washington river protection solutions

CPPO Chemical Protection Program Office


*Trenches for the PA wiring in A Farm Complex*

# Tank Operations Contract
# Chemical Protection Program Office Weekly Report

## August 10, 2017

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

Processes are now established in the CPPO for developing a weekly CPPO Notebook, facilitating regularly scheduled Integrated Project Team meetings, monitoring updates to the HanfordVapors.com website, and delivering the CPPO Weekly Report. With those challenges met, the CPPO is focusing on the completion of the Recommendations Table (Table), developing a Comprehensive Vapors Actions status dashboard and metrics process, and launching a vapors related Questions & Answers tracking system.

The Table is the compiled list of actions and deliverables in response to the recommendations from National Institute for Occupational Safety and Health (NIOSH), Tank Vapor Assessment Team (TVAT), Office of Inspector General (OIG), Office of Enterprise Assessments (EA-32), and Center for Toxicology and Environmental Health (CTEH). The Table provides the draft Comprehensive Vapors Action Plan (CVAP) Key Performance Parameter (KPP) associated with each action being implemented in response to the recommendations. The Table is in the final stages of review and continues to be a priority for finalization driven by the CPPO. The review process is complete for the recommendations and actions associated with seven of the eight KPPs. Once management reviews and concurrence is complete, it will be submitted to DOE, targeted for the end of August. The actions associated with the deliverables will then be entered into the Problem Evaluation Request (PER) system.

The CPPO has developed a variety of metrics to support the CVAP monitoring dashboard, reflecting the progress made in implementing the CVAP. The metrics are designed to monitor the progress on the CVAP KPPs 1 thru 7. The metrics inform the graphs, charts, and analysis which populate the CVAP KPP Dashboard. The metrics and the dashboard testing and review are nearing completion.

- CPPO Oversight and Tracking

**CPPO Cost and Schedule Metric**

Several projects supporting the CVAP KPPs are currently underway. Previously delayed procurements are now in place, and vendors are ramping up to support a tight schedule.

Year-to-date, $25.9M (66%) of our revised not to exceed (NTE) value of $39.1M has been spent. Monthly costs are expected to remain at about $4 M per month for the remainder of the year. At this rate we expect the NTE to last through October 2017.

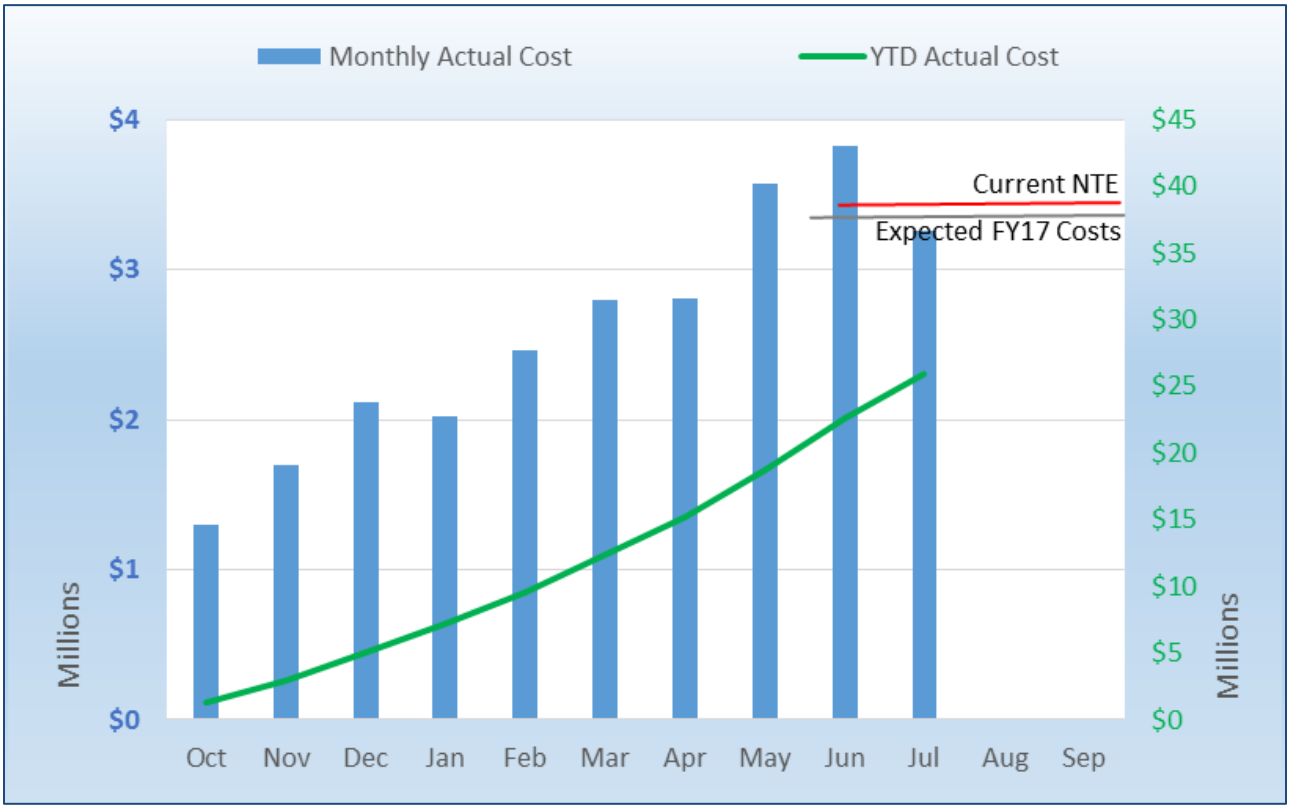


**Figure 1.** FY17 Projected CVAP Costs

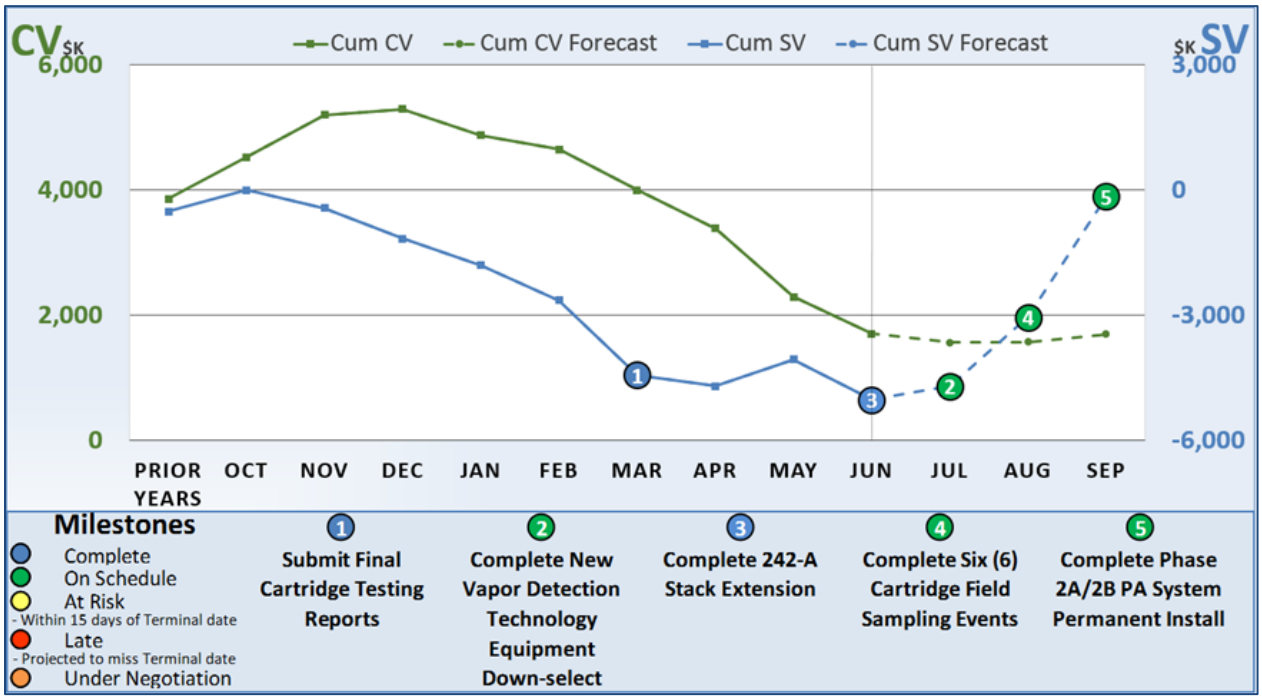


**Figure 2**. FY17 Cost and Schedule Variances for CVAP

## 2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

### KPP 1. Engagement and Effective Measurement

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

#### Chemical Protection Engagement

The engagement initiative sponsored by CPPO continues with the arrival of additional CTEH colleague to support this initiative. The team from CTEH, comprised of toxicologists and industrial hygienists, will be spending time onsite engaging the Industrial Hygiene Professionals (IHP) and Industrial Hygiene Technicians (IHT) as a knowledge and mentoring resource.

#### Chemical Protection Engagement Communications

There are currently two vapors related communication plans in development. The *Comprehensive Vapor Management Communication Plan* is a requirement of KPP 1. The *CVAP Communication Plan* is a focused plan for communicating the content of the CVAP when it is completed and issued. Both plans are in draft. The *Comprehensive Vapor Management Communication Plan* is being included in the *WRPS Hanford Communication Plan.* The plan has begun the requisite internal review.

Last week's CPPO Notebook is titled *Event Notification (PA) System Update*. This week's CPPO Notebook is titled *Strobic Update.*

A CPPO subject matter expert contributed an article on NUCON International to the July 31, 2017, publication of *Solutions.* "WRPS is supporting NUCON International as it develops a thermal oxidation demonstration project based on an internal combustion engine," reported *Solutions*.

One of the recommendations from the CPPO sponsored LEAN Management Event was to establish an e-form with which to submit vapors related questions, as well as track the question/answer to completion. An e-form has been created and is now in testing.

#### Hanford Vapors Website Updates

Hanford Vapors Website posts the week of July 31, 2017, are:

- Vapors Weekly August 2,
- CPPO Weekly Report – Aug. 3, 2017
- CVST Agenda – July 12, 2017

- Chemical Protection Engagement: Data Analysis and Visualization Tool (PHOENIX)

  **Update:** For the past four weeks, people from various organizations in WRPS have been testing the DAV tool and providing feedback. The team is in the process of sifting through the feedback from this pool of software testers. The response thus far has been positive with a lot of interactive ideas. The system remains on schedule to go live at the end of September. A summary of the DAV tool is located in Appendix A of this report.

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

- Develop New or Revised Chemicals of Potential Concern (COPC)/Occupational Exposure Limit (OEL)

  **Update:** WRPS, TerraGraphics and Dade Moller continue their review of RPP-22491, *Industrial Hygiene Chemical Technical Basis* incorporating updates as appropriate from the work produced for the Health Process Plan. The Health Process Plan team studies scientific information and provides recommendation updates on Chemicals of Potential Concern (COPC), Occupational Exposure Limits (OEL) and Transient Affect Concentrations (TAC). Several reports have been received from PNNL for WRPS's review, and reviews are ongoing. Additionally, Charter 71, which provides the internal and external review panel process for the HPP review, has been published. The internal panel has met and is in the process of reviewing and completing the evaluation for one of the HPP studies that addresses Chronic Regulatory OELs. Finally, the COPC list has been revised by WRPS IH. The updated COPC list will be finalized this fiscal year.

  **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.

- Institutionalizing the Vapors Program with the IH Program Requirements

  The Tech Basis and COPC update are expected to be finalized by the end of FY17.

- Health Process Plan

  **Last update 8/3/2017:** A schedule for FY17 has been developed for the Health Process Plan. The project is broken down into seven tasks:

  - Task 1: Schedule: Complete.
  - Task 2: Establish Tank Operations Assessment Team. Accomplishments from last week:
    - A kick-off meeting was held for the HPP internal review panel (IRP).

  - A share drive was created for use by the IRP and populated with Pacific Northwest National Laboratory (PNNL) reports for review.
- Task 3: Establish an External Peer Review Health Panel. Recommendations have been adopted into an internal procedure that has gone to ORP for concurrence.
  - Procurement is in process for putting External Expert Panel (EEP) members under subcontract.
- Task 4: Implement Routine Analysis and Screening Process for Updating COPCs.
  - The draft sampling and analytical recommendation report completed internal review.
  - A draft of the COPC report update is undergoing WRPS review.
- Task 5: Establish Acute/Transient and Chronic Exposure Action Levels.
  - The team met to complete deliberations on the mixtures dosimetry and modeling report. A timeline and next steps were agreed upon.
  - The team met to finalize the approach for TEC derivation, assigned responsibilities, established a timeline, and set up a review meeting.
- Task 6: Evaluate Computational Approaches for Predicting Exposure and Delivered Dose.
  - No new status.
- Task 7: Database Implementation and Management.
  - Worked on incorporating the CMM Wizard into the HPP Test site (adding/editing fields).
  - Examined "CMMWorkbook (MOATOE)-PAC29-15 rows final-2" Spreadsheets to understand calculations.
  - Met to discuss Risk Assessment (specifically, the workbooks and visualization).
  - Documented a few button bugs found on the site.
  - Will begin comparing new chronic report draft with the previous draft to note any major changes.
  - Began setting up GeoServer to facilitate the plume modeling for the risk assessment maps.

**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 FY 2018.

## Database Implementation and Management

In FY16, PNNL developed a database to review and update the COPC list and associated OELs. See the Health Process Plan, Task 7 for updates.

- Leading Indicators

  **Last update 8/3/2017:** For the past few months, the Leading Indicators team focused on supporting the integrated vapors data collection data quality objective (DQO) process:

  - Initiated an evaluation of Proton Transfer-Reaction Mass Spectrometry (PT-RMS) files for incorporation within the process and identified questions about connecting data to specific locations.
  - Continued the investigation of efforts needed to compile existing and new data sources (content, format, assumptions, etc.) for incorporation into analysis, including development of macros to pre-process excel files for use with R-code.
  - Continued the quality review process for historical data sets, including procedures for combining samples in series.
  - Continued the data quality objectives (DQO) support.

- Parity Implementation with Established Programs

  **Update**: Chemical Worker Tier 1 and 2 training is in the coding process for computer based training (CBT). Coding is slated to be complete by the end of August-beginning of September. Final review of the CBT will follow.

  The Tier 3 Chemical Worker Training is being developed. Tier 3 training is slated for completion by the end of FY17. The rollout of a Tier 3 pilot class is anticipated by end of FY17.

## KPP 4. Engineering Controls

- 242-A Evaporator Stack Extension

  **Update:** The installation is complete, and the new stack is functional and operational.

- Exhausters

  - **SY-Farm**: Efforts to design the exhauster system is on-going, with the target for completing the design by the end of FY17. The design is currently focused on the cathodic protection system. Site mobilization activities continue to be on-hold pending the results from the third party review of vapor controls. **A-Farm**: Acceptance testing began August 1 and is scheduled to be completed by August 16. The Request-for-Quote to procure engineering support for design on the exhauster pad re-location is ongoing.

    **AX-Farm**: The evaluation of the AX exhauster demister capabilities are on-going.

**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

- Strobic Air Dilution Fan

  **Update:** The specification for factory acceptance testing (FAT) of the Strobic unit is in SmartPlant for review, while a draft statement-of-work for Strobic to support the FAT is being prepared.

- NUCON Thermal Oxidation Vapor Abatement Unit (VAU)

  **Update:** The following activities occurred last week:

  TerraGraphics:

  - Based on the results of meetings last week, the *Functions and Requirements* (F&R) document is being revised to address the different phases of the project. The main focus of the document is to address the functions and requirements for the first phase, bench-scale testing. However, future phases will also be addressed to support planning, permitting, etc. for those phases. The F&R documents are still on-target for completion by mid-August.
  - A draft of the *Demonstration Site Selection Report* was submitted on July 31, 2017. Based on preliminary comments, a fifth site (Columbia Energy and Environmental Services) will be added to the evaluation. A walk down of Columbia Energy's test center in the Port of Benton was completed on August 3, 2017. The report is still on-track for completion by the end of August.
  - Continued development of the bench-scale test design. A full-scale effort on this design cannot be made until the site has been selected. The design is currently scheduled to be completed by mid-September.

  WRPS:

  - NUCON submitted the project proposal and a technical evaluation.
  - A Request for Proposal (RFP) has been issued for PNNL to support NUCON's bench-scale efforts. TerraGraphics continued incorporating WRPS's comments on the *Functions and Requirements* document needed to support upcoming testing activities.
  - TerraGraphics continued preparing the *Demonstration Site Selection Report*.

## KPP 5. Administrative Controls and Monitoring

- Permanent Installation of Vapor Monitoring and Detection System (VMDS) Equipment in A and AP Farms

  **Update:** The events of last week include the following:

  - Viability assessments, scheduled to be completed by mid-August, are on-going for the ultraviolet Fourier transform infrared spectrometer (UV-FTIR) and open path Fourier transform infrared spectroscopy (OP-FTIR).

**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.

- Efforts continue on the Pilot-Scale Phase 2 Report, which is currently scheduled to be completed by the end of August.
- Phase II testing procedures for VMDS equipment startup testing are being created.
- The purchase order for the 13 Ultraviolet Differential Absorption Spectrometer (UV-DOAS) is moving forward. WRPS has received a preliminary proposal and is resolving questions with the vendor.

Stack and Boundary Monitors

**Update:** The design packages for the AN, AW, and 702AZ stack monitors are being prepared. The main focus was finding locations for verification bottle racks at both AN and AW-Farms, which need to be placed outside the farms for easy access.

Establishing Safe Unrestricted Boundaries

**Update:** Quantitative Risk Assessments are being prepared for A, AP, and AW-Farms, with all targeted for completion by the end of August.

Public Address System

**Update:** Excavations were completed at AX, AY, and AZ Farms, with crews set up to complete A-Farm the second week of August. The pole mounted speakers were received by the Acquisition Verifications System group.

## KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

**Update:** Remote Monitoring Equipment: Remote monitoring equipment is still in the design phase. Procuring the equipment needed to support level and temperature mock-up testing continues. Mock-up testing is being performed to ensure the new equipment will interface with existing tank farms systems.

FY15 LEAN Report/Work Location Evaluations: A draft statement-of-work has been prepared to procure the engineering services needed to prepare the *Project Execution Plan*.

**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 8/3/2017:** Initial feedback from meetings with STC appear to be very promising for near term use of air purifying respirator/powered air purifying

respirator (APR/PAPR) in lieu of self-contained breathing apparatus (SCBA) in ventilated farms. Rob Gregory, Chief Operating Officer, shared at length at the July 13 CVST meeting, including:

- The third party, STC, is scheduled to return August 8-10. During this visit, the third party has requested to observe APR use in AP Farm. WRPS will also meet with the third party to answer any final question regarding APR testing and implantation at tank farms. The SX testing is complete. This testing was performed in preparation for barrier application slated for next year. The purpose was to determine of APRs could be worn instead of SCBA for the barrier application.
- The next cartridge test location is the AX stack. The CVST recommended that cartridge testing occur at the location with the most workers. Since AX can have 50 to 60 workers per day, it was chosen to address the CVST recommendation. The new AX exhauster is installed. The AX Stack cartridge testing is scheduled for July 21, 22, and 23. Cartridge testing at the AX stack will include a mixture of chemical vapors from 4 AX Tanks. This round of cartridge testing was made possible by the installation of this engineering control.

**Key Performance Parameter 7**

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

- An employee submitted a question about airline respirators a few months ago. To answer the question, WRPS conducted mockup airline use. Workers from the HAMTC and the Building Trades unions participated. The results of the mockup indicated that airline respirators could be used for certain applications at tank farms.
- A pilot test of actual work will be conducted with airline respirators while workers are utilizing airline respirators for certain tank farm work activities. If the pilot testing indicates that airlines respirators have an application within tank farm, the use of airline respirators will be incorporated into the ISMS and work planning.
- Cartridge Testing has been completed under non-waste disturbing conditions at the following locations:
  - AP Stack
  - SY-102 Tank
  - A-101 Tank
  - 702 AZ Stack (non-waste disturbing),
  - AX-101 Tank
  - AN Stack
  - AW Stack

- In addition, cartridge testing under waste disturbing conditions was completed at the 702-AZ stack; more testing is planned at AW Tank Farm while air lift circulators (ALCs) are operating.

## Mobile Laboratory

**Update:** Background sampling was performed at sites 1A, 2A, 3A, 2B, 3B, 4B and 5B. The background analysis is being done to better understand what the normal background for Furan and Nitrosamines are across the central Washington plateau, and how the Hanford tank farms impact these normal background levels. The scope includes a 6 week study encompassing 10 locations with repeated visits to each location throughout the test period. Sampling is done for 24 hours at each location. Site 1A represents a remote location positioned at what is historically upwind of 200W and 200E for the months of July and August. Sites 2A and 2B are locations in 200W at both the SY and T-Farms. Sites 3A and 3B are located in 200E, near the corner of 4th and Buffalo and on the north side of BY Farm. Site 4B is located approximately ½ mile east of the Waste Treatment Plant. Site 5B is located in Kennewick to evaluate background levels in residential and more urban areas.

## Personal Vapor Monitor

**Update:** Weekly accomplishments as of August 3: The simple printed circuit board and prototyped parts were received and tested (Figure 3). Light transmission tests proved that the Light Emitting Diodes (LED) could be seen through the thinned out areas of the enclosures (Figure 4). The buttons and switches were also successfully tested (Figure 5). Efforts are on-going to make prototype cartridges from Polyethylene Terephthalate Glycol (PTEG) plastic.

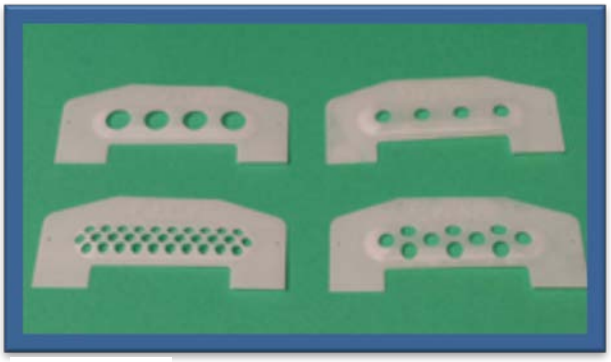

**Figure 3**

**Figure 4**

Figure 5

## 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.

## 4. Vapors Mitigation Program Plan - Top Risks -CPPO Weekly Update

The subset of the Vapors Mitigation Risk Register this week is shown in **Table 1**.

**Table 1.** Vapors Mitigation Risk Register

| CVAP ID Number | Current Status | Handling Actions | Current Risk Level |
|---|---|---|---|
| 009<br>Resources Not Available When Required. | Lack of design and engineering resources are causing delays in VMDS System Integration, 242-A Stack Extension. | 1. Identify key technical resources up front and secure availability.<br>2. Utilize resource loaded schedule where appropriate.<br>3. Coordinate work planning to streamline resource utilization. | **Medium** |
| 004<br>Integration with Other Key Projects more complex than expected. | Integration of field work for VMDS implementation and associated execution concerns for SY, A-Farm, and AW stack upgrades. Installation and turnover of PA system to tank farm operations. | 1. Identify key program interfaces early. (Ongoing)<br>2. Engage with program/project managers early. (ongoing)<br>3. Maintain weekly communication and IPT meetings.<br>4. Incorporate instrumentation (stack monitor) installation into future design of equipment. | **Medium** |

# Appendix A

# Data Analysis and Visualization (DAV) Tool

**August 7, 2017**

**NEED**

The data access and visualization (DAV) project (formerly known as PHOENIX) is designed to improve transparency, enhance communication of vapors related industrial hygiene data, and in response to the National Institute Occupational Safety and Health (NIOSH) *Review of Hanford Tank Farm Worker Safety and Health Programs* Report (November 28, 2016) recommendation for "regular communication of the information collected must be reported and made available in a timely manner that is understandable and relevant to the worker population" (pg. 37).

In an effort to provide an understandable view of the industrial hygiene data that have been collected, in fiscal year 2017, the Washington River Protection Solutions (WRPS) Chemical Protection Program Office (CPPO) subcontracted with Pacific Northwest National Laboratory (PNNL) to develop a single point data access system. This friendly user interface is the Data Analysis and Visualization (DAV) tool. The DAV is developed to be a scientific education system with which the workforce and public may better understand tank vapors at Hanford. DAV is a multi-faceted, flexible tool that will be routinely reviewed and revised to take advantage of its many capabilities, including an internal system that could provide a one-stop-shop for Industrial Hygiene (IH) to review all of the data. The DAV system is hosted in the Azure cloud for a responsive operations environment necessary to manage the large data sets generated by 24/7 real-time sampling of multiple chemicals on many instruments.

**SCHEDULE AND RELEASE INTENT**

Currently, there are two phases of DAV tool planned for development. The first phase has occurred over the course of fiscal year 2017. This phase has been successful and DAV will be integrated into the publically available HanfordVapors.com website on or before October 1, 2017.

The second phase of DAV tool development will be completed in fiscal year 2018.

**QUERY DEVELOPMENT**

Upon completion of phase 1, the workforce and the public will be able to use DAV to review data which has been collected, reviewed by an Industrial Hygienist (IH) for accuracy, and entered into the Site-Wide Industrial Hygiene Database (SWIHD). The SWIHD data will be pulled daily to update the DAV.

The data can be viewed and filtered in different ways by the user. Filters can be set by chemical (single chemicals, multiple chemicals, Chemicals of Potential Concern (COPC's), all chemicals), farm, headspace, source, area, and sampling date range. To provide a normalized graphical interface, all data points are graphed as a percentage of their respective chemical's Occupational Exposure Limit (OEL) concentration. This is a single point sample and does not reflect the Time Weighted Average (TWA) typically run through an 8 hour period.

Contextual information such as chemical descriptions, definition of OEL, and high level "Tank Vapors 101" educational materials are also provided as part of the phase 1 version of the tool.

The second phase will include daily data queries into OSIpi. This will include data from the Vapor Monitoring Detection System (VMDS) once the system is moved from testing to operations. Data from the Proton Transfer Reaction Mass Spectrometry (PTR-MS)/Mobile Lab Van may also be accessible using DAV if the data from this pilot system is loaded into OSIpi. Both the VMDS and PTR-MS include the sampling instrument and Geographic Information System (GIS) mapping locations, thus a map view will be available for this data. The data from the VMDS and PTR-MS is run through the Tank Farms Monitoring and Control System (TFMCS) for real time use by operations and stored in OSIpi as the data repository.