

Direct Reading Instrumentation Weekly Summary

01/04/17 6:00 – 01/11/17 6:00

Weekly Summary: The ToxiRAE and MultiRAE instruments are personal monitors and were not deployed for use during this week. The AreaRAE systems were taken offline to address calibration issues and did not report data during this week¹. RAE MeshGuards have sensors for ammonia and reported data (see Table 4). Bump tests were conducted on the MeshGuards this week (1/5/17). No ammonia was detected by the RAE MeshGuards during this week.

Gastronics instruments have sensors for NH₃, VOCs and N₂O. All NH₃ sensors (except 512S) have been calibrated since 12/1/16. Sensor 512S was last calibrated in August 2016 and stopped reporting on 2/1/2017. The most recent bump tests (1/10/17) on the NH₃ sensors indicated that three units (512C, H, and I) reported sensor readings that were not within 10% of the test gas concentration. No ammonia was detected by the Gastronics instruments that were in calibration and/or verified by bump tests during this week.

VOC sensors were replaced and new sensors were calibrated. Calibration checks of the VOC sensors indicated that four of the instruments (512F, G, I, and T) reported values that were not within 10% of the test gas concentration.

Data for VOC are reported only when VOC sensors are considered to be in calibration and verified by bump tests (i.e., within 10% of the test gas concentration). Of the calibrated units, no VOCs were detected by 512B, E, H, K, L, M, O, P, and R. Units 512A, C, D, J, N, Q, and U reported VOCs <2 ppm (0.2 to 0.5 ppm). None of the calibrated units reported VOCs ≥2 ppm. A total VOC limit of 2 ppm is currently employed by the Industrial Hygiene Program Technical Basis².

The N₂O sensors continue to report numerous data peaks up to full scale (512A, B, D, and S), and recurring patterns and spikes of N₂O at high concentrations >100 ppm (512C, E, F, H, I, M, N, R and T). N₂O has not been detected above background levels (0.3 to 0.4 ppm) by spectroscopic instruments around the tank farm. The N₂O sensors on the 512 instruments do not hold calibration and the calibration procedure for the N₂O sensor/transmitter is being modified to correct for transmitter output drift. The N₂O data from Gastronics sensors are not considered accurate or reliable.

Waste retrieval activities resumed on 1/6/2017 at 9:30 pm. Sluicing operations were performed for approximately 2 hours before operations shut down because temperature of a waste transfer pit fell below the required minimum temperature. Retrieval operations were not performed much of the week due to adverse winter weather. Retrieval operations did not restart until the early morning of 1/11/2017, when the supernate and slurry pumps operated between 2:00 am

¹ Note that instrument tags (labels) reported in OSI PI and often presented in weekly summary information are captured directly from OSI PI and that all gas monitoring instruments begin with 200-GM, followed by the target analyte (such as NH₃), followed by the instrument type (three digit number), and the instrument unit as sequential letters. For example, "200-GM-NH3-512C" is an ammonia sensor reporting from Gastronics (denoted as "512") instrument "C".

² RPP-22491, Rev 1, "Industrial Hygiene Chemical Vapor Technical Basis": <http://hanfordvapors.com/wp-content/uploads/2016/10/Industrial-Hygiene-Chemical-Vapor-Technical-Basis-RPP-22491 - Rev 1.pdf>

Direct Reading Instrumentation Weekly Summary

01/04/17 6:00 – 01/11/17 6:00

and 4:30 am. No anomalies in response to the waste retrieval activities were observed this week with any of the direct reading instruments that were in use and reporting data.

January 4th – January 11th 2017 Observations By Instrument:

HazScanner (501) – The HazScanners, 501A and 501B, have not been calibrated, and work is ongoing to complete their configuration. Therefore no data is presented from these instruments.

AreaRAE (502) – Not reporting during this week.

Table 1. AreaRAE Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
CO (ppm)	No data reported.	50	25	1 – 500
LEL (%)	No data reported.			0 – 100
NH ₃ (ppm)	No data reported.	25	12.5	1 – 50
Oxygen (%)	No data reported.		<19.5	1 - 30
VOC (ppm)	No data reported.		2	1 - 200

ToxiRAE (503) – Not used during this week.

Table 2. ToxiRAE Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
VOC (ppm)	Not in use.	N/A	2	0.1 - 2000

MultiRAE (504) – Not used during this week.

Table 3. MultiRAE Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
CO (ppm)	A – Not in use. B – Not in use. C – Not in use.	50	25	0 – 500
LEL (%)	A – Not in use. B – Not in use. C – Not in use.	N/A		0 – 100
NH ₃ (ppm)	A – Not in use. B – Not in use. C – Not in use.	25	12.5	1 – 500
Oxygen (%)	A – Not in use. B – Not in use.		<19.5	1 – 30

Direct Reading Instrumentation Weekly Summary

01/04/17 6:00 – 01/11/17 6:00

Compound (units)	Comment	OEL	Action Level	Detection Range
	C – Not in use.			
VOC (ppm)	A – Not in use. B – Not in use. C – Not in use.	N/A	2	0.1 – 5000

RAE MeshGuard (505) – Ammonia detection instruments are located in A Tank Farm (505G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, and X) and AP Tank Farm (505A, B, C, D, E, and F). Calibration checks were performed on the following units on 1/5/2017: 505A, C, D, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, and X. No ammonia was detected by any of the RAE MeshGuards.

Table 4. RAE MeshGuard Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
NH ₃ (ppm)	<ul style="list-style-type: none"> • Instruments reporting: 505A, C, D, F, H, I, J, K, M, N, O, P, Q, R, S, T, U, V, W, and X. • Out of calibration*: 505G, I, L, S, and W • No ammonia detected 	25	12.5	1 – 50

* Only instruments reading within 10% of the calibration gas concentration during their most recent bump/calibration test are considered in calibration and reported here.

FIS-Gastronics (512) – Monitor for ammonia, volatile organic compounds, and nitrous oxide. Units located in AP Tank Farm include: 512A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, and T. Unit 512U is located between AP Tank Farm and A Tank Farm. Units 512V, W X, and Y are located in A Tank Farm. Instruments calibrated on January 3rd and 4th include: include 512B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, and T.

Table 5. Gastronics Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
NH ₃ (ppm)	<ul style="list-style-type: none"> • Out of calibration* (1/10/17): 512C, H, and I • No ammonia detected 	25	12.5	1 – 500

Direct Reading Instrumentation Weekly Summary

01/04/17 6:00 – 01/11/17 6:00

Table 5. Gastronics Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
VOC (ppm)	<ul style="list-style-type: none"> • Out of calibration*: 512F, G, I, and T (1/10/17) • Instruments that reported no VOCs detected: 512B, E, H, K, L, M, O, P, and R • Instruments that reported a maximum value of <2 ppm: 512A, C, D, J, N, Q, and U • Instruments that reported maximum values ≥ 2 ppm: None. 	N/A	2	0 – 1000
N ₂ O (ppm)	N ₂ O sensors reported from 512A, B, C, D, E, F, G, H, I, J, K, M, N, O, P, Q, R, S, T, and U. The N ₂ O sensors on 512A, B, C, D, E, F, G, H, I, M, N, P, Q, R, S, and T reported recurring N ₂ O spikes. The N ₂ O data remain suspect until the stability of the sensor and calibration can be confirmed.	50	25	0 – 1000

*NH₃/VOC: Only instruments reading within 10% of the calibration gas concentration during their most recent bump/calibration test are considered in calibration and reported here.

January 4th– January 11th 2017 Instrument Operational Status:

Time reporting is calculated using the time sensors are reporting to OSI PI System³ for each instrument:

Table 6. HazScanner (501) % Time Reporting by Instrument.

Instrument	% Time Reporting	Instrument	% Time Reporting
501A	0	501B	0

Table 7. AreaRAE (502) % Time Reporting by Instrument.

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
502A	0	502D	0	502G	0	502J	0
502B	0	502E	0	502H	0		
502C	0	502F	0	502I	0		

Notes: % time reporting is estimated on review of graphs from OSI PI.

³ OSI PI System is a data visualization software package from [OSIsoft](http://www.osisoft.com).

Direct Reading Instrumentation Weekly Summary

01/04/17 6:00 – 01/11/17 6:00

**Table 8. ToxiRAE (503) % Time Reporting by Instrument.
(personal monitors only used when operators are in the field)**

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
503A	0	503E	0	503I	0
503B	0	503F	0	503J	0
503C	0	503G	0	503K	0
503D	0	503H	0		

**Table 9. MultiRAE (504) Time Reporting by Instrument.
(personal monitors only used when operators are in the field)**

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
504A	0	504B	0	504C	0

Table 10. RAE MeshGuard (505) % Time Reporting.

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
505A	71	505H	72	505O	72	505V	72
505B	0	505I	55	505P	72	505W	72
505C	72	505J	72	505Q	73	505X	72
505D	71	505K	37	505R	13		
505E	0	505L	0	505S	16		
505F	72	505M	72	505T	72		
505G	0	505N	71	505U	73		

Table 11. Gastronics (512) % Time Reporting by Instrument.

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
512A	10	512H	96	512N	64	512T	90
512B	96	512I	97	512O	72	512U	>99
512C	96	512J	<1	512P	41	512V	0
512D	23	512K	97	512Q	51	512W	0
512E	94	512L	77 ^a	512R	49	512X	0
512F	98	512M	25	512S	9 ^b	512Y	0
512G	1						

- (a) % time reporting for NH₃ and VOC only. N₂O sensor did not report data.
- (b) % time reporting for N₂O only. NH₃ and VOC sensors did not report data.