At the end of Fiscal Year (FY) 2016, Washington River Protection Solutions LLC (WRPS) was completing Phase I of the *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations* (WRPS-1500142), developed to address Tank Vapors Assessment Team (TVAT) recommendations. The implementation plan actions were originally planned to occur in two phases. Phase I was completed at the end of fiscal year FY 2016. During the latter part of Phase I, multiple assessments were conducted on the progress of the implementation plan and/or the overall Industrial Hygiene (IH) program, including those conducted by the National Institute for Occupational Safety and Health (NIOSH), Department of Energy (DOE)-Office of Inspector General (OIG), Center for Toxicology and Environmental Health, LLC (CTEH), and Department of Energy (DOE)-Office Environment, Safety, and Health Assessments (EA-32). Assessment results, feedback from stakeholders, and the Phase II actions were incorporated into a comprehensive vapor management strategy, focusing on the vision that all workers on the Hanford Central Plateau continue to be protected by the comprehensive approach to vapors management, and that workers are safe and feel safe. The *Comprehensive Vapor Action Plan* (CVAP), as the plan became known, presented the new implementation strategy, and replaced the *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations*.

The CVAP was organized around eight Key Performance Parameters (KPPs):

- Engagement and effectiveness measurement
- Industrial hygiene technical basis
- Industrial hygiene program parity
- Engineered controls
- Unrestricted work boundaries
- Single shell tank stewardship program
- Chemical vapor respiratory protection hierarchy of controls, and
- Support medical program enhancements

The Plan was implemented during FYs 2017 and 2018.

The Chemical Protection Program Office (CPPO) was established in October 2016. The mission of the CPPO has been to provide independent monitoring of vapor action status, and facilitate the flow of clear and transparent information throughout WRPS and to stakeholders to promote understanding of Hanford tank vapors by:

- Providing independent measures of progress to ensure actions achieved the required intent, and
- Both leading and supporting vapors engagement and communication efforts.

From FY 2017 to FY 2018, CPPO delivered KPP 1 of the CVAP: “[e]stablish a comprehensive vapor communication plan, engagement processes, and effectiveness measures,” in part by publishing the *CPPO Weekly Report*. The weekly report updated all the KPPs as described in the CVAP. WRPS’ ongoing actions, aimed at managing chemical vapor hazards from the Hanford
Tank Farms, are now focused around the outcomes of the CVAP. Instead of describing the outcomes in terms of KPPs, WRPS is now using the following descriptors:

- **People, Programs and Processes**
- **Mitigating actions/Engineering controls**
- **Information Sharing/Communication**
- **Sampling and Monitoring**

The CPPO was established as a temporary office to track vapors-related metrics and foster outreach with the workforce. Much of CPPO’s work scope is completed. The portions that remain have been transitioned to other organizations within WRPS. As of July 1, 2019, CPPO work scope is institutionalized in the following manner:

- ESH&Q will continue providing vapors Notebook’s and worker engagement opportunities.
- IH leadership is facilitating meetings with Hanford Atomic Metals Trade Council (HAMTC) Safety Representatives.
- The tank farms assessment program and safety culture surveys will be used to evaluate worker engagement and culture.

The CPPO will issue a 4th Quarterly report that will provide a comprehensive update of the chemical vapors mitigation efforts that have been made under CVAP. During the remainder of this FY, CPPO will continue ramping down. As of September 31, 2019, the CPPO will be closed. The dissolution of CPPO and transition of its remaining work scope to areas within the company is an important step in ensuring that communicating with the workforce about vapors-related topics continues.
1. **People, Programs, Processes**

People, Programs, and Processes describes actions to ensure employees are qualified and trained, processes are in place to perform work safely, and programs are developed and updated.

### Exposure Assessments

**3rd Quarter Update:**
IH and the Office of River Protection (ORP) agreed to a new exposure assessment (EA) review process in January. No longer do EAs require ORP review prior to publication. Content-only reviews will be conducted post-publication, and any necessary edits will be incorporated in subsequent revisions. The *Exposure Assessment for SY Farm* has been completed and is awaiting IH Program management approval. The draft report of the *Exposure Assessment for AY/AZ Farm* will be drafted by mid-July, and the final report will be issued by the end of July.

### IH Training

**3rd Quarter Update:**
In the 3rd Quarter, 98 percent of all WRPS IH Technicians (IHTs) successfully completed the required on-the-job trainer/on-the-job-evaluator (OJT/OJE) qualification for *ToxiRAE Pro Field Use*. As of July 15, 2019, 100% of the IHTs completed this requirement.

### Health Process Plan and Charter 71

**3rd Quarter Update:**
The following five Health Process Plan (HPP) reports (also known as Charter 71 reports) were further developed by Pacific Northwest National Laboratory (PNNL) and WRPS during the 3rd Quarter of 2019:

- **Hanford Tank Farm Occupational Exposure and Risk Assessment Plan** (PNNL-25791, Revision 1): Smart Plant review of this report was completed; it was released to WRPS as Revision 1.
- **Proposed Risk-Based Approach for Nitrosamine Chemicals of Potential Concern** (PNNL-26787): Smart Plant review of this report was completed; it was released to WRPS as Revision 0.
- **Proposed Occupational Exposure Limits for Furans** (PNNL-26775): This report is in the WRPS Smart Plant review process with PNNL preparing it for release as Revision 0.
- **Chemical Mixtures and Modeling Recommendations** (PNNL-7089): PNNL continued to develop the Chemicals of Potential Concern (COPC) Health Code Number (HCN) review of the HCN results. Preparations were made for review by the toxicology group, while data was being surveyed in preparation for developing an additional 28 HCNs.
• *Short-Duration Vapor Concentrations in Worker Breathing Zones in and near the Hanford Tank Farms: A Summary of Current Knowledge (RPP-RPT-61280) (BOLUS):* Comments from external panel members and StoneTurn Consultants (STC) continued to be addressed. PNNL and WRPS personnel also continued to meet to jointly develop the Washington State Qualified Technical Professional response.

**ERRATA:**
Please note, the CPPO 3rd Quarter Report was distributed with the above statement that PNNL and WRPS personnel were meeting jointly to develop the Washington State Qualified Technical Professional response. This is not correct, and for this reason, the final sentence in the preceding paragraph is struck out.

**Chemical Worker Training**

**3rd Quarter Update:**
The CTEH toxicologists have been moderating question and answer (Q&A) sessions at the conclusion of *Chemical Worker Training*, giving the course trainees an opportunity to get answers to their toxicology and health questions.

• **April 3, 2019:** Dr. Chris Kuhlman and Dr. Tami McMullin introduced CTEH and explained their role in supporting the CPPO. Dr. Chris Kuhlman addressed a question on air samples and explained how sampling data is used to determine how to keep workers and surrounding communities safe. Dr. Kuhlman also answered questions about the volatility of chemicals in the tank headspaces and explained how ammonia can be used as a leading indicator of the presence of other COPCs.

• **April 22, 2019:** Dr. Chris Kuhlman introduced CTEH, explaining how CTEH has reviewed the IH Technical Basis and has provided vapors-related outreach to Hanford workers. Dr. Chris Kuhlman also discussed the ten percent occupational exposure limit (OEL) action levels used by IH and explained how this is a very health-protective policy.

• **April 24, 2019:** Dr. Chris Kuhlman discussed CTEH’s role supporting the CPPO, and explained how the 61 COPCs were determined out of the thousands of chemicals in the tanks.

• **May 6, 2019:** Dr. Angie Perez introduced CTEH, explained their role in supporting the CPPO, and answered toxicology and health risk questions for approximately 40 minutes.

• **June 5, 2019:** Dr. Mike Lumpkin and Dr. Tami McMullin introduced CTEH, explaining that CTEH has provided a technical review of the IH Technical Basis and has provided vapors-related communication outreach to Hanford workers. The doctors answered the oft-asked question of potential exposure to unknown vapor constituents, and explained how both the analytical sampling and direct-read instrumentation fill that knowledge gap.

• **June 19, 2019:** Dr. Pamella Tijerina introduced CTEH, explaining that CTEH has supported CPPO and provided vapors-related communication outreach to
Hanford workers. Dr. Tijerina answered questions related to biomonitoring capabilities and procedures regarding AOP-15 event. She was also asked to share CTEH’s professional opinion regarding the WRPS IH program and how it compares to other IH programs with which CTEH interacts.

The Data Access and Visualization Tool (DAV)
3rd Quarter Update:
PNNL and IH kicked off the Internal DAV (I-DAV) project in November, which will add efficiencies to the process used to analyze EA data. I-DAV uses Tableau Server and scripting languages to augment critical IH and engineering data analysis functions. The fully automated tool sets are expected to assist qualified IH staff in updating EAs. Below are the 3rd Quarter accomplishments:

- Quality assurance test cases for EA upper threshold limit statistics code and data conditioning were successfully performed.
- I-DAV EA module design mock-ups were refined.
- PNNL worked on finalizing design documentation for the I-DAV EA module.
- AY/AZ and 702-AZ data sets were analyzed in preparation for supporting WRPS IH’s next EA.
- Data visualization tools were developed in Tableau per IH specifications for mobile laboratory data.
- The chemical mixture methodology was incorporated into Tableau, and prototype visualizations were created for the AX Farm data set developed for the EA.
- The quality assurance verification of data conditioning rules was completed and the initial draft documenting the process and results was prepared.
- The application of data conditioning rules to Site-Wide Industrial Hygiene Database (SWIHD) area, source, and headspace data was initiated.
- I-DAV implementation for exposure assessments began.
- A demonstration of the analysis tools was given to STC.
- Tableau data conditioning tools were modified based on WRPS IH feedback.
- WRPS obtained client feedback on EA summary tables and deployed revisions in Tableau and Excel.
- Internal meetings were held to discuss quality assurance requirements for preparation of I-DAV initial roll out.
- A demonstration of Tableau and I-DAV mock-ups was provided to WRPS IH staff.
- The I-DAV prototype tool was made ready for full testing.
- I-DAV code was pushed to testing in preparation for release on July 10, 2019.
**Integrated Sampling & Monitoring Strategy**

**3rd Quarter Update:**
IH established the scope and purpose for the *IH 200 Areas Surveillance Strategy* and briefed ORP. Additionally, IH drafted a sampling and monitoring strategy for the IH Program. Final comments have been received and incorporated into the sampling strategy document. The final approval process is underway and is scheduled to be complete by mid-August.

**ToxiRAE Implementation**

**2nd Quarter Summary: No further updates expected/completed**
“Beginning February 26, 2019, the ToxiRAE Pro personal ammonia sensors [became] available for use on all shifts (days, back shift, overtime) for Risk Classification One (RC1) and RC2 work being performed in all actively ventilated farms. Industrial Hygiene technicians (IHTs) [issue] the ToxiRAE Pro monitors as a primary means of monitoring ammonia concentrations to establish any change of conditions in the farm,” announced Mr. Rob Cantwell in an all-employee message.

**Root Cause Analysis**

**3rd Quarter Update**
The final Root Cause Analysis (RCA) report underwent initial review in May. Comments will be resolved and the report will be further reviewed. A meeting is scheduled to review the final report in July.
2. Mitigating Actions/Engineered Controls

AW Stack Extension

3rd Quarter Summary:
WRPS seeks to increase the AW stack’s current height from 27 feet to 60 feet. As a result of issues identified during the permitting review, the schedule for completing the AW Stack extension was extended to FY 2019. Summarized below are the 3rd Quarter accomplishments:

- **Permitting:** WRPS has been collaborating with the Department of Ecology on getting an approved permit. Nothing more can be done until the permit is acquired.

A Farm Exhausters

3rd Quarter Update:
The goals for FY 2019 are to complete the following: 1) the installation of the exhausters, exhauster valve manifold, and ventilation ducting; 2) the removal of two thermocouples; and 3) the testing of the exhausters and ventilation system. Below is a summary of what was accomplished in the 3rd Quarter:

- **Exhausters:** The installation of the moisture separator shielding structures was started. Excavation of the exhauster electrical trench also began and continued throughout the quarter. WRPS began installing electrical connections for the variable frequency drives (VFDs), the effluent monitoring cabinets, seal pots, and moisture separators. Work on installing the grounding, electrical conduits, lighting fixtures, and electrical racks continued. Excavation of the exhauster electrical trench for conduit installation also continued. Installation of the temporary access stairs from the grade to the exhauster slab and the installation of the moisture-separator shielding support structure were completed. In June, installation of POR518 and POR519 exhausters were completed in A-Farm.

- **Exhauster Valve Manifold:** During the 3rd quarter, the stairs, platform grating, handrails and a customized grating were installed. The installation of the manifold spool weldments was completed. In May, the installation of the exhauster valve manifold was completed by grouting the final base plates, torquing all flanges, and installing final grating retaining clips. In **Figure 1**, a ducting spool weldment is being installed between the valve manifold and the moisture separators.

*Figure 1. Installment of Ducting Spool Weldment (Photo courtesy of Mark Allen)*
Procurement/Fabrication: In April, procurement and engineering resources were assigned and organized to begin soliciting and fabricating grout boxes, work platforms, and spray rings. In May and June, material requests and vendor proposals for fabrication of the grout boxes, work-platforms, and spray rings were prepared.

Equipment Removal: The A-103 thermocouple was removed for the installation of the ventilation air inlet/vacuum controller assembly. See Figure 2.

Figure 2. 
Removal of A-103 Thermocouple
(Photo courtesy of Mark Allen)

NUCON®2 Thermal Oxidation Vapor Abatement Unit
3rd Quarter Update:
The current goals for FY 2019 are to start the detailed design of the next generation vapor abatement unit (VAU) and tank farm infrastructure and to apply for environmental permits, as necessary. This is a collaborative effort between WRPS, Pacific Northwest National Laboratory (PNNL), TerraGraphics, and NUCON. Below is a summary of what was accomplished in the 3rd quarter:

TerraGraphics:
- Developed, received and dispositioned comments on the Thermal Oxidation System (TOS) Infrastructure 60% Design package
- Initiated review of the NUCON® VAU Skid 60% Design
- Continued selection of a blower for the new vacuum
- Continued development of the TOS Infrastructure 90% Design Package

NUCON®:
- Continued the evaluation of equipment selection for the electric heater, booster blower, and valves, and their implementation into the NUCON® VAU Skid 60% Design
- Continued work on electrical schematics and panel layouts for NUCON® VAU Skid 60% Design
- Initiated review of the TOS Infrastructure 60% Design from TerraGraphics, and submitted design to WRPS for review
- Submitted NUCON® VAU Skid 60% Design for review and dispositioned review comments
- Continued work on the shrouded probe sampler design
• WRPS:
  - Initiated and completed review of the TOS Infrastructure 60% Design package
  - Initiated review of submitted comments for the NUCON® VAU Skid 60% Design
  - Developed and refined an out-year project plan with a schedule and cost estimate to reflect ORP direction
  - Submitted project completion date of September 2025 to the State of Washington as part of the Settlement Agreement
  - Initiated Tier 4 Test Report on diesel generator

• PNNL:
  - Completed the scope of work regarding the instrumentation trailer; PNNL’s FY 2019 scope of work is completed

Strobic®3 Air Tri-Stack3
3rd Quarter Update:
Strobic® testing was completed. WRPS and DOE-ORP will determine the next steps.

AP Farm Ultra-Violet Fourier Transformer Infrared Spectrometer
3rd Quarter Summary:
The goal for FY 2019 is to turn the AP Farm ultra-violet fourier transformer (UV-FTIR) over to Operations for ammonia monitoring. Below is a summary of the 2nd quarter accomplishments:
• Ammonia-Only Turn-Over: A number of parallel activities are being prepared in support of the ammonia-only turn-over and are discussed below:
  - Continued reviewing the ammonia-only results and continued interim reliability Operational Acceptance Test (OAT) testing.
  - Continued the no-gas OAT.
  - Instrumentation and Control Engineering continued developing the Integrated Document Management System (IDMS) interface, and continued reviewing the UV-FTIR software installation plan.
  - Continued preparing the maintenance and operating procedures.
  - Continued compiling evidence to support the readiness of turning over the UV-FTIR to Operations.
• Multi-Gas Only Turn-Over: No update until the ammonia turn-over is complete.

Continuous Emissions Monitor Sampler
3rd Quarter Update:
All procurements for the continuous emissions monitor sampler modification remain in process. The sampling test bed is being fabricated, and the skid is being assembled as the procured equipment arrives. The Sampling Test Bed fabrication was completed in May, and the Factory Acceptance Testing (FAT) was completed in
June. As of June, all of the major component procurements for the continuous emissions monitor sampler modification are complete. The ultra-violet differential optical adsorption spectrometer (UV-DOAS) sub-system FAT test was successfully completed. In July, all of the subsystem components will be received, and final fabrication and integration of the CEM system will begin.

Stack Monitor Turn-Over/Vapor Monitoring and Detection System Upgrade
3rd Quarter Update:
The goal for FY 2019 is to turn the monitors over to Operations. Below are the accomplishments for the 3rd Quarter:

- **Set-Point Calculation:** All set-point calculations have been approved for ammonia for AZ, AX, AN, and AW Farms.
- **Operational Acceptance Test:** In late March, the OAT began on AX-126 and AX-127, as well as AZ-702 in April. By the end of the third quarter, the following documentation and fieldwork was completed:
  - Passed calibration with ammonia on AZ-702, AX-126, and AX-127;
  - Developed maintenance, calibration, verification and operating procedures;
  - Developed informal computer-based training for general awareness;
  - Developed formal training for the engineers and craft to ensure they can support the stack monitors after turnover to operations; and
  - Developed OATs for AN-241 and AX-127.

As of early June, AZ-702, AX-126, and AX-127 stack monitor systems passed ammonia calibrations tests with the support from Montrose, which provided the certified calibration gases.

Public Address System
3rd Quarter Update:
The goal of installing all the reader boards associated with the public address (PA) system in FY 2019 has been realized. The PA system was completed during the 2nd quarter, and in April, it was successfully turned over to Operations for formal readiness procedures. The PA system will be integrated and fully operational in the Shift Office Event Notification (SOEN) system once readiness is formally declared.

SST Farm Automation
3rd Quarter Update:
The purpose of the single-shell tank (SST) Stewardship Program is to identify and evaluate procedures requiring entry into SSTs and determine whether those requirements can be eliminated or reduced. The goals for FY 2019 are to install remote monitoring equipment at both TY and TX Farms, and to turn-over the equipment to Operations. The following was accomplished in the 3rd Quarter:
• **T-Complex Field Construction:** The construction contract was awarded. Fabrication of components started in April and continued through June. Several items have long-lead procurement times, impacting the installation schedule, which is anticipated to commence in July.

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**Full-Face Air Purifying Respirators and Powered Air Purifying Respirators**

**3rd Quarter Summary:**
As part of the overall research and implementation of the full-face air-purifying respirators (FFAPRs) in Tank Farms, an IH SME attended a tour of the Mine Safety Applications (MSA) factory for respiratory cartridges in North Carolina in mid-January. FFAPRs were rolled out in AX, AY, and AZ Farms on February 21, 2019, and in AP and AW Farms on March 19, 2019. FFAPRs are now implemented for all RC1 and RC2 work activities in all actively ventilated tank farms (SY, AN, AX, AY, AZ, AP, and AW). Employees may voluntarily upgrade respiratory equipment to supplied air. The IH Newsletter reported that, “[i]t was a smooth transition” and “work was performed efficiently.”

In March, STC began its review of IH documents and procedures as part of its evaluation of the effectiveness of engineering controls and other methods to protect workers from tank vapors exposures. STC was onsite in April to conduct interviews with WRPS senior management, IH employees, and several fieldwork supervisors. In May, STC returned to interview workers and perform a workforce survey. STC is in the process of finalizing its report on their findings and recommendations.
3. Information Sharing/Communication

Chemical Vapors Solution Team Meetings

3rd Quarterly Update:
- April 10, 2019, Chemical Vapors Solution Team (CVST) Meeting
- May 8, 2019, CVST Meeting
- June 10, 2019, CVST Meeting CANCELED

CVST Sub-Team Meetings

3rd Quarter Update:
- April 8, 2019, CVST Communications Sub-team meeting
- April 20, 2019, CVST Communications Sub-team meeting
- May 6, 2019, CVST Communications Sub-team meeting
- May 20, 2019, CVST Communications Sub-team meeting
- June 3, 2019, CVST Communications Sub-team meeting
- June 5, 2019, Chemical Cartridge CVST Sub-team meeting
- June 17, 2019, CVST Communications Sub-team meeting

HanfordVapors.com Metric

3rd Quarter Update:
The Hanford Vapors website logged over 6,000 views in the 3rd quarter of FY 2019, which is a 17% increase from the previous quarter (Figure 3).

Thirty-one new items were reportedly uploaded to the site during the 3rd Quarter of FY 2019. As fewer new vapor-related reports are developed, the amount of new material to put online has decreased. Settlement Agreement items continue to be posted on the site.

In this reporting period, the website experienced an average of 2,132 hits per month and 66 hits per day (up from 61 the previous quarter).
Figure 3.
Hanford Vapors Website – Total Hits Per Month and Average Hits by Quarter, 3rd Quarter
Listed below are the posting made to HanfordVapors.com in the 3rd Quarter:

April 2019:
- Comprehensive Vapor Action Plan (CVAP) WRPS-1700022
- Hanford Vapor Integrated Safety Management Strategy (HVISMS) WRPS-170077
- PER AOP-015 Monthly Report March 2019
- 2018 HPMC Population Health Trending Summary, Tank Farm Hazardous Waste Worker
- EIR-2019-006 AOP-015 (02/04/2019)
- EIR-2019-013 AOP-015 03/19/2019
- EIR-2019-014 AOP-015 (03/21/2019)
- EIR-2019-012 AOP-015 (03/19/2019)

May 2019:
- Quarter 2 - WRPS Integrated Chemical Vapor Hazard Control Program Quarterly Report
- PER AOP-015 Monthly Report April 2019
- EIR-2019-019 AOP-015 U Farm Change Trailer 04222019
- EIR-2019-018 AX Tent AOP-015 04162019
- CTEH Reassessment WRPS IH Tank Vapor Program Report
- Report Summary
- WRPS Vapor Mgmt April 2019

June 2019:
- PNNL-26828 Sampling & Analysis Recommendations Report
- EIR-2019-018 AX Tent AOP-015 04162019
- PNNL-26828 Sampling & Analysis Recommendations Report Summary
- CVST Agenda May 8, 2019
  CVST Agenda April 10, 2019
  CVST Agenda March 13, 2019
  CVST Agenda January 9, 2019
- FAQ page update added link to CVAP
- Main & Side Menu Navigation and Reference Material page updated added link to Settlement Agreement Excerpts and Full Document
- PNNL-25791, Rev 1 Hanford Tank Farm Occ. Exposure & Risk Assessment Plan Report
- PNNL-26787 Rev. 0, Risked-based approach for Nitrosamine Risk Analysis Report
- PNNL-26775 Rev. 0, Proposed Occupational Exposure Limits for Furans Report
- PER AOP-015 Monthly Report May 2019
The CPPO Notebook was developed as an additional mechanism for managers to share vapors-related information with the workforce. It is delivered on a weekly basis in two primary formats, a PowerPoint presentation with speaker notes and a video narrated by a technical expert. Eleven CPPO Notebooks were distributed in the third quarter of FY 2019 on a range of topics including:

- Chemicals of potential concern (COPCs) vs chemicals of concern (COCs),
- Nitriles,
- IH updates on exposure assessments and the Data Access and Visualization (DAV) tool
- A four-part series on addressing vapor concerns at the Hanford Tank Farms,
- The installation of reader boards as part of the event notification system,
- Results of the 2019 Vapor-Information Survey conducted by the CPPO, and
- Information on the transition of the CPPO Office.

Management’s use of the notebook is tracked through data gathered from self-reporting voting button provided in the email distributing each week’s CPPO Notebook. In the 3rd Quarter of FY 2019, the editions of the notebook produced and distributed were reportedly used 116 times. **Figure 4** shows this number remains relatively steady with a slight increase this quarter. Use of the CPPO Notebook is a lagging indicator as older editions are often randomly used throughout the year.

A link to the current CPPO Notebook is included in the Safety StartUp each week, thereby providing the largest opportunity for worker exposure to the information. Additionally, the notebooks are posted on the WRPS internal website, accessible through Vapors Protection tab on the main page, as well as from the CPPO, CVST, and the ESH&Q webpages. A link to the CPPO Notebook is also sent to Team Vapor Representatives (TVRs) each week. Tracking the use of the narrated notebook files accessed from intranet traffic reveals a significantly higher utilization rate than that provided through management self-reporting. Web data includes all editions of the notebook viewed during this timeframe, regardless of when they were originally distributed. The large difference between manager-reported use and web access to the files is attributed primarily to routine use of the CPPO Notebooks in Safety StartUp and the inclusion of a link to the current edition of the notebook in **Solutions**.
Figure 4.
3rd Quarter CPPO Notebook Use
CPPO Requests and Production Metrics

3rd Quarter Update:
The CPPO routinely summarizes complex, technical vapors-related information for a general audience and has provided monitoring results, report summaries, presentations, a weekly report on WRPS vapors activities, and other information for distribution through established communication mechanisms such as the Solutions newsletter and the HanfordVapors.com website.

At the end of the third quarter FY 2019, the CPPO completed and delivered 58 vapors-related communications to the workforce. The increase this quarter was driven by the production of CVAP fact sheets and technical report summaries for the website. Table 1 shows that the products provided during this timeframe primarily consisted of these, in addition to CPPO Notebooks and updates to the external website. The CPPO Look-Ahead continues to be an effective tool to capture strategic planning and coordination of vapors-related communications development, including timing and topics.

The CPPO also tracks the distribution of all identified vapors-related communications throughout WRPS. The data for the 3rd quarter of FY 2019 is shown in Table 2 and indicates that since the beginning of the FY, vapors-related information has been shared with the workforce 3,994 times in a variety of formats. The data have remained relatively consistent across each quarter this FY. Vapors-related information is shared through two primary channels: 1) a notebook viewed at Safety StartUp meetings, and 2) pre-shift briefs that field managers hold with the workforce. The web postings are significantly elevated this FY due to the addition of several documents posted in the first quarter in accordance with the Settlement Agreement. Although other communication events occur less frequently, such as SOENs or ESH&Q messages, they continue to provide targeted vapors-related information to the workforce.

The CPPO was established as a temporary office to track vapors-related metrics and foster outreach with the workforce. Much of CPPO’s work scope is completed. The portions that remain have been transitioned to other organizations within WRPS. As of July 1, 2019, ESH&Q has the ongoing responsibility of providing vapors-related information and engagement opportunities to the workforce, and IH leadership is meeting regularly with HAMTC Safety Representatives. The dissolution of CPPO and transition of its remaining work scope to areas within the company is an important step in ensuring that communicating with the workforce about vapors-related topics continues.
### Table 1. CPPO Vapors Information Products by Quarter

<table>
<thead>
<tr>
<th>CPPO Vapors Information Products Completed FY19</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>FY Total</th>
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<tbody>
<tr>
<td>Presentations (includes CPPO Notebook and CVST)</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>31</td>
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<tr>
<td>CPPO Reports and Weekly Report</td>
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<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Articles, Summaries, and Message Maps</td>
<td>6</td>
<td>1</td>
<td>11</td>
<td>18</td>
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<tr>
<td>Surveys, Focus Groups, and Recommended Actions</td>
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<td>2</td>
<td>1</td>
<td>5</td>
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<td>Website Requests/Site Updates</td>
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<td>17</td>
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<td>Videos</td>
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<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Field Visits</td>
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<td>14</td>
<td>5</td>
<td>33</td>
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<td>Chem Worker Training Support</td>
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<td>6</td>
<td>6</td>
<td>19</td>
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<tr>
<td><strong>Totals</strong></td>
<td>136</td>
<td>48</td>
<td>58</td>
<td>259</td>
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</table>
## Table 2.
**WRPS Vapors Information Distribution Avenue by Quarter**

<table>
<thead>
<tr>
<th>WRPS Vapors Information Distribution Avenue</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>FY Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Employee Email/Meetings &amp; ESHQ Comm.</td>
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<td>15</td>
<td>3</td>
<td>31</td>
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<tr>
<td>CPPO Notebook*</td>
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<td>101</td>
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<td>335</td>
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<tr>
<td>CPPO Monthly Report</td>
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<td>3</td>
<td>11</td>
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<td>Fact Sheet &amp; Information</td>
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<td>0</td>
<td>9</td>
<td>9</td>
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<tr>
<td>Meeting - CVST *</td>
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<td>2</td>
<td>6</td>
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<tr>
<td>Meeting - CVST Sub-team meeting *</td>
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</tr>
<tr>
<td>Meeting - Hanford Advisory Board Briefing *</td>
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<td>1</td>
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</tr>
<tr>
<td>Meeting/Briefing*</td>
<td>11</td>
<td>15</td>
<td>5</td>
<td>31</td>
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<tr>
<td>Meeting - Morning/Pre-Shift Brief*†</td>
<td>1125</td>
<td>1031</td>
<td>1153</td>
<td>3309</td>
</tr>
<tr>
<td>Presentation*</td>
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<td>2</td>
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<td>Safety Start</td>
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<td>9</td>
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<td>49</td>
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<td>8</td>
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<td>27</td>
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<td>Tours*</td>
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<td>1</td>
<td>2</td>
</tr>
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<td>Vapors Weekly Update or Website Post</td>
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<td>31</td>
<td>143</td>
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<tr>
<td>Video</td>
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<td>1224</td>
<td>1376</td>
<td>3994</td>
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</tbody>
</table>

* Face-to-face communication  †Data reported with all vapor questions in quarterly metric
The forecast for delivery of WRPS vapors-related communications to the workforce in FY 2019, including monthly and cumulative estimates, is shown in Figure 5. The data trend indicates that at this rate, WRPS is on track to deliver over 5,000 vapors-related communications to the workforce in FY 2019 - largely through briefings and face-to-face interactions with the workforce.

Figure 5.
WRPS Vapor Related Communications Distribution/Trending Forecast Avenue June 2019
WRPS Vapors Communications
April 1, 2019, Industrial Hygiene Communication:
Subject: “Clarification – Use of FFAPR in Actively Ventilated Tank Farms”

April 1, 2019, Solutions, Issue 475:
Subject: CPPO Notebook, Hydrocarbons

April 8, 2019, Solutions, Issue 476:
Subject: CPPO Notebook, COPC vs COC

April 15, 2019, Solutions, Issue 477:
Subject: CPPO Notebook, Exposure Assessments

April 16, 2019, 1:05 p.m., Shift Office Event Notification:
Subject: “Entering AOP-015 for Canton, Pl, east of AX Farm. All personnel stay clear of the area. CSM”

April 16, 2019, 1:22 p.m., Shift Office Event Notification:
Subject: “All personnel in AX tent, remain in place. All personnel in AX Farm, exit through AY2 change trailer. CSM”

April 16, 2019, 1:29 p.m., Shift Office Event Notification:
Subject: “Initiated EIR-2019-018 for AX Tent AOP-015 Event. POC Becky White. CSM”

April 16, 2019, 2:34 p.m., Shift Office Event Notification:
Subject: “Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

April 16, 2019, ESQ&H Communications
Subject: The full-scale implementation and widespread use of FFAPR for RC-1 and RC-2 work in actively ventilated tank farms

April 22, 2019, Solutions, Issue 478:
Subject: CPPO Notebook, Nitriles

April 22, 2019, 10:18 a.m., Shift Office Event Notification:
Subject: “Entering AOP-015 for odors reported west of U Farm change trailer. Access restricted to U farm change trailer. All personnel stay upwind of the area. CSM”
April 22, 2019, 11:33 a.m., Shift Office Event Notification:
Subject: “Initiated EIR-2019-019 for U Farm Change Trailer AOP-015 Event. POC: Larry Dickerson. CSM”

April 22, 2019, 3:03 p.m., Shift Office Event Notification:
Subject: “Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

April 30, 2019, Solutions, Issue 479:
Subject: CPPO Notebook, Preview of the Tank Farms Internal Data Access & Visualization (I-DAV) Tool”

April 30, 2019, 10:34 a.m., Shift Office Event Notification:
Subject: “Entered AOP-015 for strong odor on south side of C Farm. All personnel stay clear of south side of C Farm until further notice. CSM”

April 30, 2019, 12:58 p.m., Shift Office Event Notification:
Subject: “Response actions for TF-AOP-015 event have been completed and the results are at or below background levels. Exiting AOP-015. CSM”

April 30, 2019, 1:08 p.m., Shift Office Event Notification:
Subject: “Initiated EIR-2019-021 for MO579 AOP-015. POC Becky White. CSM”

May 6, 2019, Solutions
Subject: CPPO Notebook, Addressing Tank Farm Vapors at Hanford, Part 1, An Overview of Vapors Concerns at Hanford.

May 9, 2019, ESH&Q Communications
Subject: “Protection Equipment and Surfaces”

May 9, 2019, 6:56 p.m., Shift Office Event Notification:
Subject: “Entered AOP-015 for sulpher (sic) odor near T Farm. All personnel stay clear of T Farm until further notice. CSM.”

May 9, 2019, 8:01 p.m., Shift Office Event Notification:
Subject: “Exiting AOP-15 for sulphur odor near T Farm. Odor was near Hanford MET Tower in the 600 Area. CSM.”

May 9, 2019, 8:07 p.m., Shift Office Event Notification:
Subject: “Based on location where odors were reported (600 Area near 622R Met Tower), there are not entry restrictions for any tank farm facilities. CSM”
May 13, 2019, Solutions
Subject: CPPO Notebook, Addressing Tank Farm Vapors at Hanford, Part 2, What has Changed?

May 20, 2019, Solutions
Subject: CPPO Notebook, Addressing Tank Farm Vapors at Hanford, Part 3, How Does WRPS Transition to a Risk-based Program?

May 21, 2019, 9:17 a.m., Shift Event Notification:
Subject: “Entered AOP-15 for odor near A Farm. All personnel stay clear of A Farm until further notice. CSM”

May 21, 2019, 10:38 a.m., Shift Event Notification:
Subject: “Response actions for TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

May 21, 2019, 3:20 p.m., Shift Event Notification:
Subject: “Initiated EIR-2019-023, AOP-015 Event South of 241-A Farm Change Trailers. POC: Becky White. CSM”

June 3, 2019, Solutions, Issue 483:
Subject: CPPO Notebooks, An Overview of Vapors Concerns at Hanford Parts 1 through 4.

June 6, 2019, ESH&Q Communication
Subject: “Regarding Proper operation of Scott SCBA Cylinder Valve assembly”

June 9, 2019, 8:38 a.m., Shift Event Notification:
Subject: “Entered TF-AOP-015 for odors inside 242-A. All personnel stay clear of 242-A until further notice. CSM”

June 9, 2019, 10:06 a.m., Shift Event Notification:
Subject: “Entered TF-AOP-015 for odors near AW Farm. All personnel stay clear of AW Farm until further notice. CSM”

June 9, 2019, 11:07 a.m., Shift Event Notification:
Subject: “Initiated EIR-2019-025 TF-AOP-015 event inside 242-A Evaporator. POC Ryan Hadley. CSM”

June 9, 2019, 11:08 a.m., Shift Event Notification:
Subject: “Initiated EIR-2019-026 TF-AOP-015 event at MO-818 AW Farm Change Trailer. POC Ryan Hadley. CSM”
June 9, 2019, 12:55 p.m., Shift Event Notification:
Subject: “Response actions for the TF-AOP-015 events at 242-A and AW Farm have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

June 10, 2019, Solutions, Issue 484:
Subject: “Vapors strategy improves worker protection”

June 10, 2019, ESH&Q Communication
Subject: “Hanford Site Emergency Alerting System Overview”

June 17, 2019, Solutions, Issue 485:
Subject: CPPO Notebooks, Tank Farm Event Notification System Reader Boards

June 19, 2019, 10:24 a.m., Shift Event Notification:
Subject: “Entered TF-AOP-015 for odors east of AP Farms. All personnel stay clear of AP Farm until further notice. CSM”

June 19, 2019, 11:17 a.m., Shift Event Notification:
Subject: “Initiated Event Investigation EIR 2019-029-TF-AOP-015 Event East of AP Farm. POC: Thea Hall. CSM”

June 19, 2019, 12:09 p.m., Shift Event Notification:
Subject: “Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. CSM”

Engagement/Site Visits
CTEH toxicologists visited the Chemical Worker Training, moderating Q&A sessions that give the course trainees an opportunity to get answers to their questions regarding the toxicology and potential health impacts from tank vapor chemicals. In the 3rd quarter of 2019, CTEH toxicologists interacted with a total of 228 trainees. Workers inquired about the likelihood of coming off of SCBA use for all of the tank farms, and asked CTEH toxicologists about their opinions of health protectiveness of APR use in the tank farms. CTEH shared stories of their own use of APRs and real-time instrumentation during chemical emergency response work and petrochemical facility visits away from the Hanford site. Some workers asked about the availability of data (pre-2008) to study historical worker exposures. A few questions were asked about the ability of the real-time instrumentation to adequately warn workers of potential exposures in time to take protective actions.

CTEH toxicologists also attended various tank farm pre-job and work team Plan of the Day meetings to answer workers’ health related questions. CTEH continued to attend IH’s coordinated meetings with HAMTC safety representatives, and CTEH also
toured various parts of the Hanford site with HAMTC members to hear about historical concerns of potential worker exposures.

**Focus Groups/Surveys**

3rd Quarter Update:
In the third quarter, the CPPO completed the second of two planned activities this FY to assess the effectiveness of vapor-related communications provided to the workforce. In April, a survey was sent to 285 members of the WRPS workforce with 103 responses received (36% response rate). The sample size was calculated to achieve a ±10% margin of error and was weighted 2:1 north of the Wye barricade. Initial results show that the strategies employed since the last survey in 2018 have been successful. Notably, more workers report the value of the notebook as a vapors information resource, and a 13% improvement was seen in both how well workers rate the understandability and the perceived credibility of the information provided as compared to the previous year. The survey results will be published in Q4, with recommendations to be tracked in the PER system.

**AOP-15 Events**

*April 16, 2019, 1:05 p.m., Shift Office Event Notification:*
**Subject:** “Entering AOP-015 for Canton, Pl, east of AX Farm. All personnel stay clear of the area. CSM”

*April 16, 2019, 1:22 p.m., Shift Office Event Notification:*
**Subject:** “All personnel in AX tent, remain in place. All personnel in AX Farm, exit through AY2 change trailer. CSM”

*April 16, 2019, 1:29 p.m., Shift Office Event Notification:*
**Subject:** “Initiated EIR-2019-018 for AX Tent AOP-015 Event. POC Becky White. CSM”

*April 16, 2019, 2:34 p.m., Shift Office Event Notification:*
**Subject:** “Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

*April 22, 2019, 10:18 a.m., Shift Office Event Notification:*
**Subject:** “Entering AOP-015 for odors reported west of U Farm change trailer. Access restricted to U farm change trailer. All personnel stay upwind of the area. CSM”

*April 22, 2019, 11:33 a.m., Shift Office Event Notification:*
**Subject:** “Initiated EIR-2019-019 for U Farm Change Trailer AOP-015 Event. POC: Larry Dickerson. CSM”
April 22, 2019, 3:03 p.m., Shift Office Event Notification:
Subject: “Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

April 30, 2019, 10:34 a.m., Shift Office Event Notification:
Subject: “Entered AOP-015 for strong odor on south side of C Farm. All personnel stay clear of south side of C Farm until further notice. CSM”

April 30, 2019, 12:58 p.m., Shift Office Event Notification:
Subject: “Response actions for TF-AOP-015 event have been completed and the results are at or below background levels. Exiting AOP-015. CSM”

April 30, 2019, 1:08 p.m., Shift Office Event Notification:
Subject: “Initiated EIR-2019-021 for MO579 AOP-015. POC Becky White. CSM”

May 9, 2019, 6:56 p.m., Shift Office Event Notification:
Subject: “Entered AOP-015 for sulphur (sic) odor near T Farm. All personnel stay clear of T Farm until further notice. CSM.”

May 9, 2019, 8:01 p.m., Shift Office Event Notification:
Subject: “Exiting AOP-15 for sulphur odor near T Farm. Odor was near Hanford MET Tower in the 600 Area. CSM.”

May 9, 2019, 8:07 p.m., Shift Office Event Notification:
Subject: “Based on location where odors were reported (600 Area near 622R Met Tower), there are not entry restrictions for any tank farm facilities. CSM”

May 21, 2019, 9:17 a.m., Shift Event Notification:
Subject: “Entered AOP-015 for odor near A Farm. All personnel stay clear of A Farm until further notice. CSM”

May 21, 2019, 10:38 a.m., Shift Event Notification:
Subject: “Response actions for TF-AOP-015 event have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

May 21, 2019, 3:20 p.m., Shift Event Notification:
Subject: “Initiated EIR-2019-023, AOP-015 Event South of 241-A Farm Change Trailers. POC: Becky White. CSM”

June 9, 2019, 8:38 a.m., Shift Event Notification:
Subject: “Entered TF-AOP-015 for odors inside 242-A. All personnel stay clear of 242-A until further notice. CSM”
June 9, 2019, 10:06 a.m., Shift Event Notification:
Subject: “Entered TF-AOP-015 for odors near AW Farm. All personnel stay clear of AW Farm until further notice. CSM”

June 9, 2019, 11:07 a.m., Shift Event Notification:
Subject: “Initiated EIR-2019-025 TF-AOP-015 event inside 242-A Evaporator. POC Ryan Hadley. CSM”

June 9, 2019, 11:08 a.m., Shift Event Notification:
Subject: “Initiated EIR-2019-026 TF-AOP-015 event at MO-818 AW Farm Change Trailer. POC Ryan Hadley. CSM”

June 9, 2019, 12:55 p.m., Shift Event Notification:
Subject: “Response actions for the TF-AOP-015 events at 242-A and AW Farm have been completed and the results are at or below background levels. Exiting TF-AOP-015. CSM”

June 19, 2019, 10:24 a.m., Shift Event Notification:
Subject: “Entered TF-AOP-015 for odors east of AP Farms. All personnel stay clear of AP Farm until further notice. CSM”

June 19, 2019, 11:17 a.m., Shift Event Notification:
Subject: “Initiated Event Investigation EIR 2019-029-TF-AOP-015 Event East of AP Farm. POC: Thea Hall. CSM”

June 19, 2019, 12:09 p.m., Shift Event Notification:
Subject: “Response actions for the TF-AOP-015 event have been completed and the results are at or below background levels. CSM”

External Assessments Recommendation Status
May 2019 Update:
The recommendations status columns in Table 3 below are defined as follows:

- **Complete** - The scope and deliverable(s) (i.e. final report or documentation) addressing the recommendation is complete and closed. CPPO validated the deliverable(s) as complete.
- **Field Work Complete** - The scope addressing the recommendation is complete, but the final deliverable(s) is not complete (i.e. final report or documentation).
- **In Progress** - The scope addressing the recommendation is in progress.
- **Pending Validation** - Status of the scope addressing the recommendation and associated deliverable(s) is awaiting initial CPPO review.
CPPO has validated that 97% of the recommendations have been addressed by actions/deliverables that are either Complete or Field Work Complete. Of the 371 total recommendations:

- 93% have been verified Complete and are considered closed.
- 4% are verified as Field Work Complete and are awaiting final deliverables (i.e. documentation) to close.
- 3% have ongoing actions and are In Progress.
- The majority of the remaining recommendations that are In Progress are scheduled to be completed in FY 2019 and FY 2020.

The In Progress recommendations are broken into four different groups or projects. These projects are:

- Aerosols
- Vapor Monitoring and Detection System (VMDS) turnover
- Supporting DOE Medical Integration
- Vapor Mitigation Tracking

The recommendations under Aerosols are currently under evaluation. VMDS Turnover is scheduled to be complete before the end of FY 2019. The remaining activities under the other recommendations will be tracked for completion into the next FY.

**Table 3. External Assessments Recommendations Status Table**

<table>
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<th>Report</th>
<th>Total</th>
<th>Validated Complete</th>
<th>Field Work Complete</th>
<th>In Progress</th>
<th>Pending</th>
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<td>Total</td>
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<td>348</td>
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<td>10</td>
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**External Assessments Recommendations Status**
CVAP Corrective Actions Tracking Metric

3rd Quarter Update:
The CPPO tracks vapor-related Problem Evaluation Requests (PERs), with the goal of communicating PER resolution status. The performance data in Figure 7 below are defined as follows:

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

The 128 draft CVAP actions are captured in the PERs listed in Figure 7 below, including the OIG actions captured in WRPS-PER-2016-2433 through 2435 and four ORP Facility Representative Surveillance (17173-TF) actions captured in WRPS-PER-2018-0551 thru 0554. 63 TVAT actions were completed during Phase I (FY 2016) and the OIG actions were completed in FY 2017. Their completions are documented in the Electronic Suspense Tracking and Routing System (E-STARS). The remaining TVAT actions have been rolled into the CVAP. The remaining recommendations from NIOSH, EA-32, CTEH, and the VMEP were added to the PER system, and corrective actions were launched. Figure 7, following four corrective action due date extensions, depicts the status of the CVAP total corrective actions and shows that no actions were due or completed in June and, therefore, overall action closures are on schedule. In addition, out of the original 128 E-STARS actions, which were identified at the beginning of FY 2016, 15 open actions are remaining with four actions due in FY 2019, nine actions due the 1st Quarter of FY 2020; one action due the 2nd Quarter of FY 2020, and one action due in FY 2021. The remaining open actions address the following areas: issuance of epidemiology studies and worker feedback; effectiveness assessment of institutionalized tank vapor management programs; fugitive emission identification and investigation; evaluation of additional equipment/technologies; evaluation of potential aerosol hazards; ensuring enhanced communications of potential vapor events; reports utilizing the Data Access and Visualization (DAV) Tool; and comparison of mobile laboratory data with direct reading instrumentation.
### Figure 7.
Vapor Corrective Action Tracking

#### Trending Fiscal Year 2019
Month Ending June 2019

**Vapor Corrective Action Tracking**
[CVAP Actions includes OIG Actions]

| KPP 1 – Engagement and Effective Measurement | WRPS-PER-2017-2161 – OPEN |
| KPP 2 and 3 – HH Technical Basis and HH Program | WRPS-PER-2017-0610 – CLOSED |
| | WRPS-PER-2017-0718 – CLOSED |
| | WRPS-PER-2017-0720 – CLOSED |
| | WRPS-PER-2017-0721 – CLOSED |
| | WRPS-PER-2017-0722 – CLOSED |
| | WRPS-PER-2017-0723 – CLOSED |
| KPP 4 – Engineering Controls | WRPS-PER-2017-2152 (4A) – CLOSED |
| | WRPS-PER-2017-2158 (4B) – CLOSED |
| KPP 5 – Administrative Controls and Monitoring | WRPS-PER-2017-2154 (5A) – OPEN |
| | WRPS-PER-2017-2155 (5B) – OPEN |
| KPP 7 – Hierarchy of Controls | WRPS-PER-2017-2157 (7A) – OPEN |
| | WRPS-PER-2017-2158 (7B) – CLOSED |
| KPP 8 – Medical Support | WRPS-PER-2017-1767 – OPEN |

#### Performance Data

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<tr>
<th>KPP</th>
<th>Number of Completed (Month)</th>
<th>Current Due (Month)</th>
<th>Running Total Due</th>
<th>Total Remaining</th>
<th>CUM Schedule Performance (%)</th>
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</table>

#### Performance Thresholds

- Achieve: ≤IL - 10
- Decline: > IL - 10 and ≤ IL - 5
- Move: > IL - 5 and ≤ IL - 10
- Exceed: > IL - 10

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Published May 23, 2019
4. **Sampling and Monitoring**

**Mobile Lab**

**3rd Quarter Update:**
In May and June, the mobile laboratory performed daily area monitoring in the A-Corridor and around TY, TX, and U Farms. It was also used to perform monitoring in support of the AZ-102 to AN-106 Transfer that started May 31, 2019, and was completed June 1, 2019. The mobile lab was used to identify the odor source of an AOP-015 event that occurred on June 19, 2019. The odor was determined to be emanating from an ultrasonic test trailer that had failed batteries.

**Cartridge Test Reports**

**2nd Quarter Summary: No further updates expected/completed**
Cartridge testing, to support efforts for the switch to FFAPR in the farms, was completed during FY 2018. The results of the testing were presented to the third party reviewers, STC, for review and comment. The review allowed the implementation of FFAPR in the double shell farms with the tested cartridges. The cartridge testing effort in the 1st Quarter of FY 2019 focused on issuing the AX Exhauster report, titled, *Analysis of Air-Purifying Respirator (APR) and Powered Air-Purifying Respirator (PAPR) Cartridge Performance Testing on a Hanford AX Tank Farm Exhauster*, and were numbered PNNL-27860 Vol. 1 and Vol. 2. Following the issue of the AX Exhauster report, efforts focused on processing the data from BY-108 (PAPR) and BY-110 (APR) field testing. The results were included in a draft report that is in the 30-day review process.

**Respiratory Protection Equipment and Surfaces: Monthly Routine Testing**

**2nd Quarter Summary: No Update**
WRPS has a routine monthly testing program to evaluate randomly-selected respiratory protective equipment (RPE) and surfaces for chemicals and bacteria. This program involves IH wipe sampling on 60 randomly-selected RPE (face pieces and regulators) for chemical and bacterial presence from the three main mask issue and sanitizing stations (2704 HV, 278 AW, and MO 2256). Samples for chemical content are analyzed at ALS Labs in Salt Lake City Utah. Samples for bacterial content are analyzed at Trinities’ Labs, Kennewick, WA.

Analytical results from January, February, and March 2019’s testing indicated that there were no instances of chemical disinfectant contamination on any of the RPE tested. Likewise, the results of bacterial testing on RPE and Mask Issue Station surfaces continue to indicate that they are considered exceptionally well-sanitized. Please note that there are no known federal standards or guidelines for clearance levels...
of either chemical (anions) or bacteria on RPE and related surfaces. Results are available on the WRPS Respiratory Protection Intranet.

1 - RAE Systems by Honeywell, San Jose, California.
2 - NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
3 - Strobic Air Tri-Stack is a registered trademark of Strobic Air Corporation, Bensalem, Pennsylvania.