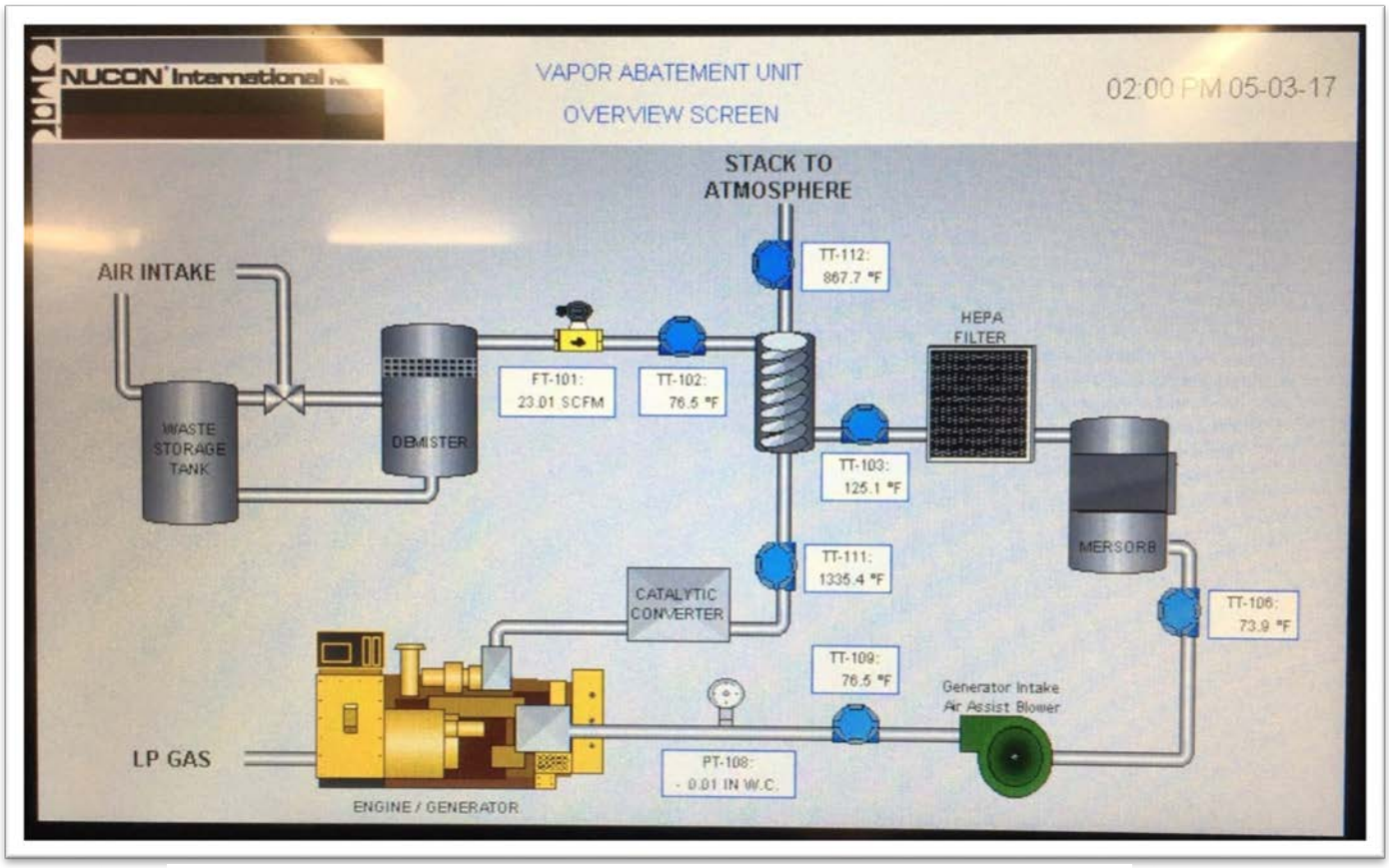
washington river protection solutions

CPPO Chemical Protection Program Office



NUCON International Vapor Abatement Unit Overview Screen – May 2017

Tank Operations Contract
Chemical Protection Program Office Weekly Report
May 11, 2017

Department of Energy Contract NTE 16-TF-0089

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

In March 2017, the CPPO performed a Vapors Communication Workforce Survey. The survey summary is in its final week of review. A PowerPoint summary of the survey is attached. The final survey summary report will be available next week.

The Chemical Protection Program Office (CPPO) continued integrating with Communications and Public Relations (C&PR) at the weekly CPPO/C&PR integration meeting. Plans for the upcoming revision to the *Hanford Vapors Management Communication Plan* (WRPS-1604608 REISSUE) were discussed.

CPPO lead a series of internal review meetings to finalize the external assessments recommendations table. The table compiles the over 320 recommendations from all that were generated by the following external assessments: 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), Center for Toxicology and Evironmental Health (CTEH), as well as the recommendations contained in the reports generated from the TVAT FY14-15 activities. The table also articulates the actions taken, and those forthcoming, to address each recommendation; the deliverable that will confirm the action is complete; and the Key Performance Parameter (KPP) from the Comprehensive Vapors Action Plan (CVAP) under which the action is addressed. Once the table has been reviewed and agreed upon, all of the recommendations, actions, and deliverables will be loaded into the Problem Evaluation Request (PER) system. CPPO has partnered with the Contractor Assurance Organization on formatting the CPPO database/table, ensuring an easy upload into the PERs system.

CPPO is partnering with Contractor Assurance Organization to support the upcoming Safety Culture Work Environment (SWCE) survey. The Contractor Assurance Oganization is the lead on this survey effort. The SCWE survey kickoff was held; the subcontractor performing the survey, Oak Ridge Associated Universities (ORAU), has begun developing the survey questions.

This week, the CPPO took part in the ongoing Vapor Monitoring and Detection System (VMDS) quorum discussions on using modeling data to determine where to place sensors within the tank farms. Currently, the group is reviewing the design and execution procedures, and finishing up the guidance for the Qualitative Risk Analysis (QRA). The purpose of this project is to use current data and a database of all potential weather conditions to evaluate worst case scenario frequencies where tank vapors could exceed 50% of OEL. These models will be used to help determine the vapor control control zone (VCZ) boundaries and respiratory protection in the farms.

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Communications

- Chemical Protection Communication

An ESH&Q Safety Flash dated May 2, 2017, discussed the results of the preliminary investigation into reports of irritation by three personnel wearing Scott face masks. Personnel are cautioned against using 3M Respirator Cleaning Wipes or SMG Safety Equipment Cleaning Pads when wiping down their face mask sealing surfaces. The wipes are not approved for Scott face masks, nor does Scott manufacture a dedicated respirator cleaning wipe for their face masks. Scott recommends a clean cotton cloth and water if the wearer elects to perform an additional wipedown.

The May 1, 2017, *Solutions* publication reported, "WRPS continued to foster communication with its workforce by promoting a safety conscious work environment through email communications, email and video newletters, events, website communications, and senior management involvement. The Hanford Tank Vapors website is regularly updated with new information and improvement. The website was visited more than 34,000 times during the quarter."

The May 1, 2017, *Solutions* publication also reported on the design and installation of the strobic-air tri-stack ventilation upgrade for the AW exhaust stack, and WRPS's support of NUCON International as it develops a thermal-oxidation project.

Hanford Vapors Website Updates

20 new AOP-015 Event Investigation Reports:

EIR-2014-10	EIR-2014-46
EIR-2014-11	EIR-2015-13
EIR-2014-17	EIR-2015-14
EIR-2014-18	EIR-2015-18
EIR-2014-20	EIR-2015-24
EIR-2014-24	EIR-2015-30
EIR-2014-25	EIR-2015-33
EIR-2014-26	EIR-2016-39
EIR-2014-29	EIR-2016-54
EIR-2014-30	
EIR-2014-33	

May 4, 2017 CPPO Weekly Report and Vapors Weekly Update

- PHOENIX

Update: Currently managed by CPPO, the Data Explorer Phoenix team continues to work on Phase 2 tasks around user experience, visuals, chart creation, and landing

screen and welcome pages. The team met with the project steering committee to show the system's progress to date. The system is expected to be 90-95% completed by the end of May. Many of the system's features were active, and the team was able to demonstrate the system to the WRPS and ORP. The team discussed adding new features, improving existing features, and the coding requirements for ensuring that existing datastreams are able to integrate into the system.

- CPPO Oversight and Tracking

Cost and Schedule Performance

Several projects supporting the Comprehensive Vapor Action Plan (CVAP) KPPs are currently underway. Delayed procurements are now in place, and vendors are ramping up to support a tight schedule. Year-to-date, $15.2M (60%) of our revised not to exceed (NTE) value of $25M has been spent. Monthly costs are expected to rise and stabilize at $3M per month for the remainder of the year. At this rate, it is anticipated spending for the fiscal year will meet our target of $33.7M.

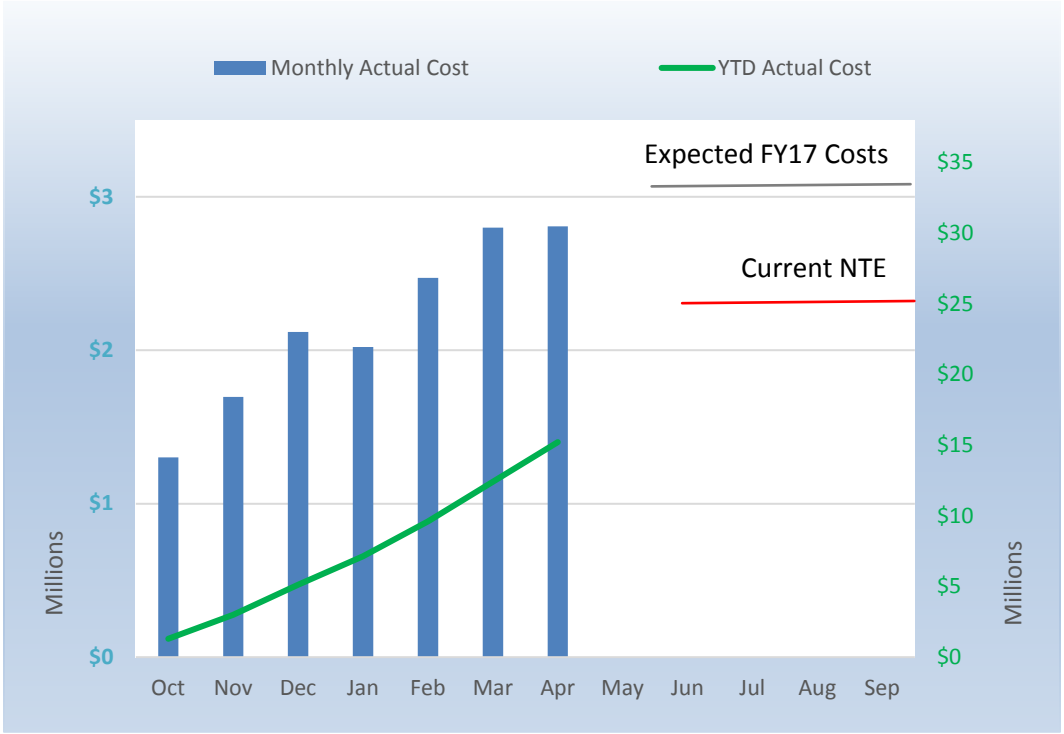


Figure 1. FY17 Projected CVAP Costs

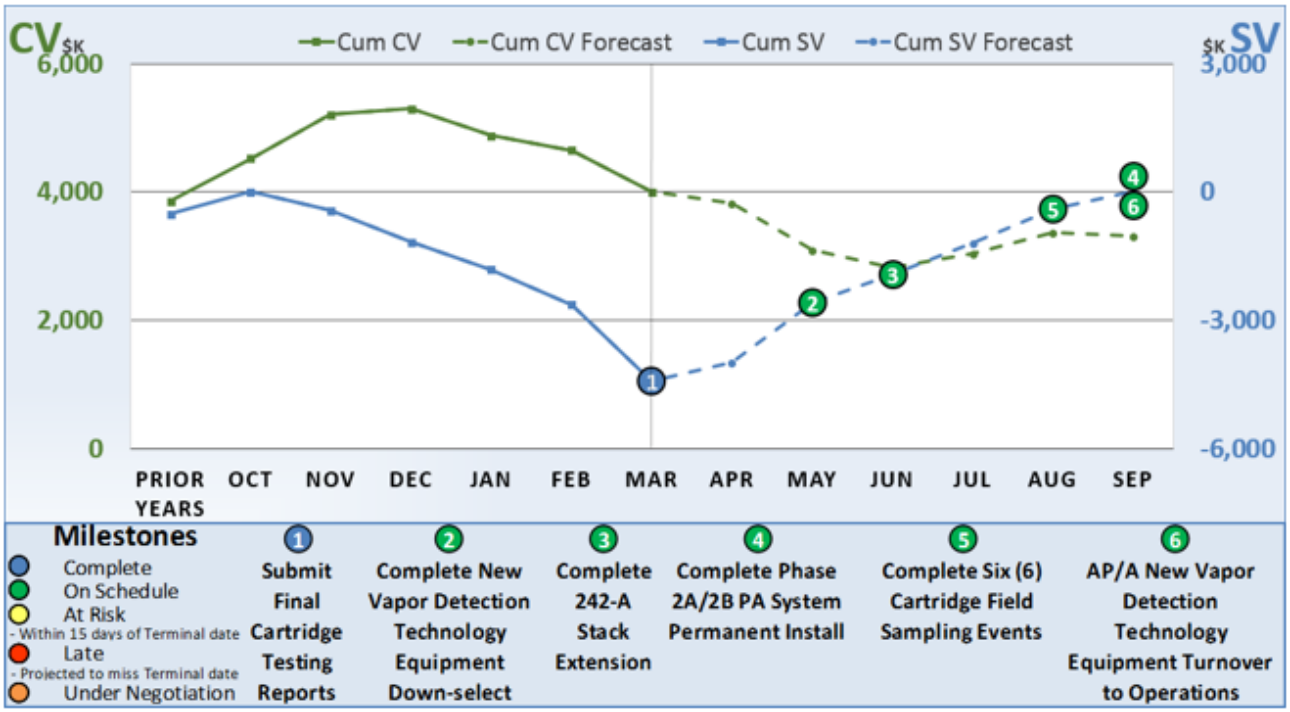


Figure 2. FY17 Cost and Schedule Variances for CVAP

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

- Develop New or Revised COPCs/OELs

Update: TerraGraphics, teamed with Dade Moeller, was awarded a subcontract to revise and update RPP-22491, *Industrial Hygiene Chemical Vapor Technical Basis* and the related COPC list. The work scope is being refined, and the IH Tech Basis and the COPC is being revised. Currently, the subcontractor is completing the requirement and document reviews and are in process of beginning the GAP analysis for the revised Technical Basis.

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.

The IH Tech Basis DQO continues its work. This week's meeting focused on determining the statistical parameters to be used going forward for all sampling done in service to the IH Tech Basis. It was decided that an Upper Threshold Limit (UTL) model, with a confidence level of 95/90, would be used. This method was chosen specifically to reduce the likelihood that a chemical would fail to be added to the COPC list when it should have been. The next step in the DQO process will be identification of the methodologies for analysis of all chemicals found within the tank farms. This process is expected to continue for several weeks.

Institutionalizing the Vapors Program with the IH Program Requirements

Last update 5/4/2017: WRPS also subcontracted the TerraGraphics/Dade Moeller team to develop an IH Program Manual focusing on Chemical Vapor Program aspects, as well as revising existing standards and implementation procedures. Recommendations from the *Critical Assessment of the Technical Basis and Implementation of the WRPS Hanford Site Waste Tank Farm Industrial Hygiene Program* report by the Center for Toxicology and Environmental Health (CTEH) are helping drive improvements in the WRPS IH program. The subcontractor is making progress, having created an outline for the new manual, and begun documenting the relevant procedures to perform a GAP analysis.

Health Process Plan

Update: PNNL Health Study Roadmap: A schedule for FY2017 has been developed for the Health Process Project. Accomplishments:

- Task 1: Schedule
- Task 2: Establish Tank Operations Assessment Team.
  - An interim TOC Assessment Committee has been identified. A charter for the Assessment Committee is developed and in review.
- Task 3: Establish an External Peer Review Health Panel.
  - Submitted the Draft External Review Recommendations. A meeting with Sr. management to finalize the membership in the Assessment Committee was held on March 14th. WRPS reviewed PNNL's assessment team recommendations, and drafted a charter for membership and function. PNNL is in the process of reviewing and providing additional comments.
- Task 4: Implement Routine Analysis and Screening Process for Updating COPCs.
  - An effort is underway to verify the flagged headspace data for series, duplicate, and distributed volume samples found in the Site Wide Industrial Hygiene Database (SWIHD). Series data would be added to obtain a result and could impact the maxima observed, whereas the other data types would not.
- Task 5: Establish Acute/Transient and Chronic Exposure Action Levels.
  - Submitted nitrosamine and furan high priority OEL documentation to PNNL management for communications with WRPS.
- Task 6: Evaluate Computational Approaches for Predicting Exposure and Delivered Dose.
- Task 7: Database Implementation and Management.
  - Tested features on the site
  - Repaired bugs found during testing
  - Improved styling for the chemical dashboard
  - Updated recommendations data forms to match the final reports

- Database Implementation and Management

  Last update 5/4/2017: In FY 2016, PNNL developed a database to review and update the COPC list and associated OELs. See Task 7, Health Process Plan, for the latest update.

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.

- Leading Indicators

  Update: Accomplishments for the week of 5/07 are shown below:
  - Continued review of analysis code
  - Investigating the data for potential revisions
  - Continued investigation of the effect of series or parallel sampling in available data
  - Support of the Leading Indicator DQO

- Parity Implementation with Established Programs

  Last update 5/4/2017: The successes in implementing parity with established programs are as follows:
  - Enhanced CHAT continues to be well received.
  - Training is hiring an additional 2 subcontractors to help complete required training documentation for the IHT Training Program.
  - HAMMER has kicked off its Team to develop the Fundamentals of Industrial Hygiene course.
  - IHT Continuing Training has held 4 sessions (2 each week) with great response to the hands on training for Physiological Monitoring Instruments and Theory on PID operation.
  - Chemical Worker Tier One is in the Design Phase; comments are bring incorporated from key stakeholders and a draft storyline is being prepared.
  - Chemical Worker Tier Two and Three are being developed.

KPP 4. Engineering Controls

- 242-A Evaporator Stack Extension

  Last update 5/4/2017: The 242-A Evaporator vessel vent extension design and critical lift plans are complete. Fabrication of the vessel vent stack is underway and construction forces are expected to mobilize for field installation. Lightning protection has been finalized and will be installed in parallel with the vessel vent stack.

Figure 3. The anchor plate for the 242-A Stack Extension

- Exhausters

  Last update 4/20/2017: New exhausters for A-Farm have been designed and are under construction. The design includes increased stack heights. Anticipated delivery date is September 2017.

Key Performance Parameter 4

Complete engineering control concept demonstrations for Strobic Air Tri-Stack® and NUCON® International, Inc. thermal combustion in support of unrestricted work boundaries.

- Strobic Air Dilution Fan

  Last Update 4/13/2017: An investigation into abatement technologies began in earnest in the first quarter of FY17 and included Strobic Air Dilution Fan technology. Tank Farm Projects lead the design and installation of the ventilation upgrade for the AW stack. A project schedule was developed, and subcontracting is in process. At the end of Q2, the SOW for the Strobic Air contract was approved in Asset Suite.

- NUCON Thermal Oxidation Proof-of-Concept Test

  Update: WRPS and TerraGraphics were in Columbus, Ohio, from May 3 to May 5 to witness the proof of concept test. The tests successfully demonstrated the destruction or removal of greater than 95% of the chemical vapors fed to the system. Further work will be needed to prepare a new prototype that can be deployed at Hanford. Testing is planned in FY17 to better characterize system performance and prepare for the technology demonstration.

Figure 4. NUCON testing facility - May 2017

KPP 5. Administrative Controls and Monitoring

- Permanent Installation of VMDS Equipment in A and AP Farms

  Update: The focus this week was on the VMDS pilot scale demonstration and necessary modifications, and modifying the UV-FTIR by installing a pump bypass valve. A first draft of the 241-A Tank Farm Quantitative Risk Analysis (QRA) was provided by Kenexis this week.

Four chemicals (ammonia, nitrous oxide, furans, and nitrosamines) in A Farm had the potential to exceed 50% of their OEL. The QRA estimates the location and frequency that 50% of the OEL might be reached so that permanent monitoring can be installed in these locations. The QRA, when coupled with sensor location, is used to demonstrate the effectiveness of a given VMDS concept.

- Stack and Boundary Monitors

  Last Update 4/13/2017: In December 2016, the project team reported that "a baseline change request (BCR) was initiated to upgrade the ammonia monitor on the 242-A stack and a kick off meeting was scheduled to start the upgrade." At the end of March, a subcontract was established with Cerex to upgrade the software.

- Establishing Safe Unrestricted Boundaries

  Last update 5/4/2017: PNNL published *Atmospheric Dispersion Modeling Tools for Hanford Tank Farms Applications*, PNNL-25654, in October 2016. To aid in establishing safe unrestricted boundaries in FY2017, PNNL's software, Air Pollutant Graphical Environmental Monitoring System (APGEMS) requires an upgrade. APGEMS will be upgraded to increase the model wind field resolution for tank farm applications and model plumes from multiple sources simultaneously. The subcontract to continue this upgrade was awarded on March 27, 2017. The kickoff meeting was held 4/26. Following are this week's accomplishments:

  - Met with PNNL software QA SME to discuss APGEMS QA planning
  - Requested "intended use" statement from WRPS to help guide QA needs
  - Held a team meeting to discuss scope items
  - Began review of IH Mod Near- and Mid-Field model and NIST FDS model

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.

- Public Address System

  Last Update 4/13/2017: On October 20, 2016, "[t]esting of an enhanced tank farms PA speaker system was completed in AP Tank Farm," CPPO reported. The latest update on the Notification Public Address (PA) system in AP farm is that its newly engineered package concept will be installed by June of this year.

KPP 6. Tank Operations Stewardship

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.

- Pilot SST Stewardship Program

  Last update 5/4/2017: The SST-Stewardship activities are still in planning package status and as such have not received a CACN. No work has been executed officially other than simple planning and execution strategies for TY-Farm.

KPP 7. Hierarchy of Controls

- Cartridge Testing and SCBA Alternatives

  Last update 4/20/2017: In March 2017, the team tested the cartridges at AZ-702 during a waste disturbing event. The samples are currently being analyzed at the 222-S laboratory. PNNL will perform the data analysis and develop the final report indicating whether the cartridges are protective of the workers during certain waste disturbing events.

- Mobile Laboratory

  Update: Work continues to support the AW farm ALC, however, a PTR-MS equipment failure took the Mobile Lab out of service for several days. This failure caused the scheduled ALC event to be delayed. The PTR-MS Pulser Module was replaced on 5/4 and the Mobile Lab has been returned to service. Work packages to move and install the A-103 manifold on the AW Stack are complete.

Key Performance Parameter 7

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

- Personal Vapor Monitor

  Update: C_2Sense, Inc. is developing a personal ammonia sensor under funding from DOE-EM. WRPS is coordinating between C2Sense, Inc. and RJ Lee Group to support prototype testing. C_2Sense delivered a draft of the test report for the first prototype tests last week.

KPP 8. Medical Support

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

Key Performae Parameter 8

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

4. VAPORS MITIGATION PROGRAM PLAN - TOP RISKS

CPPO Risk Weekly Update

Last update 5/4/2017: The subset of the Vapors Mitigation Risk Register this week is shown in **Table 1**.

Table 1. Vapors Mitigation Risk Register

CVAP ID Number	Current Status	Handling Actions	Current Risk Level
004 Integration with other key projects more complex than expected	Integration of field execution for VMDS in KPP5 continues to refine the schedule, execution conflict concerns in SY Farm. A Farm, and AW stack monitoring/Strobic Air. Extension prior to EC-06 are at risk or schedule delays due to integration issues.	1. Identify key program interfaces early. 2. Engage with program/project managers early.	Medium
009 Resources not available when required.	Head Space Sampling may not occur this year due to lack of resources.	1. Identify key technical resources up front and secure availability.	Medium
026 3rd Party Evaluation and/or subcontractor testing cause delays	Chemical Cartridge Testing – Receipt of 3rd Party Reviews are inconsistent. Communication between stakeholders and WRPS need to be clarified by upper management.	1. Engage 3rd Party and/or Subcontractor leadership in communicating status.	Medium
030 Infrastructure (hardware) to handle data processing, storage, interrogation, and reporting is found to be insufficient for the quantity of collected data	The projects under the CVAP program will collect huge amounts of data from many pieces of equipment in the field. Real time monitoring during AY102 retrieval in phase 1 has collected over 9 million data points, it is projected to increase to more than a billion data points in upcoming scope.	1. Engage with CTO Technology Management and Field Solutions to develop data handling and interrogation infrastructure.	High
016 Stakeholder approvals not received when needed	VMDS Project needs clarification on authorization past pilot scale testing.	1. Identify key stakeholders and necessary approvals/concurrences.	Medium

Attachment A

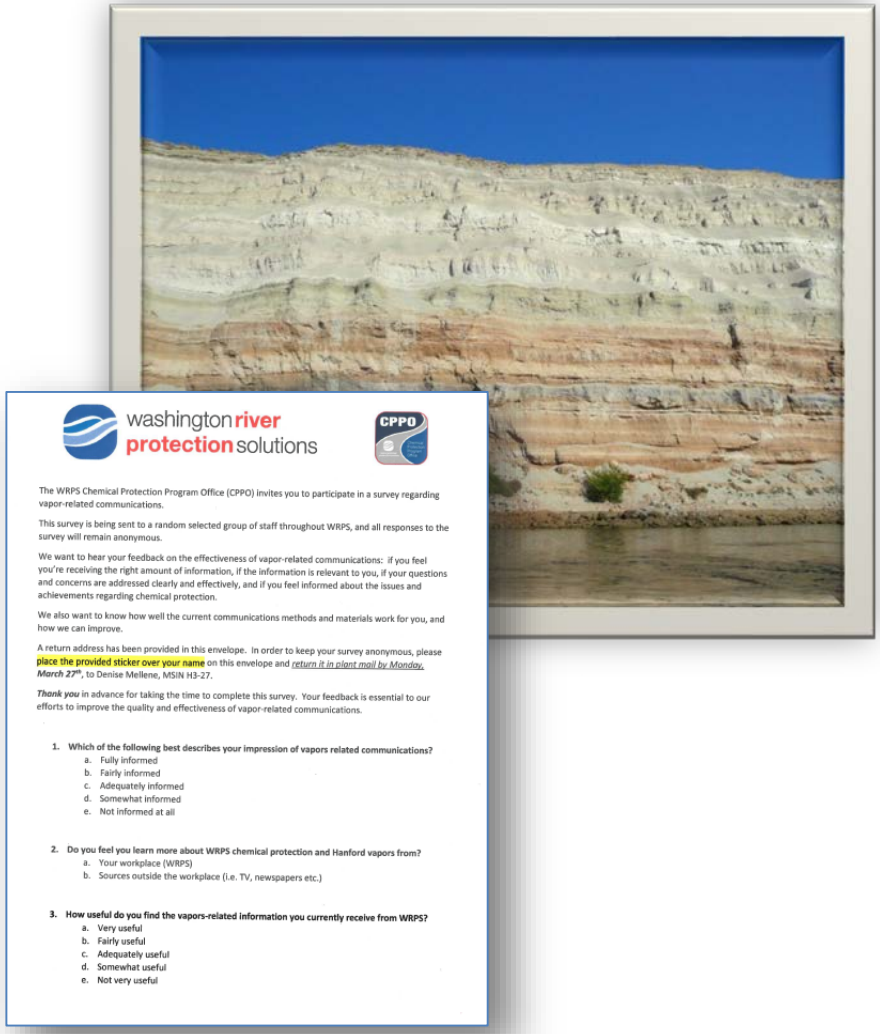
Workforce Vapors Communications Survey

Results & FY17 Path Forward

WORKFORCE – VAPORS COMMUNICATIONS SURVEY RESULTS & FY17 PATH FORWARD

REBECCA SAMS, MANAGER CPPO

MAY 4, 2017



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CPPO

The WRPS Chemical Protection Program Office (CPPO) invites you to participate in a survey regarding vapor-related communications.

This survey is being sent to a random selected group of staff throughout WRPS, and all responses to the survey will remain anonymous.

We want to hear your feedback on the effectiveness of vapor-related communications: if you feel you're receiving the right amount of information, if the information is relevant to you, if your questions and concerns are addressed clearly and effectively, and if you feel informed about the issues and achievements regarding chemical protection.

We also want to know how well the current communications methods and materials work for you, and how we can improve.

A return address has been provided in this envelope. In order to keep your survey anonymous, please place the provided sticker over your name on this envelope and *return it in plant mail by Monday, March 27th*, to Denise Mellene, MSIN H3-27.

Thank you in advance for taking the time to complete this survey. Your feedback is essential to our efforts to improve the quality and effectiveness of vapor-related communications.

1. **Which of the following best describes your impression of vapors related communications?**
   a. Fully informed
   b. Fairly informed
   c. Adequately informed
   d. Somewhat informed
   e. Not informed at all

2. **Do you feel you learn more about WRPS chemical protection and Hanford vapors from?**
   a. Your workplace (WRPS)
   b. Sources outside the workplace (i.e. TV, newspapers etc.)

3. **How useful do you find the vapors-related information you currently receive from WRPS?**
   a. Very useful
   b. Fairly useful
   c. Adequately useful
   d. Somewhat useful
   e. Not very useful

CPPO vapor-related communications survey

- The CPPO conducted the survey in March 2017
- The survey group was randomly selected
- A total of 192 surveys were distributed and 87 were returned (45% response rate)
- The survey has a ± 10% margin of error.

The Survey Results

- 77%* of the workforce
  - adequately informed or better about vapors
  - 74%* of the workforce feels the information is useful
- Some communications are clearly preferred and some are LESS preferred by the workforce
- Hanford Vapors website – not used much by the workforce

* +/- 10% margin of error

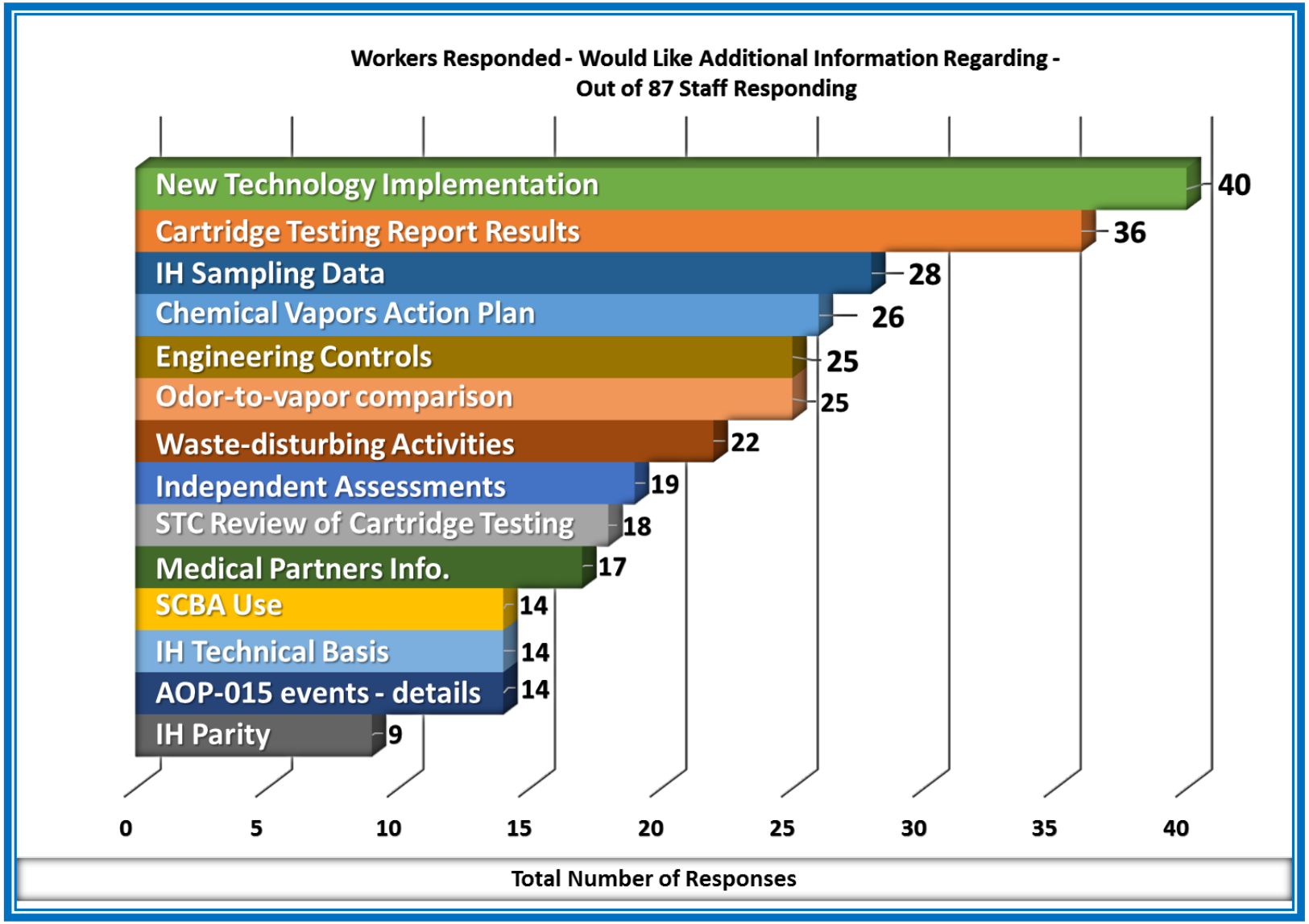
Effectiveness and value of communications distribution avenues

Top Five Communication Distribution Avenues	
As *received* by the workforce	**As *preferred* by the workforce**
1. All employee emails (56)	1. All employee emails (52)
2. Manager's briefings* (38)	2. Manager's briefings* (42)
3. Co-workers* (31)	3. *Solutions* articles (25)
4. Safety start* (30)	4. Safety start* (23)
5. *Solutions* articles (26)	5. CPPO Notebooks*, WRPS intranet (11†)

*Note. *Indicates a face-to-face communication avenue.*
†Indicates a tie.

Lowest Five Communication Distribution Avenues	
As *received* by the workforce	**As *preferred* by the workforce**
1. CVST meetings (2)	1. CVST meetings (3)
2. CVST-to-the-workforce meetings (3)	2. CVST-to-the-workforce meeting (3)
3. Email inquiry (3)	3. EAPC (5)
4. Posters (4)	4. Posters (6)
5. Employee Accident Prevention Council (6)	5. Email inquiry (6)

Vapors communication: Topics of interest



Recommendations

Specific actionable recommendations:

- Explore/Implement new ways of achieving two-way communication between management and the workforce – ***A WRPS, CPPO led Initiative is Underway***

- Utilize the top current and preferred communications delivery avenues

- Provide information on topics of interest
  - Consistent Information woven into top avenues

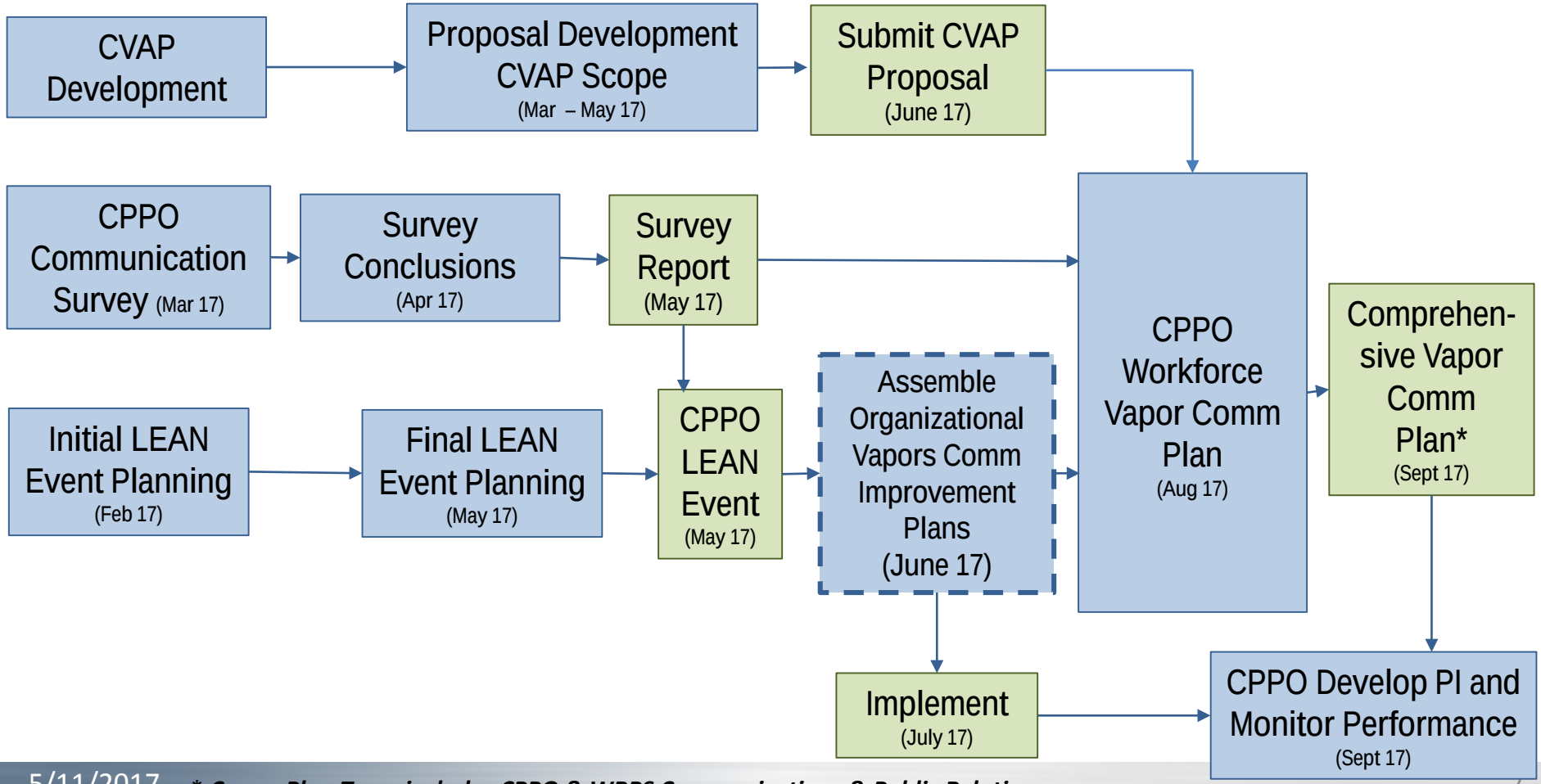
- Evaluate attendance options for CVST meetings

Vapors Communications Improvement
TIME PHASED STRATEGY CHART

Objective: Implement Vapors Workforce Communications Improvements

CPPO STRATEGY: Survey, Assess, Identify, LEAN, Develop, then Monitor/Assess

TIME: FISCAL YEAR 2017



* ***Comm Plan Team includes CPPO & WRPS Communications & Public Relations***

Random Selection and Survey Statistical Basis (± 10%)

Random Sampling – Establishing the Statistically Valid Voice of the Workforce

- The survey group was randomly selected (including exempt, non-exempt, subcontracted field staff, and bargaining unit members represented by HAMTC and Construction and Building Trades Unions).
- The group was weighted heavier towards personnel located north of the Wye barricade (to more closely represent the distribution of the WRPS worker population).
- The number of surveys required to be distributed (192) was calculated to provide a **statistically representative sample of the workforce** based on an anticipated response rate of 30-50%.
- A total of 192 surveys were distributed and 87 were returned, resulting in a response rate of 45%.

Margin of Error – Each Survey Answer Has Its Own Margin of Error Calculated

- The required sample size for responses to survey questions was calculated so that individual questions have an upper limit of ± 10% margin error
- Calculations performed based on the number of responses for each question shows no margin of error exceeded ± 11% and most were ± 10%