washington river protection solutions

CPPO Chemical Protection Program Office

CPPO Notebooks on SCBA and FFAPR use available

The Chemical Protection Program Office (CPPO) has published two notebooks on the recent history of the use of supplied air for work inside the tank farms.

Part 1 is an overview of respiratory protection use in the tank farms and the decisions that WRPS made that led to mandatory use of supplied air respiratory protection for all work inside tank farm boundaries. It includes a timeline of events that led to a Stop Work in the summer of 2016 and the signing of a Memorandum of Agreement by WRPS and HAMTC that required the use of SCBA until a respiratory cartridge filter testing program was conducted, and the results confirmed by an independent third-party consultant.

Part 2 discusses the review of filter cartridge testing data and the transition from SCBA to FFAPRs for some low-hazard, non-waste-disturbing work in some actively ventilated tank farms.

A filter cartridge testing protocol was developed to provide a reliable, repeatable method of testing cartridges in the tank farms. PNNL reviewed the test data and StoneTurn Consultants, the independent third party selected by HAMTC, reviewed the testing protocol and WRPS' respiratory protection program and its implementation.

FFAPR use was authorized for SY Farm in December and use may be authorized in AP Farm in the near term. FFAPR use in other actively ventilated farms – AY, AZ, AX, AW and AN – will follow AP Farm implementation.

Read part 1 here

Read part 2 here

Solutions, Issue 438, informed readers about last month's CPPO Notebooks on the recent history of supplied air use at Hanford Tank Farms.

Tank Operations Contract
Chemical Protection Program Office
June 7, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The FY2018-PI MD-033, *Evaluation of Implemented and Proposed Actions in Response to the Hanford Tank Vapor Assessment Report* has been drafted and is in internal review.

The most recently completed draft CVAP Dashboard is populated with April data. Most of the measures within the dashboard are lagging indicators. Progress against each KPP is ranked monthly. The overall progress on draft CVAP scope (measuring the performance for all KPPs) for April is **Meets** where the options for overall ranking are **Exceeds**, **Meets**, **Declining**, and **Adverse**.

In April, both Industrial Hygiene **KPPs 2** and **3** accomplished **Exceeds**. Under **KPP 2**, IH continues to complete additional sections of the IH Manual ahead of schedule. Under **KPP 3**, the Centralized IH Residence occupancy date is still tracking for August. Additionally, good progress is being made on the IH studies (**See KPP 3**). **KPPs 1, 5, 6,** and **7** all rank as M**eets**. Measured in **KPP 1**, CPPO continues with timely updates to the HanfordVapors.com website. Chemical Vapor Solutions Team (CVST) Team Vapor Representative (TVR) attendance is **Declining,** and for the third month in a row, is **Declining** or **Adverse**. In **KPP 5** are tracked the Unrestricted Work Boundaries, Stack and Boundary Monitors, and the Public Address (PA) System. **KPP 5** ranks as **Meets,** driven by strong performance on the PA system installation in west area. Although not measured in the dashboard, it's noted that the *Industrial Hygiene Basis for Defining the Unrestricted Work Boundary* paper is published and will be posted to the website.
The installations of monitors on AW, AN, AX, and 702-AZ Stack continue with extremely low float, as does the turnover in AP Farm. An expeditor has been assigned to help ensure fabrication and delivery of the monitors by [1]CEREX, and a phased turnover approach for AP has been implemented. The *Tank Operations Stewardship Execution Strategy* document has been released, so the metric for **KPP 6** will be phased out starting next month. **KPP 7**, Hierarchy of Controls, is **Meets,** but the float for [2]C_2Sense is slim. The personal monitors study report is tracking on schedule. All of the projects monitored within **KPP 4**, Engineering Controls, continue to progress, however they have no float; consequently, **KPP 4** is **Declining**. WRPS has enlisted ORP assistance with the environmental permitting on the AW Stack Extension.

CPPO Oversight and Tracking

External Assessments Recommendations Status

The recommendations status columns in **Table 1** below are defined as follows:

- **Complete** - The scope and deliverable(s) (i.e. final report or documentation) addressing the recommendation is complete and closed. CPPO has validated deliverable(s) complete.
- **Field Work Complete** - The scope addressing the recommendation is complete, but the final deliverable(s) is not complete (i.e. final report or documentation).
- **In Progress** - The scope addressing the recommendation is in progress.
- **Pending Validation** - Status of the scope addressing the recommendation and associated deliverable(s) is awaiting initial CPPO review.

Significant progress has been made to address these recommendations. CPPO has validated that 64% of the recommendations have been addressed by actions/deliverable that are either **Complete** or **Field Work Complete**. Of the 366 total recommendations:

- 52% have been verified **Complete** and are considered closed.
- 12% are verified as **Field Work Complete** and are awaiting final deliverables (i.e. documentation) to close.
- 36% have ongoing actions and are **In Progress.**

The pending recommendations from the previous month's update have been reviewed and statused by the CPPO. There are no **Pending** recommendations.

Table 1. External Assessments Recommendations Status

Report	As of May 31, 2018				
	Total	Validated Complete	Field Work Complete	In Progress	Pending*
TVAT	117	88	7	22	0
OIG	3	3	0	0	0
NIOSH	54	20	11	23	0
EA-32	31	16	5	10	0
CTEH	23	16	2	5	0
VMEP I, II	67	23	9	35	0
Other	74	25	11	38	0
Total	369	191	45	133	0

External Assessments Recommendations Status

Vapors Corrective Action Status

The CPPO tracks vapor-related Problem Evaluation Requests (PER), with the goal of communicating PER resolution status. The performance data in **Figure 1** below are defined as follows:

- Current Due (Month) – Current corrective actions due for the month
- Number of Completed (Month) – Number of corrective actions completed for the month
- Running Total Due – Total cumulative actions scheduled to be completed
- Total Remaining – Total cumulative actions remaining to be completed
- Cumulative Schedule Performance – Total cumulative actions completed compared to the Running Total Due.

The 128 draft CVAP actions are captured in the PERs listed in **Figure 1** below, including the 3 Office of Inspector General (OIG) actions captured in WRPS-PER-2016-2433 thru 2435 and 5 Office of River Protection (ORP) Facility Representative Surveillance (17173-TF) actions captured in WRPS-PER-2018-0551 thru 0554. Three new actions were added to WRPS-PER-2017-2151. Sixty-three TVAT actions were completed during Phase I (FY2016) and the OIG actions were completed in FY2017; its completions are documented in the Electronic Suspense Tracking and Routing System (E-STARS). The remaining TVAT actions have been rolled into the draft CVAP. The remaining recommendations from National Institute of Occupational Safety and Health (NIOSH), EA-32, Center for Toxicology and Environmental Health (CTEH), and the VMEP were added to the PER system and corrective actions launched. **Figure 1**, depicts the status of the draft CVAP total corrective actions and shows that 4 actions were completed early.

Performance Thresholds

Adverse	≤ BL-10
Declining	>BL-10 and ≤ BL-5
Meets	>BL-5 and ≤ BL+10
Exceeds	>BL+10

KPP 1 – Engagement and Effective Measurement
- WRPS-PER-2017-2151

KPP 2 and 3 – IH Technical Basis and IH Program
- WRPS-PER-2017-0610
- WRPS-PER-2017-0718
- WRPS-PER-2017-0720
- WRPS-PER-2017-0721
- WRPS-PER-2017-0722
- WRPS-PER-2017-0723

KPP 4 – Engineering Controls
- WRPS-PER-2017-2152 (4A)
- WRPS-PER-2017-2153 (4B)

KPP 5 – Administrative Controls and Monitoring
- WRPS-PER-2017-2154 (5A)
- WRPS-PER-2017-2155 (5B)

KPP 6 – Tank Operations Stewardship
- WRPS-PER-2017-2156

KPP 7 – Hierarchy of Controls
- WRPS-PER-2017-2157 (7A)
- WRPS-PER-2017-2158 (7B)

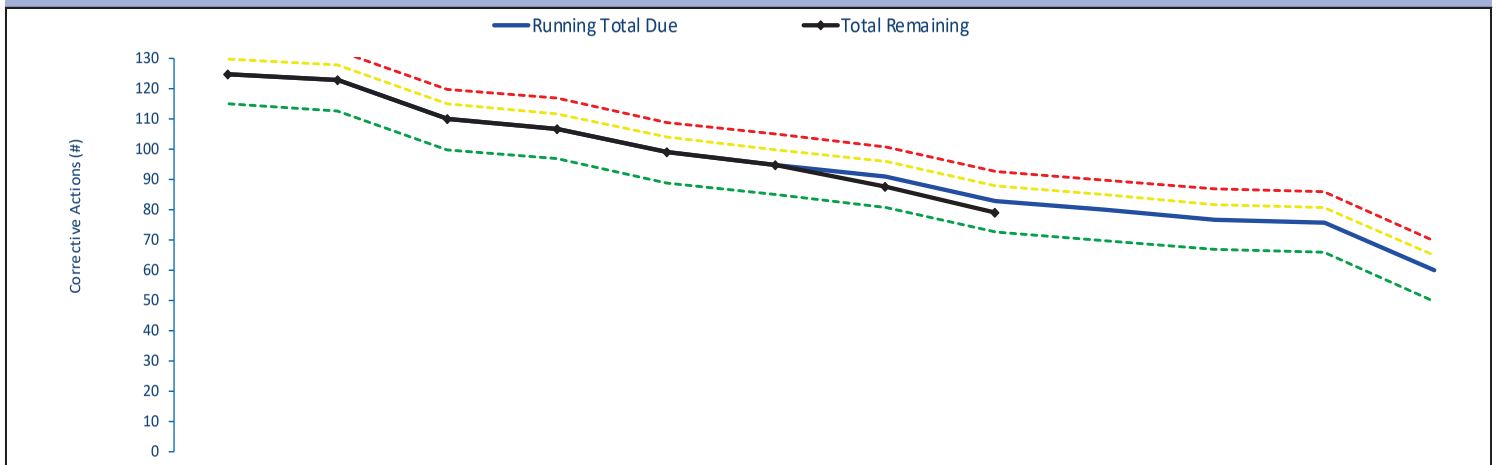
KPP 8 – Medical Support
- WRPS-PER-2017-1707

Chemical Protection Program Office

Vapor Corrective Action Tracking

[Draft-CVAP Actions (includes OIG Actions)]

Trending Fiscal Year 2018
Month Ending May 2018



Performance Data	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18
Current Due (Month)	3	2	13	3	8	4	4	8	3	3	1	16
Number of Completed (Month)	3	2	13	3	8	4	7	9				
Running Total Due	125	123	110	107	99	95	91	83	80	77	76	60
Total Remaining	125	123	110	107	99	95	88	79				
CUM Schedule Performance (#)	0	0	0	0	0	0	3	4				

Figure 1. Vapor Corrective Action Tracking May 2018

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

- Chemical Protection Engagement: Center for Toxicology and Environmental Health (CTEH)

Update:

Toxicologist Dr. Michael Lumpkin was the representative CTEH member on site last week. CTEH contributed to multiple CPPO Notebook materials. Dr. Lumpkin attended the new Chemical Worker (Tier 3) course and offered comments and suggestions to the presenters at the conclusion of the course. Dr. Lumpkin discussed the tank vapor characterization project with senior process engineering staff, and planned a follow-up teleconference for the following week. Dr. Lumpkin met with other CPPO SMEs to discuss approaches for further on-site engagement with focused worker groups. He also met with WRPS and PNNL staff to get updated on the status of HPP reports, air modeling software development, and the fugitive emissions initiative.

- Chemical Protection Engagement: Communications

Update:

Last week's CPPO Notebook is titled *Nitrous Oxide – Part 1,* and was developed by CTEH.

Solutions, Issue 438, May 21, 2018, assisted readers in accessing CPPO Notebooks on the recent history of SCBA and FFAPR.

On May 29, 2018, Shift Office Event Notification (SOEN) stated, "Lifted Stop Work on use of Scott Carri-Air respiratory equipment and easy-flow regulators/harness." Required reading has been issued.

An Industrial Hygiene *Communication* published on May 29, 2018, read, "On Friday May 18, 2018, 4 workers in the SY Tank Farm using Scott 7422-SC1 (Chemical) and/or Scott 7422-SD1 (Combo) cartridges reported the presence of charcoal (from the cartridges) in their face masks. A Stop Work was immediately issued on the use of the above Scott cartridges. Cartridges that had been used by the workers on May 18 had been disposed upon their exit from the work area. When the incidents became known, most of these cartridges were recovered and

Key Performance Parameter 1
Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

preserved for further investigation." The communication described the path forward as, "WRPS has decided to return our current in house stock of all 7422-SC1 and 7422-SD1 cartridges to the manufacturer. We will be supplied with and issue 7422-SC1 and SD1 cartridges that were manufactured only after their additional production process and additional quality inspections were implemented by Scott Safety (i.e. May 1, 2018 or later).

Chemical Protection Engagement: Hanford Vapors Website Updates

- CVST agenda - April 11, 2018
- CVST agenda - March 14, 2018
- CVST agenda - Feb. 14, 2018
- CPPO Weekly Report - May 24, 2018

Chemical Protection Engagement: Effectiveness Measures

Update:

The CPPO *FY2018 Vapors Communication Survey* report is issued.

Chemical Protection Engagement: Workforce Engagement

Update:

CPPO attended the EV Team Plan-of-the-Day meeting, providing a briefing to the approximately 35-40 members in attendance about the CPPO group and what vapors information products are available and where to find them. The briefing was followed by a Q&A session, where the workforce had a series of questions, including:

- Where will VMDS data be stored during full-time operations?
- What were results of the VMDS pilot-scale monitoring?
- What is latest on FFAPR rollout for AP-Farm?

The group suggested attaching CPPO Notebooks with Safety Start to maximize viewership. It should be noted that the EV Team is familiar with CPPO activities as management routinely reviews CPPO materials with the group.

Chemical Protection Engagement: Worker Feedback

Update:

During an EV Team Plan-of-the-Day meeting to which CPPO was invited, the group suggested attaching CPPO Notebooks with Safety Start to maximize viewership. It should be noted that the EV Team is familiar with CPPO activities as management routinely reviews CPPO materials with the group.

KPPs 2 and 3. IH Technical Basis and IH Program

- IH Manual and Technical Basis

Update:
TFC-Plan-174, *Industrial Hygiene Chemical Vapor Technical Basis Program Plan,* TFC-ESHQ-S_IH-C-66 *Identifying Chemicals of Concern in Hanford Tank Farms* and TFC-ESHQ-S_IH-C-67 *Maintenance of the Industrial Hygiene Chemical Vapor Technical Basis* are being revised to express the requirements more clearly.

Key Performance Parameter 2
Maintain Industrial Hygiene Chemical Vapor Technical Basis and the chemicals of potential concern (COPC). Institutionalize a disciplined and rigorous process for updates to include new scientific findings and enhanced understandings of potential exposures.

- Health Process Plan (HPP)

Update:
Six of the HPP studies that have transitioned in the TFC-Charter 71 process have been slated to be issued outright as version Rev 0. Three studies released at the end of May include *Proposed HTFOELs for Chronic Exposures – COPCs with Regulatory Guidelines* (PNNL-26777)*; Proposed HTFOELs for Chronic Exposures - Nitrile Class COPCs and 2,4-Dimethylpyridine* (PNNL-26819)*; and Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update* (PNNL-26820). Two studies scheduled for release in June are *Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines* and *Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors.* The report *Hanford Tank Farm Occupational Exposure and Risk Assessment Plan* is in review. The studies *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern, Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures,* and *Proposed Occupational Exposure Limits for Furans,* are in review by IH to assess the technical and economic impacts of implementing the study recommendations.

- Leading Indicators

Last update 5/10/2018:
Pacific Northwest National Laboratory supported WRPS in improving its chemical vapors hazard management program with research, analysis, development, testing, and technical support focused on better identification and understanding of the vapor hazards. PNNL-27449, *FY18 Leading Indicator Phase 2 Report*, published last month, describes one part of an overall vapors program managed by WRPS, specifically addressing the identification of chemical vapor leading indicators (LIs). The report is part of the toolbox and technical basis used by the WRPS Industrial Hygiene group to devise processes and procedures used to limit worker exposure.

Key Performance Parameter 3
Maintain Industrial Hygiene Program and institutionalize vapor program requirements, best practices and program parity, and complete necessary training to support full implementation at the beginning of FY2018.

- Air Dispersion Modeling

Update:
Industrial Hygiene submitted its final technical review of *The APGEMS – TF Atmospheric Dispersion Model for Tank Farms Applications* (PNNL-27530) and it was released at the end of May. The Air Pollutant Graphical Environmental Monitoring System (APGEMS) modeling software (version 1.0) and accompanying draft report were completed and delivered to WRPS by the Dispersion Modeling Project Team in March. The report describes the APGEMS software and discusses the technical limitations of the current version. Since then, the APGEMS software has been refined, resulting in version 1.1. PNNL delivered version 1.1 of the APGEMS-TF software for installation and testing by WRPS.

- Central Residence for Industrial Hygiene Technicians (IHT)

Update:
Proposals to install the centralized mobile office (MO) for the IH Technicians (IHTs) have been received and evaluated. The trailer has been constructed and is currently stored in the Pac Mobile yard in Pasco. The installation site is in the 200 East area on 4th Street near 218A across from PUREX.

KPP 4. Engineering Controls

- A Farm Exhausters

Last update 5/24/2018:
Exhausters: Over the last two weeks, crews continued construction of the exhauster retaining walls which support the exhauster slab. After successfully testing pumping a concrete mix ~300-feet through a metal line (at an off-site facility), the concrete for the exhauster slab retaining walls was poured at the site **Vent Ducting Isolation**: Filled each of the six A Farm tank seal-loops with grout. Isolating the 20-inch seal-loops maintains tank vacuum and provides improved visibility during retrieval. **A/AX Farm Road Expansion**: Removed the light pole located north of A-105 and continued backfill and compaction.

Key Performance Parameter 4
Complete engineering control concept demonstrations for Strobic Air Tri-Stack® and NUCON® International, Inc. thermal combustion in support of unrestricted work boundaries.

- AW Stack Extension

Last update 5/24/2018:
The fabrication of the AW Farm stack extension continued. In the last two weeks, the non-radiological and radiological permit application continued to be prepared. Both permits are with ORP for review. Additionally, planning for the foundation and stack installation activities continued. The work package for foundation activities

was completed, while the work package for installation activities is still under development. In addition, excavation for the foundation was started and submittals for fabrication of the stack extension were approved.

- AN Stack Extension

Last update 5/24/2018:

Engineering evaluations are being performed to determine the optimum height required for the stack and whether the existing superstructure can support that stack height increase. Modeling was approved last week.

- [3]Strobic® Air Dilution Fan

Last update 5/24/2018:

Efforts focused on the Strobic® Air Dilution Fan off-site testing. The following was accomplished over the last two weeks:

- The test plan, design, and equipment list, all in support of off-site testing, have been reviewed and comments are being incorporated. An important modification was made to the equipment, thus allowing higher flowrates. This was a suggestion incorporated from the comments.
- Hi-Line is repairing the damages to the fan incurred during shipping from the Strobic factory.

- [4]NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

Last update 5/24/2018:

Engineering-scale testing continued, and the following was accomplished over the last two weeks:

TerraGraphics:

- Test and Design engineers provided support for VAU startup and training activities. Options were provided for replacing oil in the generator, since the oil filter was determined to be a special order, and the oil and oil filter were changed.
- Work continued on the *Technical Demonstration Conceptual Design* for BY-108, including resolving comments from the 60% conceptual design package, and in parallel, work continues on the 90% conceptual design package. WRPS Engineering is finalizing the standards to be used in the design.

NUCON®:

NUCON® provides technical support for VAU activities.

WRPS:

Issued a Contract Change Request to TerraGraphics for additional funds needed to maintain support. In support of the NUCON® test, GC-MS analysis was completed on

ambient air samples to identify potential interferences for measuring NDMA, formaldehyde, and furans on the proton transfer reaction mass spectrometry (PTR-MS). Both methyl acetate and ethyl formate were identified as potential interferences that will present challenges to measuring NDMA with the PTR-MS at the concentrations of interest.

PNNL:

Continued implementing the test plan and performed the following:

- Established ambient air baseline concentrations.
- Completed test for establishing diesel baselines for the sample ports and also collected summa samples from the sample ports for 222-S analyses.
- Conducted the calibration of the exhaust gas flow rate.
- Completed nitrous oxide calibration of the FTIR.
- Completed test which confirms the ability to detect ammonia and nitrous oxide in the exhaust stream at nominally 10% or less of the OEL.
- Completed 2 times OEL test for nitrous oxide and ammonia.
- Completed maximum concentrations tests for nitrous oxide and ammonia.
- Completed test for detection of 1,3-butadiene, formaldehyde and 2,4-dimethylpyridine.
- Completed 2 times OEL test for 1,3-butadiene, formaldehyde, and 2,4-dimethylpyridine.
- Completed installation of the bubbler system for injection.
- Started installation of the pre-concentration system.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in AP Farm

Update:

As the month of May came to a close, efforts to obtain approvals on the Phase 2 Pilot-Scale Report, a report summarizing the results of the FY2017 pilot-scale activities, continue.

Key Performance Parameter 5

Define unrestricted work boundaries and implement monitoring on active stack ventilation and unrestricted work boundaries in the A farms to provide defense-in-depth.

- The UV-FTIR installed at AP Farm is in the process of being turned over to Operations. The on-going activities supporting the turnover include the following:
    - The functions-and-requirements (F&R) document, RPP-RPT-60580, was approved.
    - *The Operational Acceptance Test* (OAT) has been split into two separate tests to optimize approval process. The first OAT addresses startup activities where no gas testing is required,

while the second OAT addresses startup activities where gas testing is required.

- *No-Gas Testing OAT: The OAT test procedure is currently being prepared.*
- *Gas Testing OAT: The test plan has been completed and is awaiting to be reviewed by the Joint Test Group.*

- Continuing to obtain approvals for the uncertainty evaluation (RPP-RPT-60669).
- Continuing to obtain approvals for the calibration gas calculation (RPP-CALC-62150).
- Continuing efforts to complete *Operational Readiness Checklist* items.

Stack and Boundary Monitors

Update:

Activities in progress at the end of May include:

- Performing fabrication and factory acceptance testing of the Ultra Violet Differential Optic Absorption Spectrometry (UV-DOAS) units.
- Continuing to prepare work packages for installation of the 702AZ, AN Farm, AW Farm, and AX Farm stack monitors.
- Continuing to review AW Farm stack monitor design package.
- Starting to review the 90% design package for the AX Farm stack monitor.

Establishing Safe Unrestricted Boundaries

Update:

The *Industrial Hygiene Basis for defining the Unrestricted Work Boundary*, clarifying how WRPS will define work boundaries in and around the Tank Farms, was published on March 28, 2018. An internal review of the *Industrial Hygiene Basis for defining the Unrestricted Work Boundary* was conducted and a gap analysis performed. A revision to TFC-ESHQ-S_IH-C-48 *Managing Tank Chemical Vapors* was performed to address the gaps and incorporate necessary improvements to the process. C-48 is currently under review and comment resolution.

Public Address (PA) System

Update:

Activities at the end of May include the following:

- Continuing activities to support turnover of the second set of PA systems (AW, AN, AP and C Farms). Efforts are focused on resolving switch and filter issues.
- Continuing efforts for the next set of PA systems (B, S, T, and U Farms). Fieldwork at S, SX, and SY Farms was initiated and completed (excavation,

trenching, wiring, and conduit installs) with the exception of terminating wires and resolving the same switch and filter issues that are impacting the east area PA systems. Additionally, trench excavation was begun at T Farm and the installation of the crash gates at AP Farm and AW Farm were completed.

KPP 6. Tank Operations Stewardship

Key Performance Parameter 6
Institutionalize a tank operations stewardship program that minimizes required Tank Farm personnel entries; and establishes parameters for locating ancillary personnel and offices.

Pilot SST Stewardship Program

Update:
Activities completed as the month of May came to a close include the following:
SST Remote Monitoring Equipment:
Efforts to start MSA network development and installation activities have been delayed as MSA is working contract issues with their construction subcontractor. Efforts continued on the draft 60% TX-Farm design package.
FY2015 LEAN Report:
The *SST Stewardship Execution Strategy Document* was approved.

KPP 7. Hierarchy of Controls

Key Performance Parameter 7
Provide options to promote the hierarchy of controls for chemical vapor respiratory protection beyond current use self-contained breathing apparatus.

Cartridge Testing and SCBA Alternatives

Update:
PNNL began circulating its draft report of APR testing performed in SX Farm during June 2017. The report for PAPR cartridge testing conducted at SX-101 and SX-104 was released. Recent cartridge testing data collected from the AX Exhauster has been analyzed and the report is in draft. AW Stack cartridge testing is scheduled this weekend during waste disturbing activities.
SCBA chest straps on order are arriving; inventories increasing.
APR cartridge testing for excess charcoal dust has been completed. The inventory of concern was returned to the manufacturer and replaced with fresher/newer cartridges.

Mobile Laboratory

Last update 5/24/2018:
The lab will be supporting the $^{3}C_{2}$Sense® data collection from the AP Stack.

Personal Vapor Monitor

Last update 5/24/2018:

The C_2Sense® field demonstration data collection is ongoing.

- Data from four C_2Sense® units, four [4]ToxiRAE Pro detectors, and two ground truth instruments was collected from the A-103 passive breather filters (PBF). The new configuration, which uses a pump to pull high ammonia concentration air from the PBF and deliver it to an ice chest with detectors enclosed, has produced excellent results with ammonia concentrations from 0 to 200+ ppm. Developed with input from the workforce, adjustments were successfully made to the configuration to reduce the maximum ammonia concentration slightly to within range of the ammonia detectors.
- Efforts continued to obtain calibration certifications on the [6]Ventis™ Pro V detectors from the manufacturer, with plans to incorporate these units into the testing phase after the certifications are received.
- Orders were placed for four [7]GfG Micro IV ammonia detectors.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations.

Key Performance Parameter 8

Support medical program enhancements in conjunction with responsible Hanford Site organizations and establish update to WRPS process/procedures.

[1]CEREX® Stack Monitor CEREX trademark by TECAN SP, INC. Baldwin Park, California.
[2]C_2Sense is a registered trademark by C2Sense, Inc., Cambridge, Massachusetts.
[3]Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.
[4]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[5]RAE Systems by Honeywell, San Jose, California.
[6]Ventis™ Pro5 Multi-Gas Monitor is a registered trademark by Industrial Scientific in Pittsburgh, Pennsylvania.
[7]GfG Micro IV Single Gas Detector from GfG Instrumentation, Inc.