

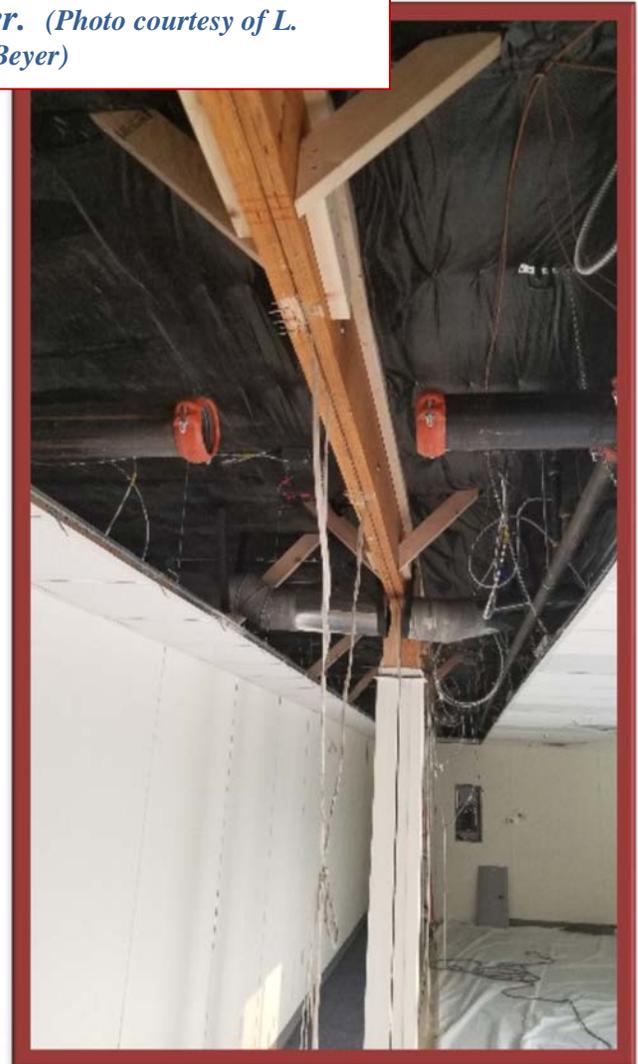


washington **river**
protection solutions



Pictured above is an above-ceiling HLAN and HVAC installation in the Industrial Hygiene Trailer. (Photo courtesy of L. Parks-Beyer)

Pictured below is an above-ceiling fire protection pipe in the Industrial Hygiene Trailer. (Photo courtesy of L. Parks-Beyer)



Tank Operations Contract
Chemical Protection Program Office
September 20, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The CPPO-led focus group report has been drafted. The final report, including observations and recommendations for improving the effectiveness of vapors information, is in technical editing.

CPPO Oversight and Tracking

Cost and Schedule Metric

Ongoing vapor projects supporting the *Comprehensive Vapor Action Plan (CVAP)* Key Performance Parameters (KPPs) are still moving forward as planned. **Figure 1** shows the FY-to-date costs of \$42.8 million spent on implementing the CVAP KPPs. Work is on schedule. **Figure 2** shows the FY 2018 costs and schedule variances for the CVAP.

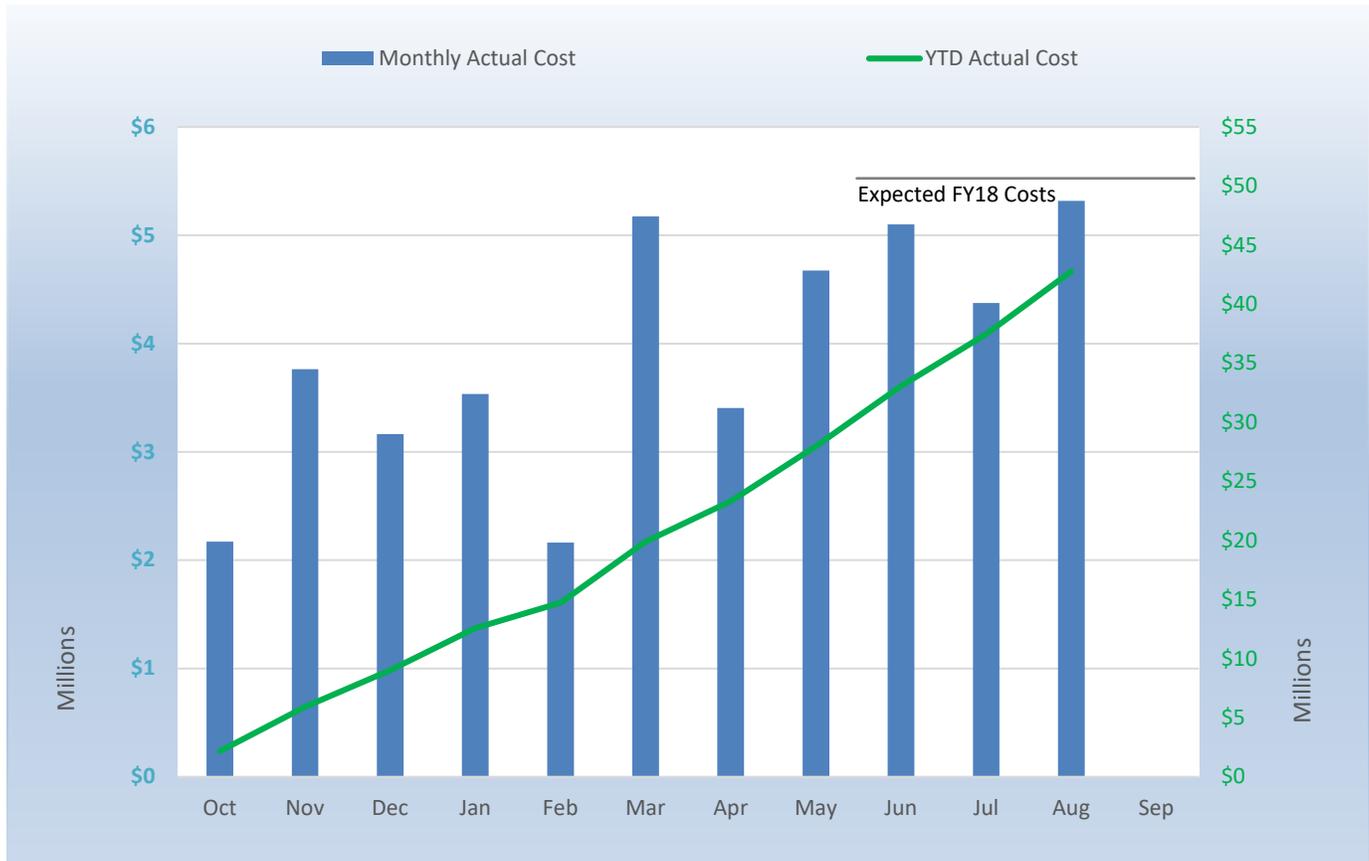


Figure 1. FY2018 Comprehensive Vapors Action Plan Costs

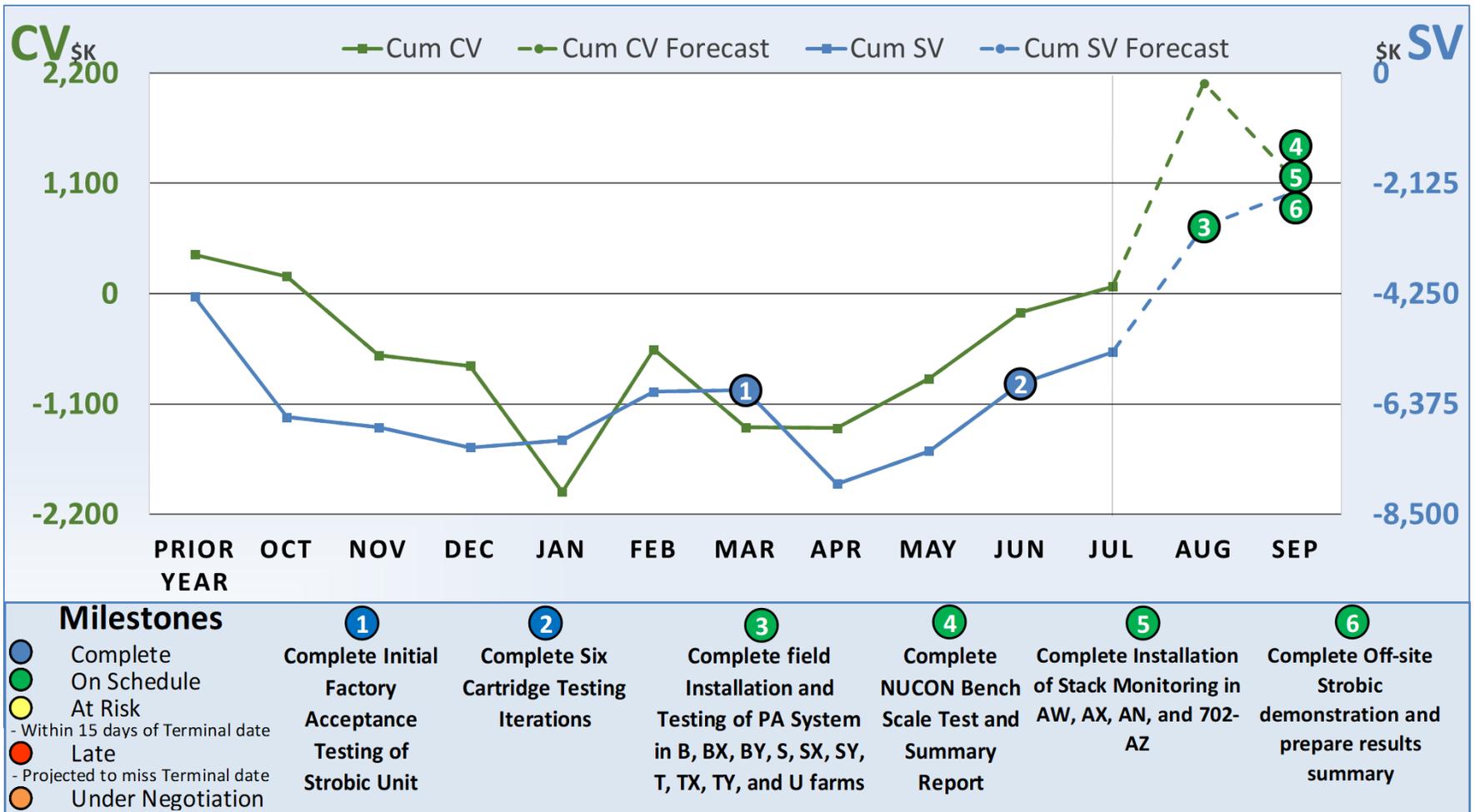


Figure 2. FY2018 Cost and Schedule Variances for the CVAP

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

✚ CTEH

Update:

CTEH toxicologists Drs. Perez and Kuhlman were onsite last week. Dr. Kuhlman met with approximately 20 workers at the conclusion of their Chemical Worker Tier 3 Training to answer questions on tank vapor toxicology and potential health risks. The discussion lasted an hour and covered topics such as the health effects of exposure to chemicals of potential concern (COPCs) and the basis of occupational exposure limits (OELs). Dr. Perez worked with CPPPO staff to develop a notebook presenting the results of a recent evaporator campaign. CTEH toxicologists continued to develop the IH Technical basis re-assessment report and conduct literature research into clinical biomarkers for tank vapor effects, in conjunction with HPMC staff.

Key Performance Parameter 1

Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

✚ Chemical Protection

Engagement: Communications

Update:

Last week's CPPPO Notebook is titled *Chemicals in the Tank Headspace – Part III: The Future of Tank Headspace Characterization*. This week's Notebook is titled *Interim Use of the 241-AP Stack Monitor for Reliable Ammonia Monitoring*.



Figure 3. Cover of the September 20, 2018, CPPPO Notebook.

The CPPO/ HAMTC Safety Representatives interface meeting was held on September 12, 2018. The CPPO, HAMTC Safety, NCOs, and IH Programs were in attendance. The HAMTC safety representatives discussed upcoming activities with grouting of the PUREX tunnel. Feedback was requested by CPPO on topics for our upcoming engagement activities; it was recommended we discuss about fugitive emissions, mobile lab and the SX asphalt barrier. There were also discussions on making PPE requirements consistent for all activities and how to approach this subject.

In an all-employee email on September 10, 2018, Industrial Hygiene communicated a major revision to TFC-ESHQ-IH-C-48, *Managing Tank Chemical Vapors*, intended to “simplify risk classification categories, align terminology with industry standards, and assist in the demarcation and communication of areas with greater potential of tank chemical hazards.” *Exclusion Zones* **replaces** *Vapor Control Zone* as the term used to demarcate “the boundary of potential vapor emission source greater than 50% of the OEL.”

Solutions, Issue 451, published on September 10, 2018, invited readers to investigate the CPPO Weekly Report and provided a link to HanfordVapors.com.

Chemical Protection Engagement: Chemical Vapors Solutions Team (CVST) Update:

A CVST New Technology Sub-team meeting was held September 12, 2018. Representatives from the Chief Technology Office (CTO), CPPO, IH Technicians, IH Programs, and DOE were in attendance. The focus of this meeting was to determine the path forward of the sub-committee team. The team leader provided an update on his meeting with CTO management who indicated that the Technology Roadmap process could be used as an alternative to the New Technology team. The team agreed to a review and vote at the next CVST Voting Members meeting.

The CVST Committee held a meeting on September 12, 2018. The ESH&Q Chemical Protection Integration Manager updated the group on FY2019 expectations, including Performance Based Initiatives, the IH Manual, QRAs, and FFAPRs in the tank farms. Mr. George Weeks gave a presentation on the FY2018 Mobile Laboratory Background Study which ran from March 18 to April 20, 2018.

Chemical Protection Engagement: Hanford Vapors Website Updates **Last update 9/13/2018:**

No documents were posted to HanfordVapors.com last week.

Chemical Protection Engagement: Workforce Engagement New Updates begin October 1, 2018

KPPs 2 and 3. IH Technical Basis and IH Program

IH Manual and Technical Basis

Last update 9/13/2018:

The TOC-IH-58435, *Industrial Hygiene Manual's* updated sections, including Section 5, *Reporting Occupational Exposure, and Medical Monitoring*, are all posted on the Industrial Hygiene webpage on the Intranet. Section 6, now titled *Work Control*, Section 7, *IH Program Administration*, and Section 8, *Documents and Records*, have successfully navigated an internal WRPS review, and are now available to DOE Office of River Protection (ORP) for its review.

Industrial Hygiene communicated a major revision to TFC-ESHQ-IH-C-48, *Managing Tank Chemical Vapors*, intended to “simplify risk classification categories, align terminology with industry standards, and assist in the demarcation and communication of areas with greater potential of tank chemical hazards.” *Exclusion Zones replaces Vapor Control Zone* as the term used to demarcate “the boundary of potential vapor emission source greater than 50% of the OEL.”

TFC-PLN-34, *Industrial Hygiene Exposure Assessment Strategy*, is WRPS’s published guideline for developing exposure assessments. The AP Farm base line exposure assessment (EA) is complete and approved by DOE. IH Management will direct its release in a carefully timed and executed rollout. A Farm EA is complete and has been given to ORP for review/comments. AW Farm EA is in draft.

TFC-PLN-173, *Use of FFAPR in Actively Ventilated Tank Farms*, is posted on the website for implementation in SY, AP, and AN Farms. It was edited to include AN Farm on September 4, 2018.

The Industrial Hygiene organization is reporting 100% of the IH workforce has been trained in *Risk Communication Techniques* and ~100% trained in *Crucial Conversations*.

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)

Last update 8/23/2018:

The following HPP studies conducted by PNNL have been released as final versions under the TFC-Charter-71 process: *Proposed OELs for Chronic Exposures – COPCs with Regulatory Guidelines, Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update, and Proposed OELs for Chronic Exposures – Nitrile Class COPCs and 2,4-Dimethylpyridine, Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines and Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors. Sampling and Analysis Plan* is cleared for release to the public as of last week.

The study *Proposed Risk-Based Approach for Nitrosamine Chemical-of-Potential Concern* is being considered further for evaluation of economic impact and technical feasibility. The study *Proposed Occupational Exposure Limits for Furans* will be further evaluated via the Charter-71 process in FY2019.

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

Last update 8/2/2018:

The Air Pollutant Graphical Environmental Monitoring System (APGEMS) modeling software (version 1.0) and accompanying report were released in May. The report describes the APGEMS-TF software and presented three test cases illustrating model performance for simulations involving the AP, AW, and AN Stacks, as well as the 242-A Evaporator. The test cases were selected to provide model predictions of ammonia and mercury air emissions during low, medium, or high wind conditions. The APGEMS-TF software was refined and version 1.1 was delivered to WRPS for acceptance testing. WRPS Engineering and IH are evaluating the software and providing feedback to the PNNL team. Representatives from Process Engineering and Chief Technology Office (CTO) Fugitive Emissions team were trained in the use of APGEMS-TF Version 1.1 last week.

Central Residence for Industrial Hygiene Technicians (IHT)

Update:

Utility and HLAN installations are ongoing in the new ten-wide facility, built to house industrial hygiene field personnel and equipment. The cover photos depict an above-ceiling fire protection pipe an above-ceiling HLAN and HVAC installation. The sewer, water and electrical subcontractors are working in parallel with anticipated completion the third week of October.

KPP 4. Engineering Controls

A Farm Exhausters

Update:

Procurement/Fabrication: In the last two weeks, procurement of the POR518/POR519 exhauster valve manifold, manifold support and access platform, ventilation ducting, riser assemblies, work platforms, cover plates, grout boxes and large spray rings continued. Subcontracts for fabrication of the stand assemblies, demister shields, and grout boxes were awarded. Commenced fabrication of the concrete blocks, work platforms and cover plates.

Construction Subcontract: Prepared the requisition for installation of the A Farm exhauster manifold and ductwork.

Equipment Removal: Continued planning to remove thermocouples from A-101, A-103, A-104 and A-106 to accommodate vent installation. Cameras were installed in A-104 and A-106 to support thermocouple investigation and removal design activities.

Exhauster Valve Manifold: The fill and compaction construction work for the POR518/POR519 exhauster valve manifold slab continued last week as well.

Key Performance Parameter 4

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

AW Stack Extension

Update:

The AW Farm stack extension installation continued the last two weeks; the following was accomplished:

- Preparations of the non-radiological and radiological permit applications continued. The radiological permit is with ORP for review while comments from Ecology on the non-radiological permit continue to be resolved.
- Stack installation and fabrication activities continued. Comments are being resolved on the final lift plan.

AN Stack Extension

Update:

The draft of the dispersion modeling reports continued over the last two weeks. In addition to the modeling report, a meeting was held to review the proposed engineering evaluation and current dispersion modeling results with WRPS management. Preliminary indications are the cons for installing the AN Farm stack extension may currently outweigh the pros, and therefore this effort may be placed on-hold.

Strobic®¹ Air Dilution Fan

Update:

The evaluation of the test results and data from the recently completed off-site Strobic® Air Unit has been completed, and the report is being drafted.

NUCON®² Thermal Oxidation Vapor Abatement Unit (VAU)

Update:

Terragraphics: Terragraphics, having received feedback on the 90% Conceptual Design of the NUCON® infrastructure for the field demonstration on BY-108, continued to work on comment-resolution.

NUCON®: Continued providing telephone consultations.

PNNL: *NUCON® Vapor Abatement Unit Performance on Hanford Tank Farm Chemical of Potential Concern*, which captures the test results from the NUCON® engineering-scale test, was submitted to WRPS. Additionally, PNNL conducted a walkthrough with WRPS engineering and project teams to evaluate potentially purchasing the trailer to support future NUCON® testing.

WRPS: Issued the final test report summarizing the NUCON® engineering-scale activities entitled *NUCON® Vapor Abatement Unit Performance on Hanford Tank Farm Chemical of Potential Concern*.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in AP Farm

Last update 9/13/2018:

Efforts to obtain approvals on the Phase 2 Pilot-Scale Report continue. For the AP Farm ultra-violet fourier transform infrared spectrometer (UV-FTIR) turnover, numerous activities were on-going during the last two weeks, including the following:

- Completing the Operational Acceptance Tests (OAT) needed to support turnover. The OAT was split into three separate tests to optimize the approval process. The first OAT addresses interim reliability of the system to support startup testing, the second OAT addresses startup activities where no gas testing is required, while the third OAT addresses startup activities where gas testing is required. A status of each OAT is provided below:
 - **Interim Reliability OAT:** Efforts to modify the algorithm have not been started because Cerex was directed to support the installation of the stack monitor.
 - **No-Gas Testing OAT:** Comments on the draft OAT by the Joint Test Working Group have been resolved.

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.

- **Gas Testing OAT:** Awaiting further development of other support activities before proceeding.
- Efforts also continued on installing the bottle racks, and procuring permeation tubes and calibration gases.

✚ Stack and Boundary Monitors

Last update 9/13/2018:

702-AZ Stack Monitor: Installation of the 702-AZ Ultra-Violet-Differential Optical Absorption Spectrometer (UV-DOAS) stack monitor continued.

AN Farm Stack Monitor: The site preparation work was completed, and installation of the UV-DOAS unit has begun.

AX Farm Stack Monitors: The UV-DOAS monitors were delivered on-site and efforts are on-going to prepare the monitors for installation. In addition, site preparation for the units, including staging tube bundles and finalizing electrical wiring, continues.

AW Farm Stack Monitor: The factory acceptance test of the UV-FTIR unit was completed successfully and the monitor was shipped. Site preparation was completed and is ready to receive the monitor upon its arrival.

✚ Establishing Safe Unrestricted Boundaries

Last update 9/13/2018:

Depicted on last week's Weekly Report cover, and depicted in **Figure 4**, is one of the new signs marking the boundary of a potential vapor emission source greater than or equal to 50% of the OEL. On September 5, 2018, Industrial Hygiene, in an all-employee email, notified the workforce of a major revision to TFC-ESHQ-IH-C-48, *Managing Tank Chemical Vapors*. Signs have been prepared to identify the Industrial Area, Exclusion Zone, and Contamination Reduction Zone. Signs will not be prepared to identify the Support/Administrative Zone or Site Boundary at this time. Meetings have been held with other site representatives informing them of the pending changes to farm signage. The new Exclusion Zone signs will be installed "in the coming days."



Figure 4. New Exclusion Zone Warning Sign.

Public Address (PA) System

Last update 9/13/2018:

The functional testing for S, T U, and B Farm public address (PA) systems was completed, while the remaining punch-list items were completed at C Farm. Administrative activities are underway to officially turnover all PA systems to Operations.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 9/13/2018:

The activities completed over the last couple of weeks include the following:

- Mission Support Alliance (MSA) continued network development activities by installing conduit that will store communications fiber. MSA confirmed the conduit was plugged. This is creating challenges. An excavation permit and work package are being prepared to support unplugging the conduit.
- In addition to these activities, efforts continue to prepare a statement of work (SOW) for FY2019 activities. The SOW will support the T Farm complex construction activities.

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.

KPP 7. Hierarchy of Controls

Cartridge Testing and SCBA Alternatives

Last update 8/2/2018:

IH attended meetings with WRPS management to discuss the status of self-contained breathing apparatus (SCBA) alternatives. Cartridge testing has been completed for FY2018, and the SX-101 and SX-104 APR and powered air purifying respirator (PAPR) reports have been issued. The BY sampling data is being analyzed by PNNL. The headspace comparison/line-loss project data is being analyzed as well.

Key Performance Parameter 7

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

Mobile Laboratory

Update:

In the last two weeks, the TerraGraphics Mobile Laboratory sampled around the SX Tank Farm during the initial activities associated with a paving project. The team

sampled around the AY Tank Farm during the AY-102 rinse. Additionally, the mobile team started troubleshooting and repairing the CEREX FTIR module.

Personal Vapor Monitor

Update:

Comments have been received and incorporated into a final report for the wearable ammonia detector field trial in A Farm. The report compares the following detectors: ToxiRAE³, Ventis Pro⁴, GfG Micro IV⁵, and the ChromAir⁶ badge. The final report will be issued once all comment resolution approvals have been received. C₂Sense^{®7} submitted an interim draft report covering data analysis and development of an alpha version of the device algorithm. While there are encouraging aspects of the alpha version of the algorithm, such as correlation with large parts of the data, false positives present in the data reveal that more work is required. C₂Sense[®] is working to enhance the algorithm and expects to deliver a new revision of the report before the end of the fiscal year.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations. **The last update from HPMC was April 12, 2018, for the 2nd Quarter.**

During the 2nd Quarter:

- The Office of the Ombudsman visit was cancelled. No new visit has been confirmed.
- Discussions continue between the HAMTC President and committee related to revising the Access Control Entry System (ACES) exclusion note in the TFC-BSM-HR_EM-C-10, *Reasonable Accommodations* procedure. No agreement has been reached as of the date of this publication.
- HPMC confirmed that it is currently working on the epidemiology study comparing Tank Farm Vapor Exposures and Non-Exposed Group of Hanford Workers.

Key Performance Parameter 8

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

¹Strobic Air Tri Stack is a registered trademark of Strobic Air Corporation, Bensalem, Pennsylvania.

²NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.

³RAE Systems by Honeywell, San Jose, California.

⁴Ventis™ Pro5 Multi-Gas Monitor is a registered trademark by Industrial Scientific in Pittsburgh, Pennsylvania

⁵GfG Micro IV Single Gas Detector from GfG Instrumentation, Inc.

⁶ChromAir is registered to Morphix Technologies, Virginia Beach, Virginia.

⁷C₂Sense is a registered trademark by C2Sense®, Inc., Cambridge, Massachusetts.