



washington **river**
protection solutions



Exhausters and stacks are important engineering controls used in the tank farms to reduce localized vapor emissions. Today's cover features the AX Farm exhauster, which recently passed its declaration of readiness for both POR-126 and POR-127, and is now in full-time operation.

Tank Operations Contract
Chemical Protection Program Office Weekly Report
December 7, 2017

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

CPPO has begun tracking and documenting WRPS’s efforts to solicit worker (end user) feedback on work in progress within vapors activities. The findings will be reported in the CPPO Weekly and Quarterly Reports under the heading Chemical Protection Engagement: Worker Feedback.

CPPO Oversight and Tracking

Hanford Vapors Website

The Hanford Vapors website logged nearly 3,000 views in November 2017, a reduction of 34% from the previous month, and the second lowest use over the previous 12 month period. In November, the website experienced an average of 100 hits per day.

Eight new items were posted to the website this month. A rise in traffic continues to occur each month on the days that the Hanford Vapors Weekly Update is posted. Other notable pages accessed frequently this month include the AOP-015 Event Investigation Report page and information on the November 28 event of odors reported inside the instrument facility.



Figure 1. Hanford Vapors Website Statistics

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

✦ Chemical Protection Engagement: Center for Toxicology and Environmental Health (CTEH)

The CTEH team attended the Sampling Operations morning meeting, the AX 102 Sampling pre-job meeting, and the AX Sluicer removal project pre-job meeting. CTEH staff was introduced to the workers and their functions and roles were explained. The team was asked questions about the fugitive emissions initiative. It was during the second Sampling Operations morning meeting last week that the CTEH team asked the workers for suggestions on ways to improve risk communications between them and WRPS management. The Sampling Operations workers did not have suggestions at that time.

Dr. Kind, a CPPO team member from CTEH, presented on *Dimethylmercury* at the November 29, 2017, Chemical Vapors Solutions Team (CVST) meeting.

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

✦ Chemical Protection Engagement: Communications

The CVST meeting was held on November 29, 2017. Multiple topics were covered at the well-attended meeting. Mr. Rob Gregory reported that mediation discussions continue. Touching on the EA-32 out-brief, Mr. Gregory solicited the group for feedback about vapors. Mr. Steve Killoy introduced himself as the ESH&Q Chemical Protection Integration Manager and shared the feedback from EA-32.

Mr. Rob Cantwell labored long to answer the many questions from an energetic audience about the move to perform work in full face air purifying respirators (FFAPR). He discussed the WRPS collaboration with the 3rd party reviewer, Stoneturn Consultants (STC) to assess the hazards and articulate the Job Hazard Analysis. Dr. Kind presented a PowerPoint on *Dimethylmercury*. A TVR shared what he described as a satisfying meeting with management about a fence line question he had posed in an earlier CVST meeting. Wrapping up the meeting was a discussion of an AOP-015 entered on November 28, 2017.

The CVST Communications Sub-committee met on November 27, 2017.

The weekly HAMTC/CPPO Interface meeting was held on November 29, 2017.

Last week's CPPO Notebook contained two topics. One is titled *Washington River Protection Solutions 2017 Safety Culture Survey Result: Vapor Snapshot*. The second

offering is a video tour of WRPS's vapors related websites. This week's CPPO Notebook is titled *Vapor Management Expert Panel (VMEP) Second Periodic Report Summary*.

The SOEN System alerted the Hanford community of a significant operational issue on November 28, 2017, at 9:13 a.m. when it reported, "Entering AOP-015 for 271AW. All personnel perform orderly exit of 217AW. Access is restricted to 271AW."

The SOEN System alerted the Hanford community of an event investigation initiation on November 28, 2017, at 9:54 a.m. when it reported, "Initiated Event Investigation (EIR-2017-043) for 271AW Instrument Building AOP-015 Event. POC: Thea Hall."

The SOEN System alerted the Hanford community of a personnel injury or illness on November 28, 2017, at 10:30 a.m. when it reported, "Three NCOs reported odor concerns at 271AW and were taken to HPMC."

WRPS Communications & Public Relations sent an all-employee email on November 28, 2017, at 11:50 a.m. in which it reported, "Odors reported inside instrument facility."

The SOEN System alerted the Hanford community of a significant operational issue on November 28, 2017, at 2:16 p.m. when it reported, "Sample analysis for the 271AW TF-AOP-015 event has been completed and the results are below action limits. Exiting TF-AOP-015."

WRPS Communications & Public Relations sent an all-employee email on November 28, 2017, at 4:28 p.m. in which it reported an update to, "Odors reported inside instrument facility."

Hanford Vapors, posted to the HanfordVapors.com website on November 28, 2017, at 7:31 p.m. reported on the vapors event stating, "Three Hanford workers were cleared to return to work after receiving precautionary medical evaluations for odors reported today inside the 271AW instrument building near AW Farm."

Chemical Protection Engagement: Worker Feedback

CPPO is now reporting on all the efforts that are made to incorporate worker feedback into the ways in which WRPS does business. An excellent example of

worker inclusion is WRPS's SCBA Equipment Evaluation Team (SEET). The team looked for alternatives to SCBA that might enhance worker protection. The workforce was instrumental in developing the cartridge testing test jig, a full face respiratory equipment that protects against arc flash, and it was worker feedback that prompted the creation of Tank Vapors Representatives.

Worker inclusion was the intent of CPPO's appeal to last week's CVST audience for volunteers for a Data Access Visualization (DAV) Tool Steering Committee. The DAV Tool developers recently finished designing the VMDS explorer, a function that shows the data from the active VMDS readings from fence lines, the area, and the stack monitors. The expression of the data is quite different in appearance than the Site Wide Industrial Hygiene Database data that is currently shown in the DAV. The DAV Tool developers are relying on workforce feedback to steer its visual end-products. The steering committee needs more volunteers. Interested persons please contact the CPPOWRPSCPPPO@rl.gov.

Nowhere is worker feedback more easily acquired than in the CVST Communications Sub-committee, which meets the second and fourth Monday of the month. During the November 27 meeting, workers reviewed and critiqued the video "WRPS Website Tour Vapor Resources." Viewer feedback drove editing changes, including slowing the pace of the video to improve understandability. Workers requested the video be distributed in a CPPO Notebook, an action which was taken.

Chemical Protection Engagement: Hanford Vapors Website Updates

- [CPPO Weekly Report - Nov. 30, 2017](#)
- [Updated EA-32 section under Independent Assessments](#)
 - [Office of Enterprise Assessments Follow-up Assessment of Progress on Actions Taken to Address Tank Vapor Concerns at the Hanford Site](#)
 - [Follow-Up Assessment of Progress on Actions Taken to Address Tank Vapor Concerns at the Hanford Site](#)
- [Updated VMEP section under Independent Assessments](#)
 - [Vapor Management Expert Panel Report](#)
- [AP Stack Weekly Report \(February, 1-8, 2017\)](#) – updated document and link
- [CVST Agenda - November 29, 2017](#)

Chemical Protection Engagement: Effectiveness Measures

CPPO is developing the next Vapors Communications Effectiveness Survey. The survey is in draft.

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

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

Last update 11/16/2017: The IH Manual (with specific focus given to institutionalizing the Chemical Vapors elements), and the 17 revised/new implementing documents and procedures, are routing for approval through the work review flow and approval (WRAP) process. These changes will be fully implemented in FY2018.

Health Process Plan

Update: Currently, all but one of the following PNNL-prepared reports has been submitted to the Internal Review Panel (IRP):

- *Proposed HTFOELs for Chronic Exposures – COPCs with Regulatory Guidelines*
- *Proposed Occupational Exposure Limits for Furans*
- *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern*
- *Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines*
- *Proposed HTFOELs for Chronic Exposures - Nitrile Class COPCs and 2,4-Dimethylpyridine*
- *Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures*
- *Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors*
- *Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update*

Still in progress is *Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures*. This study incorporates the chemical mixtures modeling, Acute Transient Exposure Concentration (TEC) Standard Operating Procedure (SOP) & Initial Screening, and a potential approach to fill gaps in acute TECs and mixture effects. After the IRP review, and before finalizing the submittal to WRPS, the studies will be reviewed by an external expert panel.

Parity Implementation with Established Programs

Update: Chemical Worker Tier 1 training course is complete. It is now part of the Tank Operations Contractor Hanford General Education Training (TOC GET) program, and included as part of WRPS's all-employee annual training. It is also a stand-alone class

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.

Key Performance Parameter 3

Maintain Industrial Hygiene Program and institutionalize vapor program requirements, best practices and program parity, and complete necessary training to support full implementation at the beginning of FY2018.

that can be taken at any time, by anyone on site. The Chemical Worker Tier 2 training course is complete too, and is coded for the new computer based training (CBT) computer system that Mission Support Alliance (MSA) will roll out at the beginning of the 2nd Quarter, FY2018. Tier 2 training is aimed at those employees who are located on site (200 East/West). Chemical Worker Tier 3 training was successfully piloted October 4, 2017. Comments from the pilot class have been incorporated in the lesson plan for final approval. This class is focused on workers who enter the farms and it will be an ACES requirement. Currently, Training and IH is identifying instructors to teach the Tier 3 class. A “train the trainer” style class is tentatively scheduled for Tier 3 instructors in mid-December. Tier 3 training is scheduled to begin in mid-January with enhanced Chemical Hazard Awareness Training, known as CHAT, to be discontinued at that time. Training is working with Radiological Controls (RADCON) to ensure that ACES is updated with the new courses to ensure a seamless transition for workers that require farm entry.

Central Residence for Industrial Hygiene Technicians (IHT)

Update: Retrieval Industrial Hygiene Technicians (IHT) and their first-line supervisors will be relocated to a centralized mobile office (MO) building. The MO is slated to house approximately 100 workers. According to retrieval field support, this new space will be large enough to house all retrieval IHTs and their first-line supervisors. Plans are to install the MO in 200 East area near the vicinity of Baltimore Avenue and 4th street. The installed and occupied MO will satisfy KPP 3 for retrieval IHTs. KPP 3 advocates a central location for IHTs that is commensurate with other technician level employees. Delivery of the 10 wide mobile office building for the IHTs is slated for February 2018. Move-in is expected sometime in May or June.

Air Dispersion Modeling

Update: The air dispersion modeling team established an algorithm to combine emissions from multiple sources, and are in the process of developing documented base emission rates for selected locations based on Vapor Control Zone (VCZ) reports, the Site Wide Industrial Hygiene Database (SWIHD), cartridge testing data, and air permits. Test cases of the model are being conducted using single emission sources (242-A Evaporator) and multiple emission sources (AP, AW, and AN stacks). These cases are being used to evaluate low wind speed periods and assess the periods when AOP-015 events occurred. The final test cases reports are expected to be delivered to WRPS the 2nd Quarter of FY2018.

KPP 4. Engineering Controls

A Farm Exhausters

Update: A Farm: During the month of November, American Electric was awarded a subcontract to isolate the A Farm ventilation ducting; the mock-up activities for the duct isolation commenced shortly thereafter. In addition to the ducting activities, a preliminary engineering design for relocating the exhausters is on-going and will be completed in late December. The design will enable the request-for-proposal (RFP) for construction of the exhauster pad and exhauster erection to be completed.

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

AW Stack Extension

Update: The 60% design package was issued for review and comments were submitted. The majority of the comments were resolved, and the design is on-track to be completed the week of 12/3. A contract was awarded to Terragraphics in mid-November for dispersion modeling support. The scope of the contract is to identify the dispersion (or plume effects) from the stack's current elevation of 27 feet to its new elevation of 60 feet.

Strobic Air Dilution Fan

Update: In late November, a contract was awarded to Strobic to support factory acceptance testing (FAT), and Strobic began fabricating equipment. The FAT is currently scheduled to be performed at Strobic's facility in March 2018. In addition, the test plan statement-of-work (which will be used to support integrated testing in late spring/early summer 2018) was approved last week.

NUCON Thermal Oxidation Vapor Abatement Unit (VAU)

Last update 11/9/2017: Development of the engineering-scale testing continued, with the following being accomplished during the reporting period:

WRPS:

In early November, WRPS sent a request for proposal to NUCON for a diesel conversion kit design. Shortly thereafter, NUCON submitted its proposal, and a technical evaluation was performed. Near the end of November, WRPS awarded a contract to NUCON to proceed with their design of the diesel conversion kit. WRPS continued to prepare the technology maturation plan for the NUCON VAU.

- **TerraGraphics:**
Issued a revised work plan detailing the scope, schedule and resources needed to support the engineering-scale testing in FY2018. TerraGraphics issued procurement documents on the test trailer rental to WRPS for approval. Throughout November, the subcontractor continued preliminary work on the revised functions and requirements document. In mid-November, TerraGraphics continued work on the electrical rack and test trailer procurement documents and requested WRPS approval to issue the contract for the electrical rack. In late November, the contract for fabrication of the electrical rack was issued to American Electric.
- **PNNL:**
PNNL continued to work on the draft of the test plan, submitting the plan to WRPS for review around Thanksgiving. Last week, WRPS completed the reviews and returned them to PNNL for resolution. PNNL continued to identify equipment necessary to the equipment-scale test. The Fourier transform infrared spectroscopy (FTIR), PTR-MS, and pre-concentrator have been deemed acceptable to support testing. The PTR-MS has been moved to PNNL's Central Lab; functional checks are on-going. The pre-concentrator will be moved to the PNNL Central Lab the week of 12/4.
In early November, PNNL evaluated COPC gas simulants with the gas vendor. The final selection of the simulated gases was made in late November. Procurement of the COPC gas simulant is tentatively scheduled to be placed the week of 12/4.
- **NUCON:**
In mid-November, NUCON submitted a diesel conversion kit design proposal, which was subsequently awarded towards the end of November. NUCON immediately started working on the design and fabrication of the diesel conversion kit.

KPP 5. Administrative Controls and Monitoring

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

Last update 11/30/2017: Numerous activities were performed throughout the week, including the following:

- Continued resolving comments on the Phase 2 Pilot-Scale Report.
- Efforts continued on the modification of the Autosampler. In support of developing test gas standards, samples were collected during a recent waste

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.

disturbing activity at AP-Farm. The samples will be analyzed by both the 222-S Lab and an off-site vendor in order to confirm the sample adequately supports integrated testing. Additional samples will be collected from the same area at AP Farm to determine the quiescent, meaning inactive or dormant, conditions. Other activities include the preparation of the test plan and procurement of the equipment (probes, pumps, UV-DOAS) needed to support integrated testing of the Autosampler. In parallel with these activities, design drawings for the test bed manifold and Hanford E-Skid are being prepared, and a draft functions and requirements (F&R) specification is being written to allow for the fabrication of additional Autosamplers.

- The Ultra-Violet Fourier transform infrared spectroscopy (UV-FTIR), currently installed at AP Farm, is going to be turned over to operations. A draft F&R is being prepared that will capture the results of equipment set point discussions. This is a key document that will provide direction for much of this project moving forward. In addition to the F&R, efforts are on-going by ARES to prepare a calculation that refines the set point for ammonia.

Stack and Boundary Monitors

Last update 11/30/2017: Stack monitor activities included:

- Procurement of the 13 Ultra Violet- Differential Optical Absorption Spectrometer (UV-DOAS) fence-line units continue to be delayed pending implementation of a WRPS Quality Assurance program.
- WRPS design group is awaiting the final Cerex design reports for the UV-DOAS stack monitors before initiating design revisions.

Establishing Safe Unrestricted Boundaries

Update: The scope of work defined in the draft CVAP under KPP 5 is to define unrestricted work boundaries, implement monitoring on active stack ventilation, and unrestricted boundaries in the A Farms to provide defense-in-depth. More will be revealed in coming CPPO Weekly Reports.

Public Address System

Update: Excavation work at both C and AP Farms was delayed as a result of weather and resource issues; functional testing was delayed as well. After system and functional tests have been completed, the construction acceptance testing (CAT) will be performed.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 11/30/2017: Remote Monitoring Equipment: An engineering contract for the TY Farm automation design was awarded the week of 11/6, and work was immediately started with a kick-off meeting the week of 11/13. A draft schedule was prepared outlining all design activities to be performed by the engineering contractor. Concurrent with these activities, the briefly delayed level and temperature bench-scale tests were re-started; the tests continue to collect the data needed to support equipment design and procurement. **Update: FY LEAN 2015:**

Report/Work Location Evaluations: A draft of the SST Stewardship Execution Strategy Document was started on the week of 11/13 and is currently scheduled to be completed by February 2018.

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

Update: Prior to June 30, 2017, cartridge testing was conducted at the AP Stack, A-101, 702-AZ, AN Exhauster, AW Stack, BY-108, AX-101, SX-101 and SX-104 tank farm locations. PNNL reports are complete for all of the above except for SX Farm. Copies of the completed reports are available [HERE](#). In August, cartridge testing was performed at the AX Stack. The PNNL reports for the SX Farm and the AX Stack are currently being written. More information on these cartridge tests will be made available as the reports go final. PNNL has developed a summary report rolling up the information contained in the cartridge testing reports issued to date. This summary report went final in September 2017. Cartridge testing for FY-2017 was completed at the end of August. Cartridge testing for FY2018 is slated to begin in January/February of 2018.

The third party (STC) and WRPS agree that use of FFAPR equipped with the Scott 7422-SC or the Scott 7422-SD1 cartridge is adequate when supported by a hazard assessment conducted on a farm by farm basis. The Schedule for FFAPR is currently being built.

Key Performance Parameter 7

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

Mobile Laboratory

FY2018 scope is being finalized and the RJ Lee Mobile Lab activities continue to be on-hold until a new contract is issued.

Personal Vapor Monitor

Update: November saw the successful completion of the integrated field test, including testing of the prototype readers and sensor chip, at the R. J. Lee facility in Pasco, Washington. C₂Sense and WRPS completed review and comment resolution of the technical report summarizing the test activities. A notable omission from the final report was the conversion of raw conductance data from the sensor material to ammonia concentration values. C₂Sense intends to develop the algorithms necessary to perform this function during the FY2018 field test in the tank farms. Towards the end of November, prototype units were shipped to WRPS as a final deliverable of the existing contract. These prototype units will be used to support the FY2018 field test at tank farms. C₂Sense also started working on the proposal for the next phase of the project, which is to provide support for the FY2018 field test.

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.