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242-A Evaporator Campaign-06 Area Monitoring and Sampling

**Tank Operations Contract
Chemical Protection Program Office Weekly Report**

September 7, 2017

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The CPPO continues to focus on the completion of the Recommendations Table (Table), coordinating the mentoring and engagement activities of the CPPO team members from Center for Toxicology and Environmental Health (CTEH), finalizing the Comprehensive Vapors Actions status dashboard and metrics process, and tracking vapors related Questions & Answers in the CPPO tracking system.

The Recommendations Table (The Table) is the compiled list of actions and deliverables in response to the recommendations from the National Institute for Occupational Safety and Health (NIOSH), Tank Vapor Assessment Team (TVAT), Office of Inspector General (OIG), Office of Enterprise Assessments (EA-32), Vapors Expert Management Panel (VMEP) and CTEH. The actions have been discussed with the project and DOE, and are being added to the Problem Evaluation Request (PER) system for implementation and tracking.

The CPPO has developed a variety of metrics in anticipation of the draft Comprehensive Vapors Action Plan (CVAP) monitoring dashboard. The metrics are designed to monitor the progress of the draft CVAP Key Performance Parameters (KPP) 1 thru 7. The metrics inform the graphs, charts, and analysis which populate the draft CVAP KPP Dashboard. The dashboard and metrics update processes have been determined. July 2017 data launched the first test of the processes. The team is reviewing and refining the final product.

CPPO Oversight and Tracking
Hanford Vapors Website



Figure 1. Hanford Vapors Website Statistics

The Hanford Vapors website logged nearly 4,400 views in August, an increase of over 17 percent from the previous month. The website experienced an average of 142 hits per day. The website experienced an average of 142 hits per day. The largest number of views continue to occur on the days that the Hanford Vapors Weekly Update is posted, with carryover views logged on the days immediately following the updates. Additional events that drove traffic to the website this month included the presentation by Stoneturn Consultants regarding respirator use and the Secretary of Energy’s visit to the Hanford Site.

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 CPPO engagement and mentoring initiatives featuring the team from CTEH continues. Last week’s engagement activities by CTEH included involvement in the

Project's Industrial Hygiene (IH) Team meeting and pre-job meetings for AP06A pump removal and replacement. CTEH participated in a discussion on the ongoing Vapors Monitoring and Detection Systems (VMDS)/Tank Farm of the Future plans, as well as the odors at 4th and Buffalo with Industrial Hygiene Professionals (IHP) and Industrial Hygiene Technicians (IHT). The odor at 4th and Buffalo was a topic of discussion by HAMTC Safety Representatives as CTEH was escorted on a walk around. CTEH also toured B-Complex, escorted by Industrial Hygiene.

Key Performance Parameter 1

Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

Chemical Protection Engagement: Communications

Last update 8/17/2017: The *Comprehensive Vapor Management Communication Plan* is a requirement of KPP 1 and is in the requisite reviews.

Last week's CPPO Notebook is titled *242-A Evaporator Campaign-06: Industrial hygiene sampling and monitoring results*. This week's CPPO Notebook was created by Drs. Kind and Kuhlman from CTEH, and is titled *Nitrosamines Part 1*. It is the first in a two part educational series on nitrosamines in the environment, health effects, and common everyday exposure.

Solutions, Issue 405, published August 28, 2017, reported, "The [LEAN Management] event, sponsored by the Chemical Protection Program Office (CPPO), focused on finding ways to increase face-to-face communication with subject-matter experts, strengthen the use of the Chemical Vapors Solutions Team (CVST) as an effective communication tool, and improve the workforce's access to web-based vapors resources." Furthermore, "[t]hirteen of the 19 action items have been completed and the remainder are in progress. All items are expected to be completed by the end of calendar year 2017."

The August 31, 2017, all employee *Hanford Tank Vapors* also reported on the results of the LEAN Management event. *Hanford Tank Vapors* wrote, "One notable improvement is creating a Team Vapor Representative (TVR) from each work team to attend the CVST meetings. The TVRs are tasked with attending the twice-monthly meetings and reporting back to their teams."

Hanford Vapors Website Updates

Table 1. Hanford Vapors Website Updates

Hanford Vapors Website Updates Week of August 17-24			
Non-Personal Headspace/Source Sampling Data 2008 to 2017			
A Farm Headspace	AY Farm Source	C Farm Headspace	T Farm Headspace
A Farm Source	AZ Farm Source	C Farm Source	T Farm Source
AN Farm Source	B Farm Source	S Farm Source	TX Farm Headspace
AP Farm Source	BX Farm Headspace	SX Farm Headspace	TX Farm Source
AW Farm Source	BX Farm Source	SX Farm Source	TY Farm Source
AX Farm Headspace	BY Farm Headspace	SY Farm Headspace	U Farm Source
AX Farm Source	BY Farm Source	SY Farm Source	
Percent of OEL 2008 to 2017			
A Farm percent OEL	AY Farm percent OEL	BY Farm percent OEL	SY Farm percent OEL
AN Farm percent OEL	AZ Farm percent OEL	C Farm percent OEL	T Farm percent OEL
AP Farm percent OEL	702-AZ percent OEL	S Farm percent OEL	TX Farm percent OEL
AW Farm percent OEL	B Farm percent OEL	SX Farm percent OEL	TY Farm percent OEL
AX Farm percent OEL	BX Farm percent OEL		U Farm percent OEL

✦ Chemical Protection Engagement: Data Analysis and Visualization Tool (DAV)

Update: The Data Analysis and Visualization (DAV) Tool is complete. The web-based data explorer application was built and deployed by Pacific Northwest National Laboratory (PNNL) to:

- Provide users with access to historical and current tank vapor sampling and monitoring results
- Provide intuitive visualizations of relevant data and contextual information
- Avail the data to the user with little technical background, and allow the more technically sophisticated user to drill down to detailed content.

The DAV tool is complete, and will be introduced to the workforce through the CVST and the CPPO Notebook and will be deployed to the HanfordVapors.com website.

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

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

Update: WRPS, TerraGraphics and Dade Moller continue their work of RPP-22491, *Industrial Hygiene Chemical Technical Basis*. All draft procedures for the manual have been received from the sub-contractor. The IH department

**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.

has established a review group of both field and program personnel. The Office of River Protection (ORP) is reviewing and commenting on the procedures concurrently with the IH department. Once through review, the procedures are forwarded to the procedures group. Weekly status meetings continue to be held to ensure the sub-contractor's direction is consistent with the expectations of IH management. Several of the procedures will be ready for the procedures group next week.

Institutionalizing the Vapors Program with the IH Program Requirements

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

Health Process Plan

Update: The project is broken down into seven tasks. Last week's accomplishment include:

- Task 1: Schedule: Complete.
- Task 2: Establish Tank Operations Assessment Team.
- Task 3: Establish an External Peer Review Health Panel.
- Task 4: Implement Routine Analysis and Screening Process for Updating COPCs.
- Task 5: Establish Acute/Transient and Chronic Exposure Action Levels.
 - Chronic OELs regulatory and furans reports have been updated.
 - For nitrosamine report, comments have been addressed but need to be reviewed prior to transmittal. Expect transmittal week of September 8.
 - Acute Regulatory Report internal review in progress, expect transmittal by September 11.
 - Nitriles: awaiting comments
- Task 6: Evaluate Computational Approaches for Predicting Exposure and Delivered Dose.
- Task 7: Database Implementation and Management.

Key Performance Parameter 3

Maintain Industrial Hygiene Program and institutionalize vapor program requirements, best practices and program parity, and complete necessary training to support full implementation at the beginning of FY 2018.

Database Implementation and Management

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

Leading Indicators

Update: The accomplishments as of August 31 are:

- Investigated PTR-MS data for COPCs with no analysis on FY16 report due to lack of available data
- Continued developing macros to prepare PTR-MS data sets (current and future) to be used within R-code

Parity Implementation with Established Programs

Update: Chemical Worker Tier 1 training is complete. It is in its final review stage, and should be listed on the WEB as a training option by September 7.

Chemical Worker Tier 2 is currently being formatted for use in computer based training (CBT). The Tier 3 Chemical Worker Training is being developed concurrently with Tiers 1 and 2. The Chemical Worker 3 Team held a meeting on August 31. Comments from this meeting are being incorporated. Tier 3 training is slated for completion by the end of FY17. The rollout of a Tier 3 pilot class is on track for the first week of October. The Industrial Hygiene Fundamentals class is on track to have four modules ready for its pilot presentation at the Volpentest Hammer Federal Training Center (HAMMER) 20 year anniversary celebration on October 2, 2017. The other four modules of the IH Fundamentals class will be finalized after HAMMER's anniversary celebration.

KPP 4. Engineering Controls

Exhausters

Last update 8/31/2017: SY-Farm Efforts to design the exhauster system are ongoing, with only a few Engineering Change Notices requiring approval. They are on-track to complete the design by the middle of September. Permission was provided to restart site mobilization activities. **Update: A-Farm** The factory acceptance test (FAT) was extended to address heat-trace issues, which are still being resolved. **Last update 8/31/2017: AX-Farm** The team is evaluating the AX exhauster demister video in order to understand why the demisters are loading faster than expected.

Strobic Air Dilution Fan

Update: The specification for FAT was approved in SmartPlant, while the draft statement-of-work (SOW) for Strobic to support the FAT is still being routed for approval.

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

✦ NUCON Thermal Oxidation Vapor Abatement Unit (VAU)

Update: The following activities occurred last week:

TerraGraphics:

- The Functions and Requirements (F&R) document was revised and released for review. Initial comments have been received. The F&R is currently scheduled to be completed in mid-September.

NUCON:

- The Vapor Abatement Unit was packaged and is ready for shipment (see **Figure 2** below).



Figure 2. NUCON Vapor Abatement Unit Ready for Shipping (courtesy G. Weeks).

KPP 5. Administrative Controls and Monitoring

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

Update: The events of last week include the following:

- Viability assessments are on-going for the ultraviolet Fourier transform infrared spectrometer (UV-FTIR) and open path Fourier transform infrared spectroscopy (OP-FTIR).
- Efforts continue on the *Pilot-Scale Phase 2 Report*, which is currently scheduled to be completed in late September to early October.
- Test director issued a revised test procedures to keep the equipment left in the field (coastal meteorological station, UV-FTIR, OP-FTIR and Ultra-Violet-Differential Optical Absorption Spectrometer) operative.
- A draft schedule was completed and reviewed during the week for turnover of the UV-FTIR stack monitor at AP-Farm. The schedule outlines the details needed to turn over the equipment to operations, which is currently expected to be completed in early 2018.

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.

Stack and Boundary Monitors

Update: The majority of the AW, AN, and AZ preliminary designs have been completed. Formal reviews are scheduled to start next week. The designs are still on-target to be completed by the end of September. Additionally, procurement issued a purchase order to purchase 13 UV-DOAS fence-line monitors.

Establishing Safe Unrestricted Boundaries

Last update 8/24/2017: Quantitative Risk Assessments for A, AP, and AW-Farms are in review. Comment resolution is in its very early stages.

Public Address System

Update: All pole installations have been completed except for one A-Farm and one AW-Farm location.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 8/31/2017: FY15 LEAN Report/Work Location Evaluations: A draft SOW is being routed for review and approval to procure engineering services needed to prepare the *Project Execution Plan*.

Key Performance Parameter 6

Institutionalize a tank operations stewardship program that minimizes required tank farm personnel entries; and establishes parameters for locating ancillary personnel and offices.

KPP 7. Hierarchy of Controls

+ Cartridge Testing and SCBA Alternatives

Last update 8/31/2017: Cartridge testing at AX Farm was conducted August 25-26. This will complete the cartridge testing at AX farm. No further testing is planned for the rest of FY 2017.

+ Mobile Laboratory

Update: Background sampling for furan and nitrosamines was performed at sites 1A, 1B, 2B, 3B, 4B and 5B. In addition, five weekly reports from the background sampling were released during the week.

+ Personal Vapor Monitor

Update: The C₂Sense Personal Ammonia Monitoring System continues to evolve. Fabrication of the printed circuit boards (PCB) is complete and an initial integration test has been completed. The integrated test included the 3D printed housing, Raspberry Pi3, custom PCB assembly, and sensor chip/cartridge (see **Figure 3** below). Preliminary testing looks positive with only some minor modifications to housing required.

Key Performance Parameter 7

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

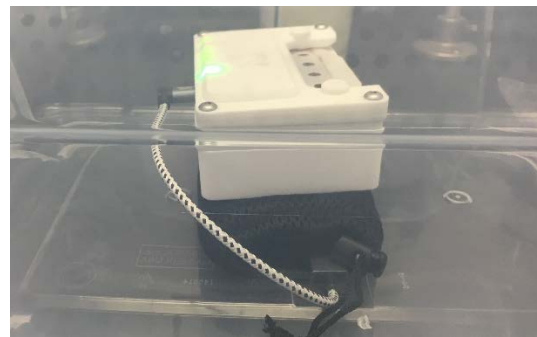
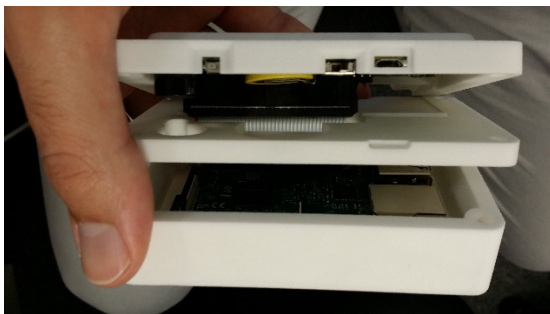


Figure 3. Wearable Ammonia Analyzer (courtesy G. Weeks)

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations.

Key Performance Parameter 8

Support medical program enhancements in conjunction with responsible Hanford Site organizations and establish update to WRPS process/procedures.

4. Vapors Mitigation Program Plan - Top Risks -CPPPO Weekly Update

Last update 8/24/2017: The subset of the Vapors Mitigation Risk Register this week is shown in **Table 2**.

Table 2. Vapors Mitigation Risk Register

CVAP ID Number	Current Status	Handling Actions	Current Risk Level
023 Internal Reviews take longer than anticipated.	Internal reviews are due Sept 17, leaving no float for delays and large amount of work for reviewers.	1. Assign expediter to the project to speed process - complete	High
009 Resources not available when required.	Lack of design and engineering resources are causing delays in VMDS System Integration, 242-A Stack Extension.	1. Identify key technical resources up front and secure availability. 2. Utilize resource loaded schedule where appropriate. 3. Coordinate work planning to streamline resource utilization.	Medium
004 Integration with other key projects more complex than expected.	Integration of field work for VMDS implementation and associated execution concerns for SY, A-Farm, and AW stack upgrades. Installation and turnover of PA system to tank farm operations.	1. Identify key program interfaces early. (Ongoing) 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