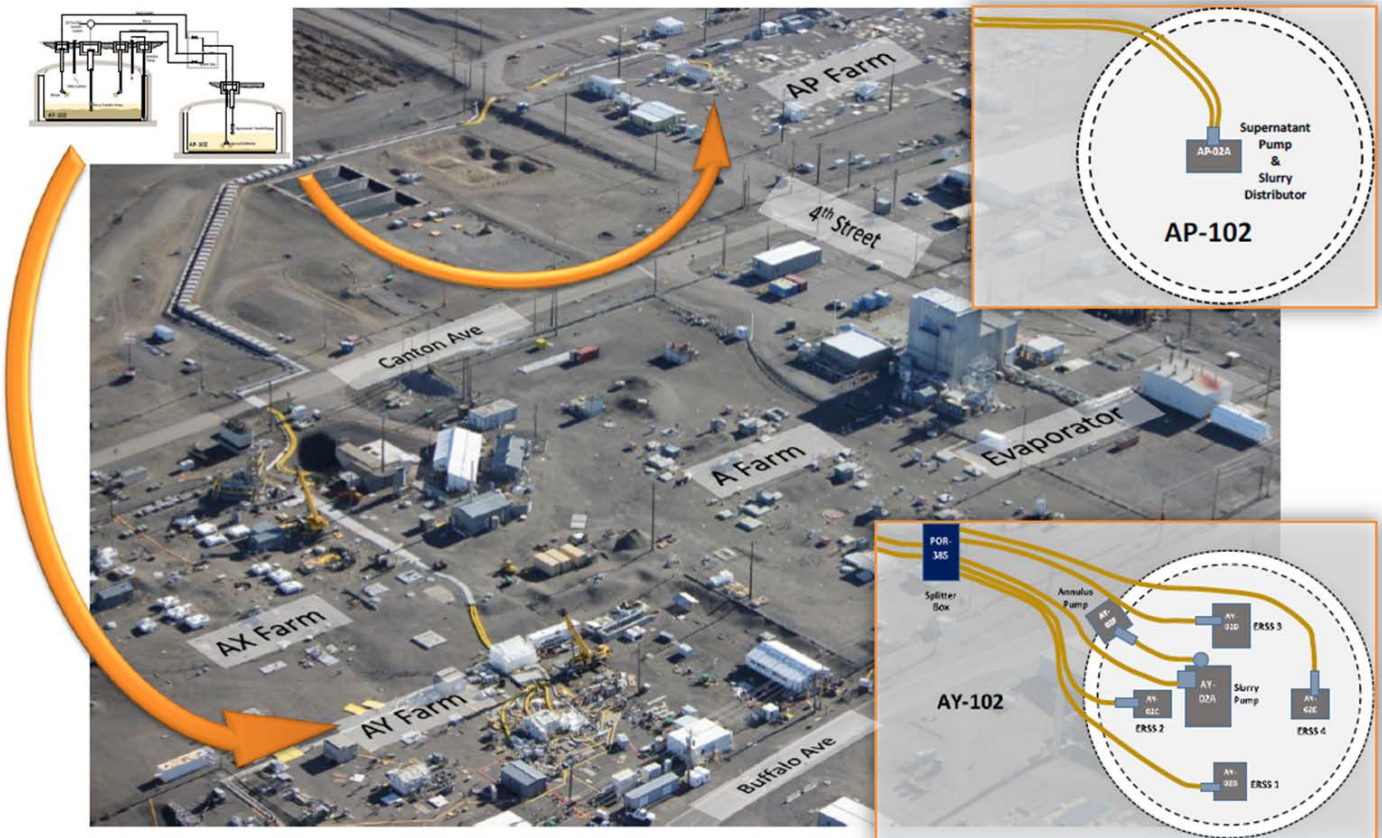


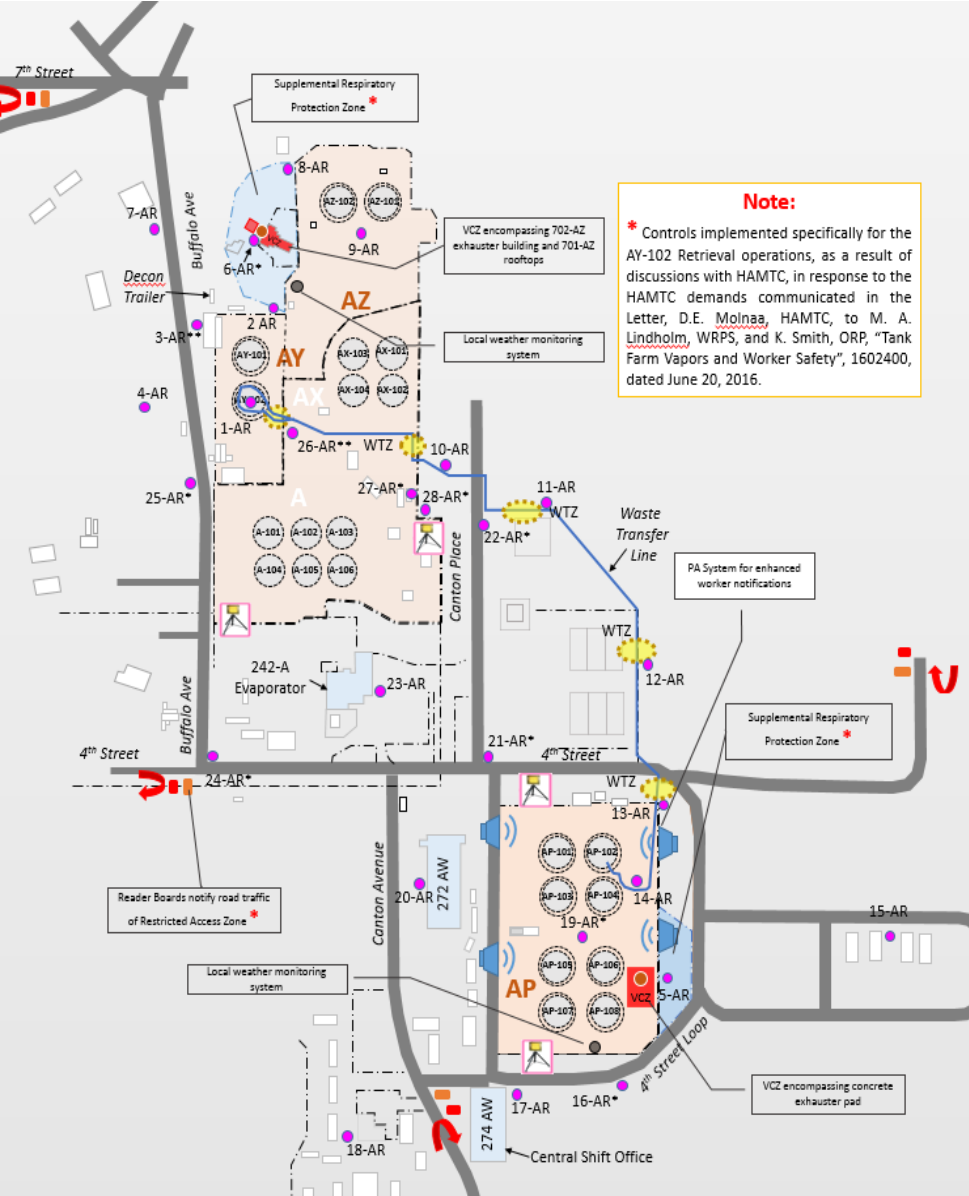
AY-102 to AP-102 Retrievals Summary



Retrieval and Transfer Layout

AY-102 to AP-102 Retrieval waste transfer route.





LEGEND










Location of exhauster

“Caution: Respiratory Protection
Required Beyond this Point”

Transfer Route with Waste Transfer Zone

Authorized Access



| | |
|---|---|
| PA System speaker locations |  |
| Warning Sign * |  |
| Reader board * |  |
| Turnaround locations * |  |
| <p>AreaRAE locations</p> <p>(*past AOP-15 locations and/or AreaRAEs to be left out when retrieval is shut down</p> <p>** required when performing annulus pumping</p> <p>*** only required when the annulus exhauster is operating)</p> |  |
| Vapor Control Zones |  |
| Pilot Scale Vapor Monitoring and Detection System |  |
| Supplemental zone with required respiratory protection * |  |
| Local weather monitoring system |  |

| Hierarchy of Controls | Control |
|-------------------------|--|
| Eliminate the Hazard | Retrieval to be performed on backshifts and weekends only*. Access restricted to "Authorized Personnel Only" during retrieval*. |
| Engineered Systems | Retrieval operations only when AY/AZ and AP Farms ventilation operating. AY-102 Annulus exhauster off. Ventilation cross-tie installed between annulus space and primary tank to provide ventilation path thru primary tank exhauster. |
| Administrative Controls | Establish Vapor Control Zones (VCZ) and Supplemental Protection Zones* IH monitoring and sampling. AOP-15 response to reported unusual vapor odors/worker vapor exposure symptoms. |
| PPE | Supplied-air respirators required in AY and AP farms, VCZ's, and supplemental zones*. |

Throughout the retrieval operations and during normal operations, the WRPS Industrial Hygiene (IH) group collected Direct Reading Instruments (DRI) measurements throughout the A Complex tank farms (A, AN, AW, AX, AY, AZ and AP). This included area, vapor control zone (VCZ), and source readings.

In addition to retrieval sampling, the IH group continued to conduct its monitoring of work occurring outside of the retrieval operations period. The data was compiled for both operations and analyzed to determine if tank farm chemical concentrations increased during and after retrieval.

The analysis of the tank farm data did not show any increase in area or vapor control zone chemical concentrations.

Source readings did show elevated levels of ammonia as expected, however, elevated ammonia levels were not found in the farms during or after retrieval operations.

AY-102 Retrieval | Source DRI Readings 12/10/2016 to 2/8/2017

| Location | Agent | Peak Value | Total Count of Readings |
|-----------|---------------------------|------------------------|-------------------------|
| 702-AZ | Ammonia | 30 ppm | 136 |
| | Mercury | 8200 ng/m ³ | 1 |
| | Volatile Organic Compound | 1.29 ppm | 54 |
| A Complex | Ammonia | 2 ppm | 19 |
| | Mercury | 3 ng/m ³ | 2 |
| | Volatile Organic Compound | 4 ppm | 19 |
| AP FARM | Ammonia | 60 ppm | 9 |
| | Volatile Organic Compound | 0 ppm | 8 |
| Non-Farm | Ammonia | 21 ppm | 19 |
| Total | | | 267 |

During this period two area readings were detected above an Action Limit:

VOC measurement above action level within the A complex occurred during urethane foam scraping operations in the AX-103A pit.

AY-102 Retrieval | Area, BZ, & VCZ DRI Readings 12/8/2016 to 2/8/2017

| Location | Agent | Action Limit | Peak Value | Reading Counts | | |
|-----------|---------------------------|--------------------------|----------------------|----------------|-------------------|-------------------|
| | | | | Non-detectable | Detected Below AL | Detected Above AL |
| 702-AZ | Ammonia | 12 ppm | 3 ppm | 6 | 1 | - |
| | Mercury | 12,500 ng/m ³ | 11 ng/m ³ | - | 1 | - |
| | Volatile Organic Compound | 2 ppm | 0.03 ppm | 6 | 1 | - |
| A Complex | Ammonia | 12 ppm | 1 ppm | 762 | 1 | - |
| | Mercury | 12,500 ng/m ³ | 31 ng/m ³ | 8 | 11 | - |
| | Volatile Organic Compound | 2 ppm | 6.74 ppm | 735 | 10 | 1 |
| AP FARM | Ammonia | 12 ppm | 0 ppm | 31 | - | - |
| | Mercury | 12,500 ng/m ³ | 6 ng/m ³ | 11 | 6 | - |
| | Volatile Organic Compound | 2 ppm | 0.05 ppm | 30 | 1 | - |
| Non-Farm | Ammonia | 12 ppm | 0.2 ppm | 1511 | 1 | - |
| | Mercury | 12,500 ng/m ³ | 68 ng/m ³ | 16 | 39 | - |
| | Volatile Organic Compound | 2 ppm | 28.5 ppm | 1479 | 6 | 1 |
| Totals | | | | 4595 | 78 | 2 |

At 0500 on 2/6/17 AreaRae at Canton(lift station)#1157 started alarming for VOCs. Checked with a Multi Rae and readings were below detectable. Also swapped out the AreaRae

The RJ Lee Proton Transfer Reaction – Mass Spectrometer or, PTR-MS, Mobile Lab drove from Columbia Basin College (CBC) to the Hanford site taking readings throughout the path of travel to capture data from the surrounding communities (in-town and highway traffic, fueling stations, tire stores, etc.) and at the Hanford site tank farms.

The Mobile Lab takes readings every 2 seconds continuously for:

- 185+ compounds, including 52 of the 59 COPCs
- Weather data
- GPS location data

The data is analyzed by software to determine the compound identities and their concentrations.

In total, over 73,000,000 measurements were recorded from 12/9/16 – 1/31/17 for 185+ compounds.

Each measurement is recorded every 2 seconds (for example, 10 measurements would equal 20 seconds).

Compounds detected from 12/9/2016 – 01/31/2017

- NDMA
- NDEA
- NMOR
- 2,3-dihydrofuran
- 2-methylfuran
- 2-pentylfuran
- 2-ethyl-5-pentylfuran
- 2,5-dimethylfuran
- 4-(1-methylpropyl)-2,3-dihydrofuran

None of these detections were sustained, and were similar to those found while the mobile lab was offsite.

Primary source of elevated compound levels is vehicle/generator exhaust. Chemicals found onsite are very similar to those found offsite while the van was driving from CBC/RJ Lee to the Hanford site.

The Vapor Monitoring Detection System (VMDS) uses a series of detectors installed within A and AP farm to continuously monitor chemical concentrations along the AP farm fence line, inside of A farm, and AP stack.

These instruments use infrared and/or ultraviolet light to detect chemicals along the path between the emitter and the reflectors.

In total, almost 10 million readings were recorded from 12/8/16 – 2/8/17 of which over 507,000 measurements were for ammonia from the A farm & AP farm fencelines and the AP stack detectors.

AY-102 Retrieval | Ammonia VMDS Data 12/8/2016 to 2/8/2017

| Location | Instrument | Analyte | Peak Reading | Total Count of Readings |
|----------------------|------------|---------|--------------|-------------------------|
| A Farm | NH3-508A | Ammonia | 0.044 ppm | 159,998 |
| AP Farm Fenceline | NH3-506A | Ammonia | 0.022 ppm | 57,193 |
| | NH3-506B | Ammonia | 0.024 ppm | 63,034 |
| AP Stack | NH3-507I | Ammonia | 70.654 ppm | 109,583 |
| | NH3-507U | Ammonia | 79.629 ppm | 117,412 |
| Total | | | | 507,220 |

The AP Stack showed consistent readings for ammonia throughout the retrieval and non-retrieval periods.

Total Measurement Count

The total number of discrete measurements taken throughout the retrieval period includes all IH data collected throughout the A complex, VMDS pilot study spectrometry data from, and the data collected by the RJ Lee mobile PTR-MS.

12/8/2016 – 2/8/2017

| Data Type | Reading Counts |
|---------------------------|-------------------|
| IH Group Data | 4942 |
| VMDS Pilot Data | 9,772,890 |
| RJ Lee PTR-MS Data | 73,638,258 |
| Total Measurements | 83,416,090 |

A total count of over 83 million measurements were taken throughout this time period.

Taking this data into account, there does not appear to be a measurable increase in tank farm vapor concentrations both during and after the retrieval periods inside the tank farms, along the AP fenceline, or around the A Complex.