN complete.

(b)(6)

0620 CRP on Cat FR [redacted] and [redacted] notified of 615 (b)(6)

entry.

0648 - IHT completed flame gas surveillance of SY Farm. SY-101 and SY-102 reading 0% of LFL. SY-103 reading 2% of LFL.

Entered LCO 3.1A on 8/11/13 @ 0900 hours for SY Farm

In-Service VTP O/S. LCO 3.1A2.1 due NLT 8/17/13

@ 0929, LCO 3.1A2.2 due 8/21/13. (BOSC-011 pg 233 case)

0649 - IHT completed flame gas surveillance of AY/AZ Farm. AY-101, AZ-101, and AZ-102 reading 2% of LFL. AY-102 reading 0% of LFL.

Next AY SR 3.7.1 due NLT 8/19/13 @ 1021.

Next AZ SR 3.7.1 due NLT 8/19/13 @ 1030.

8/15/13

B-Shift

(b)(6) →

0717- [] issued a Stop Work on TFC-WO-11-5518

(b)(6)

until the completion of Event Investigation for ACP-015
response on 8/14/13. CPOC [] PER-2013-

→

0726- Upon entry to ACP-015 all personnel are to immediately
evacuate the Farm, Facility, and/or immediate area in an
orderly fashion. (POC:

→

0734- Stop Work on the restoration of power to the 241-SY B-Train
primary exhaust until appropriate LCID can be installed.

(b)(6)

(POC [] PER-2013-) (BOSO-011 PG 243; 1851)

(b)(6)

0755- [] ORP On-Call FR, notified of 0717, 0726, and
0734 entry.

(b)(6)

0805- [] WRPS (On-Call Senior Manager, notified of 0717, 0726, 0734
entries. SOEN³ complete for 0717, 0726, 0734 entries.

(b)(6)

0812- [] initiated an Event Investigation for ACP-015 odor
response in AW Farm on 8/14/13. Event investigation number
2013-0316. SOEN complete.

(b)(6)

0817- [] ORP On-Call FR, notified of 0812 entry.

073413 0630 Assumed EUADM duties [redacted] (b)(6)
0840 - AW "B" train started. A [redacted]
AW VTP "B" train started. AW VTP "A"
currently "OOS" due to MOV-352 be-
ing inoperable.

1010 - AP VTP "A" train was started and "B"
train went into standby mode.

1525 - AW VTP "A" train was started on gener-
ator power and "B" went into standby mode.

1630 - Secured from EUADM duties [redacted]

8-1-2013 0630 - Assumed EUADM duties [redacted] (b)(6)

0818 - AW VTP "A" was restarted on
generator power.

0920 - AW Farm UCZ downposted, A
"A" train declared operating/ope-
rational.

8-1-13

1420 - Completed switching AW VTP
from generator power to normal
operation with AW VTP "B" in standby mode.

141629 Secured from EUADM duties [redacted] (b)(6)

8-5-13 0525 - Assumed EUADM duties [redacted]

0810 - 90 ton crane entered 241AWT
to work on Pit per TFC-11-5518

1415 - Secured from EUADM duties [redacted] (b)(6)

8-6-13 0525 - Assumed EUADM duties [redacted] (b)(6)

0655 - AP VTA "B" Train shutdown to
support API07 VLSR abatement
(w.p. #TFC-WO-13-3614).

1145 - 107AP Astarters abatement comp-
crane moved off of the exclusion
all other support vehicles exited.

1325 - 241AP VTA "B" Train started.

1330 - LOTO 241AP-13-02 installed on "A"
Train VTA heater system to ensure
personnel protection.

1438 - Secured from [redacted] (b)(6)

8-1-13

8-7-13 0528 - Assumed EVADM duties [redacted] (b)(6)
 1328 - 241AW VTP "A" Train was started
 on Temporary power.
 1600 - AW VTP "B" Train was started
 on normal power.
 1730 - Secured from EVADM duties [redacted]
 8-8-13 0630 - Resumed EV ADM [redacted] (b)(6)
 1600 - Swapped AW-B to AW-A VTP on to
 power.
 1700 - Secured EV ADM [redacted] (b)(6)
 8-9-13 0630 - Resumed EV ADM [redacted] (b)(6)
 1230 - Started AW Power Outage. All AW load
 EU power to AW secured. AW-A VTP
 on temporary generator power.
 1505 - Secured EV ADM [redacted] (b)(6)
 8-12-13 0625 - Resumed EV ADM [redacted] (b)(6)
 0630 - Late Entry. (8/9/13 @ 1230) Started in
 for LCO 3-1-B. Enter LCO 3-1-B. No lat.
 8/19/13 @ 1229 pm.
 0635 AW101 LDE o/s (153) due to power outage
 generator power was cycled. Maintenance
 day o/s clock started.
 1305 IMACS NCO reports AW101 LDE 1
 cleared. 90 day o/s clock secured.
 1730 Secured EV SM [redacted] (b)(6)
 8-13-13 0630 - Resumed EV SM - [redacted] (b)(6)
 0715 - Forklift and flatbed into AW for [redacted]
 0825 - V-B Van into AW for AW VTP Inlet St
 0900 - Flatbed & forklift out of AW.
 1530 - Secured EV SM [redacted] (b)(6)
 8-14-13 0515 - Resumed EV SM [redacted]
 0815 - 2 workers detected "body" odor in AW. &
 North side of farm on cathodic protection
 for Term Maintenance. Major who came
 from to the MC. Notified CSM.
 access to AW.
 1600 - Secured EV SM [redacted] (b)(6)

ATTACHMENT C
Completed AOP-15 Vapor Exposure Communication Form

WASHINGTON RIVER PROTECTION SOLUTIONS Industrial Hygiene Program		AOP-15 VAPOR EXPOSURE COMMUNICATION FORM			
Event	Date: 8/14/2013	Odor Location: AW Farm			
	Farm/Site: AW Farm/200R	Source Location: "West of primary exhaustor/south of crane/low to ground"			
DRI	AGENT	@ ODOR	@ SOURCE	EXPOSURE LIMIT	REPORTING LIMIT
	Ammonia	0 ppm	ppm	25 ppm OEL/35 ppm STEL	>0 ppm
	Total VOCs	4 ppb	ppb	2,000 ppb AL	>0 ppb
	Mercury	2 ng/m ³	ng/m ³	25,000 ng/m ³ OEL	16 ng/m ³
	Nitrous Oxide	0 ppm	ppm	25 ppm AL	>0 ppm
GC/MS	AGENT	@ ODOR	@ SOURCE	EXPOSURE LIMIT	All Analytes 20 ppb
	Nonanal	1.1ppb			
	Short Chain Aldehyde	-detectable		Not quantifiable	
	2-ethyl-1-hexanol	7.5ppb			
Comments: 08:20 - 08:28 Entered AOP-15 for odors reported in AW farm, access is restricted. 1 <input type="checkbox"/> 1 (b)(6) sent to HPMC for reporting symptoms. BO S&H Manager discussed with Central Shift Manager that EV team IHT would respond to farm and collect samples. It was reported to CSM that individuals were performing Cathodic Protection PM work south of crane and west of exhaustor. Discussed with IHT appropriate sampling plan and location to collect samples. 08:30-08:48 Co-located work in AW Farm included Tank Farm Projects performing demobilization with a large crew at 241-AW-02E pump pit (TFC-WO-11-5518). TFP Projects IHT continuously monitored their work area while workers orderly exited the area and secured the location in a safe configuration. DRI readings that were taken with the ITX and ppbRA2 were recorded during this evolution revealed that no detectable VOC or ammonia was present in the general work area (DRI Survey 13-02901). 08:30 BO IHT gathered equipment and prepped Flexfilm bags in the BO IH Lab. EV Team IH, BO S&H Manager and IHT First Line Manager discussed farm entry and strategy for collecting samples. 08:40 BO IHT and IH reported to shift office for permission to enter farm and obtain radio, then ACE'd under TF-102 and proceeded to AW Farm. All employees had vacated the farm, with one operator in the change trailer who assisted with restricting access. 08:48 BO IH contacted the Central IH programs group to inform them of AOP-15 and to ensure that instrumentation would be available when IHT arrives with bag samples. The IH relayed the information to them that the employee reported a "body odor" smell in AW Farm. 08:50 - 09:08 BO IHT and EV team IH entered farm to obtain samples and investigate area of reported concern. Several cathodic protection boxes were examined in the reported location as well as other potential sources in the vicinity. Results are recorded on DRI Survey #13-02897. 09:45 IHT transported samples to 2704HV IH lab for processing. 10:06 TFP Projects reported that a rigger working on their job requested medical surveillance. The employee was taken to HPMC. BO S&H Manager was in contact with Safety Program Case Manager on update of situation.					

WASHINGTON RIVER PROTECTION SOLUTIONS Industrial Hygiene Program		AOP-15 VAPOR EXPOSURE COMMUNICATION FORM (CONTINUED)	
Event	Date:	Odor Location:	
	8/14/2013	AW Farm	
	Farm/Site:	Source Location:	
	AW Farm/200E	"West of primary exhausters/south of crane/low to ground"	
<p>10:28 - 10:50 IHT analyzed bag samples with Miran and Lumex at 2704HV. Results are on DRI Survey# 13-02897.</p> <p>10:32 Employees transported to Kadlec after visit at HPMC (200 West)</p> <p>11:45 Contacted by HPMC for information to relay to the physicians concerning possible COPC's to be aware of in regards to patient evaluation.</p> <p>12:08 BO S&H Manager briefed BO VP of Operations of current information and background of events.</p> <p>12:20 BO S&H Manager talked to Program IH and discussed preliminary results and was notified of small peak of "aldehydes" that was being re-analyzed on instrumentation.</p> <p>12:23 HPMC was contacted to discuss possible "aldehyde" scenario and gave them the Program IH cell phone number for further information if needed.</p> <p>(b)(6) 12:58 <input type="checkbox"/> released from HPMC to return to work.</p> <p>16:46 Rigging Employee released from Kadlec, will be returning to work through HPMC.</p> <p>17:37 GC/MS (HAPSITE) results completed, all COPC's less than 20ppb, analysis had very low concentrations of low molecular weight aldehydes. FTIR was ran and no short chain aldehydes were observed, i.e. No formaldehyde, acetaldehyde, butanal, or other odorous compounds. Based on the very low VOC's it is likely sample was beneath the limits of detection.</p> <p>(b)(6) 18:00 <input type="checkbox"/> released from Kadlec, will be returning to work through HPMC.</p> <p>18:28 AOP-15 exited for AW farm, IH analysis completed, levels at or below background. Normal access restored.</p>			
Prepared by: Wendy Adams, Daniel Wolf			


INTEROFFICE MEMORANDUM



WRPS-1303044

Date: July 23, 2013

To: D. J. Saueressig, Manager
C Farm Retrieval & Closure

From: W. E. Ross, Initial Event Investigation Team Lead 
SST Retrieval & Closure

Subject: INITIAL EVENT INVESTIGATION REPORT EIR-2013-022, TF-AOP-015
EVENT AND RESPONSE AT C FARM GREENFIELD

Submitted for your information and use is the event investigation report EIR-2013-022, "TF-AOP-015 Event and Response at C Farm Greenfield." 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-2013-1050 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 373-5434.

GLR:JAS

Enclosure: EIR-2013-022, "TF-AOP-015 Event and Response at C Farm Greenfield"

cc:	WRPS Correspondence Control	J. A. McDonald
	A. D. Basche	R. S. Page
	R. L. Brown	N. L. Peters
	C. Burrows	G. L. Rensink
	W. C. Clark	W. E. Ross
	M. W. Ellis	G. A. Skogley
	R. E. Gregory	R. J. Skwarek
	J. N. Holloway	D. K. Smith
	G. J. Johnson	C. B. Thom
	E. M. LaRock	S. F. Waters
	D. B. Little	R. E. Wilkinson

Enclosure

INITIAL EVENT INVESTIGATION REPORT
EIR-2013-022

TF-AOP-015 EVENT AND RESPONSE AT C FARM GREENFIELD

Consisting of 7 pages
Including cover sheet

EVENT INVESTIGATION REPORT

TF-AOP-015 Event and Response at C Farm Greenfield

Event Investigation Report Number EIR-2013-022

WE Ross
Event Investigation Team Lead

Date

DJ Saueressig
PER Responsible Manager

Date

PER No. WRPS-PER-2013-1050

TF-AOP-015 Event and Response at C Farm Greenfield

Investigation Summary

On June 14, 2013 at 1123 hours AOP-015 (TF-AOP-015, Response to Reported Odors or Unexpected Changes to Vapor Conditions) was entered due to stronger than normal odors being reported between AN and C Farms. Work was stopped and personnel were moved to upwind locations. Sample results were taken with the results indicating less than detectable (LTD) readings and AOP-015 was exited at 1425 hours. A number of issues and questions arose during the time that AOP-015 was in place that indicates a need for further investigation.

(b)(6) The first factor that produced consequences from this event was a miscommunication/ understanding between [redacted] who experienced the odors and their first line supervisor. [redacted] (b)(6)
(b)(6) [redacted] reported that they experienced stronger than normal odors at the change trailer they were at. The supervisor having dealt with an AOP-015 event from the day before (Thursday, June 13, 2013) and the fact that [redacted] were supporting retrieval operations, concluded that the location of the issue was at MO-522, the C-101 retrieval change trailer and the waste transfer route north of this trailer. In reality, the odors were at AN Farm's change trailer MO-497 and north of the AN Farm along the transfer route. This misunderstanding was promulgated to the Central Shift Office (CSO) when the Rad Con First Line Supervisor contacted the Base Operations (Base Ops) Central Shift Manager (CSM) to report the odors.

The next factor that produced consequences was the decision by [redacted] to enter AOP-015. (b)(6)
Section 2.0 of AOP-015 lists the entry conditions for this procedure. One of the entry requirements is "a stronger than normal odor is detected by multiple personnel outside of areas where potential or actual vapor concerns are expected". Since retrieval operations had begun at C-101 (see time line below) one perspective could be that the areas around C Farm and AN Farm are such that odors are expected and therefore AOP-015 should not have been entered.

(b)(6) The next factor from this event that produced consequences was when [redacted] entered AOP-015. [redacted] (b)(6)
(b)(6) [redacted] based on his understanding of the area involved, requested all work to be stopped and personnel be relocated to an upwind location from the Greenfield between AN and C Farm. Upon receiving this instruction the C-105 construction crew who were pumping concrete for the MARS-V system footing evacuated the area where the concrete pumping truck was located and staged the work crew at the entrance to the area on 7th Street. The factor here was that the definition of what area is the Greenfield between C and AN Farm was not universally understood.
(b)(6) [redacted] believed it encompassed the area including MO-522 change trailer, MO-117 (C-101 control trailer), MO-529 (C-109/C-110 control trailer), and the retrieval water addition skid. Retrieval Operations personnel (who were located in MO-117 and MO-522) understand that the Greenfield area as the area along the waste transfer corridor between C and AN farm (see attached map). The Retrieval Operations understanding of the area encompassed in the Greenfield is consistent with the definition listed in Standing Order OPS-12-007. This factor resulted in the appearance that only some workers (Construction) had to leave their work areas while others (Retrieval Operations) did not and therefore the appearance of a double standard.

A factor that could have mitigated this consequence was if Step 3.1. of AOP-015 had been properly administered. This step is to implement SWIMs (Stop, Warn, Isolate, Minimize) at the event scene. It includes assigning a field lead to the event scene. Such a response could have addressed the inconsistencies in the area under evacuation and possibly uncover the fact of the wrong location being reported.

(b)(6) Another factor from this event which mitigated some of the confusion in when (b)(6)
(b)(6) responded to the field and connected with (b)(6) who had originally reported the
(b)(6) stronger than normal odors. By doing so (b)(6) escorted the IHT to the correct locations of the
odors at MO-497 and north of the AN Farm along the transfer route (Survey point C-5 as
identified on the attached map) and therefore the air samples and monitoring occurred at the
correct locations. A question that was raised at this time was should (b)(6) and (b)(6) who went (b)(6)
(b)(6) to the areas of concern to collect air samples and readings have had respiratory protection? (b)(6)
(b)(6) (b)(6) stated that she monitored their approach to the areas with her instruments. Here again if
someone in charge was at the event scene this opportunity to understand the correct location of
the vapor concern could have mitigated the effects from this event.

The actual source(s) of the stronger than usual odors could not be determined.

Photographs, drawings, log entries and personal statements were gathered. A Fact Finding Meeting was not held.

Event Timeline

06/14/2013 (Friday)

0927 SOEN sent "C-101 to AN-101 retrieval about to start. Possible source of odors in C & AN Farms. AN ADM."

0931 SOEN sent "C-101 to AN-101 retrieval has started. Possible source of odors in C & AN Farms. AN ADM."

(b)(6) 1100 While conducting radiological transfer survey, (b)(6) smelled unusual odors. (b)(6)
(b)(6) (b)(6) contacted Rad Con First Line Manager and reported that strong odors were
smelled at the top of the hill over the transfer route survey point C-5 in AN Farm.

~1110 Rad Con First Line Manager notified CSM that (b)(6) smelled unusual odors. (b)(6)

1112 Base Ops IH receives call from CSM about the AOP-015 situation. Decision made to assign Central Shift IHT to respond to event.

1121 Base Ops IH gave AOP response direction to Central Shift IHT, the shift IHT requested HPT support and the shift IHT collects her instrumentation to respond to event.

~1122 Construction crew started pumping concrete to pour pad for C-105 MARS-V pad. Part of the crew was in the farm while others, pump truck and concrete trucks were outside the farm by lower C (MO-522). Truck driver, line watch, construction workers, and FWS indicated they had not smelled any odors.

1123 SOEN sent "AOP-015 entered for Greenfield between AN to C Farm. Stay upwind until further notice. CSM"

CSM log entry: Entering AOP-015 for stronger than normal odors in the Greenfield between C and AN Farms. Work was stopped and all personnel moved upwind to a safe location SOEN sent. DOE Fac Rep and Sr. on-call and shift operations manager notified. Environmental on call was notified of the concrete cleanup.

- 1125 Construction concrete pour field crew instructed by the CSM to leave Greenfield area between C and AN farms and move upwind. Field work supervisor (FWS) moved workers and concrete trucks across 7th Street to parking lot. Construction FWS observed others were in/out of C Farm Control trailers and MO-522 during this time frame.
- 1126 Base Ops IS&H manager contacts Retrieval IH and requests she assume the lead of this AOP-015 event.
- 1145 Retrieval IH confirms with the CSM that she will now have the lead role for the response.
- ~1200 Base Ops IHT and a Retrieval HPT (one who experienced the odors) go to AN Farm and Survey Point C-5 to conduct sampling. This information was not relayed back to the CSM.
- ~1230 After discussion with Sr. Management, it was agreed that with IHT monitoring Construction could move the concrete pump truck out, clean the pump truck out of the concrete using established methods.
- ~1300 Concrete pump truck released from C Farm retrieval courtyard area.
- 1422 From CSM Log "IH reports IH sample results were less than detectible (LTD) in the Greenfield. Exiting AOP-015. SOEN sent and DOE Fac Rep notified".
- 1425 SOEN sent "Exiting AOP-015 for C Farm Greenfield. Sample results were LTD. Access Restored. CSM"

Compensatory Measures

- 06/14/2013 - IH sampling performed and results were LTD.

Preliminary Extent of Condition Review

- The extent of condition for this event extends to retrieval operations. A more formal review will be accomplished through resolution of the PER

Discussion of Potential Causes

- Miscommunication/understanding of the exact location of the odors.
- Entering AOP-015 when odors from retrieval operations is an expected situation
- Not following the instructions in AOP-015 to send a field lead to the event scene to implement SWIM.
- Miscommunication/understand as to what encompasses the retrieval greenfield area between C and AN-Farm

Discussion of Barriers That Could Have Impacted the Cause

- Clear understanding of AOP-015 entry requirements when the suspected source of the odor is known.
- Use of precise three way communication with little or no usage of terms such as "greenfield" that are not well understood by all involved.
- The fact that the responding contacted who experienced the odors such that the correct locations were sampled and evaluated.

Recommendations/Proposed Corrective Actions

- Reinforce the need for accurate communication when notifying of a possible adverse condition/event.
- Either ensure the definition of the retrieval greenfield is universally understood or put out expectations to stop the use of such terms.
- Revisit the entry requirements of AOP-015 for expected conditions such as a waste disturbing activity. Possibly have a contingency response plan for stronger than expected odors when an expected condition is anticipated.
- Reinforce the instructions of AOP-015 to send a field lead to coordinate actions at the event scene.

Conditions Adverse to Quality

- No additional conditions adverse to quality were discovered during this initial event investigation

Lessons Learned

This event highlights the importance of clear and precise communications, following procedures and maintaining a health questioning attitude.

Personnel Interviewed/Personal Statements received

(b)(6)

<ul style="list-style-type: none">••••••••••	
---	--

Aerial photo of AN and C Farm



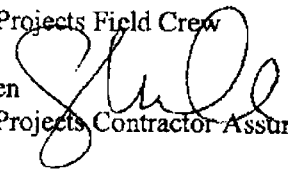
INTEROFFICE MEMORANDUM



WRPS-1401413

Date: April 14, 2014

To: C. W. Peoples
Tank Farm Projects Field Crew

From: N. J. Milliken 
Tank Farm Projects Contractor Assurance

Subject: EVENT INVESTIGATION REPORT EIR-2014-010, "S FARM TF-AOP-015 ENTRY"

Submitted for your information and use is the Event Investigation Report EIR-2014-010, *S Farm TF-AOP-015 Entry*. 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-2014-0604 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 376-7846.

NJM:PMH

Enclosure: EIR-2014-010, *S Farm TF-AOP-015 Entry* (5 pages)

cc: WRPS Correspondence Control	R. E. Gregory	L. D. Olson
R. L. Frink, ORP	R. C. Holland	R. S. Page
R. M. Irwin, ORP	J. N. Holloway	R. J. Skwarek
D. H. Patel, ORP	G. J. Johnson	D. K. Smith
D. M. Gutowski, DNFSB	E. E. Kennedy	T. F. Tatro
R. G. Quirk, DNFSB	D. B. Little	C. B. Thom
A. D. Basche	J. R. Maasen	B. R. Thomas
C. Burrows	J. A. McDonald	C. E. Upchurch
W. C. Clark	D. H. Noland	S. R. Waters
		R. E. Wilkinson

EVENT INVESTIGATION REPORT

S Farm TF-AOP-015 Entry
EIR-2014-010

Nancy Milliken

Event Investigation Team Lead

Date

C. W. Peoples

PER Responsible Manager

Date

PER No. WRPS-PER-2014-0604

S Farm TF-AOP-015 Entry

Investigation Summary

(b)(6) On April 4, 2014, management was notified by [redacted] of symptoms believed to have been received while working in S farm on April 3, 2014 performing Liquid Observation Well (LOW) surveillance. The employee was unsure of whether or not the symptoms were as a result of working close to breather filters in S farm. Management made the required notifications and TF-AOP-015, Response to Reported Odors or Unexpected Changes to Vapor Conditions, was entered.

The worker was encouraged to be evaluated at the site medical provider, HPMC, but declined. There were two (2) other workers on the LOW crew and it was confirmed that they did not smell odors and had no symptoms.

An event investigation was initiated on April 4, 2014, but no fact finding meeting was held.

Event Timeline

April 3, 2014

(b)(6) Two (2) [redacted] and one (1) [redacted] performed LOW measurements in S farm (at 241-S-101, 241-S-104, 241-S-107, and 241-S-110). No issues were reported.

April 4, 2014

(b)(6) 0852 Field Crew Manager reported that [redacted] developed a sore throat and lost her voice overnight. [redacted] was supporting the performance of LOW activities in S Farm yesterday around breather filters at 241-S-101, 241-S-104, 241-S-107, and 241-S-110 and believes these symptoms may be related. Field Crew Manager to take employee to site medical provider (HPMC).

0854 Entered TF-AOP-015 for S farm and restricted access. Field Lead is ST Area Day Shift Manager. Shift Office Event Notification (SOEN) sent. Radio announcement completed.

0930 Field Crew Manager reported to Central Shift Manager that [redacted] and the work crew did not actually smell any odors in the farm yesterday, but believed the symptoms were due to being around the breather filters in S farm. Industrial Hygiene Technician (IHT) was dispatched to perform sampling even though this event did not meet AOP entry criteria. (b)(6)

1030 Based on communications with the Manager, Tank Farm Projects and the Manager, Base Operations, TF-AOP-015 was exited and sampling was not performed in S farm. [redacted] did not request IHT sampling and told Field Crew Manager it was not necessary. Exited TF-AOP-015 for S farm and SOEN was sent. (b)(6)

Compensatory Measures

- Entered TF-AOP-015 for S farm.
- Restricted access to S farm.
- Respiratory Protection Form (TO-040-333, Liquid Observation Well (LOW) Surveillance Van Startup and Operation, TO-040-350, Obtain Drywell Data using Radionuclide Assessment System, and TO-320-060, Operate Model 503DR M1HP-4 Hydroprobe Neutron Moisture Gauge) was updated for voluntary upgrade for LOWs, RAS, and Moisture Data Logging.

Preliminary Extent of Condition Review

There were two (2) other workers on the LOW crew and it was confirmed that they did not smell odors and had no symptoms. Other vapor events are also being reviewed separately.

Discussion of Potential Causes

As discussed above, symptoms may have been due to being around the breather filters in S farm. No odors reported.

Recommendations/Proposed Corrective Actions

1. Evaluate TF-AOP-015 entry requirements
 - a. To ensure clear/correct communications per the entry criteria
 - b. For impact on entry requirements for past events.

Lessons Learned

To be addressed, if required, by the causal analysis via a corrective action under WRPS-PER-2014-0604.

Attachments

- A. Shift Manager's Logbook Entries

Attachment A
Shift Manager's Logbook Entries

4/3/14 D-Shift [redacted] (b)(6)
 1808 (cont.) ISR at POR-104 to support the closure
 of Stopwork initiated at 1802 hrs. Verified
 that [redacted] it was ok for release.
 2105 Initiated temp round CSO-TR-59 to obtain
 Awt tank pressure twice per shift. Revised
 CSO-TR-51 to remove Awt tank pressures while
 CSO-TR-59 is active.
 4/4/14 D-Shift [redacted] (b)(6)
 0812 Relieved as CSM by [redacted] (b)(6)
 0812 RELIEVED [redacted] AS CSM [redacted] (b)(6)
 0815 RELIEVED BY [redacted] AS CSM [redacted] (b)(6)
 0805 - Assumed duties as CSM. Sgt. [redacted] K16
 0812 [redacted] reported that [redacted] (b)(6)
 developed a sore throat and lost her voice
 overnight. She was performing Low activities
 in S Farm yesterday around breeder
 filters at S04, S04, S03, and S112 and
 believes these symptoms may be related. [redacted]
 [redacted] is taking her to HPMC in 200nd.
 0814 - Entered APP-015 [redacted] will be
 recognizing a field lead at S Farm and
 restricting access. S022 1st radio
 equipment complete. [redacted] (b)(6)
 [redacted] and [redacted]
 0816 - S022 sent for [redacted] being taken to HPMC
 [redacted] (S. Manager) and
 [redacted] (Facility)
 0812 [redacted] reported that [redacted] (b)(6)
 and the work crew did not actually
 smell any odors in the farm yesterday,
 but she believes her symptoms are due
 to being around the breeder filters in
 S Farm. TTTT is being dispatched to (cont.)

11/4/14 C-shops [redacted] (b)(6)
 (cont.) perform sampling even though this client
 did not meet the AOP entry criteria.
 1031 - Based on communications from [redacted] (b)(6)
 and [redacted] we may exit AOP-015
 and not perform sampling. [redacted] (b)(6)
 is not requesting Tilt sampling and
 told [redacted] it is not necessary.
 Exited AOP-015 for 5 farm, SOEN sent
 Notified [redacted] (FACEP) and [redacted] (b)(6)
 [redacted] (Sr. Manager), Radio announced
 complete.
 1040 - [redacted] met her manager [redacted] (b)(6)
 [redacted] agreed to lift the step-work
 for POC-104. TFC was up 2764 based on
 clarification of respiratory requirements.
 Notified [redacted] (FACEP) and [redacted] (b)(6)
 [redacted] (Sr. Manager) - SOEN sent.
 1105 - AOP-015 response inside tank farm boundaries
 require respiratory protection until AOP-015
 is updated as necessary. (POC [redacted] (b)(6)
 1110 - Notified [redacted] (FACEP) and [redacted] (b)(6)
 [redacted] (Sr. Manager) - SOEN sent for 1105 entry.
 1213 - Relieved as per [redacted] (b)(6)
 1213 - Relieved [redacted] (b)(6)
 1237 - [redacted] reports 2 1/2 gallon of diesel
 fuel spilled to the ground at the White separator
 north of AW Farm. Environmental (Hamilton)
 notified, SOE responding to clean up.
 1315 - Based Standing Order OHS-14-002, AV/AZ
 Complex Respiratory Requirements. SOEN sent.
 1318 - Exiting AOP-015 based on issuance of
 Standing Order OHS-14-002 for AV/AZ Farm.
 A Complex, SOEN sent.
 1326 - Relieved [redacted] (b)(6)

Vorpapel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, August 22, 2013 11:12 AM
Subject: Dave's Dispatch - C-101 incident



Aug. 22, 2013

An Alert level emergency, the Hanford Site's lowest level of emergency classification, was declared at C-Farm late last night due to higher than expected radiation dose readings found during monitoring of sluicing equipment in Tank C-101. The radiation readings can indicate radioactive waste outside of containment and, according to procedure, resulted in workers being evacuated from C Farm and employees in the 200 East and several other areas sheltering in place throughout the late evening and early morning hours. Access to the site was also restricted for a time.

All personnel surveyed and exited C-Farm without incident. No reports of odors or symptoms were reported. As a precaution, workers who were in C-Farm when the high radiation dose was discovered were sent to medical for evaluation and later released.

Following chemical and radiological surveys of the C Farm perimeter which found no detectable levels of contamination, workers entered C Farm early this morning to monitor radiation levels in the area where the higher-than-expected levels of radiation were earlier detected. They found no visible indication of any waste leakage, and no additional radiation or contamination was found in the surrounding area. Radiation readings were lower than the earlier readings, but still higher than expected. As a precaution, a fixative was applied to the location to isolate any potential contamination.

The final shelter in place protective action, for 200 East and nearby areas, was lifted at 4:03 a.m. and the Alert was terminated at 5:05 a.m. this morning.

Barricades remain in place around C Farm while WRPS Retrieval and Closure staff performs follow-up evaluations. C Farm retrieval operations are on hold, pending further evaluations.

Additional detail is available at www.hanford.gov.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, March 27, 2014 2:19 PM
Subject: Dave's Dispatch - update on recent vapors-related actions

March 27, 2014

Multiple vapors-related incidents in the tank farms over the past week have sent several of our co-workers to the site medical provider and, in some cases, the hospital for further evaluation. We are concerned about the symptoms they have been experiencing, and are glad to hear that all employees—with the exception of one who is undergoing further evaluation—were cleared to return to work.

We are aware of the potential risks—including chemical vapors—that our workers face when in the farms, and we are continuously looking for ways to minimize potential worker exposure. This includes comprehensive efforts to identify the source of the vapors and what can be done to reduce the chance of future occurrences.

Consistent with an ALARA (As Low As Reasonably Achievable) approach, we've taken several actions over the past several days to identify and mitigate potential sources of vapors. These include:

- Investigating farms with direct-read instruments and taking bag samples for analysis
- Requiring operators use a personal sample pump when performing routine surveillances
- Encouraging personal respiratory upgrades, where desired
- Taking corrective actions to seal off confirmed sources of elevated readings related to vapors
- Deploying additional sampling equipment in the farms to further investigate potential sources of vapors

Specific information related to the affected farms

In the A/AY/AZ complex, field investigations identified a cut in the insulation surrounding the A-106 central pump pit as one potential source of vapor emissions. The cut was sealed with foam and the area was re-evaluated. Instruments no longer detect elevated levels of potential vapor-causing compounds in the local area. Investigations are ongoing to identify other potential sources of vapors in the farms.

In S/SX Farms, investigations have identified liquid in an aging cover block bag as a potential source of emissions. Workers reported vapors-like symptoms when cutting into the plastic and subsequent investigations have confirmed the area as a likely source. It has been cordoned off as a Vapor Control Zone. Efforts are moving forward to sample the liquid for analysis.

In T Farm, a work crew was working downwind of the tanks and also downwind of an herbicide application crew when employees reported symptoms. An industrial hygiene technician with the work crew found no detectable measurement. Additional samples were collected several hours later. Investigations continue as industrial hygiene techs gather additional data.

Other efforts

In addition to these more recent activities, a joint management/employee Industrial Hygiene Technical Panel meets regularly to monitor efforts and help solve chemical vapor issues and concerns. Together, the team works to identify potential hazards and develop needed controls.

These efforts have allowed WRPS to keep tank farm worker exposure to chemical vapors far below occupational limits. While the risk cannot be completely eliminated, we continue to look at ways we can reduce the risk to employees.

As always, your nose is the best indicator of the potential presence of vapors. I would ask that you continue to be vigilant in taking personal responsibility for your own safety and that of your co-workers. It is important that we are conservative in our approach, report any changes in condition, follow established procedures and seek medical evaluation, when necessary.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, March 27, 2014 12:58 PM
Subject: Safety briefing documents

TO: All WRPS Managers
ISSUED: March 27, 2014
FROM: Clint Wolfley, Safety and Health
SUBJECT: Safety briefing documents

As promised, attached are the documents to be used for today's mandatory safety briefing.

Please address questions to John A. McDonald 509.438.9257 and/or Clint Wolfley 509.713.6055.



AOP 15
refocus.pptx

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Monday, March 31, 2014 7:41 AM
Subject: Dave's Dispatch - Update on vapors-related activities

March 31, 2014

I participated in three of last Thursday's safety briefings on our recent vapor incidents and heard first-hand your concerns about the protection of yourself and your co-workers from the potential health risks posed by chemical vapors. I share that concern, and this week we will continue or, in some cases, begin additional activities aimed at preventing or further minimizing potential vapor exposures.

Another incident Thursday only reinforced the need for further action. We had another of our co-workers, at work in the A Farm complex, report potential vapor-related symptoms. The employee was evaluated at our site medical provider and released for return for work by the end of the day. While, as I told you in a message last Thursday, we have identified and sealed one potential source of vapor emissions at the A-106 central pump pit, this incident confirms the need for our continuing investigation in the A Farm complex.

For now, the A complex of farms will remain in restricted access status, while we look to identify and deal with other potential vapor emission sources there.

In regards to broader vapor concerns, I have named Doug Greenwell as the project manager responsible for maintaining our focus on vapor issues. His assignment, with a broad range of worker involvement, will be to oversee the implementation of a number of related vapor control improvements. Some actions will be near-term; others may take several months or longer.

Tomorrow, your managers will be sharing more detailed information with you as to some of these actions.

We all know finding better ways to minimize vapors and related risks is a complex, multi-faceted challenge—one that the tank farms have made significant progress toward over the past several years. But, we can do better. More work remains to be done. And, as it was last Thursday, your involvement and input is appreciated and crucial to our success.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Tuesday, April 01, 2014 7:28 AM
Subject: Dave's Dispatch - Vapors update; 4-1-14

April 1, 2014

Yesterday, the WRPS Executive Safety Review Board (ESRB) met to review our recent chemical vapor events, the impacts to our employees, and our plan of action to address future events.

The ESRB recommended that access to the A-Complex of tank farms remain restricted pending completion of a follow-up ESRB meeting scheduled for late today. The ESRB will review actions taken to date and make a recommendation on any additional actions to be taken before resuming unrestricted operations in the A Farms.

The ESRB also recommended that we reinstitute the Chemical Vapors Safety Team (CVST) comprised of workers and management, to first review the information that is being readied for managers to communicate with their employees. To allow time for that CVST review, I am delaying the briefing by managers planned for today. I want to make sure the information addresses employee concerns as well as contains recommendations on future actions to improve our chemical vapor hazards analysis, controls, and response. This information will be provided as soon as input is obtained from the CVST. The CVST will continue to assist us as we move forward on this topic.

In the meantime, if you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Your safety is my primary concern as we cope with these events. I will remain personally involved in the actions needed to improve chemical vapor safety in the tank farms.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Wednesday, April 02, 2014 12:48 PM
Subject: Dave's Dispatch - Vapors update 4-2-14

April 2, 2014

Here's an update on vapors-related actions.

- This afternoon, managers will be briefed in preparation for tomorrow's employee briefings. Tomorrow, employees will be provided a tailgate safety briefing on recent chemical vapor events and follow-up actions at a time and location arranged by their managers.
- The A Farms complex remains under restricted access.
- A WRPS employee issued a stop work this morning restricting access to all tank farm hazardous waste areas for a number of employees associated with the recent potential vapor exposure incidents. It **applies only** to those employees who had been cleared for return to work but who have not received final medical laboratory results.
- Yesterday, a WRPS employee, who had no symptoms, but who had worked in one of the affected areas last week, requested and received a medical evaluation. The worker was released and returned to work.
- All employees/subcontractors evaluated during the last two weeks at either the site medical provider or Kadlec Regional Medical Center were released for return for work.
- Monday, MSA workers called a stop work for their employees within fenced tank farm areas and within 100 yards of fenced tank farm areas, while they receive information from WRPS on the recent vapors incidents.
- CHPRC workers at the 200 West Pump and Treat Facility called a stop work yesterday after working hours due to concerns about odors. The stop work is not related to any vapor issues from the tank farms.

The 200 West Pump and Treat Facility uses biological processing, very similar to a municipal sewage treatment plant, to treat contaminated groundwater. This process can create odors similar to ammonia; industrial hygiene regularly monitors the area to ensure the safety of employees. One employee who reported ammonia-like smells and reported feeling ill after performing maintenance work was taken to HPMC and was released to return to work without restrictions.

- The answers to the Safety Stand Down questions can be found on the Safety and Health webpage at the following link:

- \\hanford\Data\sitedata\EnvironmentalHealth\Safety Stand Down\03-27-14 Stand Down AOP-015.pdf

If you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, April 03, 2014 11:07 AM
Subject: Links to Vapors Q&As

TO: All WRPS Employees
(Please pass this message on to those who did not receive it.)

ISSUED: April 3, 2014

FROM: External Affairs

SUBJECT: Links to Vapors Q&As

In yesterday's *Dave's Dispatch* message, employees were referred to a link to access question and answers on recent vapor concerns. That link has been updated. To go directly to the Q&As, click on http://toc.ri.gov/rapidweb/SAFE/docs/1/docs/03-27-14_Stand_Down_AOP-015QA.pdf

Current Vapors Q&As can also be accessed via the WRPS intranet home page at: <http://toc.ri.gov/rapidweb-v7/wrps/>. Then click on the Chemical Vapors Q&A link located under Tank Farm Updates on the right.

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, April 03, 2014 2:31 PM
Subject: Vapors briefing presentation 4.3.14

TO: All WRPS Employees
(Please pass this message on to those who did not receive it.)

ISSUED: April 3, 2014

FROM: External Affairs

SUBJECT: Vapors briefing presentation 4.3.14

The presentation from today's briefings on chemical vapors is available on the WRPS intranet home page at <http://toc.ri.gov/rapidweb-v7/wrps/>. Click *Protecting workers from chemical vapors 04-03-14* under *Tank farm updates* in the column on the right.

Vorpapel, Lindsay R

From: ^WRPS General Delivery
Sent: Monday, April 07, 2014 12:49 PM
Subject: Dave's Dispatch - Vapors update 4-7-14

April 7, 2014

Here's an update on vapors-related actions.

- The Mission Support Alliance stop work for their employees working within fenced tank farm areas and within 100 yards of fenced tank farm areas was lifted last Friday afternoon.
- Work in the A complex of tank farms, which had been on restricted access following recent vapor incidents, also resumed last Friday afternoon. Until further notice, workers in the A complex farms are required to wear respirators.
- Teams spent the weekend monitoring for potential vapors in A, AN, AX, AY/AZ, C, S, SX and SY Farms. Industrial hygiene techs took surveys of all Vapor Control Zones and checked perimeters and controls in those areas, which were deemed adequate.

They also surveyed pump pits, sluice pits, annulus pits—essentially anything that had a direct path to a tank—and monitored those areas for correct foaming, seals and controls to mitigate vapors. All compounds detected were less than 1 percent of Occupational Exposure Limits, and the controls in the areas surveyed were appropriate.

These farms were surveyed first based on the level of work activity in or near them. Moving forward, a similar process will be used on backshift and off shift to move through the remainder of the farms.

- The S Farm was evacuated as a precaution last Friday morning for potential chemical vapors. Further investigation found no chemical vapors had been reported by workers and no workers were in the S Farm when the evacuation notice was issued.
 - Since March 19, 26 WRPS or Hanford employees/subcontractors have been sent for medical evaluations after either reporting a concern or unusual odors and/or experiencing potential vapors-related symptoms in or near the Hanford tank farms. A non-WRPS employee last Thursday requested and received a medical evaluation related to an earlier vapor incident. The worker was released and returned to work.

- Current Vapors Q&As can be accessed directly at http://toc.rl.gov/rapidweb/SAFE/docs/1/docs/03-27-14_Stand_Down_AOP-015QA.pdf or via the WRPS intranet home page at: <http://toc.rl.gov/rapidweb-v7/wrps/>. Then click on the Chemical Vapors Q&A link located under Tank Farm Updates on the right.
- The presentation from the April 3 briefing on chemical vapors is available on the WRPS intranet home page at <http://toc.rl.gov/rapidweb-v7/wrps/>. Click *Protecting workers from chemical vapors 04-03-14* under *Tank farm updates* in the column on the right.

If you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Tuesday, April 15, 2014 1:39 PM
Subject: Dave's Dispatch - Vapors update 4-15-14



April 15, 2014

Action continues on activities related to dealing with chemical vapors.

I am pleased to announce that our Chief Engineer, David Little, has named Dan Baide to lead a focused team of engineers to evaluate and prioritize potential improvements to further reduce tank vapor exposure for tank farm employees. This team will work closely with the Chemical Vapors Solutions Team as part of our integrated approach to address this issue with an initial focus on A-Complex Tank Farms. The team will provide a fresh look at vapor release sources, dispersion modeling, and equipment and infrastructure options such as stack extensions, portable exhausters, passive breathing, and radial filters.

Also, arrangements are being finalized for an independent expert panel review of a number of chemical vapors-related areas.

I appreciate the input and involvement of many of our team in working this issue. If you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, April 24, 2014 1:46 PM
Subject: Dave's Dispatch - Organizational changes

April 24, 2014

A large majority of our team participated in all-employee sessions over the last couple of weeks.

I hope a key "take away" from these sessions is the focus on our five mission priorities:

- Completion of C Farm retrievals
- Start of A & AX Farm retrievals
- Increased double shell tank space
- Improved tank farm infrastructure
- WTP integration

and how we as a company must continually adapt in order to achieve our mission.

To that end, I'm announcing some organizational changes that 1) continue our transition to broader 24 hours-a-day, 7 days-a-week field operations and 2) strengthen our commitment to safety and reliability through human performance improvement (HPI). The changes will also further the professional development of some of our senior leaders.

Effective April 28, 2014:

- Kent Smith will become manager of Production Operations (formerly Base Operations). As part of his responsibilities, he will work to eventually integrate major elements of the current SST Retrieval and Closure organization into Production Operations.

Eric LaRock will become acting SST Retrieval and Closure Manager. The position will be posted in May.

- Bob Wilkinson will become Environment, Safety, Health & Quality manager. In addition, he will remain responsible for overseeing the completion of the upcoming 242-A Evaporator campaign readiness assessment activities.

- John McDonald will become manager of a new organization, Organizational Performance Improvement (OPI), reporting to me. The current Procedures and Training Departments, as well as HPI and conduct of operations programmatic functions, will be moved to OPI. As part

of his duties, John will foster Conduct of Operations improvements, focusing on safe, reliable, predictable, and excellent performance of work. He will also maintain a leadership role as executive sponsor of the Chemical Vapors Solutions Team.

Please join me in welcoming Kent, Eric, Bob and John to their new roles.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, April 24, 2014 3:03 PM
Subject: Dave's Dispatch - Chemical vapors update

April 24, 2014

A number of improvements have been made in recent years to address chemical vapors hazards in the tank farms. However, the events in late March and early April, where 26 of our fellow employees sought medical attention for potential vapor exposures, demonstrate that we have much more work that needs to be done.

This week, several activities have begun that I believe will make a positive difference in protecting tank farm workers from future chemical vapor exposures.

First, our reconstituted Chemical Vapors Solutions Team (CVST) met this week. The CVST is a working group that evaluates and provides input to improve our vapor hazard identification, control and training. Members will serve on sub-teams that will pursue improvement projects and recommend actions to the CVST. The members will also be the conduit to the CVST for questions and concerns raised by employees. It's worth noting that both MSA and CHPRC have sent members to our CVST.

The CVST is working on near-term improvements and steps to remove the standing order requiring respiratory protection in the A, AX, AY and AZ tank farms. New vapor controls are expected to be in place by mid-May.

Second, we are in the final stage of arrangements with an outside organization to set up an expert panel to assess our vapors management program and related worker protection measures and recommend improvements. As in the past, we will incorporate feasible improvements into our vapor protection program.

Third, staff with the Hanford Site medical provider, HPMC, met with a group of tank farm employees to discuss its practices for handling workers potentially exposed to chemical vapors. Several follow-up actions were identified to address worker concerns.

I want to thank employees for their feedback on the chemical vapors issue. Your ideas and concerns are being taken seriously and are helping guide our efforts to make the tank farms a safer place to work. As improvements are identified, they will be tracked weekly on a project schedule by senior management.

I will continue to keep you informed.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Monday, April 28, 2014 7:24 AM
Subject: Dave's Dispatch - SRNL to lead review of vapors protection

April 28, 2014

I'm pleased to announce that Savannah River National Laboratory has agreed to set up an expert panel to assess our vapors management program and related worker protection measures. *(Below you will find the press announcement SRNL issued last Friday afternoon.)*

This external review is one of a number of actions we're taking to improve vapor controls, and I expect it to be quite beneficial in helping us develop more reliable, more predictable measures to protect our employees.

Savannah River National Laboratory asked to lead independent expert review of chemical vapors and worker protection at DOE's Hanford waste tanks

AIKEN, SC (April 25, 2014) -- Washington River Protection Solutions (WRPS) has asked Savannah River National Laboratory (SRNL) to establish and oversee a panel of external experts to examine hazardous chemical vapors management and related worker protection measures at the U.S. Department of Energy's Hanford nuclear waste cleanup site in Washington state.

WRPS is the DOE contractor responsible for the management and cleanup of millions of gallons of nuclear and hazardous waste currently stored in underground tanks at Hanford. SRNL is a multiprogram National Laboratory providing scientific and technical expertise to support DOE's Environmental Management program.

The request for the external review and accompanying recommendations comes after more than two dozen workers received medical attention this spring following apparent on-the-job exposures to vapors emanating from the waste storage tanks. WRPS has requested that this new study have an enhanced scope for analysis and recommendation beyond that of the two previous technical reviews of Hanford tank waste vapor policies and issues in 2008 and 2010.

"While a number of steps have been taken and improvements made in recent years to address chemical vapors hazards, the latest set of exposures shows that more work needs to be done. This new review, with its broad scope and the involvement of recognized experts, will make a difference in better protecting Hanford workers from future chemical vapor exposures," said WRPS President and Project Manager Dave Olson.

Features of the panel's work are expected to include:

- A review of the last four years of relevant technical data gathered as part of the WRPS industrial hygiene program and actions taken as a result;

- An overall examination of both the adequacy and implementation of present policies, protections, practices and responses to potential vapor exposures, particularly in light of the new exposures;
- A review of currently used and additional available technology that can provide protection against inhalation or other contact with tank vapors, including the use, effectiveness, and availability of personal protective equipment;
- A look at how to improve data collection, retention and analysis to assist in developing workforce and individual worker protection and health evaluation;
- A review of the response to past recommendations and their implementation and potential improvements, and
- Methods to institutionalize the knowledge and ongoing application of best practices in vapors protection and monitoring.

"SRNL's role is to ensure that the best experts are brought in and given full latitude to ask hard questions and make their recommendations," said Dr. Terry Michalske, Director of SRNL. "This is one more important way that the National Lab can provide relevant scientific and technical assistance for the safe execution of a critical DOE environmental management mission."

SRNL will manage the interface of the panel with WRPS and will ensure that its report is made public. The final scope and schedule for the review will be developed in consultation with the expert panel. Any recommendations are entirely the domain of the expert panel.

Dave Olson
President and Project Manager

Vorpagel, Lindsay R

From: ^WRPS General Delivery
Sent: Monday, April 28, 2014 5:55 PM
Subject: Dave's Dispatch - C-Farm vapors event



April 28, 2014

Two WRPS employees were sent to the site medical provider for evaluation Monday afternoon for potential exposure to chemical vapors in C Farm. Both employees were cleared to return to work late Monday.

Waste retrieval resumed Sunday in tank C-102. Seven workers were in the farm when the potential exposure occurred. Retrieval operations were stopped and the farm was immediately evacuated as a precaution.

C-Farm access remains restricted pending completion of an event investigation to be conducted Tuesday morning and implementation of any corrective actions, which will be communicated to employees.

Dave Olson
President and Project Manager

Vorpapel, Lindsay R

From: ^WRPS General Delivery
Sent: Thursday, May 01, 2014 4:00 PM
Subject: Dave's Dispatch - Improvements to HPMC exposure protocol



May 1, 2014

With the recent spike in reported exposure to chemical vapors, WRPS has been working closely with HPMC, the Hanford Site medical provider, to improve and revise the vapors-response protocol. The new protocol, which is still undergoing changes based on worker input, seeks to more immediately and effectively evaluate those experiencing vapors-related symptoms.

As part of this effort, HPMC has moved to a "first-in-line" approach to vapor-exposure patients. Upon arrival at the clinic, vapors-affected workers will take priority over other patients, and those with the most severe symptoms will be seen first.

And, starting today, HPMC is implementing an Exposure Response Team. This team will be responsible for making contact with WRPS Industrial Hygiene to get as much real-time information as possible during a vapors event. This information will be made available to medical staff during a patient assessment to help them better understand the details of potential exposure.

Also, the medical provider is working to expedite the analysis of blood and urine samples and report the results back to the affected workers as soon as they are available.

The complete details of HPMC's revised exposure protocol are available on its website. WRPS will continue to work with HPMC to further strengthen and improve our combined response to vapors-related incidents.

Dave Olson
President and Project Manager

Protecting workers from chemical vapors



April 3, 2014

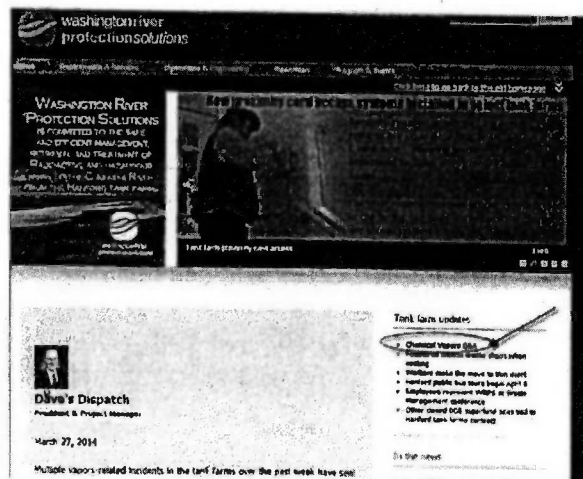


Purpose

Over the past two weeks, 25 tank farm workers have received medical evaluations after reporting a concern or experiencing physical symptoms from exposure to chemical vapors.

The purpose of this meeting is:

1. Communicate what has been done and what actions are planned
2. Answer questions raised at last week's safety briefings.





Employee Involvement & Management Commitment

- Employee involvement is an essential part of planning and performing work safely at WRPS – we need and value your input
- Tell us if we are missing any important issues
- If you have further questions or concerns about chemical vapors or odors, contact the Safety & Health Department by:
 - Sending an email to IHHotline@rl.gov or
 - Contact your project Industrial Hygienist



Page 3



Current Status

- Since March 19, 25 WRPS and subcontractor employees have reported chemical-vapor concerns and/or exposures
 - received medical evaluations at Kadlec Hospital or HPMC
- All employees were cleared for return to work through HPMC; stop work in place for employees waiting lab results
- Implementing corrective actions
- Tank farm areas involved: A complex (A, AX, AY, AZ), S/SX and T; an area outside of U Farm
 - A-Complex has majority of AOP-015 responses and odors



Page 4



Recent Chemical Vapor Events

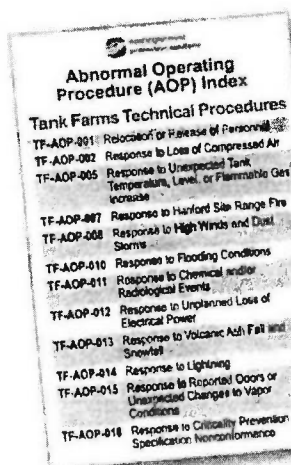
Date	Location	Basis of Investigation	Employees Impacted	Sample Results
3/19/2014	AY/AZ Farms	Employees reported irritation symptoms and odors of a "copper-like metallic taste in mouth."	2 WRPS employees	No compounds detected above background levels.
3/25/2014	A/AX/AY/AZ Farms	Employees reported odors and displayed irritation symptoms such as "metallic taste in mouth."	7 WRPS employees 2 subcontractor employees	A -106 pump pit source identified; foam repaired on pump pit.
	S/SX Farms	Employees reported irritation symptoms and odors such as "ammonia, rotten egg, and sulfur-like."	3 WRPS employees	No compounds detected above background levels. Potential source identified around cover block plastic cover and access restricted.
3/26/2014	T Farm	Employees reported irritation symptoms and odors that resembled "household paint or glue."	3 WRPS employees 1 additional worker sent to HPMC on 4/1/14.	No compounds detected above background levels. (Potential source identified as herbicide application)
3/27/2014	A Farm	Employees reported odors and irritation symptoms such as "metallic taste in mouth."	1 employee	No compounds detected above background levels.
3/31/2014	South of U Farm, near 202-U	Employees reported odors similar to "herbicide/pesticide."	6 WRPS employees	No compounds detected above background levels. (Potential source identified as herbicide application)

Page 5

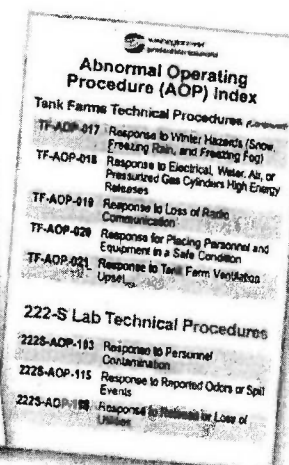


Abnormal Operating Procedure (AOP) - 015

- AOP-015 is a Abnormal Operating Procedure for response to reported odors or unexpected changes to vapor conditions
- AOP-015 does not need to be entered if the odor source is readily apparent, such as vehicle exhaust, septic systems or animal odors
- There are two entry requirements -- Odors are present and meet any of the following conditions:
 - Odors have caused symptoms of exposure (e.g., headaches, irritation of the skin, eyes, nose, or lungs, nausea, difficulty breathing)
 - A stronger-than-normal odor is detected by multiple personnel outside of areas where potential or actual vapor concerns are expected



Side 1



Side 2

Note: This procedure applies to WRPS personnel and subcontractors doing work in 200 East Area, 200 West Area, and the 600 Area controlled by WRPS and equipment in these areas. (It does not apply to WRPS personnel and subcontractors doing work at the 222-S Laboratory complex.)

Page 6



AOP 15 Immediate Actions

- When entering an AOP-015, announcements are made over radio channel(s) and SOEN notification is distributed that includes:
 - location and instructions for affected personnel
 - evacuation of the affected area
 - Employees are moved to an upwind location, normally defined as the tank farm boundary
- Notify other personnel in adjacent work areas who may not receive radio communication or SOEN (e.g., matrixed employees, subcontractors, vendors, etc.)
- Minimize personnel exposure by preventing inadvertent entry into hazardous areas
- Employees who exhibit symptoms report for medical evaluation; medical evaluation also offered to employees without symptoms



Page 7



Immediate Responses for AOP-15

- If an odor source is suspected to be from tank waste, Industrial Hygiene staff implement the Tank Waste Odor Sample Plan, specific to the area of concern.
 - Engineered controls are reviewed, known emission sources checked, grab bag samples are taken from area, and direct-reading instruments are deployed to identify potential source points
- IH monitoring focuses on Chemicals of Potential Concern (COPCs)

TANK VAPOR INFORMATION SHEET		Washington River Protection Solutions		TUS Number TUS-2-AV-AC-031	
Location: 3Y 303 3.0 P Facility		Revision Date: 01/08/2014			
Chemicals of Potential Concern for Monitoring COPC		Emission Points		Description	
Amonium	25 ppm	25		No personnel activities were identified during active evaluation	
U3 Hexafluoride	1 ppm				
Uranium	1 ppm				
Hydrofluoric Acid	0.1 ppm				
Hydrochloric Acid	0.1 ppm				
Sulfuric Acid	0.1 ppm				
Hydrogen	25 ppm				
		COPCs with Personal Samples - 8PPM DEL		None	
		Note:			
Monitor Exposure Group		Min Required RPE		Voluntary RPE	
Site	Instrument	Mask	Cartridge	Unit	Cartridge
1	Exposure: 100 ppm, 100% O ₂ , 100% H ₂ O	None	None	None	None
2	Exposure: 100 ppm, 100% O ₂ , 100% H ₂ O	None	None	None	None
3	Exposure: 100 ppm, 100% O ₂ , 100% H ₂ O	None	None	None	None
4	Exposure: 100 ppm, 100% O ₂ , 100% H ₂ O	None	None	None	None

AOP-15 RPE 0

Page 8



Immediate Actions Taken

Last week:

- Sealed A-106 source of emissions (AOP-015 for A-Farm on 3/25/2014)
- Implemented restricted access at S/SX Farm for identified source
- Reemphasized the voluntary use of higher levels of PPE
- Conducted Safety Stand Down
- Placed A-Complex farms in restricted access for further evaluation
- Installed additional sampling instrumentation in A-Complex

Monday:

- Continued restricted access for A-Complex farms
- Established project manager to implement chemical-vapor response plan – Doug Greenwell
- Require Executive Safety Review Board (ESRB) approval to exit out of AOP-015 for A-Complex
- Reinstating the Chemical Vapor Solutions Team (CVST), including representation from bargaining-unit employees, industrial hygiene professionals, and line management

Page 9



Immediate Actions

This week:

- Begin to evaluate Abnormal Operating Procedure (AOP-015) and response team actions, personal protective equipment (e.g., use of APR/PAPRs with appropriate cartridges), and IH sampling and monitoring strategies
- Implemented a new Red Arrow for A-Complex farms
 - At a minimum, full-faced PRs with appropriate cartridges are required for A-Complex work activities
 - Work activities are to be reviewed and processed through the Work Control process (IH review)
 - These controls are to be put in place while long-term actions are finalized and implemented
- Perform IH monitoring for A-Complex focused on known sources, vapor control zones, emission points, and identify any additional sources

Page 10



Immediate Actions (continued)

This week:

- Hold event investigations for AOP-015 events
- Initiate a common-cause PER to review all recent vapor incidents
- Posted the questions and answers raised by the workforce at the 3/27/2014 safety meetings; to be periodically updated
- Began to inform other Hanford contractors of current status of chemical vapor concerns and actions



Page 11



Longer-Term Actions

- Implement improved personal sampling pilot
- Perform external independent review of Industrial Hygiene Program as follow-up to 2010 review
- Evaluate other farms with reported concerns of chemical vapor/odors
- Identify additional engineered controls to minimize vapor exposures to employees
- Evaluate purchasing upgraded sampling/analysis equipment
- Empower the Chemical Vapor Solutions Team (CVST) to review and evaluate corrective actions
- Improve communication of sample results and exposures
- Replace damaged windsocks



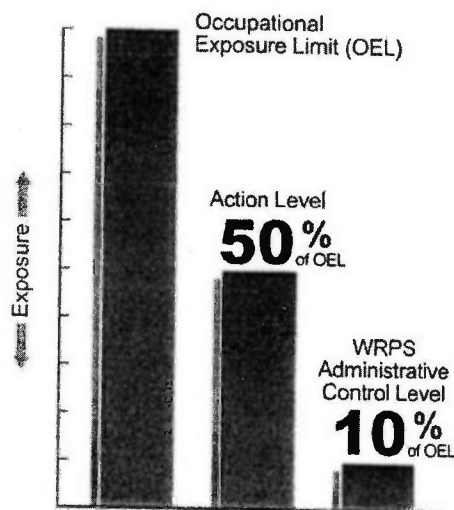
Page 12



Occupational Exposure Limits (OELs)

- Occupational Exposure Limits (OELs) are set to protect workers and prevent long-term health effects
- All COPCs at tank farms have OELs
- WRPS instituted Administrative Control Levels (ACLs) for COPCs at 10% of the OELs

Conservative Approach to Exposure



The majority of all sample results indicate levels below the ACL (10% of the established OEL), which means – there is room for improvement

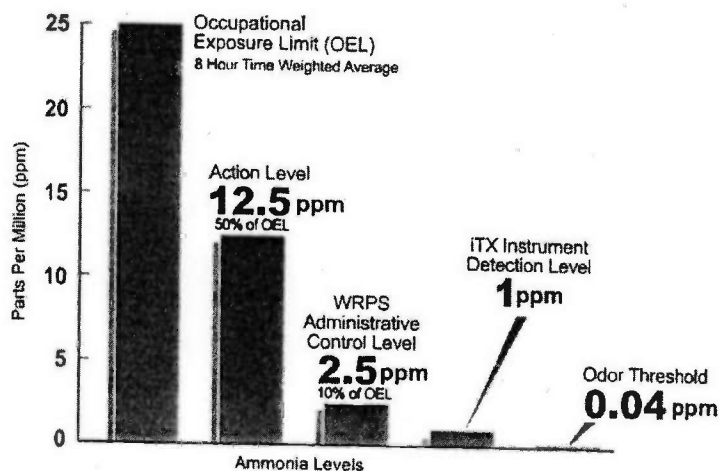
Page 13



Ammonia example

- The most sensitive individuals can detect ammonia concentrations at 0.04 ppm
- This is well below the concentration that presents health hazards
- All odors above what is expected need to be reported to ensure that proper response and current controls can be evaluated per AOP-15

Ammonia



Page 14



Limitations

- Representative sampling
 - Timely response to chemical vapor/odor concerns
 - IH, RadCon and response teams work diligently to respond as quickly and safely as possible
 - Accuracy of sampling/monitoring location versus reported area
 - It's imperative that detailed descriptions of concerned area are reported
- Instrumentation limitations
 - All COPCs have OELs
 - Some instruments measure only specific chemicals, vapors, gases, volatile organic compounds, or particulates
- Environmental conditions
 - Weather inversions, barometric pressure fluctuations and tank activities (mixing, transfers, etc.) contribute to trends associated with odor responses

The chemical-vapors hazard in the tank farms cannot be eliminated; we are taking steps to minimize the risk.

Page 15



Summary

- WRPS is taking a prudent and responsible approach to all chemical-vapor incidents
- Management and employees will work together to reduce exposures and improve response to chemical vapor incidents
- It is important to report odors consistent with AOP-15, follow established procedures, and seek medical evaluation, when necessary
- Conduct additional communications as additional information is obtained
- If you have questions or concerns about chemical vapors, please contact the Safety & Health Department by:
 - Submit a question by sending an email to IHHotline@rl.gov or
 - Contact your project Industrial Hygienist
- Questions and answers will be added to the IH website

Page 16



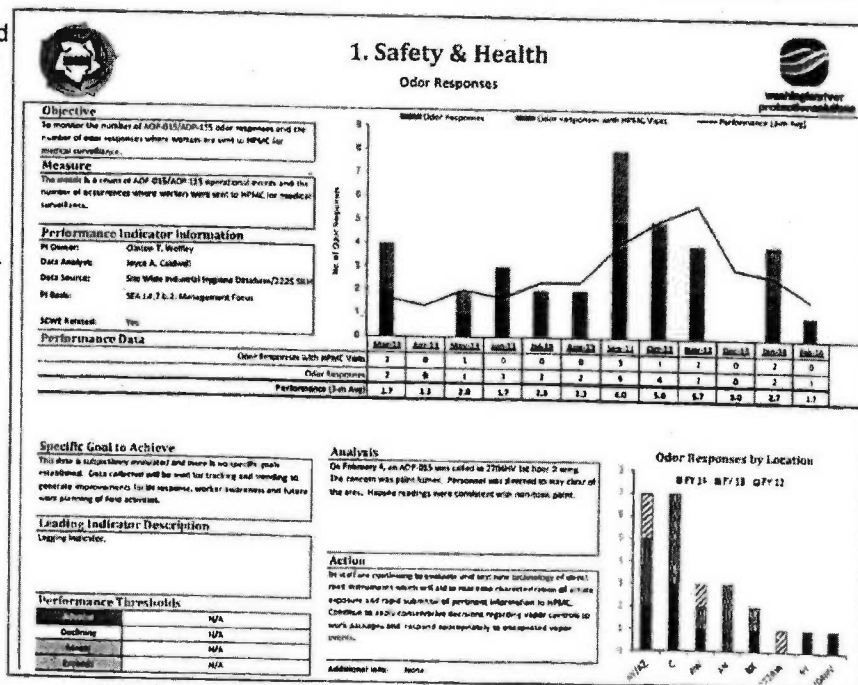
Background Slides

Page 17



Chemical Vapors at Tank Farms

- Odor responses are tracked and analyzed on a monthly basis
- Weather inversions, barometric pressure fluctuations and tank activities contribute to trends associated with odor responses
- Historical sampling and employee efforts have kept the tank farm worker exposure of chemical vapors far below occupational limits
- It is imperative that we continue to use an ALARA (As Low As Reasonably Achievable) approach to minimize worker exposure to chemical vapors



Page 18



Hierarchy of Controls

1. **Elimination of vapor sources**
2. **Engineering Controls** (e.g., active & passive ventilation systems, passive, fugitive emission controls, remote systems, tools & equipment)
3. **Administrative Controls** (e.g., procedures, training, standards, direct-reading instruments, personal sample pumps, areas sample pumps, bag samples, etc.,)
4. **Personal Protective Equipment** (e.g., self-contained breathing apparatus, powered air-purifying or air-purifying respirator with appropriate filters and/or canisters, disposable chemical resistant coveralls, protective footwear and/or chemical-resistant shoe covers, inner/outer chemical-resistant gloves).

Page 19



Engineering Controls

Active Ventilation Systems	Result
Active ventilation of double-shell tanks	Increased dispersion of emissions from a single source
Exhausters in AN, AW, SY farms have increased flow rate, higher stacks	Increased dispersion of emissions, eliminated fugitive emissions around fan motor housings at the old exhausters
Removed exhaust stack rain guards that directed emissions downward into work areas	Increased dispersion of emissions away from work area

Passive Ventilation Systems	Result
Passive HEPA breather filter ventilation on Single Shell Tanks (SSTs)	Dispersion of emissions from primarily a single source
Breather filter stack extension (BX-104, By-108, C-103, U-102, U-103, U-105, U-106, U-108, U-112)	Increased dispersion of emissions from a single source
Radial breather filters on 30-40 tanks, designed housing elevated out of work area	Reduced man-hours near emissions from a single source

Page 20



Engineering Controls

Fugitive Emission Control	Result
Sealing pit covers and instituting a continuing maintenance program	Eliminated fugitive emissions
Pit drain seals redesigned to remain sealed until it's necessary to drain liquids into the tank	Reduced man-hours near emission source during pit work and reduced fugitive emission source
Replaced lines in Continuous Air Monitor (CAM) cabinets with sealed piping	Eliminated fugitive emission source
Valve handles sealed (e.g., rubber gaskets)	Eliminated or reduced fugitive emission source
A constant inlet flow regulating system in AN and AW farms ensures the flammable gas watch list tanks are getting good inlet flow	Reduced headspace and emission concentrations

Page 21



Engineering Controls

Remote Systems	Result
Cameras for single-shell tank 24-hour RCRA surveillance	Eliminated man-hours near emission source

Tools & Equipment	Result
Waste-contacted equipment is flushed with improved spray rings with the flushed material remaining in the waste tank and equipment is completely contained in sleeving	Maintains containment of waste, limiting evaporation and emissions into the work area
Use of long-reach tools when handling Waste-contacted equipment (e.g., jumpers)	Distance from emission source allows for increased dispersion

Page 22



Industrial Hygiene Instrumentation

- Industrial Hygiene uses a wide range of instruments to monitor for chemicals, vapors, gases, particulates, and workplace hazards
- This includes, but is not limited, to:
 - Direct Reading Instruments
 - Personal Sample Pumps
 - Areas Sample Pumps
 - Bag Samples
- Based on the description of the event or scope of work, a detailed evaluation is performed to select the appropriate sampling/monitoring equipment
- Industrial Hygiene professionals and technicians complete detailed training for each instrument and sampling strategy

Page 23



Industrial Hygiene Instrumentation

Instrument	Monitoring/Sampling Capabilities	Strengths	Limitations
TTX Multi-Gas Monitor	Up to six gases, including carbon monoxide, oxygen, ammonia, hydrogen sulfide, and % LEL	<ul style="list-style-type: none">• Continuous reading• Remote sampling & logging capability• Customizable for other gases• Quick response time• Range varies depending on chemical of interest	<ul style="list-style-type: none">• Moderate sensitivity part per million (ppm)• Not suitable in high ammonia areas (>100ppm)
ppbRAE VOC Monitor	Volatile organic compounds (VOCs) with a 10.6 eV lamp	<ul style="list-style-type: none">• Sensitivity is parts per billion• Logging capability• PC compatibility• Hand-held size• Range from 1 ppb to 199 ppm	<ul style="list-style-type: none">• Detects chemicals that ionize at 10.6 eV or less
AreaRAE Multi-gas Monitor	VOCs, combustible gases, oxygen, carbon monoxide and ammonia	<ul style="list-style-type: none">• Remote sampling with real-time data transmission & logging capability• Weatherproof• Customizable for other gases (one to five sensors)• Range varies with chemical of interest	<ul style="list-style-type: none">• Slow response time for ammonia (2.5 minutes)• Moderate sensitivity (ppm)

Page 24



Industrial Hygiene Instrumentation

Instrument	Monitoring & Sampling Capabilities	Strengths	Limitations
MIRAN XL Analyzer	Gases and vapors, including nitrous oxide, ammonia, benzene, xylene, acetonitrile, acetone	<ul style="list-style-type: none"> Continuous reading High repeatability & sensitivity Selectivity and accuracy Linear digital response logging capability Fast response time Variable ranges depending on chemical of interest 	<ul style="list-style-type: none"> Simple set-up Fragile Short battery life Heavy Long Warm-up time (30 minutes) Only detects chemicals with an infrared response
TVA Toxic Vapor Analyzer	Gases and vapors	<ul style="list-style-type: none"> PID and FID capabilities High sensitivity to hydrocarbon vapors Very stable and repeatable results High sensitivity to aromatics, unsaturated hydrocarbons, and chlorinated hydrocarbons (PID) Ability to measure some inorganic gases (PID) 	<ul style="list-style-type: none"> Cumbersome Short battery life Small dynamic range (0.5-2000 ppm PID) Susceptible to interference from water vapor (PID)
RA-915+ Mercury Vapor Analyzer	Mercury vapor	<ul style="list-style-type: none"> Portable Continuous reading Range 2 to 50,000 n g/m³ Minimize interferences 	<ul style="list-style-type: none"> No differentiation for dimethyl mercury

Page 25



Industrial Hygiene Instrumentation

Instrument	Monitoring & Sampling Capabilities	Strengths	Limitations
Colorimetric Tubes (Dräger)	Over 500 gases and vapors	<ul style="list-style-type: none"> Simple operation Low maintenance Accurate, repeatable results Hand-held size Wide range of detection Fast response time 	<ul style="list-style-type: none"> Two-year shelf life for most tubes Broken glass hazard
HAPSITE Gas Chromatograph/Mass Spectrometer	Organic vapors	<ul style="list-style-type: none"> Simple operation Quick turnaround time Field portable capable Accurate identification 	<ul style="list-style-type: none"> Heavy instrument Limited mass range
Personal/Area Air Sampling Pumps	Various chemical constituents	<ul style="list-style-type: none"> Simple operation Representative sampling technique Accurate High repeatability Variable ranges depending on chemical of interest Lightweight & versatile Samples multiple chemicals simultaneously 	<ul style="list-style-type: none"> Lab analysis turnaround time Broken glass hazard Sample media shelf life

Page 26



Personal Protective Equipment (PPE)

- A wide variety of PPE is available for workers and is often required based upon the outcome of the team planning meetings, employee input, and technical hazard review
- Available PPE for chemical vapors includes:
 - Respiratory protection (e.g., self-contained breathing apparatus, powered air-purifying or air-purifying respirator with appropriate filters and/or canisters)
 - Disposable chemical resistant coveralls
 - Protective footwear and/or chemical-resistant shoe covers
 - Inner/outer chemical-resistant gloves
- Employees may voluntarily wear respirators when respiratory protection is not required. Employees must be medically qualified, fit tested (as applicable), and trained to use the respiratory equipment being requested.



Page 27



Sampling/Monitoring and Results

Where can I find sampling results?

- Sampling results (not identifiable by individual) are posted on the Safety & Health website:
<http://toc.rl.gov/rapidweb/safe/index.cfm?PageNum=160>
- Workers who wear a personal sampling apparatus receive a notification letter of their results
- The notification letters are sent out to employees

Page 28

Description

- Over the last week, many of our fellow coworkers experienced and reported symptoms associated with chemical vapors.
- WRPS has a very low threshold for vapor-related incidents and takes incidents of them seriously
- Workers demonstrated proper work practices and followed applicable procedures in their response to the chemical/vapor events
- Numerous corrective actions have been conducted and to help us better the events and how we might be able to do to reduce similar events from occurring in the future

Safety Stand Down AOP-15 Events

March 27, 2014



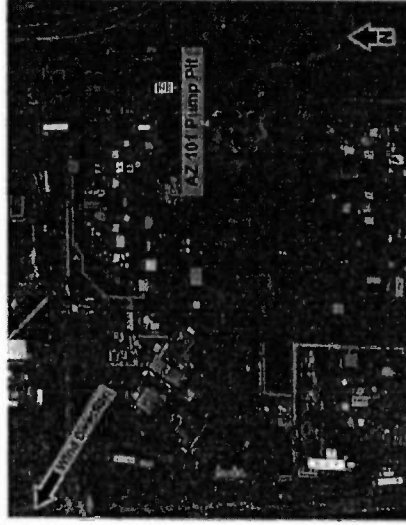
AOP-15 Review

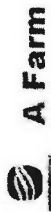
- **Wednesday 3/19/14, Entered AOP-15 AY/AZ Farms**
 - 2 Employees reported concern and were evaluated by medical released to work.
 - Industrial Hygiene sampling and monitoring was conducted in the concerned area to include identification of the potential source. Controls were put into place to reduce future concerns, briefings were conducted with the area team, and additional sampling protocol was implemented with sample pumps installed in the work area.
- **Tuesday 3/25/14, A Farm**
 - 7 WRPS employees and 3 subcontractor employees reported concern and were evaluated by medical, 9 employee released to work and the other employee is undergoing additional medical evaluation.
 - Industrial hygiene sampling and monitoring was conducted in the concerned area.
 - Exited AOP-15 Thursday 3/27/2014.
- **Tuesday 3/25/14, Entered AOP-15 S/SX Farms**
 - 3 Employees reported concern and were evaluated by medical, all released to work.
 - Exited AOP-15 Wednesday 3/26/2014.
- **Wednesday 3/26/14, Entered AOP-15 T Farm**
 - 3 employees reported concern and were evaluated by medical, 2 released to work and other employee is undergoing additional medical evaluation.
 - Industrial hygiene sampling (IHT monitoring) was being conducted during the time of the reported concern. Additional industrial hygiene sampling and analyses is being performed.



AY/AZ Farm

- Workers reported concerns and AOP-15 was entered
- Industrial Hygiene sampling and monitoring was conducted in the concerned area to include identification of the potential source
- Controls were put into place to reduce future incidents, briefings were conducted with the area team, and additional sampling protocol was implemented with sample pumps installed in the work area





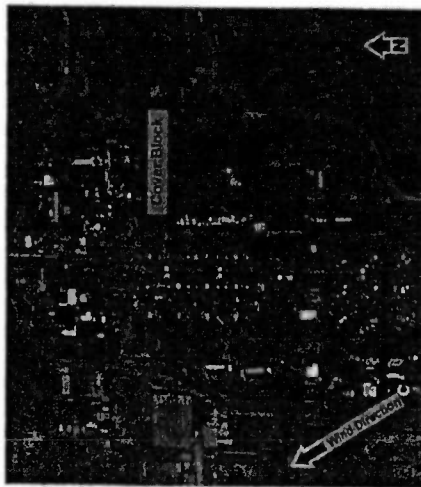
A Farm

- Workers were obtaining sump level readings from A-350
- Workers reported concerns and AOP-15 was entered
- Industrial Hygiene sampling and monitoring was conducted in the concerned area to include identification of the potential source
- Controls were put into place to reduce future incidents, briefings were conducted with the area team, and additional sampling protocol was implemented



S/SX Farm

- Employees were preparing removed cover blocks for repackaging in the RCE lay down area
- AOP-15 entered when employee reported chemical/vapor symptoms
- Industrial Hygiene sampling and monitoring was conducted and results indicated hazards of concern were below the action level





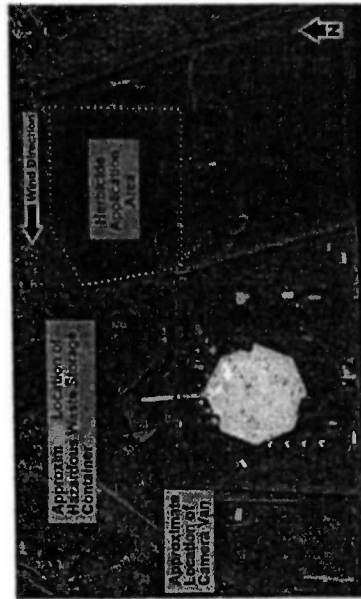
T Farm, March 26, 2014

- Workers were performing video inspection activities at T-201
- AOP-15 was entered and workers reported chemical/vapor related symptoms
- IHT sampling being the conducted during the work activity prior to AOP-15 being entered
- MSA applying herbicide in the vicinity
- Further IH sampling and monitoring indicated that no herbicides or vapor-related compounds above background readings were detected



Summary

- Chemical/Vapor hazards are taken seriously and protocols are in place for appropriate response
- WRPS takes a conservative approach for all chemical/vapor incidents in the AOP response process
- When these events occur, Industrial Hygiene monitoring and sampling is conducted with current technology to evaluate the hazards
- If you have questions or concerns contact your Industrial Hygiene professional or Clint Wolfley



Holloway, Jerry N

From: Holloway, Jerry N
Sent: Tuesday, March 25, 2014 5:09 PM
To: 'Frame, Susannah'; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C
Subject: RE: inquiry from KING 5

Importance: High

Statement on tank farm vapor events

There have been several incidents in the past week where Hanford workers have smelled chemical vapors in the tank farms. In each of these instances, workers responded in accordance with procedures and training to limit exposure.

This morning, two workers were transported to Kadlec Hospital in Richland after complaining of coughing and throat irritation after smelling vapors in one of Hanford's tank farms. Workers in the farm exited the area and moved upwind.

The two workers were examined and released from the hospital and returned to work. Seven additional workers elected to go to the Hanford site medical provider, HPMC Occupational Medical Services, where they were examined and released.

Last Wednesday two workers were checked at HPMC after smelling chemical vapors and were returned to work.

Hanford's underground waste tanks are vented to the atmosphere. Chemicals contained in the waste generate vapors. Washington River Protection Solutions has a comprehensive industrial hygiene program that monitors chemical vapors in the tank farms and in recent years WRPS has taken a number of steps to reduce potential vapor exposures to its workers.

3.25.2014
5:10 p.m.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Frame, Susannah [<mailto:sframe@king5.com>]
Sent: Tuesday, March 25, 2014 4:06 PM
To: Holloway, Jerry N; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C
Subject: inquiry from KING 5

Hi there,

I left voicemails this afternoon and a message for Lori but haven't heard back. Can anyone offer a comment or any additional information on the story about the WRPS workers breathing in vapors (last Tuesday and today) that sent them to the hospital and/or the HPMC? One issue several employees have brought up to me is the lack of monitoring for chemical releases at tank farms. They say there are no monitors in place for this sort of release in tank farms and there is inadequate monitoring and filtering on the "minor" stacks on annuluses.

I look forward to hearing back from someone on this issue.

Thank you,

(b)(6) cell

Susannah Frame

Investigative Reporter

KING Television

206.448.3876



[Susannah's bio](#)

Holloway, Jerry N

From: Holloway, Jerry N
Sent: Wednesday, March 26, 2014 6:06 PM
To: Frame, Susannah (sframe@king5.com)
Cc: Gamache, Lori M; Britton, John C
Subject: Additional Hanford workers sent for vapors-related evaluation today

Three Washington River Protection Solution (WRPS) workers were sent for medical evaluation today after experiencing vapors-related symptoms in Hanford's T Farm. Two were sent to the hospital for further evaluation. The third was taken to the site medical provider for evaluation and subsequently released back to work.

Separately, three non-WRPS workers reported possible vapors-related symptoms today after working yesterday near AY/AZ Farms, where other workers were evacuated Tuesday. All three were taken to the site medical provider; two were released back to work. Evaluation of the third is pending.

Data collection and analysis is underway in the affected farms to understand what happened and what might be done to reduce the likelihood of future occurrences.

The presence of chemical vapors is one of the hazards of tank farm operations, and WRPS takes a conservative approach to dealing with its risks—one designed to minimize potential worker exposure and provide an appropriate medical response, when necessary.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

- This afternoon, an additional worker was sent to the site medical provider for vapor-related medical evaluation.

Rob Roxburgh
WRPS External Affairs
(509) 376-5188
Washington River Protection Solutions
Contractor to the U.S. Department of Energy

From: [Henderson, Robert J.](#)
Subject: UPDATE: Recent WRPS actions related to tank-vapor concerns
Date: Thursday, March 27, 2014 4:47:21 PM

The worker referenced below was evaluated at the site medical provider and released for return to work late this afternoon.

Rob Roxburgh
WRPS External Affairs
(509) 376-5188
Washington River Protection Solutions
Contractor to the U.S. Department of Energy
www.wrls.com

From: Roudburgh, Robert T
Sent: Thursday, March 27, 2014 3:43 PM
Subject: Recent WRPS actions related to tank-vapor concerns

March 27, 2014

Recent WRPS actions related to tank-vapor concerns

- Washington River Protection Solutions (WRPS) managers met with employees Thursday in multiple briefings across the project to discuss recent actions aimed at identifying and mitigating potential sources of vapors at the Hanford tank farms.
- Investigations in several tank farms have identified potential sources of vapor emissions.
 - In one farm, field investigations identified a cut in the insulation surrounding a pump pit as one potential source of vapor emissions. The cut was sealed with foam and the area was re-evaluated. Instruments no longer detect elevated levels of potential vapor-causing compounds in the local area.
 - In another tank farm, investigations identified liquid in old, unused equipment that had been staged for disposal as a potential source of emissions. It has been cordoned off as a Vapor Control Zone. The liquid is being sampled and analyzed.
 - Evaluations in a third farm where vapors-related symptoms were experienced found no detectable measurement of vapors-causing compounds.
- Investigations are ongoing to identify other potential sources of vapors in the tank farms.
- Employees are encouraged to use additional protective gear—including respiratory devices—when the potential for chemical vapors exists.
- In addition to these more recent activities, a joint management/employee Industrial Hygiene Technical Panel meets regularly to monitor efforts and help solve chemical vapor issues and concerns. Together, the team works to identify potential hazards and develop needed controls.
- These efforts have allowed WRPS to keep tank farm worker exposure to chemical

March 31, 2014

WRPS workers checked, released following chemical vapors exposure

Late this morning, six Washington River Protection Solution (WRPS) workers were sent to the Hanford Site medical provider for evaluation after experiencing chemical vapors-related symptoms. All six were released to return to work.

The workers were not in one of Hanford's tank farms. They were working in the 200-West Area near the SY Tank Farm when they smelled a chemical odor. The workers reported throat and nasal irritation and headaches. As a precaution, WRPS management requested the workers receive a medical evaluation.

Air samples collected by industrial hygiene technicians are being analyzed. Further efforts will be made to determine the potential source of the vapors.

Holloway, Jerry N

From: Holloway, Jerry N
Sent: Tuesday, April 01, 2014 2:55 PM
To: Britton, John C
Subject: media update

Update on WRPS vapors incidents and follow-up actions

4.1.14

- Since March 19, 25 WRPS employees/subcontractors have been sent for medical evaluations after either reporting a concern or unusual odors and/or experiencing potential vapors-related symptoms in or near the Hanford tank farms. This includes a worker who had no symptoms, but who had worked in one of the affected areas last week, requesting and receiving a medical evaluation today. The worker was released and returned to work.
- All of the employees/subcontractors have been evaluated by medical professionals at either the site medical provider or Kadlec Regional Medical Center and released for return to work.
- While tank farm worker exposure to chemical vapors remains far below applicable occupational limits, the number of recent incidents within such a short period is of special concern.
- WRPS has taken and is continuing to take several actions to prevent or mitigate further instances where employees might suffer physical symptoms.
- Investigations in several tank farms have identified potential sources of vapor emissions and taken corrective actions.
 - In one farm, field investigations identified a cut in the insulation surrounding a pump pit as one potential source of vapor emissions. The cut was sealed with foam and the area was re-evaluated. Instruments no longer detect elevated levels of potential vapor-causing compounds in the local area, but the farm complex remains under restricted access.
 - In another tank farm, investigations identified liquid in old, unused equipment that had been staged for disposal as a potential source of emissions. The area around the equipment has been cordoned off as a Vapor Control Zone.
 - Evaluations in a third farm where vapors-related symptoms were experienced found no detectable measurement of vapors-causing compounds, but may have been linked to an herbicide application.
- A senior project manager has been named to oversee any further investigations and corrective actions that might be necessary.
- Additional engineered controls, sampling/analysis equipment and procedure changes are being evaluated.

Jerry Holloway
External Affairs Manager

Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

Project: EDCO, JETL C
Subject: WRPS employees on tank farm vapors
Date: Thursday, April 03, 2014 4:01:27 PM

Update on WRPS vapors incidents and follow-up actions

4.3.14

- Informational briefings were held today with WRPS and Mission Support Alliance employees to review recent vapor events in or near the Hanford tank farms, new actions taken to deal with known vapor sources and other planned or potential actions to further reduce worker exposure to chemical vapors.
- It was announced that work will resume in the A Farm Complex with employees entering those areas required to wear respiratory gear while further evaluation of the farms continue. Workers in those farms will be involved in determining other follow-up actions, including how long the requirement for respiratory gear might continue.
- Since March 19, 26 WRPS or Hanford employees/subcontractors have been sent for medical evaluations after either reporting a concern or unusual odors and/or experiencing potential vapors-related symptoms in or near the Hanford tank farms. A non-WRPS employee today requested and received a medical evaluation related to an earlier vapor incident. The worker was released and returned to work.

From: Holloway, Jerry R
To: Ernest, Susan@all-chemicals.com; Walker, Bud
Cc: Catherine, Lou@all-chemicals.com
Subject: Response to KING-5 questions from 4.4.14
Date: Tuesday, April 08, 2014 2:17:00 PM

Response to KING-5 questions from 4.4.14

Independent medical professionals, not WRPS, make the determination as to whether workers should be returned to work. Workers who report chemical vapors symptoms or who voluntarily seek medical aid are required to have an independent medical evaluation before they are allowed to return to work. The initial independent medical reviews cleared all of the 26 workers potentially affected by vapors. Workers also have the option to seek additional medical treatment by a physician of their choice at any time. WRPS is not pressuring workers to return to work and is not involved in the determination of when an employee is medically released to work.

Worker safety is a core value for WRPS throughout all of its operations. A job hazard analysis is completed to identify potential hazards and determine what steps are needed to eliminate or reduce risks. The requirement for wearing any Personal Protective Equipment, including respiratory protection, is determined through the job hazard analysis process. The majority of the recent chemical vapor issues identified occurred at the A-Farm complex. Respiratory protection equipment is now required in the A-Farm until further evaluation of worker safety and health controls has been conducted. Based on evaluations of the potential hazards present in the other farms, the use of respiratory protection remains voluntary, unless required in what are known as Vapor Control Zones, where a higher level of respiratory hazard has been identified. Respiratory protection is provided to workers who want the added protection even if not required to safely perform the duties. In the case of chemical vapors, tank farm worker exposure remains far below applicable occupational levels for chemicals of potential concern.

WRPS uses real-time monitoring instruments to measure area chemical vapor concentrations in locations of known concern such as C-Farm. WRPS also has real-time hand-held instruments that industrial health technicians use to monitor the immediate work area and breathing zone of employees on jobs where job hazard analyses identify the potential for chemical vapors. An example of this would be working on a system that is directly connected to a tank. Some employees also wear air-sampling devices to determine their personal exposures to chemicals of concern. The samples are analyzed and the results reported to the employee. WRPS is researching other available instrumentation and broader application of currently used real-time monitors to improve detection capabilities.

Exhaust stack heights have been increased in a number of tank farms and other extensions are planned to further minimize worker vapor exposure.

Holloway, Jerry N

From: Holloway, Jerry N
Sent: Monday, April 28, 2014 4:55 PM
To: 'Frame, Susannah'; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C; Walker, Russ
Subject: RE: today's incident in C farm

Two WRPS employees were sent to the site medical provider for evaluation today for potential exposure to chemical vapors in Hanford's C Farm. Seven workers were in the farm. Tank waste retrieval operations were stopped and the farm was immediately evacuated as a precaution about 1 p.m. Both employees were cleared to return to work late Monday afternoon. Access to C Farm remains restricted at this time.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Frame, Susannah [mailto:sframe@king5.com]
Sent: Monday, April 28, 2014 2:33 PM
To: Holloway, Jerry N; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C; Walker, Russ
Subject: today's incident in C farm

Hello,

(b)(6) Would anyone like to comment on who experienced symptoms (burning lung sensation) after exposure to vapors today in C farm?

Thanks,
Susannah

Susannah Frame
Investigative Reporter
KING Television
206.448.3876



[Susannah's bio](#)

News from Savannah River National Laboratory

A U.S. DEPARTMENT OF ENERGY NATIONAL LABORATORY • OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS, LLC

Media Contact: Will Callicott
(803) 725-3786
Will.callicott@srnl.doe.gov

Savannah River National Laboratory asked to lead independent expert review of chemical vapors and worker protection at DOE's Hanford waste tanks

AIKEN, SC (April 25, 2014) -- Washington River Protection Solutions (WRPS) has asked Savannah River National Laboratory (SRNL) to establish and oversee a panel of external experts to examine hazardous chemical vapors management and related worker protection measures at the U.S. Department of Energy's Hanford nuclear waste cleanup site in Washington state.

WRPS is the DOE contractor responsible for the management and cleanup of millions of gallons of nuclear and hazardous waste currently stored in underground tanks at Hanford. SRNL is a multiprogram National Laboratory providing scientific and technical expertise to support DOE's Environmental Management program.

The request for the external review and accompanying recommendations comes after more than two dozen workers received medical attention this spring following apparent on-the-job exposures to vapors emanating from the waste storage tanks. WRPS has requested that this new study have an enhanced scope for analysis and recommendation beyond that of the two previous technical reviews of Hanford tank waste vapor policies and issues in 2008 and 2010.

"While a number of steps have been taken and improvements made in recent years to address chemical vapors hazards, the latest set of exposures shows that more work needs to be done. This new review, with its broad scope and the involvement of recognized experts, will make a difference in better protecting Hanford workers from future chemical vapor exposures," said WRPS President and Project Manager Dave Olson.

Features of the panel's work are expected to include:

- A review of the last four years of relevant technical data gathered as part of the WRPS industrial hygiene program and actions taken as a result;



Savannah River National Laboratory
OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS

A U.S. DEPARTMENT OF ENERGY NATIONAL LABORATORY • AIKEN, SC USA 29808 • SRNL.DOE.GOV

News from Savannah River National Laboratory

A U.S. DEPARTMENT OF ENERGY NATIONAL LABORATORY • OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS, LLC

- An overall examination of both the adequacy and implementation of present policies, protections, practices and responses to potential vapor exposures, particularly in light of the new exposures;
- A review of currently used and additional available technology that can provide protection against inhalation or other contact with tank vapors, including the use, effectiveness, and availability of personal protective equipment;
- A look at how to improve data collection, retention and analysis to assist in developing workforce and individual worker protection and health evaluation;
- A review of the response to past recommendations and their implementation and potential improvements, and
- Methods to institutionalize the knowledge and ongoing application of best practices in vapors protection and monitoring.

“SRNL’s role is to ensure that the best experts are brought in and given full latitude to ask hard questions and make their recommendations,” said Dr. Terry Michalske, Director of SRNL. “This is one more important way that the National Lab can provide relevant scientific and technical assistance for the safe execution of a critical DOE environmental management mission.”

SRNL will manage the interface of the panel with WRPS and will ensure that its report is made public. The final scope and schedule for the review will be developed in consultation with the expert panel. Any recommendations are entirely the domain of the expert panel.

SRNS2014-214



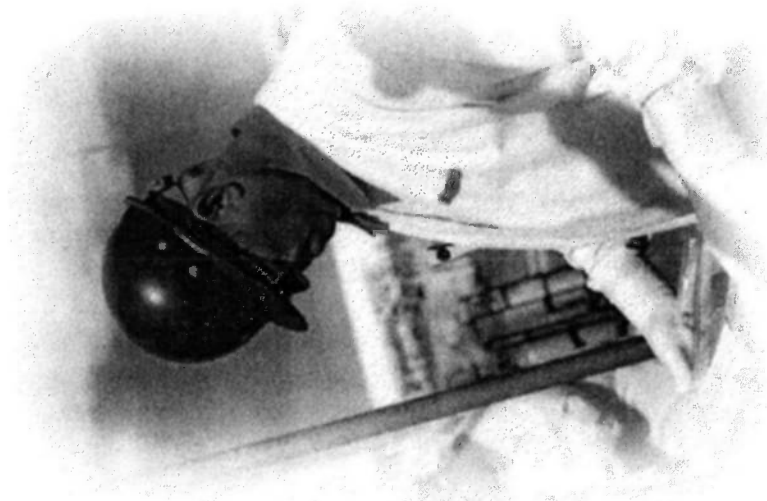
Savannah River National Laboratory

OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS

A U.S. DEPARTMENT OF ENERGY NATIONAL LABORATORY • AIKEN, SC USA 29808 • SRNL.DOE.GOV

Protecting workers from chemical vapors

April 3, 2014

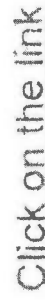




Over the past two weeks, 25 tank farm workers have received medical evaluations after reporting a concern or experiencing physical symptoms from exposure to chemical vapors.

The purpose of this meeting is:

1. Communicate what has been done and what actions are planned
2. Answer questions raised at last week's safety briefings.

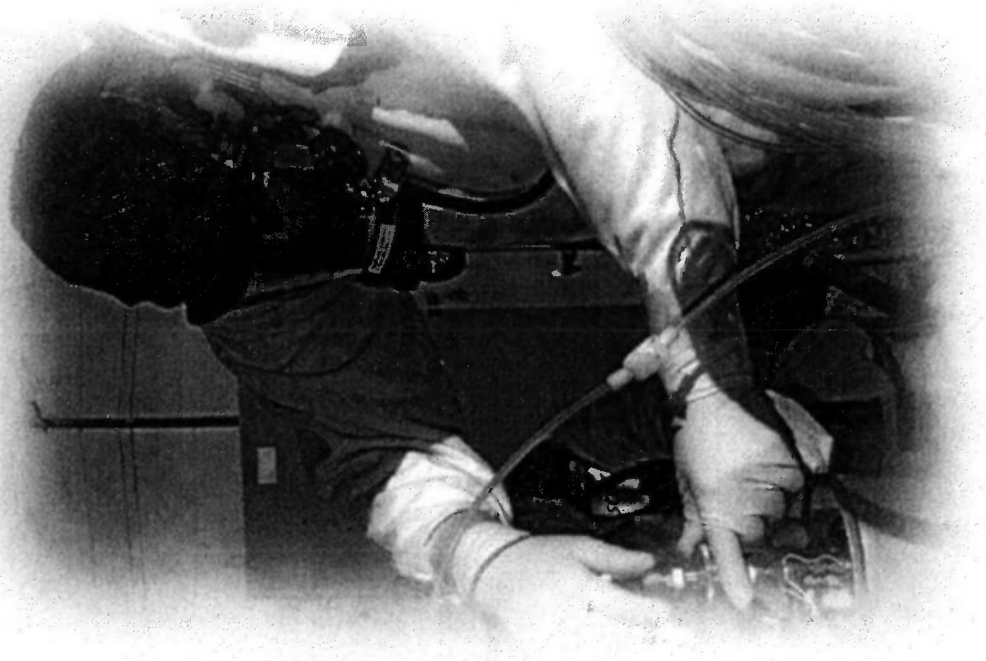


Questions and Answers - Chemical Vapors



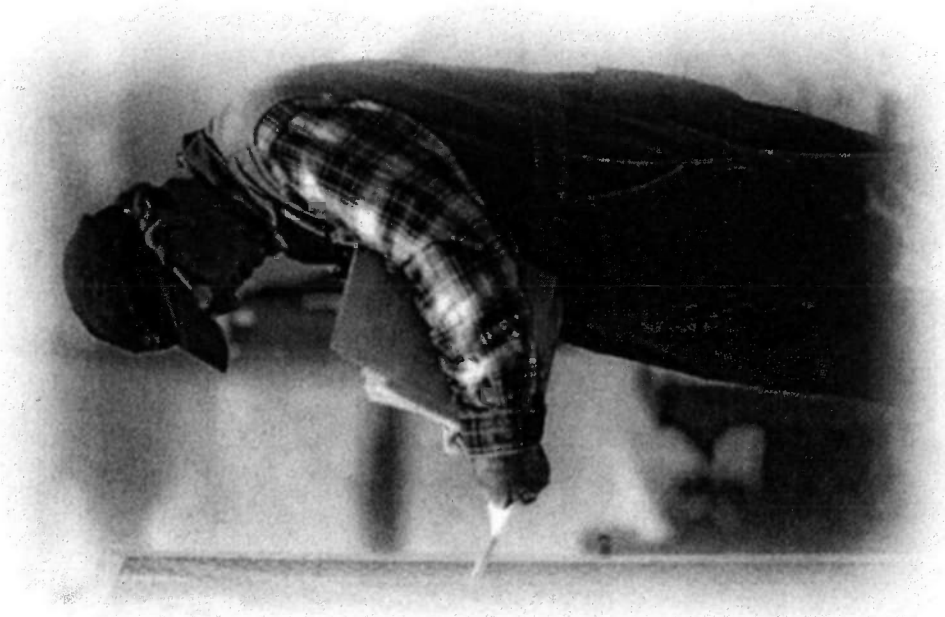
Employee Involvement & Management Commitment

- Employee involvement is an essential part of planning and performing work safely at WRPS – we need and value your input
- Tell us if we are missing any important issues
- If you have further questions or concerns about chemical vapors or odors, contact the Safety & Health Department by:
 - Sending an email to IHHotline@rhl.gov or
 - Contact your project Industrial Hygienist



Current Status

- Since March 19, 25 WRPS and subcontractor employees have reported chemical-vapor concerns and/or exposures
 - received medical evaluations at Kadlec Hospital or HPMC
- All employees were cleared for return to work through HPMC; stop work in place for employees waiting lab results
- Implementing corrective actions
- Tank farm areas involved: A complex (A, AX, AY, AZ), S/SX and T; an area outside of U Farm
 - A-Complex has majority of AOP-015 responses and odors





Washington River
Protection Solutions

Recent Chemical Vapor Events

Date	Location	Basis of Investigation	Employees Impacted	Sample Results
3/19/2014	AY/AZ Farms	Employees reported irritation symptoms and odors of a "copper- like metallic taste in mouth."	2 WRPS employees	No compounds detected above background levels.
3/25/2014	A/AX/AY/AZ Farms	Employees reported odors and displayed irritation symptoms such as "metallic taste in mouth."	7 WRPS employees 2 subcontractor employees	A -106 pump pit source identified; foam repaired on pump pit.
	S/SX Farms	Employees reported irritation symptoms and odors such as "ammonia, rotten egg, and sulfur-like."	3 WRPS employees	No compounds detected above background levels. Potential source identified around cover block plastic cover and access restricted.
3/26/2014	T Farm	Employees reported irritation symptoms and odors that resembled "household paint or glue."	3 WRPS employees 1 additional worker sent to HPMC on 4/1/14	No compounds detected above background levels. (Potential source identified as herbicide application)
3/27/2014	A Farm	Employees reported odors and irritation symptoms such as "metallic taste in mouth."	1 employee	No compounds detected above background levels.
3/31/2014	South of U Farm, near 202-U	Employees reported odors similar to "herbicide/pesticide."	6 WRPS employees	No compounds detected above background levels. (Potential source identified as herbicide application)

Abnormal Operating Procedure (AOP) - 015

- AOP-015 is a Abnormal Operating Procedure for response to reported odors or unexpected changes to vapor conditions
- AOP-015 does not need to be entered if the odor source is readily apparent, such as vehicle exhaust, septic systems or animal odors
- There are two entry requirements -- Odors are present and meet any of the following conditions:
 1. Odors have caused symptoms of exposure (e.g., headaches, irritation of the skin, eyes, nose, or lungs, nausea, difficulty breathing)
 2. A stronger-than-normal odor is detected by multiple personnel outside of areas where potential or actual vapor concerns are expected

Note: This procedure applies to WRPS personnel and subcontractors doing work in 200 East Area, 200 West Area, and the 600 Area controlled by WRPS and equipment in these areas. (It does not apply to WRPS personnel and subcontractors doing work at the 222-S Laboratory complex.)

 Abnormal Operating Procedure (AOP) Index Tank Farms Technical Procedures	
TF-AOP-001	Relocation or Release of Personnel
TF-AOP-002	Response to Loss of Compressed Air
TF-AOP-005	Response to Unexpected Tank Temperature, Level, or Flammable Gas Increase
TF-AOP-007	Response to Hanford Site Range Fire
TF-AOP-008	Response to High Winds and Dust Storms
TF-AOP-010	Response to Flooding Conditions
TF-AOP-011	Response to Chemical and/or Radiological Events
TF-AOP-012	Response to Unplanned Loss of Electrical Power
TF-AOP-013	Response to Volcanic Ash Fall and Snowfall
TF-AOP-014	Response to Lightning
TF-AOP-015	Response to Reported Odors or Unexpected Changes to Vapor Conditions
TF-AOP-016	Response to Criticality Prevention Specification Nonconformance

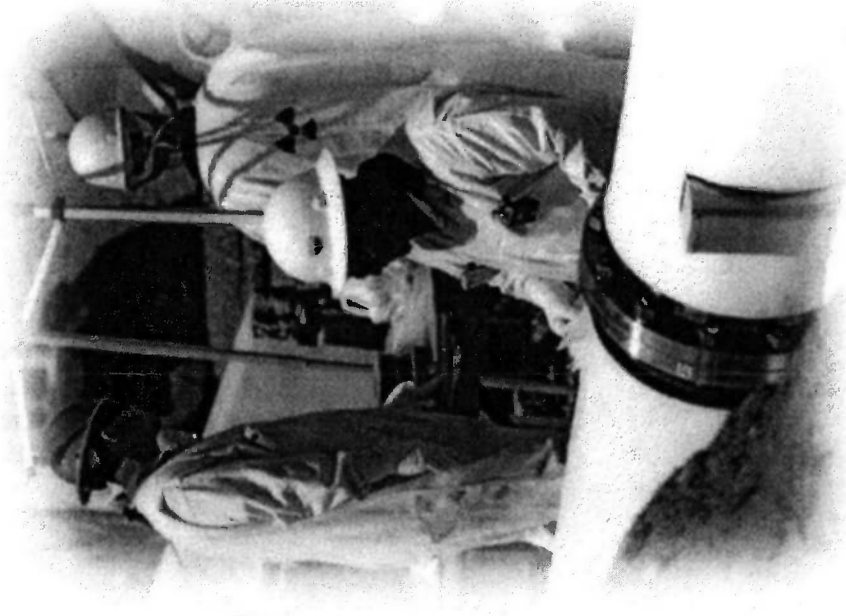
Side 1

 Abnormal Operating Procedure (AOP) Index Tank Farms Technical Procedures (Continued)	
TF-AOP-017	Response to Winter Hazards (Snow, Freezing Rain, and Freezing Fog)
TF-AOP-018	Response to Electrical, Water, Air, or Pressurized Gas Cylinders High Energy Releases
TF-AOP-019	Response to Loss of Radio Communication
TF-AOP-020	Response for Placing Personnel and Equipment in a Safe Condition
TF-AOP-021	Response to Tank Farm Ventilation Upset
222-S Lab Technical Procedures	
222S-AOP-103	Response to Personnel Contamination
222S-AOP-115	Response to Reported Odors or Spill Events
222S-AOP-118	Response to Release or Loss of Utilities

Side 2

AOP 15 Immediate Actions

- When entering an AOP-015, announcements are made over radio channel(s) and SOEN notification is distributed that includes:
 - location and instructions for affected personnel
 - evacuation of the affected area
 - Employees are moved to an upwind location, normally defined as the tank farm boundary
- Notify other personnel in adjacent work areas who may not receive radio communication or SOEN (e.g., matrixed employees, subcontractors, vendors, etc.)
- Minimize personnel exposure by preventing inadvertent entry into hazardous areas
- Employees who exhibit symptoms report for medical evaluation; medical evaluation also offered to employees without symptoms





Immediate Responses for AOP-15

- If an odor source is suspected to be from tank waste, Industrial Hygiene staff implement the Tank Waste Odor Sample Plan, specific to the area of concern.
 - Engineered controls are reviewed, known emission sources checked, grab bag samples are taken from area, and direct-reading instruments are deployed to identify potential source points
- IH monitoring focuses on Chemicals of Potential Concern (COPCs)

TANK VAPOR INFORMATION SHEET			Washington River Protection Solutions		TMS Number TY18-AV-AR-001 Expiration Date: 35/29/2034	
Location: AV and AZ Tanks			Emission Points		Description	
COPC	Chemicals of Potential Concern for Monitoring	OEL	EP	N/A	No permanent emission points identified during active ventilation	
	Asbestos	25 ppm				
	1,3 Butadiene	1 ppm				
	Polys	1 ppb				
	Hexachlorobenzene	0.1 ppb				
	Non-halogenated aromatic hydrocarbons	0.1 ppb				
	Non-halogenated aliphatic aromatic hydrocarbons	0.1 ppb				
	Mercury	25 µg/m³				
COPCs with Personal Samples ≥ 50% OEL						
None						
Similar Exposure Groups			Min Required RPE	Mask	Cartridge	Changeout
SEG	Description	INSP	Mask	Cartridge	Voluntary RPE	Cartridge
1	General farm entry in VZ zone	EABO-1103	None	N/A	Refer to SEG 3 Min Required Voluntary RPE	Refer to SEG 3 Min Required Voluntary RPE
2	Static conditions, open path, or intensive activities with associated high level of physical exertion; where ventilation monitoring requires presence	EABO-11050	None	N/A	Refer to SEG 3 Min Required Voluntary RPE	Refer to SEG 3 Min Required Voluntary RPE
3	Non-enclosed intensive activities where ventilation does not maintain negative pressure	EABO-11100	FFAPR	MSA Merox 3M 60929 Scot 7422-7B	Refer to SEG 3 Min Required Voluntary RPE	Refer to SEG 3 Min Required Voluntary RPE
4	Non-enclosed conditions (e.g. ventilation dependent, AOP 21)	EABO-11037	FFAPR	MSA Merox 3M 60929 Scot 7422-7B	N/A	N/A

A-8004-003 (REV 8)

Immediate Actions Taken

Last week:

- Sealed A-106 source of emissions (AOP-015 for A-Farm on 3/25/2014)
- Implemented restricted access at S/SX Farm for identified source
- Reemphasized the voluntary use of higher levels of PPE
- Conducted Safety Stand Down
- Placed A-Complex farms in restricted access for further evaluation
- Installed additional sampling instrumentation in A-Complex

Monday:

- Continued restricted access for A-Complex farms
- Established project manager to implement chemical-vapor response plan – Doug Greenwell
- Require Executive Safety Review Board (ESRB) approval to exit out of AOP-015 for A-Complex
- Reconstituting the Chemical Vapor Solutions Team (CVST), including representation from bargaining-unit employees, industrial hygiene professionals, and line management

Immediate Actions

This week:

- Begin to evaluate Abnormal Operating Procedure (AOP-015) and response team actions, personal protective equipment (e.g., use of APR/PAPRs with appropriate cartridges), and IH sampling and monitoring strategies
- Implemented a new Red Arrow for A-Complex farms
 - At a minimum, full-faced PRs with appropriate cartridges are required for A-Complex work activities
 - Work activities are to be reviewed and processed through the Work Control process (IH review)
 - These controls are to be put in place while long-term actions are finalized and implemented
- Perform IH monitoring for A-Complex focused on known sources, vapor control zones, emission points, and identify any additional sources

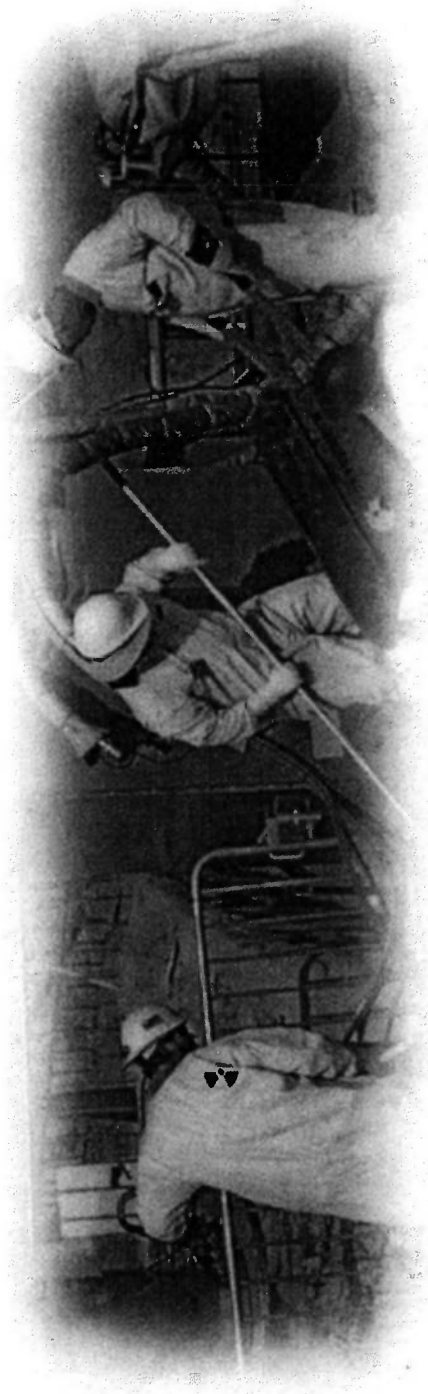


washington river
protectionsolutions

Immediate Actions (continued)

This week:

- Hold event investigations for AOP-015 events
- Initiate a common-cause PER to review all recent vapor incidents
- Posted the questions and answers raised by the workforce at the 3/27/2014 safety meetings; to be periodically updated
- Began to inform other Hanford contractors of current status of chemical vapor concerns and actions

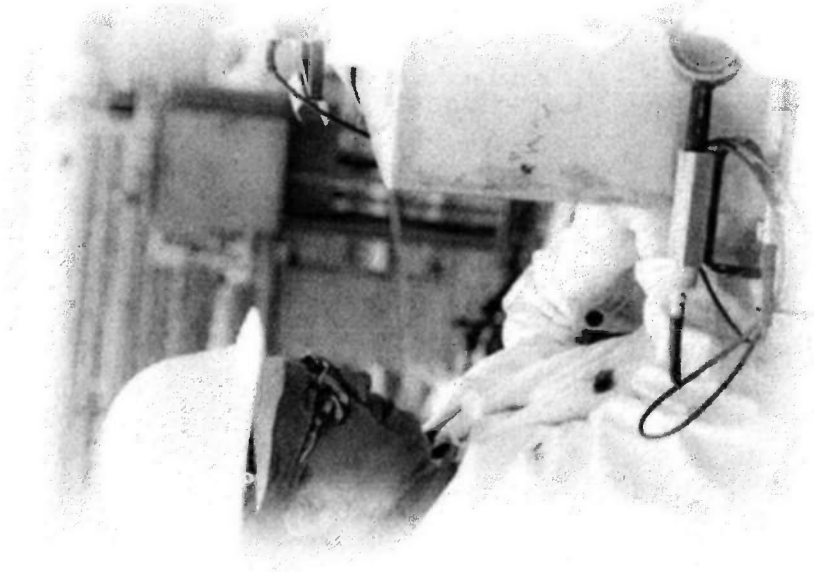




washington river
protection solutions

Longer-Term Actions

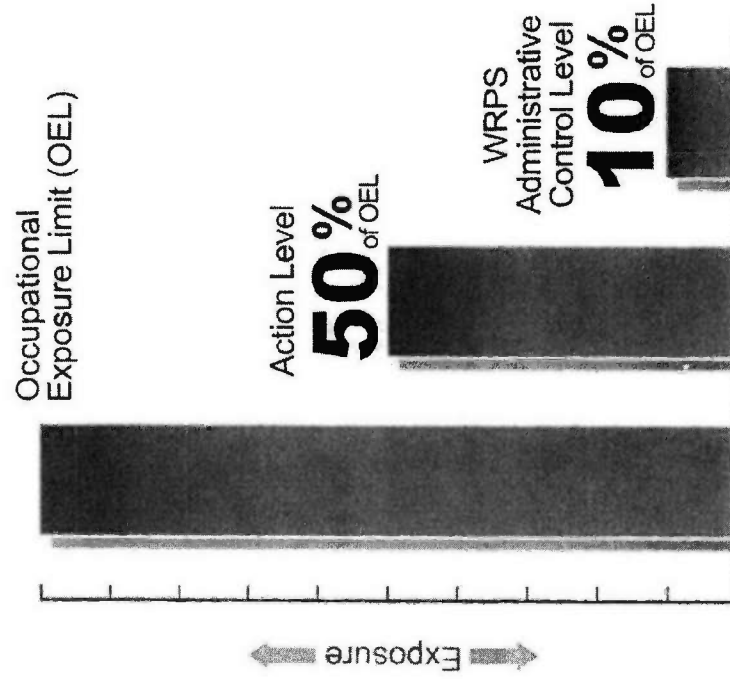
- Implement improved personal sampling pilot
- Perform external independent review of Industrial Hygiene Program as follow-up to 2010 review
- Evaluate other farms with reported concerns of chemical vapor/odors
- Identify additional engineered controls to minimize vapor exposures to employees
- Evaluate purchasing upgraded sampling/analysis equipment
- Empower the Chemical Vapor Solutions Team (CVST) to review and evaluate corrective actions
- Improve communication of sample results and exposures
- Replace damaged windsocks



Occupational Exposure Limits (OELs)

Conservative Approach to Exposure

- Occupational Exposure Limits (OELs) are set to protect workers and prevent long-term health effects
- All COPCs at tank farms have OELs
- WRPS instituted Administrative Control Levels (ACLs) for COPCs at 10% of the OELs

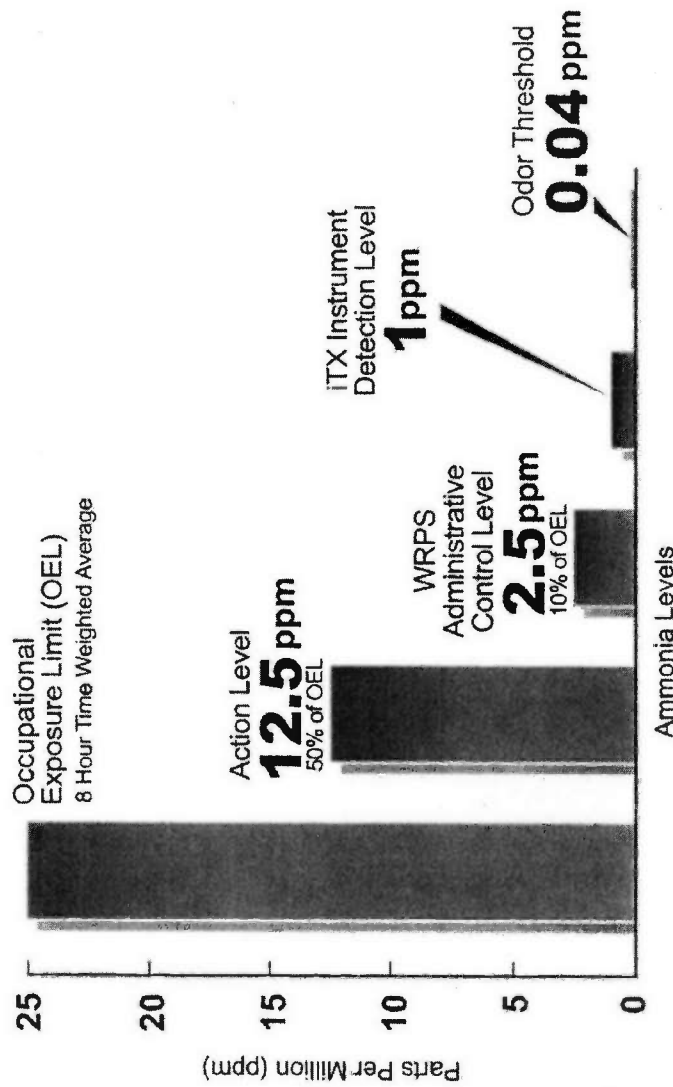


The majority of all sample results indicate levels below the ACL (10% of the established OEL), which means – there is room for improvement

Ammonia example

- The most sensitive individuals can detect ammonia concentrations at 0.04 ppm
- This is well below the concentration that presents health hazards
- All odors above what is expected need to be reported to ensure that proper response and current controls can be evaluated per AOP-15

Ammonia



Limitations

- Representative sampling
 - Timely response to chemical vapor/odor concerns
 - IH, RadCon and response teams work diligently to respond as quickly and safely as possible
 - Accuracy of sampling/monitoring location versus reported area
 - It's imperative that detailed descriptions of concerned area are reported
- Instrumentation limitations
 - All COPCs have OELs
 - Some instruments measure only specific chemicals, vapors, gases, volatile organic compounds, or particulates
- Environmental conditions
 - Weather inversions, barometric pressure fluctuations and tank activities (mixing, transfers, etc.) contribute to trends associated with odor responses

The chemical-vapors hazard in the tank farms cannot be eliminated; we are taking steps to minimize the risk.

Summary

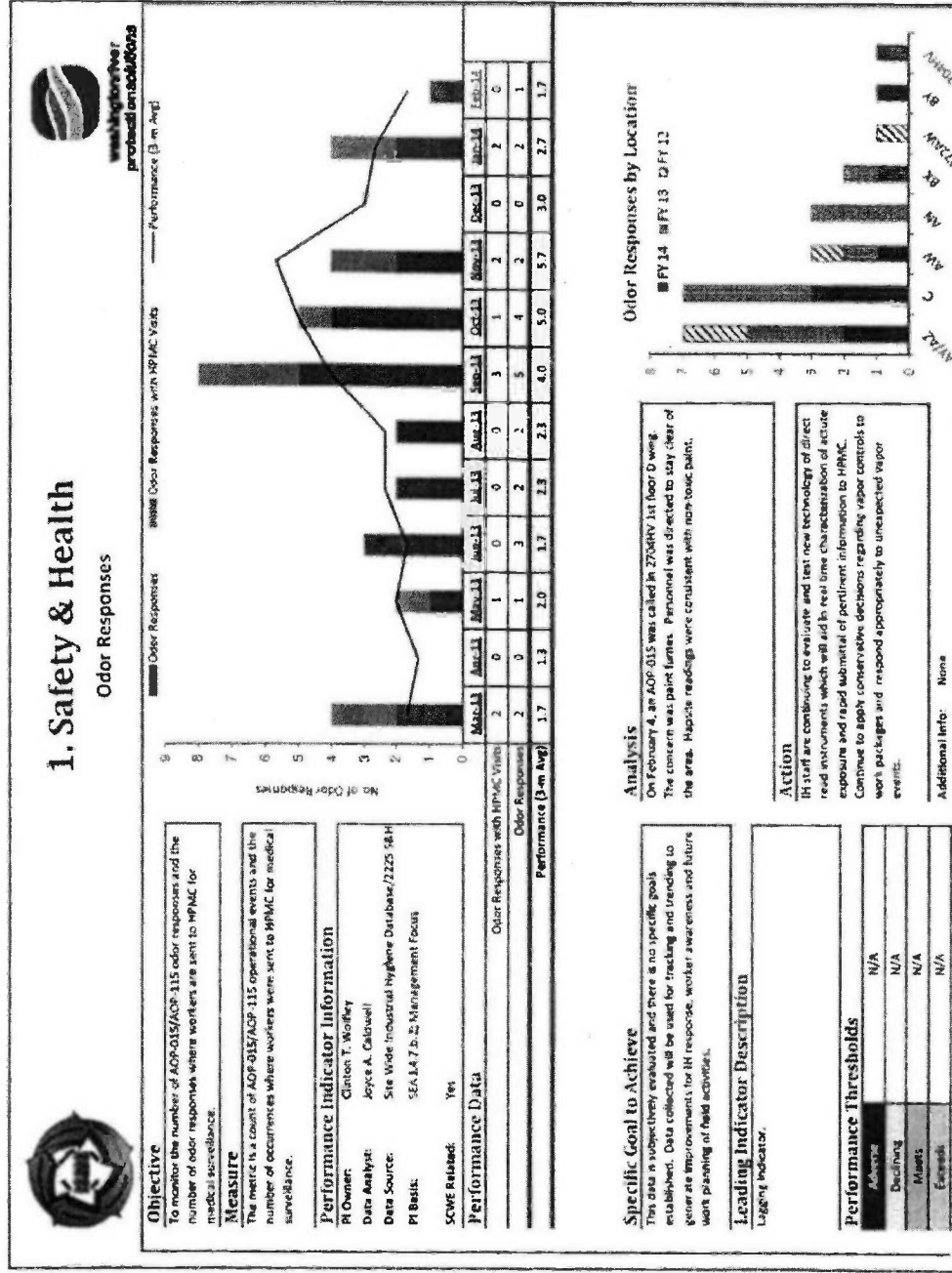
- WRPS is taking a prudent and responsible approach to all chemical-vapor incidents
- Management and employees will work together to reduce exposures and improve response to chemical vapor incidents
- It is important to report odors consistent with AOP-15, follow established procedures, and seek medical evaluation, when necessary
- Conduct additional communications as additional information is obtained
- If you have questions or concerns about chemical vapors, please contact the Safety & Health Department by:
 - Submit a question by sending an email to IHHotline@rl.gov or
 - Contact your project Industrial Hygienist
- Questions and answers will be added to the IH website



Background Slides

Chemical Vapors at Tank Farms

- Odor responses are tracked and analyzed on a monthly basis
- Weather inversions, barometric pressure fluctuations and tank activities contribute to trends associated with odor responses
- Historical sampling and employee efforts have kept the tank farm worker exposure of chemical vapors far below occupational limits
- It is imperative that we continue to use an ALARA (As Low As Reasonably Achievable) approach to minimize worker exposure to chemical vapors



Hierarchy of Controls

1. **Elimination of vapor sources**
2. **Engineering Controls** (e.g., active & passive ventilation systems, passive, fugitive emission controls, remote systems, tools & equipment)
3. **Administrative Controls** (e.g., procedures, training, standards, direct-reading instruments, personal sample pumps, areas sample pumps, bag samples, etc.,)
4. **Personal Protective Equipment** (e.g., self-contained breathing apparatus, powered air-purifying or air-purifying respirator with appropriate filters and/or canisters, disposable chemical resistant coveralls, protective footwear and/or chemical-resistant shoe covers, inner/outer chemical-resistant gloves).



Engineering Controls

Active Ventilation Systems		Result
Active ventilation of double-shell tanks		Increased dispersion of emissions from a single source
Exhausters in AN, AW, SY farms have increased flow rate, higher stacks		Increased dispersion of emissions, eliminated fugitive emissions around fan motor housings at the old exhausters
Removed exhaust stack rain guards that directed emissions downward into work areas		Increased dispersion of emissions away from work area
Passive Ventilation Systems		Result
Passive HEPA breather filter ventilation on Single Shell Tanks (SSTs)		Dispersion of emissions from primarily a single source
Breather filter stack extension (BX-104, By-108, C-103, U-102, U-103, U-105, U-106, U-108, U-112)		Increased dispersion of emissions from a single source
Radial breather filters on 30-40 tanks, designed housing elevated out of work area		Reduced man-hours near emissions from a single source



Engineering Controls

Fugitive Emission Control		Result
Sealing pit covers and instituting a continuing maintenance program		Eliminated fugitive emissions
Pit drain seals redesigned to remain sealed until it's necessary to drain liquids into the tank		Reduced man-hours near emission source during pit work and reduced fugitive emission source
Replaced lines in Continuous Air Monitor (CAM) cabinets with sealed piping		Eliminated fugitive emission source
Valve handles sealed (e.g., rubber gaskets)		Eliminated or reduced fugitive emission source
A constant inlet flow regulating system in AN and AW farms ensures the flammable-gas watch list tanks are getting good inlet flow		Reduced headspace and emission concentrations



Engineering Controls

Remote Systems	Result
Cameras for single-shell tank 24-hour RCRA surveillance	Eliminated man-hours near emission source

Tools & Equipment	Result
Waste-contacted equipment is flushed with improved spray rings with the flushed material remaining in the waste tank and equipment is completely contained in sleeving	Maintains containment of waste, limiting evaporation and emissions into the work area
Use of long-reach tools when handling Waste-contacted equipment (e.g., jumpers)	Distance from emission source allows for increased dispersion

Industrial Hygiene Instrumentation

- Industrial Hygiene uses a wide range of instruments to monitor for chemicals, vapors, gases, particulates, and workplace hazards
- This includes, but is not limited, to:
 - Direct Reading Instruments
 - Personal Sample Pumps
 - Areas Sample Pumps
 - Bag Samples
- Based on the description of the event or scope of work, a detailed evaluation is performed to select the appropriate sampling/monitoring equipment
- Industrial Hygiene professionals and technicians complete detailed training for each instrument and sampling strategy

Industrial Hygiene Instrumentation

Instrument	Monitoring/Sampling Capabilities	Strengths	Limitations
ITX Multi-Gas Monitor	Up to six gases, including carbon monoxide, oxygen, ammonia, hydrogen sulfide, and % LEL	<ul style="list-style-type: none"> Continuous reading Remote sampling & logging capability Customizable for other gases Quick response time Range varies depending on chemical of interest 	<ul style="list-style-type: none"> Moderate sensitivity part per million (ppm) Not suitable in high ammonia areas (>100ppm)
ppbRAE VOC Monitor	Volatile organic compounds (VOCs) with a 10.6 eV lamp	<ul style="list-style-type: none"> Sensitivity is parts per billion Logging capability PC compatibility Hand-held size Range from 1 ppb to 199 ppm 	<ul style="list-style-type: none"> Detects chemicals that ionize at 10.6 eV or less
AreaRAE Multi-gas Monitor	VOCs, combustible gases, oxygen, carbon monoxide and ammonia	<ul style="list-style-type: none"> Remote sampling with real-time data transmission & logging capability Weatherproof Customizable for other gases (one to five sensors) Range varies with chemical of interest 	<ul style="list-style-type: none"> Slow response time for ammonia (2.5 minutes) Moderate sensitivity (ppm)

Industrial Hygiene Instrumentation

Instrument	Monitoring & Sampling Capabilities	Strengths	Limitations
MIRAN XL Analyzer	Gases and vapors, including nitrous oxide, ammonia, benzene, xylene, acetonitrile, acetone	<ul style="list-style-type: none"> • Continuous reading • High repeatability & sensitivity • Selectivity and accuracy • Linear digital response logging capability • Fast response time • Variable ranges depending on chemical of interest 	<ul style="list-style-type: none"> • Complex set-up • Fragile • Short battery life • Heavy (30 minutes) • Only detects chemicals with an infrared response
TVA Toxic Vapor Analyzer	Gases and vapors	<ul style="list-style-type: none"> • PID and FID capabilities • High sensitivity to hydrocarbon vapors • Very stable and repeatable results • High sensitivity to aromatics, unsaturated hydrocarbons, and chlorinated hydrocarbons (PID) • Ability to measure some inorganic gases (PID) 	<ul style="list-style-type: none"> • Cumbersome • Short battery life • Small dynamic range (0.5-2000 ppm PID) • Susceptible to interference from water vapor (PID)
RA-915+ Mercury Vapor Analyzer	Mercury vapor	<ul style="list-style-type: none"> • Portable • Continuous reading • Range 2 to 50,000 n g/m3 • Minimize interferences 	<ul style="list-style-type: none"> • No differentiation for dimethyl mercury



Industrial Hygiene Instrumentation

Instrument	Monitoring & Sampling Capabilities	Strengths	Limitations
Colorimetric Tubes (Drager)	Over 500 gases and vapors	<ul style="list-style-type: none"> • Simple operation • Low maintenance • Accurate, repeatable results • Hand-held size • Wide range of detection • Fast response time 	<ul style="list-style-type: none"> • Two-year shelf life for most tubes • Broken glass hazard
HAPSITE Gas Chromatograph/Mass Spectrometer	Organic vapors	<ul style="list-style-type: none"> • Simple operation • Quick turnaround time • Field portable capable • Accurate identification 	<ul style="list-style-type: none"> • Heavy instrument • Limited mass range
Personal/Area Air Sampling Pumps	Various chemical constituents	<ul style="list-style-type: none"> • Simple operation • Representative sampling technique • Accurate • High repeatability • Variable ranges depending on chemical of interest • Lightweight & versatile • Samples multiple chemicals simultaneously 	<ul style="list-style-type: none"> • Lab analysis turnaround time • Broken glass hazard • Sample media shelf life

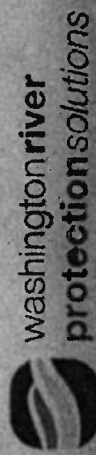
Personal Protective Equipment (PPE)

- A wide variety of PPE is available for workers and is often required based upon the outcome of the team planning meetings, employee input, and technical hazard review
- Available PPE for chemical vapors includes:
 - Respiratory protection (e.g., self-contained breathing apparatus, powered air-purifying or air-purifying respirator with appropriate filters and/or canisters)
 - Disposable chemical resistant coveralls
 - Protective footwear and/or chemical-resistant shoe covers
 - Inner/outer chemical-resistant gloves
- Employees may voluntarily wear respirators when respiratory protection is not required. Employees must be medically qualified, fit tested (as applicable), and trained to use the respiratory equipment being requested.



Where can I find sampling results?

- Sampling results (not identifiable by individual) are posted on the Safety & Health website:
<http://toc.rl.gov/rapidweb/safe/index.cfm?PageNum=160>
- Workers who wear a personal sampling apparatus receive a notification letter of their results
- The notification letters are sent out to employees



Safety Stand Down

AOP-15 Events

March 27, 2014

Description

- Over the last week, many of our fellow coworkers experienced and reported symptoms associated with chemical vapors.
- WRPS has a very low threshold for vapor-related incidents and takes incidents of them seriously
- Workers demonstrated proper work practices and followed applicable procedures in their response to the chemical/vapor events
- Numerous corrective actions have been conducted and to help us better the events and how we might be able to do to reduce similar events from occurring in the future



washingtonriver
protectionsolutions

AOP-15 Review

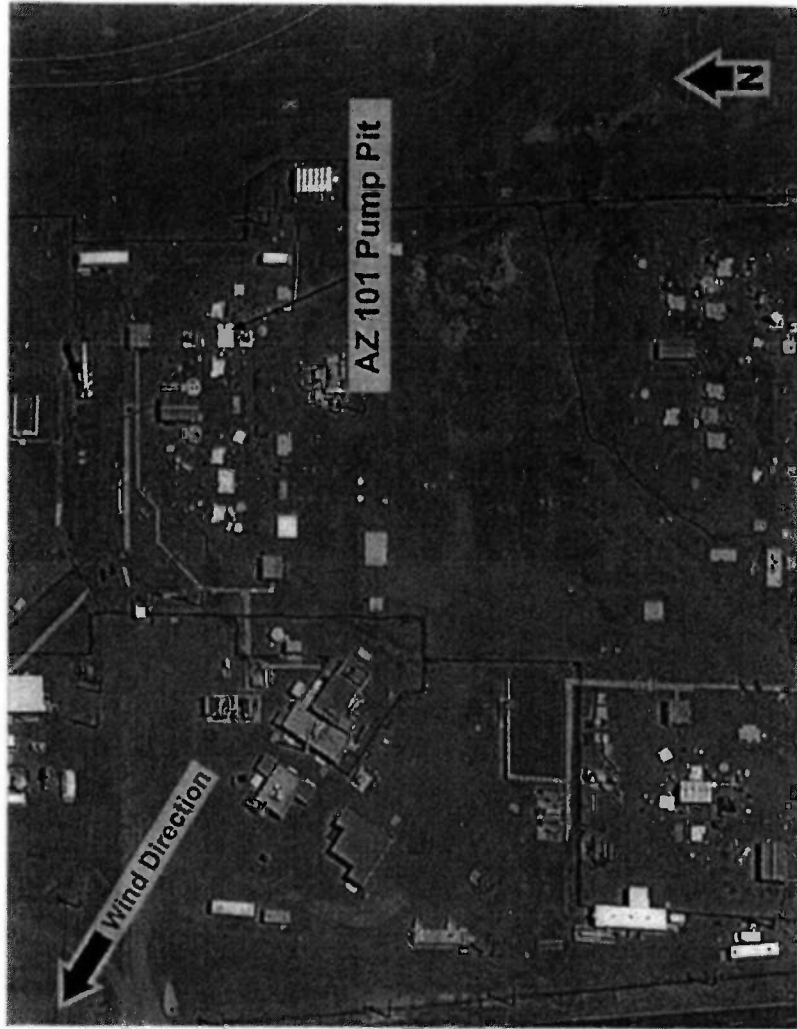
- **Wednesday 3/19/14, Entered AOP-15 AY/AZ Farms**
 - 2 Employees reported concern and were evaluated by medical released to work.
 - Industrial Hygiene sampling and monitoring was conducted in the concerned area to include identification of the potential source. Controls were put into place to reduce future concerns, briefings were conducted with the area team, and additional sampling protocol was implemented with sample pumps installed in the work area.
- **Tuesday 3/25/14, A Farm**
 - 7 WRPS employees and 3 subcontractor employees reported concern and were evaluated by medical, 9 employee released to work and the other employee is undergoing additional medical evaluation.
 - Industrial hygiene sampling and monitoring was conducted in the concerned area.
 - Exited AOP-15 Thursday 3/27/2014.
- **Tuesday 3/25/14, Entered AOP-15 S/SX Farms**
 - 3 Employees reported concern and were evaluated by medical, all released to work.
 - Exited AOP-15 Wednesday 3/26/2014.
- **Wednesday 3/26/14, Entered AOP-15 T Farm**
 - 3 employees reported concern and were evaluated by medical, 2 released to work and other employee is undergoing additional medical evaluation.
 - Industrial hygiene sampling (IHT monitoring) was being conducted during the time of the reported concern. Additional industrial hygiene sampling and analyses is being performed.



washington river
protection solutions

AY/AZ Farm

- Workers reported concerns and AOP-15 was entered
- Industrial Hygiene sampling and monitoring was conducted in the concerned area to include identification of the potential source
- Controls were put into place to reduce future incidents, briefings were conducted with the area team, and additional sampling protocol was implemented with sample pumps installed in the work area





A Farm

- Workers were obtaining sump level readings from A-350
- Workers reported concerns and AOP-15 was entered
- Industrial Hygiene sampling and monitoring was conducted in the concerned area to include identification of the potential source
- Controls were put into place to reduce future incidents, briefings were conducted with the area team, and additional sampling protocol was implemented

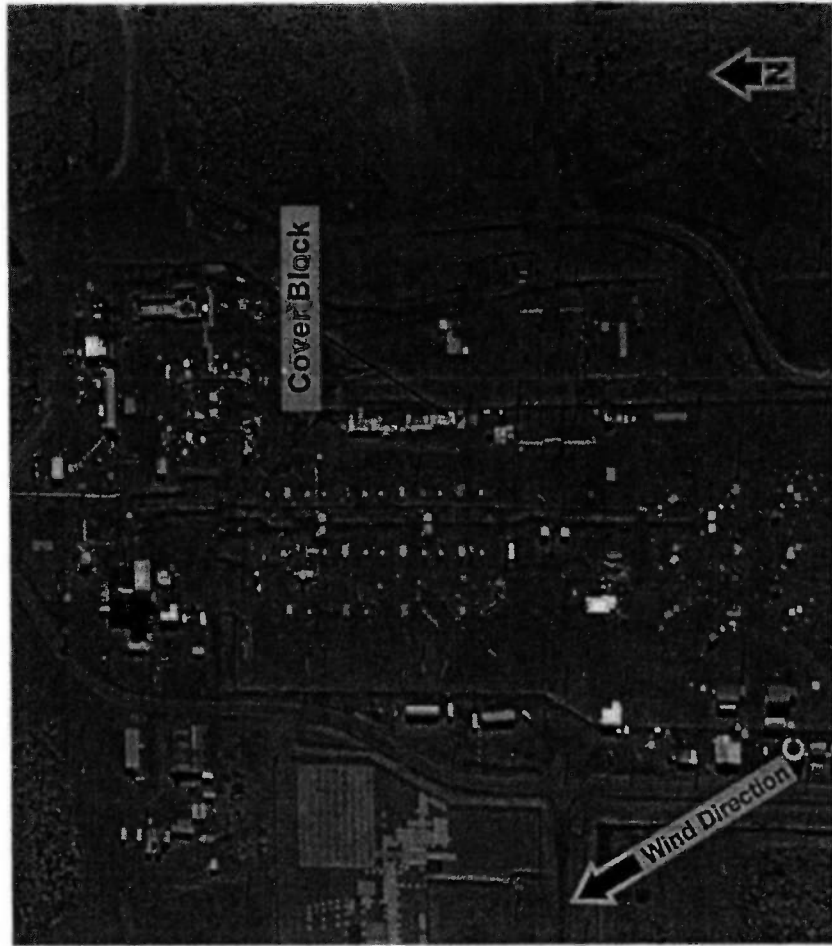




washington river
protection solutions

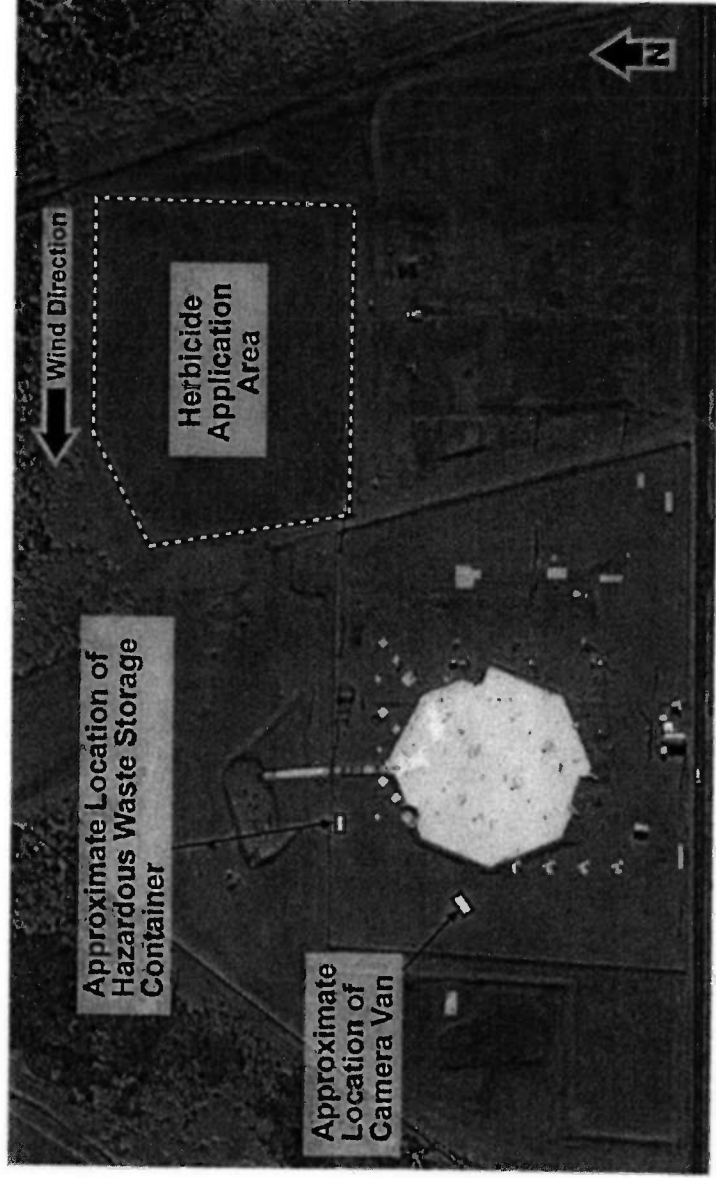
S/SX Farm

- Employees were preparing removed cover blocks for repackaging in the RCE lay down area
- AOP-15 entered when employee reported chemical/vapor symptoms
- Industrial Hygiene sampling and monitoring was conducted and results indicated hazards of concern were below the action level



T Farm, March 26, 2014

- Workers were performing video inspection activities at T-201
- AOP-15 was entered and workers reported chemical/vapor related symptoms
- IHT sampling being the conducted during the work activity prior to AOP-15 being entered
- MSA applying herbicide in the vicinity
- Further IH sampling and monitoring indicated that no herbicides or vapor-related compounds above background readings were detected



Summary

- Chemical/Vapor hazards are taken seriously and protocols are in place for appropriate response
 - WRPS takes a conservative approach for all chemical/vapor incidents in the AOP response process
 - When these events occur, Industrial Hygiene monitoring and sampling is conducted with current technology to evaluate the hazards
 - If you have questions or concerns contact your Industrial Hygiene professional or Clint Wolfley
-

Barnes, Nada

From: ^WRPS General Delivery
Sent: Tuesday, October 26, 2010 8:46 AM
Subject: Chemical Vapors Solutions Team meeting

TO: All WRPS Employees
(Please pass this message on to those who did not receive it.)

ISSUED: Oct. 26, 2010

FROM: Ray Skwarek, Manager, Environment, Safety, Health & Quality

SUBJECT: Chemical Vapors Solutions Team meeting

Interested employees are invited to a special meeting of the Chemical Vapors Solutions Team (CVST) on Thursday from 12:30 p.m. to 1:30 p.m. in 2704-HV, Conference Room G-206 to hear a briefing on an independent review of the Tank Farms Chemical Vapor Management Strategy.

The independent review, sponsored by the Hanford Concerns Council, recommends improvements in WRPS' Industrial Hygiene program consistent with the principles of chemical ALARA. The review, as well as the initial WRPS response, will also be discussed.

The independent review was written by Dr. Patrick Breysee, Certified Industrial Hygienist of The Johns Hopkins University School of Public Health, and Mark Stenzel, Certified Industrial Hygienist of Exposure Assessment Applications, LLC. They will be available for informal conversations with employees in 2704-HV room E-213 from 11:30 a.m. to 12:30 p.m., prior to the CVST meeting, and after the meeting from 1:30 to 2:30 p.m. for follow-up discussions with interested employees.

If you are not a CVST member, but are interested in attending the meeting or talking with the members of the review panel, please obtain advance approval from your manager or supervisor. Thanks for your interest in this important issue.

Barnes, Nada

From: ^WRPS General Delivery
Sent: Tuesday, February 09, 2010 8:02 AM
Subject: Tank Vapors Actions



Feb. 9, 2010

As you are likely aware, we halted the retrieval of high-level radioactive waste from single-shell tank C-104 on Feb. 2 after several workers reported exposures to chemical vapors.

Beginning Jan. 25, during retrieval of waste from C-104, workers on three occasions reported chemical odors. Odors from chemicals in the waste are commonplace in the tank farms, especially during work that disturbs the waste, such as waste retrieval. Industrial hygienists responded and took instrument readings where workers reported odors from the exhaust stack on the C-104 ventilation system. All the point source instrument readings were below established action levels for the chemicals detected.

What concerns me and my management team is that several of our employees complained of symptoms from exposure to the chemicals. They were referred to AMH and Kadlec Hospital for examination and possible treatment.

WRPS has embraced the chemical vapor program and taken a number of significant steps to improve it. We have worked closely with the Hanford Concerns Council and instituted several of the recommendations of an independent expert review panel that reviewed our technical basis for establishing exposure limits to chemicals in the tank farms. However, it's clear to me that we need to take further steps, with the goal being to keep exposures as low as reasonably achievable.

Since we stopped C-104 retrieval, there have been several meetings on this issue. Following meetings with employees early last week, my deputy Scott Sax and ESH&Q Manager Fred Beranek met last Thursday with Office of River Protection Manager Shirley Olinger and Tom Carpenter of the Hanford Concerns Council. The Hanford Advisory Board was briefed on Friday. Yesterday, about 20 employees representing construction, engineering, nuclear-chemical operators, health physics and industrial hygiene technicians, and HAMTC safety representatives met to come up with ideas for a path forward.

I met with the team yesterday afternoon and was briefed on its findings. We are now developing a short-term action plan that includes additional measures to control vapors in C Farm and instituting ALARA principles to minimize worker exposure to chemical odors. During this week, the plan will be further defined and communicated to you. After that, we will likely restart C-104 retrieval.

Thank you for all your hard work and patience as we work through this complex issue that has been with the tank farms for a long time. Together, we will work to solve it. Again, we will be communicating more in the near future.

A handwritten signature in black ink, appearing to read "Chuck", followed by a long, horizontal, wavy line that extends to the right.

Barnes, Nada

From: ^WRPS General Delivery
Sent: Wednesday, February 10, 2010 4:34 PM
Subject: Tank vapors update



Feb. 10, 2010

I want to give you all an update on our path forward regarding waste retrieval from tank C-104 and related vapor concerns.

In the past few days there have been several meetings between management and field personnel from both the Retrieval and Closure organization and from Base Operations on this issue. In addition, a Chemical Vapors ALARA Team was assembled to make recommendations to further reduce the potential for workers to experience symptoms from vapor exposures during retrieval operations. The ALARA team was made up of HAMTC safety reps, industrial hygiene technicians, health physics technicians, operators, engineers, construction personnel and management.

We have begun to implement the top priority recommendations coming from these meetings, and affected work groups are being briefed on the changes that we are making, beginning Wednesday. The ALARA recommendations include both short-term and long-term actions.

The short-term actions include establishing a Vapor Reduction Zone (VRZ), including all of C Farm, all of AN Farm and a roped-off corridor between the two farms, in which the use of carbon-impregnated face pieces will be required at a minimum. In addition, we will reemphasize the voluntary use of higher-level respiratory protection and increased emphasis on reducing peer pressure which prevents some workers from using such protection. Remote-reading alarming area monitoring capability will be installed in the VRZ corridor between the C and AN Farms, and we will increase the grab sampling from the exhaust stack and VRZ to provide additional data on vapors being emitted. Smoking will not be permitted inside the VRZ, and personnel should not loiter adjacent to the VRZ.

Longer-term changes are being explored, including increasing the height of the exhaust stack to improve dispersion of tank vapors, increasing exhaust discharge velocity and routing stack discharges to a remote location. A variety of other long-term options are also being considered.

Our monitoring data continues to show that exposure levels are significantly below action levels. However, we recognize that the odors and symptoms that some people experience are a concern and impede the ability of our workers to do their jobs. That's why we are implementing a chemical ALARA program.

Once all field personnel have been thoroughly briefed on the changes, the appropriate procedural and equipment changes have been made and needed supplies of the masks are in hand, we will resume retrieval of waste from C-104.

Again, I appreciate the efforts of all those involved in working this issue.

A handwritten signature in black ink, appearing to read "Chuck", followed by a long, horizontal, wavy line that extends to the right.

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, August 22, 2013 11:12 AM
Subject: Dave's Dispatch - C-101 incident



Aug. 22, 2013

An Alert level emergency, the Hanford Site's lowest level of emergency classification, was declared at C-Farm late last night due to higher than expected radiation dose readings found during monitoring of sluicing equipment in Tank C-101. The radiation readings can indicate radioactive waste outside of containment and, according to procedure, resulted in workers being evacuated from C Farm and employees in the 200 East and several other areas sheltering in place throughout the late evening and early morning hours. Access to the site was also restricted for a time.

All personnel surveyed and exited C-Farm without incident. No reports of odors or symptoms were reported. As a precaution, workers who were in C-Farm when the high radiation dose was discovered were sent to medical for evaluation and later released.

Following chemical and radiological surveys of the C Farm perimeter which found no detectable levels of contamination, workers entered C Farm early this morning to monitor radiation levels in the area where the higher-than-expected levels of radiation were earlier detected. They found no visible indication of any waste leakage, and no additional radiation or contamination was found in the surrounding area. Radiation readings were lower than the earlier readings, but still higher than expected. As a precaution, a fixative was applied to the location to isolate any potential contamination.

The final shelter in place protective action, for 200 East and nearby areas, was lifted at 4:03 a.m. and the Alert was terminated at 5:05 a.m. this morning.

Barricades remain in place around C Farm while WRPS Retrieval and Closure staff performs follow-up evaluations. C Farm retrieval operations are on hold, pending further evaluations.

Additional detail is available at www.hanford.gov.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Wednesday, April 02, 2014 12:48 PM
Subject: Dave's Dispatch - Vapors update 4-2-14

April 2, 2014

Here's an update on vapors-related actions.

- This afternoon, managers will be briefed in preparation for tomorrow's employee briefings. Tomorrow, employees will be provided a tailgate safety briefing on recent chemical vapor events and follow-up actions at a time and location arranged by their managers.
- The A Farms complex remains under restricted access.
- A WRPS employee issued a stop work this morning restricting access to all tank farm hazardous waste areas for a number of employees associated with the recent potential vapor exposure incidents. It **applies only** to those employees who had been cleared for return to work but who have not received final medical laboratory results.
- Yesterday, a WRPS employee, who had no symptoms, but who had worked in one of the affected areas last week, requested and received a medical evaluation. The worker was released and returned to work.
- All employees/subcontractors evaluated during the last two weeks at either the site medical provider or Kadlec Regional Medical Center were released for return for work.
- Monday, MSA workers called a stop work for their employees within fenced tank farm areas and within 100 yards of fenced tank farm areas, while they receive information from WRPS on the recent vapors incidents.
- CHPRC workers at the 200 West Pump and Treat Facility called a stop work yesterday after working hours due to concerns about odors. The stop work is not related to any vapor issues from the tank farms.

The 200 West Pump and Treat Facility uses biological processing, very similar to a municipal sewage treatment plant, to treat contaminated groundwater. This process can create odors similar to ammonia; industrial hygiene regularly monitors the area to ensure the safety of employees. One employee who reported ammonia-like smells and reported feeling ill after performing maintenance work was taken to HPMC and was released to return to work without restrictions.

- The answers to the Safety Stand Down questions can be found on the Safety and Health webpage at the following link:

- \\hanford\Data\sitedata\EnvironmentalHealth\Safety Stand Down\03-27-14 Stand Down AOP-015.pdf

If you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Monday, April 07, 2014 12:49 PM
Subject: Dave's Dispatch - Vapors update 4-7-14

April 7, 2014

Here's an update on vapors-related actions.

- The Mission Support Alliance stop work for their employees working within fenced tank farm areas and within 100 yards of fenced tank farm areas was lifted last Friday afternoon.
- Work in the A complex of tank farms, which had been on restricted access following recent vapor incidents, also resumed last Friday afternoon. Until further notice, workers in the A complex farms are required to wear respirators.
- Teams spent the weekend monitoring for potential vapors in A, AN, AX, AY/AZ, C, S, SX and SY Farms. Industrial hygiene techs took surveys of all Vapor Control Zones and checked perimeters and controls in those areas, which were deemed adequate.

They also surveyed pump pits, sluice pits, annulus pits—essentially anything that had a direct path to a tank—and monitored those areas for correct foaming, seals and controls to mitigate vapors. All compounds detected were less than 1 percent of Occupational Exposure Limits, and the controls in the areas surveyed were appropriate.

These farms were surveyed first based on the level of work activity in or near them. Moving forward, a similar process will be used on backshift and off shift to move through the remainder of the farms.

- The S Farm was evacuated as a precaution last Friday morning for potential chemical vapors. Further investigation found no chemical vapors had been reported by workers and no workers were in the S Farm when the evacuation notice was issued.
 - Since March 19, 26 WRPS or Hanford employees/subcontractors have been sent for medical evaluations after either reporting a concern or unusual odors and/or experiencing potential vapors-related symptoms in or near the Hanford tank farms. A non-WRPS employee last Thursday requested and received a medical evaluation related to an earlier vapor incident. The worker was released and returned to work.

- Current Vapors Q&As can be accessed directly at http://toc.ri.gov/rapidweb/SAFE/docs/1/docs/03-27-14_Stand_Down_AOP-015QA.pdf or via the WRPS intranet home page at: <http://toc.ri.gov/rapidweb-v7/wrps/>. Then click on the Chemical Vapors Q&A link located under Tank Farm Updates on the right.
- The presentation from the April 3 briefing on chemical vapors is available on the WRPS intranet home page at <http://toc.ri.gov/rapidweb-v7/wrps/>. Click *Protecting workers from chemical vapors 04-03-14* under *Tank farm updates* in the column on the right.

If you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Tuesday, April 01, 2014 7:28 AM
Subject: Dave's Dispatch - Vapors update; 4-1-14

April 1, 2014

Yesterday, the WRPS Executive Safety Review Board (ESRB) met to review our recent chemical vapor events, the impacts to our employees, and our plan of action to address future events.

The ESRB recommended that access to the A-Complex of tank farms remain restricted pending completion of a follow-up ESRB meeting scheduled for late today. The ESRB will review actions taken to date and make a recommendation on any additional actions to be taken before resuming unrestricted operations in the A Farms.

The ESRB also recommended that we reinstitute the Chemical Vapors Safety Team (CVST) comprised of workers and management, to first review the information that is being readied for managers to communicate with their employees. To allow time for that CVST review, I am delaying the briefing by managers planned for today. I want to make sure the information addresses employee concerns as well as contains recommendations on future actions to improve our chemical vapor hazards analysis, controls, and response. This information will be provided as soon as input is obtained from the CVST. The CVST will continue to assist us as we move forward on this topic.

In the meantime, if you have questions, please talk to your manager, your Industrial Hygiene representative, or call Safety and Health Manager Clint Wolfley at 372-9226 or Doug Greenwell at 376-2504.

Your safety is my primary concern as we cope with these events. I will remain personally involved in the actions needed to improve chemical vapor safety in the tank farms.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, April 03, 2014 11:07 AM
Subject: Links to Vapors Q&As

TO: All WRPS Employees
(Please pass this message on to those who did not receive it.)

ISSUED: April 3, 2014

FROM: External Affairs

SUBJECT: Links to Vapors Q&As

In yesterday's *Dave's Dispatch* message, employees were referred to a link to access question and answers on recent vapor concerns. That link has been updated. To go directly to the Q&As, click on http://toc.ri.gov/rapidweb/SAFE/docs/1/docs/03-27-14_Stand_Down_AOP-015QA.pdf

Current Vapors Q&As can also be accessed via theWRPS intranet home page at: <http://toc.ri.gov/rapidweb-v7/wrps/>. Then click on the Chemical Vapors Q&A link located under Tank Farm Updates on the right.

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, March 27, 2014 12:58 PM
Subject: Safety briefing documents

TO: All WRPS Managers
ISSUED: March 27, 2014
FROM: Clint Wolfley, Safety and Health
SUBJECT: Safety briefing documents

As promised, attached are the documents to be used for today's mandatory safety briefing.

Please address questions to John A. McDonald 509.438.9257 and/or Clint Wolfley 509.713.6055.



AOP 15
refocus.pptx

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, March 27, 2014 11:23 AM
Subject: Safety briefing this afternoon – MANDATORY

TO: All WRPS Managers

ISSUED: March 28, 2014

FROM: Wyatt Clark, Project Operations Manager

SUBJECT: Safety briefing this afternoon – **MANDATORY**

This afternoon each manager is to provide a safety briefing to their work group. The purpose of this briefing is to address vapor issues. Briefing material will be provided in a later email by approximately 12 p.m. Please coordinate with other managers on joint briefings as appropriate. Meetings are expected to start no later than 1 p.m. with the possible exception of field work being put in a safe condition with briefings to follow.

Please address questions to John A. McDonald 509.438.9257 and/or Clint Wolfley 509.713.6055.

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, April 03, 2014 2:31 PM
Subject: Vapors briefing presentation 4.3.14

TO: All WRPS Employees
(Please pass this message on to those who did not receive it.)

ISSUED: April 3, 2014

FROM: External Affairs

SUBJECT: Vapors briefing presentation 4.3.14

The presentation from today's briefings on chemical vapors is available on the WRPS intranet home page at <http://toc.ri.gov/rapidweb-v7/wrps/>. Click *Protecting workers from chemical vapors 04-03-14* under *Tank farm updates* in the column on the right.

Barnes, Nada

From: ^WRPS General Delivery
Sent: Monday, April 28, 2014 5:55 PM
Subject: Dave's Dispatch - C-Farm vapors event



April 28, 2014

Two WRPS employees were sent to the site medical provider for evaluation Monday afternoon for potential exposure to chemical vapors in C Farm. Both employees were cleared to return to work late Monday.

Waste retrieval resumed Sunday in tank C-102. Seven workers were in the farm when the potential exposure occurred. Retrieval operations were stopped and the farm was immediately evacuated as a precaution.

C-Farm access remains restricted pending completion of an event investigation to be conducted Tuesday morning and implementation of any corrective actions, which will be communicated to employees.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, April 24, 2014 3:03 PM
Subject: Dave's Dispatch - Chemical vapors update

April 24, 2014

A number of improvements have been made in recent years to address chemical vapors hazards in the tank farms. However, the events in late March and early April, where 26 of our fellow employees sought medical attention for potential vapor exposures, demonstrate that we have much more work that needs to be done.

This week, several activities have begun that I believe will make a positive difference in protecting tank farm workers from future chemical vapor exposures.

First, our reconstituted Chemical Vapors Solutions Team (CVST) met this week. The CVST is a working group that evaluates and provides input to improve our vapor hazard identification, control and training. Members will serve on sub-teams that will pursue improvement projects and recommend actions to the CVST. The members will also be the conduit to the CVST for questions and concerns raised by employees. It's worth noting that both MSA and CHPRC have sent members to our CVST.

The CVST is working on near-term improvements and steps to remove the standing order requiring respiratory protection in the A, AX, AY and AZ tank farms. New vapor controls are expected to be in place by mid-May.

Second, we are in the final stage of arrangements with an outside organization to set up an expert panel to assess our vapors management program and related worker protection measures and recommend improvements. As in the past, we will incorporate feasible improvements into our vapor protection program.

Third, staff with the Hanford Site medical provider, HPMC, met with a group of tank farm employees to discuss its practices for handling workers potentially exposed to chemical vapors. Several follow-up actions were identified to address worker concerns.

I want to thank employees for their feedback on the chemical vapors issue. Your ideas and concerns are being taken seriously and are helping guide our efforts to make the tank farms a safer place to work. As improvements are identified, they will be tracked weekly on a project schedule by senior management.

I will continue to keep you informed.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, May 01, 2014 4:00 PM
Subject: Dave's Dispatch - Improvements to HPMC exposure protocol



May 1, 2014

With the recent spike in reported exposure to chemical vapors, WRPS has been working closely with HPMC, the Hanford Site medical provider, to improve and revise the vapors-response protocol. The new protocol, which is still undergoing changes based on worker input, seeks to more immediately and effectively evaluate those experiencing vapors-related symptoms.

As part of this effort, HPMC has moved to a "first-in-line" approach to vapor-exposure patients. Upon arrival at the clinic, vapors-affected workers will take priority over other patients, and those with the most severe symptoms will be seen first.

And, starting today, HPMC is implementing an Exposure Response Team. This team will be responsible for making contact with WRPS Industrial Hygiene to get as much real-time information as possible during a vapors event. This information will be made available to medical staff during a patient assessment to help them better understand the details of potential exposure.

Also, the medical provider is working to expedite the analysis of blood and urine samples and report the results back to the affected workers as soon as they are available.

The complete details of HPMC's revised exposure protocol are available on its website. WRPS will continue to work with HPMC to further strengthen and improve our combined response to vapors-related incidents.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, April 24, 2014 1:46 PM
Subject: Dave's Dispatch - Organizational changes

April 24, 2014

A large majority of our team participated in all-employee sessions over the last couple of weeks.

I hope a key "take away" from these sessions is the focus on our five mission priorities:

- Completion of C Farm retrievals
- Start of A & AX Farm retrievals
- Increased double shell tank space
- Improved tank farm infrastructure
- WTP integration

and how we as a company must continually adapt in order to achieve our mission.

To that end, I'm announcing some organizational changes that 1) continue our transition to broader 24 hours-a-day, 7 days-a-week field operations and 2) strengthen our commitment to safety and reliability through human performance improvement (HPI). The changes will also further the professional development of some of our senior leaders.

Effective April 28, 2014:

- Kent Smith will become manager of Production Operations (formerly Base Operations). As part of his responsibilities, he will work to eventually integrate major elements of the current SST Retrieval and Closure organization into Production Operations.

Eric LaRock will become acting SST Retrieval and Closure Manager. The position will be posted in May.

- Bob Wilkinson will become Environment, Safety, Health & Quality manager. In addition, he will remain responsible for overseeing the completion of the upcoming 242-A Evaporator campaign readiness assessment activities.

- John McDonald will become manager of a new organization, Organizational Performance Improvement (OPI), reporting to me. The current Procedures and Training Departments, as well as HPI and conduct of operations programmatic functions, will be moved to OPI. As part

of his duties, John will foster Conduct of Operations improvements, focusing on safe, reliable, predictable, and excellent performance of work. He will also maintain a leadership role as executive sponsor of the Chemical Vapors Solutions Team.

Please join me in welcoming Kent, Eric, Bob and John to their new roles.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Monday, April 28, 2014 7:24 AM
Subject: Dave's Dispatch - SRNL to lead review of vapors protection

April 28, 2014

I'm pleased to announce that Savannah River National Laboratory has agreed to set up an expert panel to assess our vapors management program and related worker protection measures. *(Below you will find the press announcement SRNL issued last Friday afternoon.)*

This external review is one of a number of actions we're taking to improve vapor controls, and I expect it to be quite beneficial in helping us develop more reliable, more predictable measures to protect our employees.

Savannah River National Laboratory asked to lead independent expert review of chemical vapors and worker protection at DOE's Hanford waste tanks

AIKEN, SC (April 25, 2014) – Washington River Protection Solutions (WRPS) has asked Savannah River National Laboratory (SRNL) to establish and oversee a panel of external experts to examine hazardous chemical vapors management and related worker protection measures at the U.S. Department of Energy's Hanford nuclear waste cleanup site in Washington state.

WRPS is the DOE contractor responsible for the management and cleanup of millions of gallons of nuclear and hazardous waste currently stored in underground tanks at Hanford. SRNL is a multiprogram National Laboratory providing scientific and technical expertise to support DOE's Environmental Management program.

The request for the external review and accompanying recommendations comes after more than two dozen workers received medical attention this spring following apparent on-the-job exposures to vapors emanating from the waste storage tanks. WRPS has requested that this new study have an enhanced scope for analysis and recommendation beyond that of the two previous technical reviews of Hanford tank waste vapor policies and issues in 2008 and 2010.

"While a number of steps have been taken and improvements made in recent years to address chemical vapors hazards, the latest set of exposures shows that more work needs to be done. This new review, with its broad scope and the involvement of recognized experts, will make a difference in better protecting Hanford workers from future chemical vapor exposures," said WRPS President and Project Manager Dave Olson.

Features of the panel's work are expected to include:

- A review of the last four years of relevant technical data gathered as part of the WRPS industrial hygiene program and actions taken as a result;

- An overall examination of both the adequacy and implementation of present policies, protections, practices and responses to potential vapor exposures, particularly in light of the new exposures;
- A review of currently used and additional available technology that can provide protection against inhalation or other contact with tank vapors, including the use, effectiveness, and availability of personal protective equipment;
- A look at how to improve data collection, retention and analysis to assist in developing workforce and individual worker protection and health evaluation;
- A review of the response to past recommendations and their implementation and potential improvements, and
- Methods to institutionalize the knowledge and ongoing application of best practices in vapors protection and monitoring.

“SRNL’s role is to ensure that the best experts are brought in and given full latitude to ask hard questions and make their recommendations,” said Dr. Terry Michalske, Director of SRNL. “This is one more important way that the National Lab can provide relevant scientific and technical assistance for the safe execution of a critical DOE environmental management mission.”

SRNL will manage the interface of the panel with WRPS and will ensure that its report is made public. The final scope and schedule for the review will be developed in consultation with the expert panel. Any recommendations are entirely the domain of the expert panel.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Thursday, March 27, 2014 2:19 PM
Subject: Dave's Dispatch - update on recent vapors-related actions

March 27, 2014

Multiple vapors-related incidents in the tank farms over the past week have sent several of our co-workers to the site medical provider and, in some cases, the hospital for further evaluation. We are concerned about the symptoms they have been experiencing, and are glad to hear that all employees—with the exception of one who is undergoing further evaluation—were cleared to return to work.

We are aware of the potential risks—including chemical vapors—that our workers face when in the farms, and we are continuously looking for ways to minimize potential worker exposure. This includes comprehensive efforts to identify the source of the vapors and what can be done to reduce the chance of future occurrences.

Consistent with an ALARA (As Low As Reasonably Achievable) approach, we've taken several actions over the past several days to identify and mitigate potential sources of vapors. These include:

- Investigating farms with direct-read instruments and taking bag samples for analysis
- Requiring operators use a personal sample pump when performing routine surveillances
- Encouraging personal respiratory upgrades, where desired
- Taking corrective actions to seal off confirmed sources of elevated readings related to vapors
- Deploying additional sampling equipment in the farms to further investigate potential sources of vapors

Specific information related to the affected farms

In the A/AY/AZ complex, field investigations identified a cut in the insulation surrounding the A-106 central pump pit as one potential source of vapor emissions. The cut was sealed with foam and the area was re-evaluated. Instruments no longer detect elevated levels of potential vapor-causing compounds in the local area. Investigations are ongoing to identify other potential sources of vapors in the farms.

In S/SX Farms, investigations have identified liquid in an aging cover block bag as a potential source of emissions. Workers reported vapors-like symptoms when cutting into the plastic and subsequent investigations have confirmed the area as a likely source. It has been cordoned off as a Vapor Control Zone. Efforts are moving forward to sample the liquid for analysis.

In T Farm, a work crew was working downwind of the tanks and also downwind of an herbicide application crew when employees reported symptoms. An industrial hygiene technician with the work crew found no detectable measurement. Additional samples were collected several hours later. Investigations continue as industrial hygiene techs gather additional data.

Other efforts

In addition to these more recent activities, a joint management/employee Industrial Hygiene Technical Panel meets regularly to monitor efforts and help solve chemical vapor issues and concerns. Together, the team works to identify potential hazards and develop needed controls.

These efforts have allowed WRPS to keep tank farm worker exposure to chemical vapors far below occupational limits. While the risk cannot be completely eliminated, we continue to look at ways we can reduce the risk to employees.

As always, your nose is the best indicator of the potential presence of vapors. I would ask that you continue to be vigilant in taking personal responsibility for your own safety and that of your co-workers. It is important that we are conservative in our approach, report any changes in condition, follow established procedures and seek medical evaluation, when necessary.

Dave Olson
President and Project Manager

Barnes, Nada

From: ^WRPS General Delivery
Sent: Monday, March 31, 2014 7:41 AM
Subject: Dave's Dispatch - Update on vapors-related activities

March 31, 2014

I participated in three of last Thursday's safety briefings on our recent vapor incidents and heard first-hand your concerns about the protection of yourself and your co-workers from the potential health risks posed by chemical vapors. I share that concern, and this week we will continue or, in some cases, begin additional activities aimed at preventing or further minimizing potential vapor exposures.

Another incident Thursday only reinforced the need for further action. We had another of our co-workers, at work in the A Farm complex, report potential vapor-related symptoms. The employee was evaluated at our site medical provider and released for return for work by the end of the day. While, as I told you in a message last Thursday, we have identified and sealed one potential source of vapor emissions at the A-106 central pump pit, this incident confirms the need for our continuing investigation in the A Farm complex.

For now, the A complex of farms will remain in restricted access status, while we look to identify and deal with other potential vapor emission sources there.

In regards to broader vapor concerns, I have named Doug Greenwell as the project manager responsible for maintaining our focus on vapor issues. His assignment, with a broad range of worker involvement, will be to oversee the implementation of a number of related vapor control improvements. Some actions will be near-term; others may take several months or longer.

Tomorrow, your managers will be sharing more detailed information with you as to some of these actions.

We all know finding better ways to minimize vapors and related risks is a complex, multi-faceted challenge—one that the tank farms have made significant progress toward over the past several years. But, we can do better. More work remains to be done. And, as it was last Thursday, your involvement and input is appreciated and crucial to our success.

Dave Olson
President and Project Manager



Tank Farm Vapors Update

- Recent worker vapors exposures are of concern to WRPS
- Chemical vapors are one of several risks in the tank farms
- WRPS has a comprehensive Industrial Hygiene program that uses layers of protection and has proven effective in keeping worker exposures to chemical vapors to as low as reasonably achievable
- Due to the difficulty of eliminating all chemical vapors, WRPS uses a conservative approach for responding to exposure incidents
- Management and employees are working together to further reduce exposures and improve response to chemical vapor incidents
- Challenge is to balance competing worker risks as we strive to reach zero chemical exposures

March 31, 2014

WRPS workers checked, released following chemical vapors exposure

Late this morning, six Washington River Protection Solution (WRPS) workers were sent to the Hanford Site medical provider for evaluation after experiencing chemical vapors-related symptoms. All six were released to return to work.

The workers were not in one of Hanford's tank farms. They were working in the 200-West Area near the SY Tank Farm when they smelled a chemical odor. The workers reported throat and nasal irritation and headaches. As a precaution, WRPS management requested the workers receive a medical evaluation.

Air samples collected by industrial hygiene technicians are being analyzed. Further efforts will be made to determine the potential source of the vapors.

From: Holloway, Jerry N
To: "Frame, Susannah"; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C
Subject: RE: inquiry from KING 5
Date: Tuesday, March 25, 2014 5:09:00 PM
Importance: High

Statement on tank farm vapor events

There have been several incidents in the past week where Hanford workers have smelled chemical vapors in the tank farms. In each of these instances, workers responded in accordance with procedures and training to limit exposure.

This morning, two workers were transported to Kadlec Hospital in Richland after complaining of coughing and throat irritation after smelling vapors in one of Hanford's tank farms.

Workers in the farm exited the area and moved upwind.

The two workers were examined and released from the hospital and returned to work. Seven additional workers elected to go to the Hanford site medical provider, HPMC Occupational Medical Services, where they were examined and released.

Last Wednesday two workers were checked at HPMC after smelling chemical vapors and were returned to work.

Hanford's underground waste tanks are vented to the atmosphere. Chemicals contained in the waste generate vapors. Washington River Protection Solutions has a comprehensive industrial hygiene program that monitors chemical vapors in the tank farms and in recent years WRPS has taken a number of steps to reduce potential vapor exposures to its workers.

3.25.2014

5:10 p.m.


Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Frame, Susannah [mailto:sframe@king5.com]
Sent: Tuesday, March 25, 2014 4:06 PM
To: Holloway, Jerry N; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C
Subject: inquiry from KING 5

Hi there,

I left voicemails this afternoon and a message for Lori but haven't heard back. Can anyone offer a comment or any additional information on the story about the WRPS workers breathing in vapors (last Tuesday and today) that sent them to the hospital and/or the HPMC? One issue several employees have brought up to me is the lack of monitoring for chemical releases at tank farms. They say there are no monitors in place for this sort of release in tank farms and there is inadequate monitoring and filtering on the "minor" stacks on annuluses.

I look forward to hearing back from someone on this issue.

(b)(6) Thank you,
/cell

Susannah Frame
Investigative Reporter
KING Television
206.448.3876



[Susannah's bio](#)

From: Holloway, Jerry N
To: [Frame, Susannah \(sframe@king5.com\)](mailto:sframe@king5.com)
Cc: [Gamache, Lori M](#); [Britton, John C](#)
Subject: Additional Hanford workers sent for vapors-related evaluation today
Date: Wednesday, March 26, 2014 6:06:00 PM

Three Washington River Protection Solution (WRPS) workers were sent for medical evaluation today after experiencing vapors-related symptoms in Hanford's T Farm. Two were sent to the hospital for further evaluation. The third was taken to the site medical provider for evaluation and subsequently released back to work.

Separately, three non-WRPS workers reported possible vapors-related symptoms today after working yesterday near AY/AZ Farms, where other workers were evacuated Tuesday. All three were taken to the site medical provider; two were released back to work. Evaluation of the third is pending.

Data collection and analysis is underway in the affected farms to understand what happened and what might be done to reduce the likelihood of future occurrences.

The presence of chemical vapors is one of the hazards of tank farm operations, and WRPS takes a conservative approach to dealing with its risks—one designed to minimize potential worker exposure and provide an appropriate medical response, when necessary.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Roxburgh, Robert T
Subject: UPDATE: Recent WRPS actions related to tank-vapor concerns
Date: Thursday, March 27, 2014 4:47:21 PM

The worker referenced below was evaluated at the site medical provider and released for return to work late this afternoon.

Rob Roxburgh
WRPS External Affairs
(509) 376-5188
WashingtonRiverProtectionSolutions
Contractor to the U.S. Department of Energy
www.wrpsinc.com

From: Roxburgh, Robert T
Sent: Thursday, March 27, 2014 3:43 PM
Subject: Recent WRPS actions related to tank-vapor concerns

March 27, 2014

Recent WRPS actions related to tank-vapor concerns

- Washington River Protection Solutions (WRPS) managers met with employees Thursday in multiple briefings across the project to discuss recent actions aimed at identifying and mitigating potential sources of vapors at the Hanford tank farms.
- Investigations in several tank farms have identified potential sources of vapor emissions.
 - In one farm, field investigations identified a cut in the insulation surrounding a pump pit as one potential source of vapor emissions. The cut was sealed with foam and the area was re-evaluated. Instruments no longer detect elevated levels of potential vapor-causing compounds in the local area.
 - In another tank farm, investigations identified liquid in old, unused equipment that had been staged for disposal as a potential source of emissions. It has been cordoned off as a Vapor Control Zone. The liquid is being sampled and analyzed.
 - Evaluations in a third farm where vapors-related symptoms were experienced found no detectable measurement of vapors-causing compounds.
- Investigations are ongoing to identify other potential sources of vapors in the tank farms.
- Employees are encouraged to use additional protective gear—including respiratory devices—when the potential for chemical vapors exists.
- In addition to these more recent activities, a joint management/employee Industrial Hygiene Technical Panel meets regularly to monitor efforts and help solve chemical vapor issues and concerns. Together, the team works to identify potential hazards and develop needed controls.
- These efforts have allowed WRPS to keep tank farm worker exposure to chemical

vapors far below occupational limits. While the risk cannot be completely eliminated, WRPS continues to look at ways the risk to employees can be reduced.

- This afternoon, an additional worker was sent to the site medical provider for vapor-related medical evaluation.

Rob Roxburgh

WRPS External Affairs

(509) 376-5188

WashingtonRiverProtectionSolutions

Contractor to the U.S. Department of Energy

www.wrpsol.com

March 31, 2014

WRPS workers checked, released following chemical vapors exposure

Late this morning, six Washington River Protection Solution (WRPS) workers were sent to the Hanford Site medical provider for evaluation after experiencing chemical vapors-related symptoms. All six were released to return to work.

The workers were not in one of Hanford's tank farms. They were working in the 200-West Area near the SY Tank Farm when they smelled a chemical odor. The workers reported throat and nasal irritation and headaches. As a precaution, WRPS management requested the workers receive a medical evaluation.

Air samples collected by industrial hygiene technicians are being analyzed. Further efforts will be made to determine the potential source of the vapors.

From: Holloway, Jerry N
To: Britton, John C
Subject: media update
Date: Tuesday, April 01, 2014 2:54:00 PM

Update on WRPS vapors incidents and follow-up actions

4.1.14

- Since March 19, 25 WRPS employees/subcontractors have been sent for medical evaluations after either reporting a concern or unusual odors and/or experiencing potential vapors-related symptoms in or near the Hanford tank farms. This includes a worker who had no symptoms, but who had worked in one of the affected areas last week, requesting and receiving a medical evaluation today. The worker was released and returned to work.
- All of the employees/subcontractors have been evaluated by medical professionals at either the site medical provider or Kadlec Regional Medical Center and released for return to work.

While tank farm worker exposure to chemical vapors remains far below applicable occupational limits, the number of recent incidents within such a short period is of special concern.

WRPS has taken and is continuing to take several actions to prevent or mitigate further instances where employees might suffer physical symptoms.

Investigations in several tank farms have identified potential sources of vapor emissions and taken corrective actions.

- In one farm, field investigations identified a cut in the insulation surrounding a pump pit as one potential source of vapor emissions. The cut was sealed with foam and the area was re-evaluated. Instruments no longer detect elevated levels of potential vapor-causing compounds in the local area, but the farm complex remains under restricted access.
- In another tank farm, investigations identified liquid in old, unused equipment that had been staged for disposal as a potential source of emissions. The area around the equipment has been cordoned off as a Vapor Control Zone.
- Evaluations in a third farm where vapors-related symptoms were experienced found no detectable measurement of vapors-causing compounds, but may have been linked to an herbicide application.
- A senior project manager has been named to oversee any further investigations and

corrective actions that might be necessary.

- Additional engineered controls, sampling/analysis equipment and procedure changes are being evaluated.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Britton, John C
Subject: WRPS media update on tank farm vapors
Date: Thursday, April 03, 2014 4:01:27 PM

Update on WRPS vapors incidents and follow-up actions

4.3.14

- Informational briefings were held today with WRPS and Mission Support Alliance employees to review recent vapor events in or near the Hanford tank farms, new actions taken to deal with known vapor sources and other planned or potential actions to further reduce worker exposure to chemical vapors.
- It was announced that work will resume in the A Farm Complex with employees entering those areas required to wear respiratory gear while further evaluation of the farms continue. Workers in those farms will be involved in determining other follow-up actions, including how long the requirement for respiratory gear might continue.
- Since March 19, 26 WRPS or Hanford employees/subcontractors have been sent for medical evaluations after either reporting a concern or unusual odors and/or experiencing potential vapors-related symptoms in or near the Hanford tank farms. A non-WRPS employee today requested and received a medical evaluation related to an earlier vapor incident. The worker was released and returned to work.

Update: We have confirmed **no workers were in the S Farm when the evacuation notice was issued**, and worker access was restricted until the evacuation notice was further investigated.

Media Statement – 4/4/14

Some news media outlets are today reporting that chemical vapors were detected in Hanford's S Farm this morning, resulting in an evacuation of workers.

The S Farm was evacuated as a precaution this morning for potential chemical vapors. Further investigation found **no chemical vapors had been reported by workers; no workers were sent for medical evaluation.** The evacuation was ended in approximately 90 minutes.

Media outlets are also reporting that 25 workers refused to go to work in the "A" tank farm this morning.

Work in the A complex of tank farms, which had been on restricted access following recent vapor incidents, resumed early this afternoon. Until further notice, workers in the A-complex farms are required to wear respirators.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Holioway, Jerry N
To: [Frame, Susannah \(sframe@king5.com\)](mailto:sframe@king5.com); "Walker, Russ"
Cc: [Gamache, Lori M](#); [Britton, John C](#)
Subject: Responses to KING-5 questions from 4.4.14
Date: Tuesday, April 08, 2014 2:17:00 PM

Response to KING-5 questions from 4.4.14

Independent medical professionals, not WRPS, make the determination as to whether workers should be returned to work. Workers who report chemical vapors symptoms or who voluntarily seek medical aid are required to have an independent medical evaluation before they are allowed to return to work. The initial independent medical reviews cleared all of the 26 workers potentially affected by vapors. Workers also have the option to seek additional medical treatment by a physician of their choice at any time. WRPS is not pressuring workers to return to work and is not involved in the determination of when an employee is medically released to work.

Worker safety is a core value for WRPS throughout all of its operations. A job hazard analysis is completed to identify potential hazards and determine what steps are needed to eliminate or reduce risks. The requirement for wearing any Personal Protective Equipment, including respiratory protection, is determined through the job hazard analysis process. The majority of the recent chemical vapor issues identified occurred at the A-Farm complex. Respiratory protection equipment is now required in the A-Farm until further evaluation of worker safety and health controls has been conducted. Based on evaluations of the potential hazards present in the other farms, the use of respiratory protection remains voluntary, unless required in what are known as Vapor Control Zones, where a higher level of respiratory hazard has been identified. Respiratory protection is provided to workers who want the added protection even if not required to safely perform the duties. In the case of chemical vapors, tank farm worker exposure remains far below applicable occupational levels for chemicals of potential concern.

WRPS uses real-time monitoring instruments to measure area chemical vapor concentrations in locations of known concern such as C-Farm. WRPS also has real-time hand-held instruments that industrial health technicians use to monitor the immediate work area and breathing zone of employees on jobs where job hazard analyses identify the potential for chemical vapors. An example of this would be working on a system that is directly connected to a tank. Some employees also wear air-sampling devices to determine their personal exposures to chemicals of concern. The samples are analyzed and the results reported to the employee. WRPS is researching other available instrumentation and broader application of currently used real-time monitors to improve detection capabilities.

Exhaust stack heights have been increased in a number of tank farms and other extensions are planned to further minimize worker vapor exposure.

From: Holloway, Jerry N
To: "Frame, Susannah"; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C; Walker, Russ
Subject: RE: today's incident in C farm
Date: Monday, April 28, 2014 4:54:00 PM

Two WRPS employees were sent to the site medical provider for evaluation today for potential exposure to chemical vapors in Hanford's C Farm. Seven workers were in the farm. Tank waste retrieval operations were stopped and the farm was immediately evacuated as a precaution about 1 p.m. Both employees were cleared to return to work late Monday afternoon. Access to C Farm remains restricted at this time.

Jerry Holloway
External Affairs Manager
Washington River Protection Solutions,
contractor to the United States Department of Energy
509.372.9953

From: Frame, Susannah [mailto:sframe@king5.com]
Sent: Monday, April 28, 2014 2:33 PM
To: Holloway, Jerry N; Britton, John C
Cc: Gamache, Lori M; Meyer, Carrie C; Walker, Russ
Subject: today's incident in C farm

Hello,

Would anyone like to comment on (b)(6) who experienced symptoms (burning lung sensation) after exposure to vapors today in C farm?

Thanks,
Susannah

Susannah Frame
Investigative Reporter
KING Television
206.448.3876



[Susannah's bio](#)