



washington **river**  
**protection** solutions



*Pictured is the new Mobile Monitoring Laboratory.  
(Photo courtesy of Kirk Riedner.)*

**Tank Operations Contract**  
**Chemical Protection Program Office**  
**August 16, 2018**

## 1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

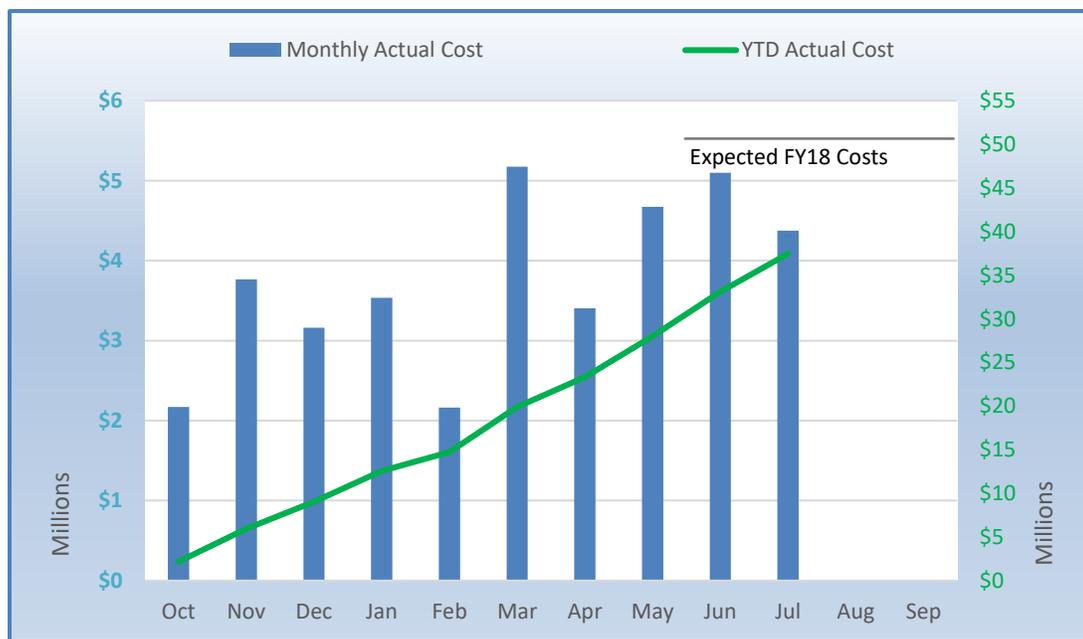
Two interns, one from CPPO and another from Contracts, performed a review of the Hanfordvapors.com website. They observed selected subjects as they navigated the website in search of various topics. The interns' findings about the website's ease of navigation, understandability, age of the information, and the usefulness of the information have been compiled into a draft assessment, which is currently in technical editing.

The CPPO concluded four focus group sessions with Tank Farm Workers. The feedback has been compiled into a draft report, which includes recommendations for improving the effectiveness of vapors information. The final report will be distributed before the end of the Fiscal Year (FY)2018.

### 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 \$37.5 million spent on implementing the CVAP KPPs. The delay in Vapor Monitoring and Detection System (VMDS) procurements with CEREX<sup>®1</sup> has slowed the expected spending. Expenditures will increase during the summer months as the stack monitors and the Industrial Hygiene (IH) Trailer procurement are delivered to Washington River Protection Solutions (WRPS). **Figure 2** shows the FY 2018 costs and schedule variances for the CVAP.



Figures 1. FY2018 Comprehensive Vapors Action Plan Costs

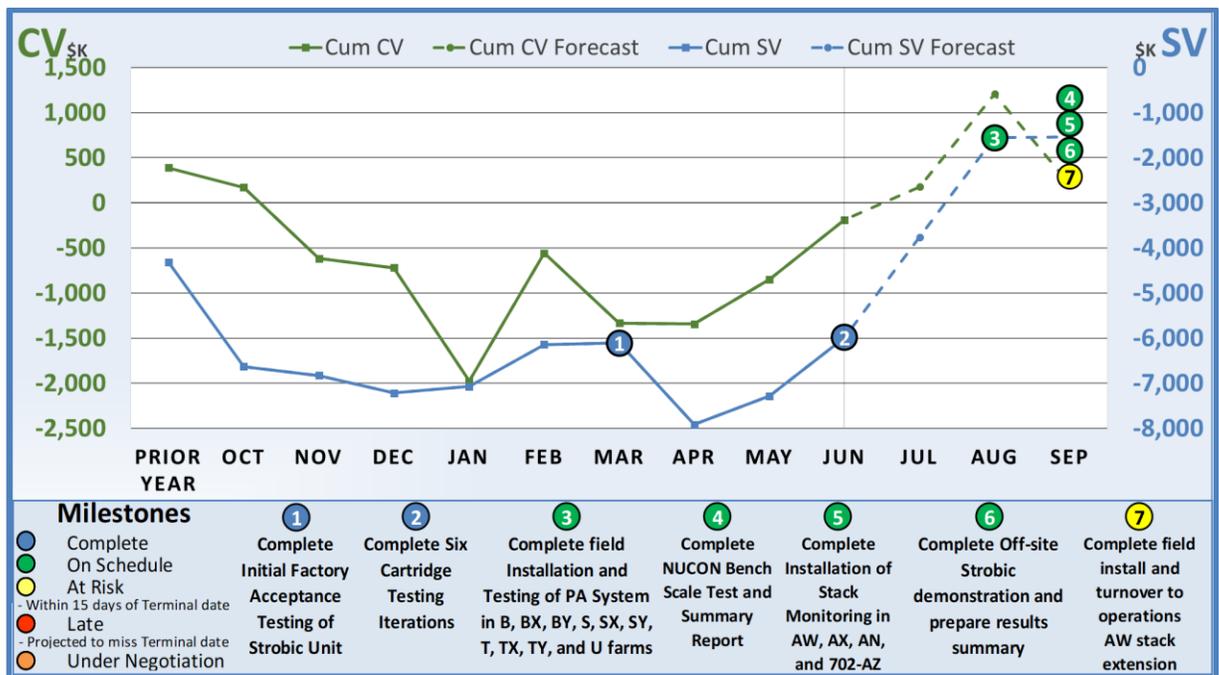


Figure 2. FY2018 Cost and Schedule Variances for the CVAP

## 2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

### KPP 1. Engagement and Effective Measurement

#### CTEH

##### Update:

For the week of August 6 through 9, 2018, CTEH met with numerous Subject Matter Experts (SMEs) to discuss CPPO Notebooks that are in progress. Dan Christensen and Dr. Angie Perez met on-site with Dan Wolf, the Production Operations Safety & Health Manager, at the IH lab to discuss his team's role in on-site sampling. CTEH participation in the Chemical Worker III training session was cancelled, but Dr. Angie Perez responded to a question from a worker wanting to know more about how distance from a vapor source dilutes the vapors.

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

With respect to CPPO Notebook development and completion, the respirator cartridge notebook was completed and recorded; however, the notebook publication was delayed due to the respirator cartridges being pulled from use on August 7, 2018, because of the breakthrough of carbon material in some filters. The Air Pollution Graphical Environmental Modeling System-Tank Farms (APGEMS-TF) Notebook, developed by Dr. Pamela Tijerina, was recorded by Dr. Perez, and

published. Dr. Perez completed a draft of the Evaporator Campaign (EC)-06 analytical data notebook, which she submitted to SMEs for review.

### Chemical Protection Engagement: Communications

#### **Update:**

On August 9, 2018, CPPO released the Notebook entitled, *Air Dispersion Modeling Project: APGEMS-TF*. Information on this Notebook was provided to Communications and Public Relations (C&PR) to be used for a future article in *Solutions*. The prior week's Notebook entitled, *Leading Indicators for Monitoring Tank Vapors: Phase 2*, was presented at the Monday morning Safety Startup meeting.

A Shift Office Event Notice was released on Thursday, August 9, 2018, issuing a standing order on vapor monitoring and detection system (VMDS) chemical concentration values.

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

#### **Update:**

The CVST New Technology Sub-Team scheduled for August 8, 2018, was cancelled.

The CVST Committee held a meeting on August 8, 2018. Groups in attendance included Communications, IH Programs and Technicians, Management, Operations, Hanford Atomic Metal Trades Council (HAMTC) Safety Representatives, Nuclear Chemical Operators, Radiological Control personnel, and CPPO. Steve Killoy opened the meeting with an overview of the topics that would be discussed. Rob Cantwell discussed Stoneturn Consultants' visit to Hanford during the end of July. Stoneturn Consultants observed and interacted with workers who wear full face air purifying respirators (FFAPRs) and self-contained breather apparatuses (SCBAs) in the AP Tank Farm. Stoneturn Consultants' feedback was positive, and they recommended moving forward with FFAPR implementation. Ken Way discussed the presence of carbon dust inside several of the workers' masks who were on FFAPR, and the actions that will be taken to investigate the cause and to resolve the issue. Scott Clingenpeel of the IH group provided insight on Exposure Assessments, where they came from, their purpose and methodology, and the data validation process. The procedure for Exposure Assessment implementation is going through final review and approvals. Doug Greenwell discussed the AY-102 rinse and caustic addition activity scheduled for two weekends in August and early September. Ryan Greenough of IH wrapped up the CVST meeting with a presentation of the ToxiRae Pro personal ammonia monitor and future plans to have the workforce use these monitors.

### Chemical Protection Engagement: Hanford Vapors Website Updates

- [TOC-IH-58451 - Rev 00 Unrestricted Work Boundary Report Summary](#)
- [TOC-IH-58451 - Rev 00 Unrestricted Work Boundary Report](#)
- [EIR-2018-021](#)
- [CPPO Weekly Report - August 2, 2018](#)

### Chemical Protection Engagement: Workforce Engagement

#### **Last update 8/2/2018:**

The CPPO has decided to suspend site briefings for the remainder of FY2018 to allow the workforce to focus on completing end-of-the-year commitments. The tentative plan is to restart the vapors-related workforce site briefings at the beginning of FY2019.

## **KPPs 2 and 3. IH Technical Basis and IH Program**

### IH Manual and Technical Basis

#### **Last update 8/2/2018:**

Since the beginning of the 4<sup>th</sup> Quarter, the TOC-IH-58435, *Industrial Hygiene Manual's* updated sections expanded to include Section 5, *Reporting Occupational Exposure, and Medical Monitoring*, which is now on the Industrial Hygiene webpage on the Intranet. Section 6 is renamed and repurposed, and is now titled *Work Control*. It is in draft review with Department of Energy (DOE) Office of River Protection (ORP). Section 7, *IH Program Administration*, is drafted, and is in internal WRPS review. Section 8, *Documents and Records*, is also in draft and in internal WRPS review. TFC-PLN-173, *Use of FFAPR in Actively Ventilated Tank Farms*, is posted on the website for implementation in SY and AP Farms. It is being edited to include AN Farm.

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

### Health Process Plan (HPP)

#### **Last update 8/2/2018:**

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*. Two studies are in internal review by PNNL prior to release as final versions: *Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines and Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors*. Two studies are currently being reviewed by IH for technical and economic impact per the Charter 71 process. They are *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern* and *Proposed Occupational Exposure Limits for Furans*. One study is in internal review by PNNL prior to release as final version: *Sampling and Analysis Recommendations*.

### 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 tests 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.

#### **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.

### Central Residence for Industrial Hygiene Technicians (IHT)

#### **Last update 8/9/2018:**

As of last week, five of the ten 10-wide trailer sections had been delivered to the 200 East area on 4th Street near 218A across from PUREX. The 10-Wide trailer foundation and tie-down construction is complete. The new trailer's furniture for

occupancy has been received and is in the warehouse for delivery when the trailer assembly is completed.

The trailer sections began arriving for installation on July 31, 2018. Each section is being set and securely tied down as it arrives. All ten sections are scheduled to arrive and to be secured early next week. The vendor will begin the process of marrying up the seams at the walls first, followed by the roof and ceiling

**Figures 3 and 4** show the progress that has been made on the installation of the trailers.



**Figure 3.**  
*IH Trailer  
tie-down  
slabs  
ready.*  
(Photo  
courtesy of  
L. Parks-  
Beyer.)



**Figure 4.**  
*The IH  
Trailers as  
they are  
being  
connected.*  
(Photo  
courtesy of  
Darren  
Merrill.)

## KPP 4. Engineering Controls

### + A Farm Exhausters

**Last update: 7/26/2018:**

**Exhausters:** Over the last two weeks, crews assembled and completed the exhauster slab concrete forms in the A Farm. Additionally, the team began setting rebar for the foundation.

**A/AX Farm Road Expansion:** The team continued establishing crossing plates so that support cranes can access the area.

#### Key Performance Parameter 4

Complete engineering control concept demonstrations for Strobic Air Tri-Stack<sup>®2</sup> and NUCON<sup>®3</sup> International, Inc. thermal combustion in support of unrestricted work boundaries.

**Procurement/Fabrication:** A material request was completed for the POR518/POR519 exhauster valve manifold, the manifold support, the access platform, ventilation ducting, riser assemblies, duct stand assemblies, and concrete blocks.

### + AW Stack Extension

**Last update 7/26/2018:**

Over the last two weeks, the preparation for the installation of the AW Farm Stack extension continued. The following was accomplished during the reporting period:

- The non-radiological and radiological permit application continues. The radiological permit is with the ORP for review, and the non-radiological permit is with Washington State Department of Ecology for review.
- The stack foundation fabrication and preparation for installation activities continued. The site foundation has been completed.

### + AN Stack Extension

**Last update 8/9/2018**

Design Engineering has a draft stack extension evaluation under review. The current infrastructure may be able to support an 18-foot extension to the stack.

### + Strobic<sup>®4</sup> Air Dilution Fan

**Last update 7/26/2018:**

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

- Testing, initiated in the 3rd Quarter, was completed in this quarter.
- Efforts started on evaluating the test results and data.

## NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

### **Last update 7/26/2018:**

Since the beginning of July, the following was accomplished:

#### **TerraGraphics:**

- Work continued on the *Technical Demonstration Conceptual Design* for BY-108, including providing a briefing on the 90% conceptual design to the NUCON® Integrated Project Team. The design package was submitted for review.

#### **NUCON®:**

Phone consultations were provided to WRPS and PNNL.

#### **WRPS:**

- WRPS worked with the 222-S Lab and third party analytical labs to determine a path forward for solving analytical challenges with N-Nitrosodimethylamine (NDMA) encountered during the engineering-scale test;
- Provided final comments on the draft *Quick Look Report*; and
- Prepared documentation to procure the PNNL portion of the FY2019 NUCON® scope.

#### **PNNL:**

PNNL is evaluating test results and preparing the draft test report, as well as incorporating WRPS's comments into the draft test report.

## **KPP 5. Administrative Controls and Monitoring**

### Permanent Installation of VMDS Equipment in AP Farm

#### **Update:**

- 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 reporting period, including the following:

#### **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 Operational Acceptance Tests (OATs) needed to support turnover were completed. The OAT was split into three separate OATs 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; and the third OAT addresses startup activities where gas testing is required. A status of each OAT is provided below:
  - Interim Reliability OAT: Comments from the Joint Test Group and Joint Test Working Group committee were resolved, and the OAT was released for use.
  - No-Gas Testing OAT: The draft OAT has been prepared and is awaiting a Joint Test Working Group review.
  - Gas Testing OAT: This OAT will be started after the Interim Reliability and No-Gas OATs are completed.
- A contract was awarded to a calibration contractor who will support testing activities.
- Efforts also continued on installing the bottle rack and procuring permeation tubes.

#### Stack and Boundary Monitors

##### **Update:**

- The ultraviolet differential optical absorption spectrometer (UV-DOAS) unit for AZ-Farm was delivered on-site, and efforts to fabricate and factory-acceptance test the UV-DOAS unit for AN-Farm continued.
- Site preparatory work for the 702AZ stack was completed and installation of the UV-DOAS monitor began.
- Site preparation work for the installation of the AN-Farm stack monitor continues.
- The work package for installation of the AW-Farm UV-FTIR stack monitor was released and site preparation was started.
- The draft work package for installation of the AX-Farm stack monitor was completed and is currently under review.

#### Establishing Safe Unrestricted Boundaries

##### **Last update 8/2/2018:**

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.

### **+ Public Address (PA) System**

#### **Update:**

- Activities supporting the turnover of the second set of public address (PA) systems (AW, AN, AP and C-farms) continue.
- Efforts for the next set of PA systems (B, S, T and U-Farms) continue. The excavation, trenching, wiring, and conduit installations for S, T and U-Farm complexes were completed and are ready for functional testing, while wire installation activities at B-Farm continue.

#### **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 6. Tank Operations Stewardship**

### **+ Pilot SST Stewardship Program**

#### **Update:**

Remote Monitoring Equipment: Efforts on the final design package commenced with a number of the support calculations getting approved. In addition to the design package, Mission Support Alliance has started laying fiber in support of network development activities.

## **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 SCBA alternatives. Cartridge testing has been completed for FY2018, and the SX-101 and SX-104 APR and 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**

#### **Last update 8/9/2018:**

TerraGraphics (TG) has designed and built a new mobile laboratory that WRPS will lease. The new mobile laboratory features enhanced capabilities, including a more sensitive proton transfer reaction-mass spectrometry (PTR-MS), UV-DOAS, fourier transform infrared spectrometer (FTIR), flame ionizing detector, photo-ionizing

detector, and a Picarro ammonia analyzer. Since the beginning of July, TG has focused on resolving FTIR procurement issues and confirming procedures for equipment testing and validation. The TG mobile laboratory made its inaugural trip to the tank farms earlier this month and performed area monitoring at the corner of 4<sup>th</sup> and Buffalo. The new mobile laboratory's first two activities will be: 1) monitoring to support AP Stack ammonia spike testing; and 2) sampling and diluting the AP Stack gas in support of personal ammonia detector testing.

### Personal Vapor Monitor

#### **Last Updated 8/9/2018:**

Due to limited Radiological Control Technician (RCT) and Industrial Hygiene Technician (IHT) support for the remainder of FY2018, IH management decided to stop Phase II C<sub>2</sub>Sense<sup>®4</sup> testing with the mobile laboratory and proceed directly to report preparation. Phase III of C<sub>2</sub>Sense<sup>®5</sup> testing, to collect zero ammonia background data for instrument sensitivity calculations, was initiated. One of two planned weeks of data collection has been completed. Phase III of C<sub>2</sub>Sense<sup>®</sup> testing does not require RCT or IHT support. Data analysis and report preparation for Phase I and Phase III testing is underway.

## **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 2<sup>nd</sup> Quarter.**

During the 2<sup>nd</sup> 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 they are 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.

<sup>1</sup> CEREX is a registered trademark of Fike Corporation, Blue Springs, Missouri.

<sup>2</sup> Strobic Air Tri-Stack is a registered trademark of Strobic Air Corporation, Bensalem, Pennsylvania.

<sup>3</sup> NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.

<sup>4</sup> Strobic is a registered trademark of MPC Inc., Wilmington, Delaware.

<sup>5</sup> C<sub>2</sub>Sense is a registered trademark by C2Sense, Inc., Cambridge, Massachusetts.