While work activities are being performed, hose tenders monitor hoses during the AP airline respirator feasibility evaluation.
1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The Recommendations Table (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. Once management reviews and concurrence is complete, it will then 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 are being tested and reviewed.

All employees were given the opportunity to take the safety culture survey launched on July 17, 2017, by Oak Ridge Associate Universities (ORAU). The survey period ended on July 31, 2017. WRPS management will receive a report in September.

CPPO Oversight and Tracking
Hanford Vapors Website

The Hanford vapors website logged over 3,700 views in July, a drop of almost 25% from the previous month. The website experienced an average of 120 hits per day, with the largest number of views occurring on the days that the Hanford Vapors Weekly Update is posted. On those days, 40% of the total traffic is attributed to views of the Vapors Weekly.
2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

Chemical Protection Communication

As part of a key engagement and mentoring initiative sponsored by CPPO, last week, Dr. John Kind, several additional CTEH colleagues and other CPPO team members began interface with the Industrial Hygiene (IH) managers to discuss coordination of upcoming mentoring and engagement efforts. The CTEH toxicologists and industrial hygienists will be spending more time onsite engaging the IHPs and IHTs as a knowledge and mentoring resource.

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 not yet begun the requisite internal review.

Figure 1. Hanford Vapors Website Use in the month of July
Last week’s CPPO Notebook is titled *NUCON Thermal Oxidation Unit: Proof-of-Concept testing*. This week’s CPPO Notebook is titled *Tank Farms Event Notification System (ENS)*.

On July 25, 2017, Jason Vitali led a tour of the AP-Tank Farm Vapor Monitoring & Detection System (VMDS) and control room for DOE participants, including Brian Carter (DOE Human Capital, Director).

This week, several items were discussed with the HAMTC Safety Representatives at the CPPO/HAMTC weekly meeting. Included in the discussions were the buildings designated as take cover facilities. A preliminary determination has been made that the 272AW building is not currently a designated take cover facility. An engineering evaluation to verify the building HVAC electrical disconnects is ongoing. It was suggested that the CVST meeting could be a good place to discuss the potential for odors at the corner of 4th and Buffalo. The HAMTC Safety Reps provided a short overview of the EC-06 evaporator campaign and shared some of the issues that played into its completion such as the brush fire onsite, the respiratory protection tent/tunnel, and the evaporator P-B-2 slurry pump failure which resulted in gravity slurry to AP Farm. It was suggested that during EC-07, the stack analyzer data be compared to the EC-06 data to determine if there is a difference between pumping slurry to AP Farm data (EC-07) and gravity slurry to AP Farm data. Additional discussions were had regarding new training on photoionization detectors and the effects on detection from the use of different lamps (e.g. 9.8 eV, 10.6 eV, and 11.7 eV).

A CVST meeting was held on July 26, 2017, during which Rob Gregory provided an update on the ongoing mediation. He reported that mediation is scheduled for its fourth round from August 1-3, 2017. He also spoke of the upcoming site visit from StoneTurn Consultants (STC) regarding the chemical cartridge testing. The STC team will be in town from Aug 7 – 9. Upon completion of their visit, they will provide a briefing to HAMTC, Office of River Protection, and WRPS. Mr. Gregory acknowledged that the IH controls for the upcoming EC-07 evaporator campaign have been reviewed and solidified. Presentations this week included three presentations from the CPPO subject matter experts covering toxicology and odors, the Vapors Management Expert Panel (VMEP) report, and the NUCON abatement project.

The *Message from Mark*, published on July 25, reported, “[a]nother significant safety and health accomplishment that I’m particularly proud of is the recent
completion of the 242-A Evaporator stack extension project. The ventilation stack was extended from 63 feet to 111 feet above ground to help minimize the potential for chemical vapors and to enhance the safety of nearby workers during operating campaigns.”

**Hanford Vapors Website Updates**
Hanford Vapors Website posts the week of July 24, 2017, were the following:
- Vapors weekly update – July 20, 2017
- CPPO Weekly Report **July 27, 2017**

**Data Analysis and Visualization Tool (DAV)**
**Update:** A team of five CTEH data managers and IH technicians are performing a QA/QC evaluation of the Site Wide Industrial Hygiene Database (SWIHD). The team has studied the data collection process and schema of the database, assisted by the IH department and SWIHD administrators during their initial two week orientation onsite. Area, source, and headspace analytical sampling data have been prioritized for an extent of condition of potential QA/QC issues before rollout of the DAV; this assessment will be performed offsite in the coming weeks.

The PHOENIX Team anticipates its public debut of the DAV Tool on October 1, 2017, via the HanfordVapors.com website. At the October 1 rollout, the DAV tool will not include the Vapor Monitoring and Detection System (VMDS) data or the Proton Transfer Reaction – Mass Spectrometer (PTR-MS) data. Once the VMDS transitions from a pilot system (meaning it is in development) to an operational system, it will be incorporated into the DAV Tool.

**KPPs 2 and 3. IH Technical Basis and IH Program**
**Develop New or Revised Chemicals of Potential Concern (COPC)/Occupational Exposure Limit (OEL)**

**Update:** Updates to RPP-22491, *Industrial Hygiene Chemical Vapor Technical Basis*, are underway. WRPS, Terra Graphics, and Dade Moller have met several times and reviewed the initial draft of the Requirements Implementation Matrix and Gap Analysis. Weekly status meetings are held, ensuring the direction of the contractor is consistent with the expectations of IH management. A meeting was held with the Office of River Protection to update them on the progress of this effort. Information on the new procedures was provided to the Procedures Group in order to expedite the review process and move the revisions through Workflow Review & Approval Process (WRAP).
Institutionalizing the Vapors Program with the IH Program Requirements

**Last update 7/6/2017:** The Tech Basis and COPC update are expected to be finalized by the end of FY17.

**Health Process Plan**

**Update:** The Health Process Plan is broken down into seven tasks:

- **Task 1:** Schedule. Complete.
- **Task 2:** Establish Tank Operations Assessment Team.
- **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 sub-contract.
- **Task 4:** Implement Routine Analysis and Screening Process for Updating COPCs.
  - WRPS review of the sampling and analytical recommendation report draft and COPC update report are in progress.
- **Task 5:** Establish Acute/Transient and Chronic Exposure Action Levels.
  - Met and refined the plan for evaluating compounds without regulatory driven acute OELs for sufficient data to support TEC development. Established a schedule for the effort.
  - Reviewed Lower Priority Chronic Nitriles and 2,4-Dimethylpyridine (DMP) report and returned to author.
- **Task 6:** Evaluate Computational Approaches for Predicting Exposure and Delivered Dose.
  - Chemical Mixture Model (CMM): Continued work on preliminary draft report and completion of test cases. Also, worked on a re-evaluation of the health code number assignments, in particular for ammonia.
- **Task 7:** Database Implementation and Management.
  - Reviewed the CMM workbooks.
  - Organized the site navigation bar.
  - Small edits to CMM form on the test site.
  - Planning data views to add in for the CMM.

**Database Implementation and Management**

**Update:** In FY16, Pacific Northwest National Lab (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

Update: The team met with RJ Lee Group Mobile Lab and others to discuss PTR-MS data. The accomplishments as of July 27 include:

- Continued the investigation of efforts needed to compile existing and new data sources (content, format, assumptions, etc.) for incorporation into analysis; this includes initiating an effective sample size investigation to determine how best to incorporate PTR-MS time-series data.
- Continuation of R-code development, initial macro development for conversion of PTR-MS data files for use with R-code.

Parity Implementation with Established Programs

Last update 7/24/2017: Chemical Worker Tier 1 training has been reviewed and is in the process of being coded for computer based training in the Hanford General Employee Training. The schedule for coding is being developed for both Tier 1 and 2. Additional feedback and comments will be included in the final product prior to release. The Chemical Worker Tier 2 storyboard has been created and is being reviewed by the Training review team (IH, Management). Chemical Worker Tier 2 is being designed to address facility specific issues and applications. Chemical Worker Tier 2 & 3 are being develop concurrently, and are on scheduled to be in place by year end. However, the current focus is on completing and implementing Tier 1.

Update: Other Items:

- An accelerated training plan has been created for the new 35 Industrial Hygiene Technicians (IHTs) that will be coming on board. The first group’s orientation was held July 3, 2017. Additional IHTs came on board July 17, 2017.
- IH Programs has brought on an intern who is helping to review procedures for inclusion in the next phase of the IH Manual (FY18), as well as working on the implementation plan for the roll-out of the FY17 work scope.

KPP 4. Engineering Controls

242-A Evaporator Stack Extension: The installation is complete, and the new stack is functional and operational.

Exhausters

Update: SY-Farm: Site mobilization activities have been put on hold until resolution of vapor-related issues. Meanwhile, design efforts for cathodic protection were started. A-Farm: The fabrication of both exhauster units was completed the week of July 24. Acceptance testing is currently scheduled to start the week of July 31. The statement-of-work to obtain engineering support for design of the exhauster pad re-location has been prepared and a request for quote
has been submitted. The pad will be re-located to move it farther away from personnel working adjacent to the 242-A Evaporator.

**Strobic Air Dilution Fan**

**Update:** The procurement specification and statement of work continue to be drafted. These will be used to support upcoming factory acceptance testing to be performed by Strobic.

**NUCON Thermal Oxidation Vapor Abatement Unit (VAU)**

**Update:** The accomplishments were plentiful in July, and the week of July 24 included:

- **TerraGraphics:**
  - Submitted the revised Functions and Requirements Document and the review comment records (RCR) with a disposition of the reviewer’s comments.
  - Continued work on the Demonstration Site Selection Report. The four sites that were down-selected for final scoring and evaluation are the Hanford Cold Test Facility, PNNL, Hil ine, and MCE. All four sites have been reviewed and scoring is in process. The first draft of the Site Selection Report is scheduled to be submitted the last week of July.
  - Work was initiated on the Bench-scale test design development, however, the final site selection needs to be determined before proceeding.
  - TerraGraphics submitted the RPP-RPT-60211, *Demonstration of NUCON Vapor Abatement Unit*, into SmartPlant on July 20, 2017. The report is designated as Official Use Only; therefore, access is limited currently to the authors.

- **WRPS:** The Request for Proposal (RFP) for the NUCON subcontract has been issued. The subcontract is for NUCON to ship their VAU to Hanford for off-site testing and to provide installation and engineering support for the VAU. NUCON is currently preparing a proposal for this work scope.
KPP 5. Administrative Controls and Monitoring

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

Update: The equipment viability assessments, pilot-scale testing summary reports, and quantitative risk analyses are progressing. The Gastronics Fixed Instrument Skids were removed from AP Farm this week. A request for quote was submitted by procurement to Cerex for 13 Ultra-Violet-Differential Optical Absorption Spectrometer (UV-DOAS) units for perimeter monitoring along the A Complex corridor.

Stack and Boundary Monitors

Update: Design packages for the AN, AW and 702AZ stack monitors continue to be prepared, with Cerex submitting their preliminary design for the AN-Farm UV-DOAS monitor. The target completion date is the end of September.

Establishing Safe Unrestricted Boundaries

Update: The team completed the editorial review of the latest air dispersion modeling report; the final revisions are underway. Weekly accomplishments as of July 31 include:

- Clarifying WRPS’s use of the software COMSOL®; including that clarification in the air dispersion report.
- Continuing the conversion to chemical emission for the Air Pollutant Graphical Environmental Monitoring System (APGEMS) design.

Public Address System

Update: Trenching in

The concrete bases for the poles are complete in AW, AN, AZ, and AX. The pole mounted speakers were assembled and tested at Total Energy and have been shipped to Acquisition Verification System (AVS) for receipt inspection and delivery to the field. It is anticipated that the poles and speakers will be installed at AW, AN, AZ, and AX by the end of August. A Farm has presented some challenges, but those are being worked through. The PA system should be complete in that farm by end of September.
KPP 6. Tank Operations Stewardship

**Pilot SST Stewardship Program**

**Update:** Initiated conversations with procurement to obtain engineering services for developing a Project Execution Plan (PEP). The PEP will document the scope and schedule for implementing feasible recommendations from the FY15 LEAN Event focused on reducing tank farm entries.

KPP 7. Hierarchy of Controls

**Cartridge Testing and SCBA Alternatives**

**Update:** Initial feedback from meetings with StoneTurn Consultants (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. STC is visiting the site August 7-9, 2017.

On July 27, workers performed field activities wearing air lines instead of SCBA. Bottles of air housed on carts to which the airlines were attached were provided the AP Farm workers who performed minor excavations. By relieving the field worker of the need to carry the supplied air bottles while performing work in SCBA, it is anticipated the worker may be more efficient and safe without the added weight of supplied air bottles.

**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.

**Key Performance Parameter 7**

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

**Figure 2. Bottle Cart Setup**

**Figure 3. Airline Entry**

**Figure 4. Three Deployed 200’ Hoses**
Figure 5. Vent Pit Opening with Personnel below with Airline

Figure 6. Pipefitter Working
Mobile Laboratory

Update: Weekly accomplishments as of July 31 include area background sampling, per the project test plan, for nitrosamines and furans:

- Background sampling 1A, 2A, 3A, 4A, 5A, and 1B (specific 200 Area Plateau and Tri-City locations).

Personal Vapor Monitor

Update: The personal device development plan submitted by C2Sense focuses on testing the prototype device and its integration with cellular phones and servers. The accomplishments for the week of July 31 include:

- A simple PCB to enable testing of key prototyped parts including LED light transmission through the 3D printed enclosure, alignment of the spring contacts with the sensor chip, and sensor data collection (via a potentiostat) was designed and sent for manufacture.
- Renderings of the current reader and badge are attached for reference.

KPP 8. Medical Support

The scope of KPP-8 is to support DOE Richland Operation Office (RL) medical program enhancements in conjunction with other Hanford Site organizations.
3. 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

<table>
<thead>
<tr>
<th>CVAP ID Number</th>
<th>Current Status</th>
<th>Handling Actions</th>
<th>Current Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive Work Stoppages</td>
<td>AOP-15 events, Beryllium Controls, labor disputes, stop works, inclement weather, or other work stoppages routinely impact the conduct of field work within the tank farms. A risk exists that excessive work stoppages hinder execution of work, impacting project cost and schedule.</td>
<td>1. Pre-plan for work stoppages based on historical data. (ongoing) 2. Additional communication to workforce (ongoing) 3. POD vapors updates. (ongoing) 4. Actively publishing/sharing IH measurement data to reassure workforce. (ongoing) 5. Move work off shift to minimize impacts from recovery actions (septic pumping, purex collapse). (ongoing) 6. Modify shift schedules to lower risk of AOP15s.</td>
<td>High</td>
</tr>
<tr>
<td>Lack of Critical Technical Expertise</td>
<td>Execution of work under this program will require specific key technical expertise that is known to be limited. A risk exits that critical technical expertise is not available when needed and work is delayed.</td>
<td>1. Identify key technical resources up front and secure availability. (ongoing) 2. Develop succession plan, critical resources retention plan and development of necessary engineering resources. (initiated)</td>
<td>High</td>
</tr>
<tr>
<td>Stakeholder Expectations Unrealistic/Conflicting</td>
<td>WRPS maintains relationships with numerous stakeholders who have different interests and concerns related to WRPS priorities. As a result of the TVAT report and ongoing vapor incidents within the TOC stakeholders have expressed concern and desire to achieve objectives. A risk exists that stakeholders maintain unrealistic or</td>
<td>1. CPPO in place to support enhanced stakeholder engagement. 2. Issue CVAP and CVAP (KPP) proposal submission to customer. (ongoing) 3. Enhanced integration/interface with ORP/DOE Stakeholders. (ongoing)</td>
<td>High</td>
</tr>
<tr>
<td>Problem Area</td>
<td>Description</td>
<td>Potential Effects</td>
<td>Proposed Actions</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
| New Requirements Imposed | WRPS is executing the VIP based on the recommendations outlined in the TVAT and the associated Vapors Implementation Plan. WRPS is compliant with existing OSHA standards as well as requirements from DOE, the WDOH, as well as other regulatory agencies. Possible effects from the outcome of Health Process Plan. A risk exists that new or changing requirements are imposed and rework is required impacting program cost and schedule. | 1. Evaluate new requirements as part of incorporation of change. (ongoing)  
2. Establish WRPS company work priority list. (ongoing)  
3. Plan Work schedule tasking to encompass SCBA bottle inventory limitations. (ongoing) | High |
| Internal Reviews Take Longer Than Anticipated | Internal Reviews delay release of report. | 1. assign expediter to project to speed process - complete | High |
| Infrastructure (hardware) to handle data processing, storage, interrogation, and reporting is found to be insufficient for the quantity of collected data. | The projects under the CVAP program will collect huge amounts of data from many pieces of equipment in the field. Real time monitoring during AY102 retrieval in phase 1 has collected over 9 million data points, it is projected to increase to more than a billion data points in upcoming scope. This amount of data may prove to be unmanageable with current hardware and software infrastructure, a risk exists that additional infrastructure improvement must occur to effectively manage the data stream. | 1. Engage with CTO Technology Management and Field Solutions to develop data handling and interrogation infrastructure. (ongoing) | High |
| Litigation requires legal scrutiny of communications with workforce. | The ongoing vapors litigation and negotiations constrain the expedited release and communication of planned vapors program activities. Currently the risk is realized and ongoing. | 1. Continue to prepare communication documents and releases in anticipation of legal release.  
2. Coordinate and communicate with WRPS legal team early and often.  
3. Communicate all allowable data and information to the workforce in lieu of vapors program plans. | High |
| Testing Identifies Additional Scope Required to Achieve Objectives |
| Many projects as part of this program will perform instrument and vapor testing to provide recommendations on a path forward to detect, monitor, and protect workers from vapors. Leading Indicators project cannot statistically bound an indicator to COPCs or COCs resulting in a need for rework, or expansion of scope. A risk exists that results from testing are inconclusive and more testing is required to achieve objectives. |
| 1. Outline testing scope with customer buy-in as part of proposal. (complete)  
2. Conduct National Lab reviews of testing scope and methods. (ongoing)  
3. Data Quality Objectives process to establish the amount, type, and quality of data required to ensure feasibility of analyzing testing results. (ongoing) |
| Medium |

| Testing Practices/Methodology Challenged |
| Many of the projects as part of this program will perform instrument testing and sample vapors to provide recommendations on a path forward to detect, monitor, and protect workers from vapors. A risk exists that the testing practices or methodology (including DQO) is challenged and further justification or rework is required. |
| 1. Conduct national lab reviews of testing scope and methods. (complete)  
2. Utilize historical pricing from similar development activities. (ongoing)  
3. 3rd party review of testing practices and methodology. |
| Medium |

| Integration with Other Key Projects more complex than expected. |
| Multiple aspects of the program will interact and must be integrated with other WRPS activities or priorities. A risk exists that integration with other activities encounters difficulties and rework is required. |
| 1. Identify key program interfaces early. (Ongoing)  
2. Engage with program/project managers early. (ongoing)  
3. Maintain weekly communication and IPT meetings.  
4. Incorporate instrumentation (stack monitor) installation into future design of equipment. |
| Medium |