



# Direct Reading Instrumentation Weekly Summary

12/28/16 6:00 – 01/04/17 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 week<sup>1</sup>. RAE MeshGuards have sensors for ammonia and reported data. No ammonia was detected by the RAE MeshGuards during this week.

Gastronics instruments have sensors for NH<sub>3</sub>, VOCs and N<sub>2</sub>O. No ammonia was detected by Gastronics instruments that were in calibration.

VOC sensors were replaced and new sensors have been calibrated. Of the 512 instruments reporting, VOC sensors on 512A through 512U were calibrated between 12/6 and 12/27; 512E, H and T were re-calibrated on 12/29; 512B, C, E, and T were calibrated again on 1/3/17. VOC data are reported only when sensors are considered to be in calibration and verified by bump tests. On the calibrated units, no VOCs were detected by 512C, E, F, and I,. Units 512A, R, T, and U reported VOCs <2 ppm (0.3 to 0.8 ppm). Unit 512B reported VOCs > 2 ppm—a spike of 2.7 ppm on December 29. A total VOC limit of 2 ppm currently is employed by the Industrial Hygiene Program Technical Basis<sup>2</sup>

The N<sub>2</sub>O sensors on 512 instruments in AP Farm (512A – 512T) were recently re-calibrated and will be observed for a period to determine whether the instruments will hold calibration. The N<sub>2</sub>O sensors on the 512 instruments have been difficult to keep in calibration and the calibration procedure for the N<sub>2</sub>O sensor/transmitter was modified to correct for transmitter output drift. The N<sub>2</sub>O data will remain suspect until the stability of the sensor and calibration can be confirmed. N<sub>2</sub>O has not been detected above background levels (0.3 to 0.4 ppm) by spectroscopic instruments along the fencelines around the farm.

## **December 28<sup>th</sup> 2016 – January 4<sup>th</sup> 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 – other than up-time.

AreaRAE (502) – Not reporting during this week.

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<sup>1</sup> 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 NH<sub>3</sub>), 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”.

<sup>2</sup> 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>

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**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 <sub>3</sub> (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 <sub>3</sub> (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. C – Not in use.		<19.5	1 – 30
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 located in A Tank Farm (18 sensors) and located in AP Tank Farms (4 sensors).

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**Table 4. RAE MeshGuard Comments.**

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

FIS-Gastronics (512) – Monitor for ammonia, volatile organic compounds, and nitrous oxide. All 512 NH<sub>3</sub>/VOC sensors were calibrated between 12/1/2016 and 12/27/2016. The following 512 units were bump tested for NH<sub>3</sub> and VOCs on 12/28/2016: 512D, F, G, J, K, L, M, N, O, P, Q, R, V, W, X, and Y.

**Table 5. Gastronics Comments.**

Compound (units)	Comment	OEL	Action Level	Detection Range
NH <sub>3</sub> (ppm)	No ammonia reported on any instrument (other than calibration tests)	25	12.5	1 – 500
VOC (ppm)	<ul style="list-style-type: none"> <li>• Out of Calibration*: 512G, L, N, O, Q, and S</li> <li>• Instruments 512E and T in calibration last 5.5 days of reporting period.</li> <li>• Instruments that reported no VOCs detected: 512C, E, F, I, K, M, P, and Q</li> <li>• Instruments that reported a maximum value of ≤ 2 ppm: 512A, R, T, and U</li> <li>• Instruments that reported maximum values &gt; 2 ppm: 512B</li> </ul>	N/A	2	0 – 1000
N <sub>2</sub> O (ppm)	N <sub>2</sub> O sensors reported from 512A, B, C, E, F, I, K, M, O, P, Q, R, T, and U. The N <sub>2</sub> O sensors on 512A, B, C, F, I, M, O, P, Q, and R reported recurring N <sub>2</sub> O spikes. The N <sub>2</sub> O data remain suspect until the stability of the sensor and calibration can be confirmed.	50	25	0 – 1000

\*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.

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## December 28<sup>th</sup> 2016 – January 4<sup>th</sup> 2017 Instrument Operational Status:

Time reporting is calculated using the time sensors are reporting to OSI PI System<sup>3</sup> 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.

**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	43	505H	47	505O	46	505V	48
505B	0	505I	2	505P	49	505W	47
505C	46	505J	46	505Q	48	505X	48
505D	46	505K	< 1	505R	< 1		
505E	0	505L	0	505S	0		
505F	45	505M	47	505T	47		
505G	0	505N	47	505U	48		

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

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

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
512A	79	512H	0	512N	0	512T	4
512B	96	512I	89	512O	50	512U	100
512C	94	512J	0	512P	74	512V	0
512D	0	512K	92	512Q	68	512W	0
512E	29	512L	71	512R	51	512X	0
512F	86	512M	90	512S	0	512Y	0
512G	0						