

IMPACT OF UPDATING MM CALIBRATION AND INTRODUCING NEW FILTERS: First meeting

Elisa Santos

4/26/2017

Performance you can rely on.



Outline

- Summary
- Data description
- Data Visualization
- Models: Under construction
- Appendices
 - Appendix 1:
COAT: Proposal for introducing new filters
 - Appendix 2: Aeration profiles for the 6 tests (updated MM calibration and 08/08/2016 filters) by Lab
 - Appendix 3: Modeling Avg. Aeration

Summary

- Main findings
 - When compared to matrix test results, it seems that recent 833 tests have lower aeration
 - 832 tests results seem to be at the original level during matrix
- Goal for this meeting: I would like to show you the current data and get a directive on how the SP would like to proceed
 - Are the labs collecting additional data?
 - Are there additional issues that need to be addressed before collecting more data?

Data

- Itms file (Chart = Yes) 4/21/2017
 - Note that 1005, VGRA tests are chart = No
 - Total of 47 tests
 - 22 matrix tests,
 - 19 after matrix but before recent changes,
 - 6 tests, two from each lab, were run under the updated MM calibration and 08/08/2016 filters
 - Out of the 19 after matrix but before recent changes, labs identified
 - 12 with steep aeration profiles and
 - 5 (2016 filters) with shallow aeration profiles
 - Aeration profile for the remaining 2 tests are missing: I assumed they are steep because they are from May 2015, right after the matrix ends
 - 6 tests (updated MM calibration and 08/08/2016 filters)
 - All 6 tests present shallow aeration profiles (see Appendix 2)

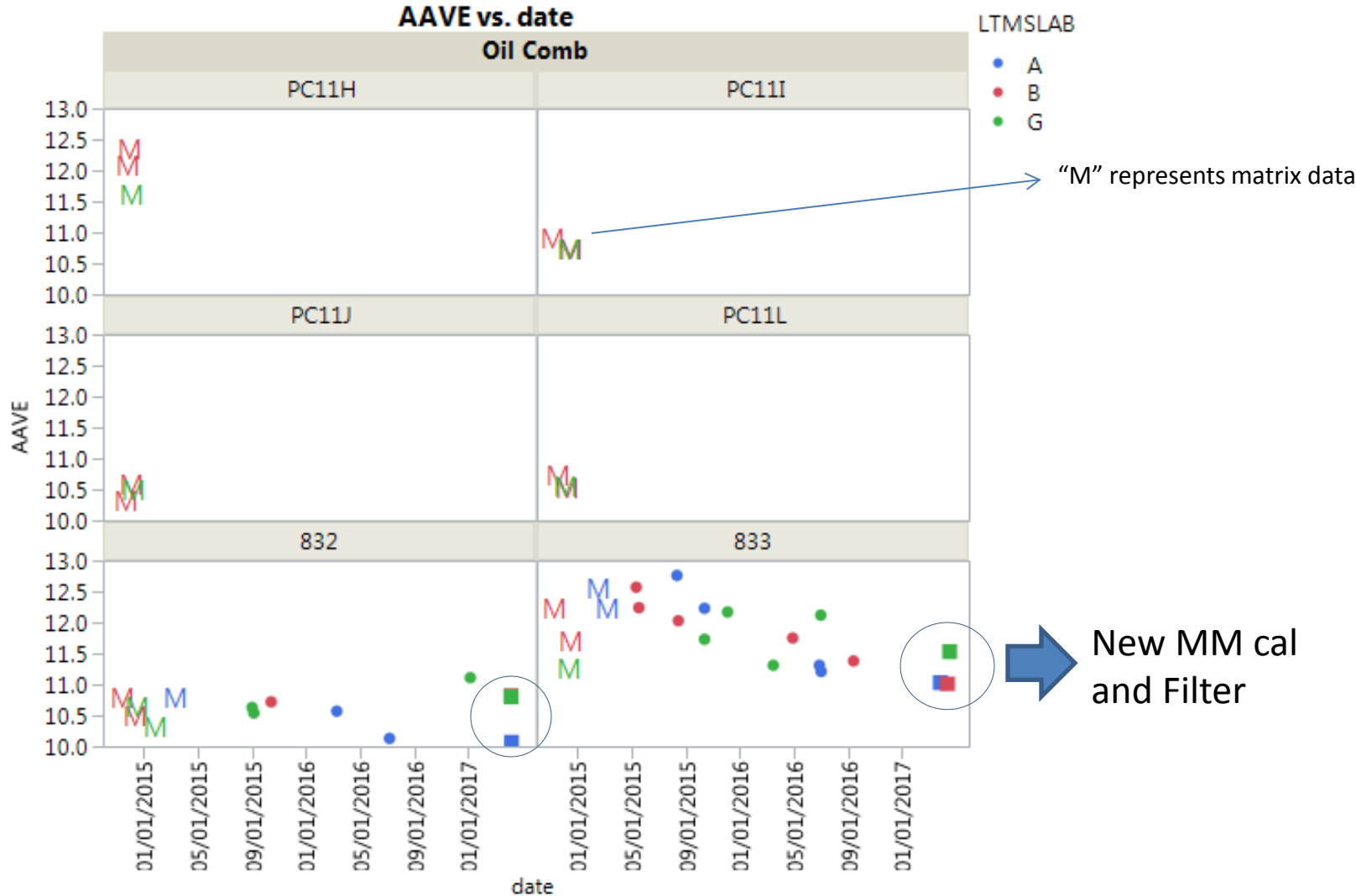
	Oil Comb	N Rows
1	PC11H	3
2	PC11I	3
3	PC11J	3
4	PC11L	3
5	832	14
6	833	21

Summary of Itms for the last 6 tests

Lab	testkey	Oil	effective Yiv2	effective Ziv2	EI	abs(ei)	ei Fail (level 3)	ei Fail (level 2)
A	118883-COAT	833	-3.19298	-1.9071	1	1.836975	0	1
A	111348-COAT	832	-2.95567	-2.22167	1	1.048565	0	0
B	119478-COAT	832	0.738916	-0.17884	0	1.311073	0	0
B	120248-COAT	833	-3.26316	-1.10413	0	3.084323	1	1
G	111344-COAT	832	0.640394	0.430969	0	0.299179	0	0
G	116607-COAT	833	-1.4386	-0.1299	0	1.869565	0	1

Average Aeration vs. date by Oil and Lab

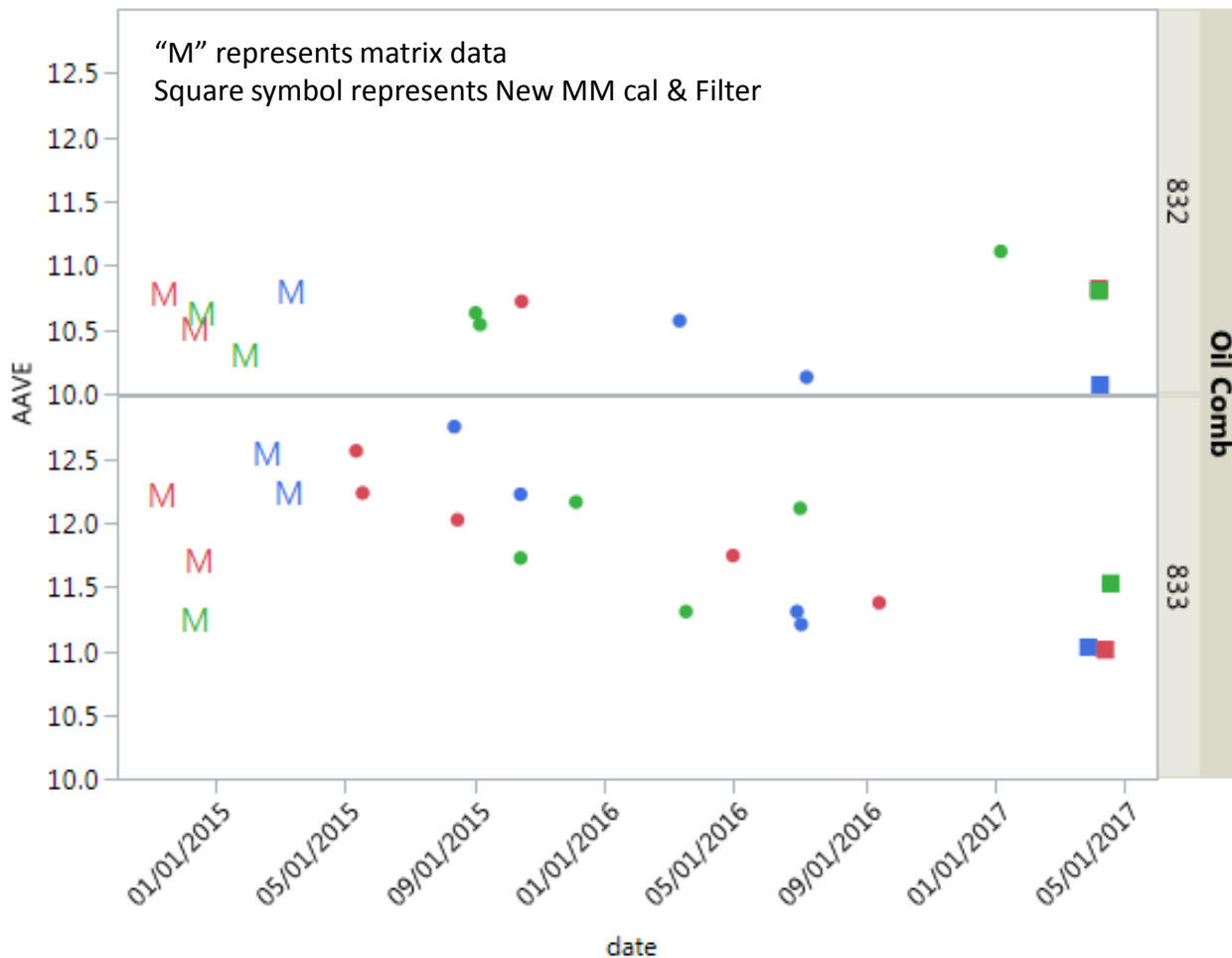
Looking at the recent data, it seems that 833 have decreased



Average Aeration vs. date by Oil and Lab

Zooming in oils 832 and 833

AAVE vs. date



LTMSLAB

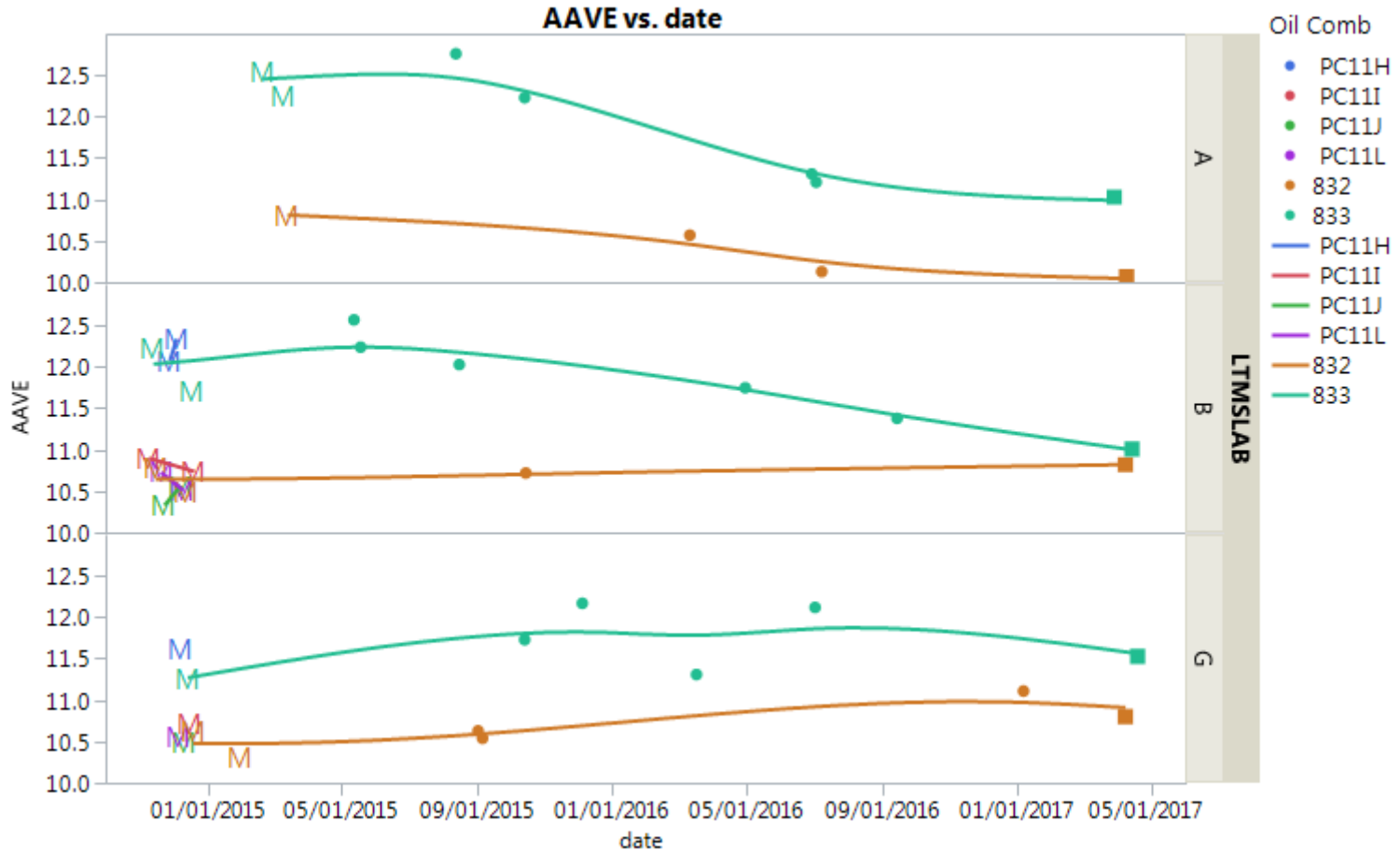
- A
- B
- G

6 test results for updated MM calibration and 08/08/2016 filters

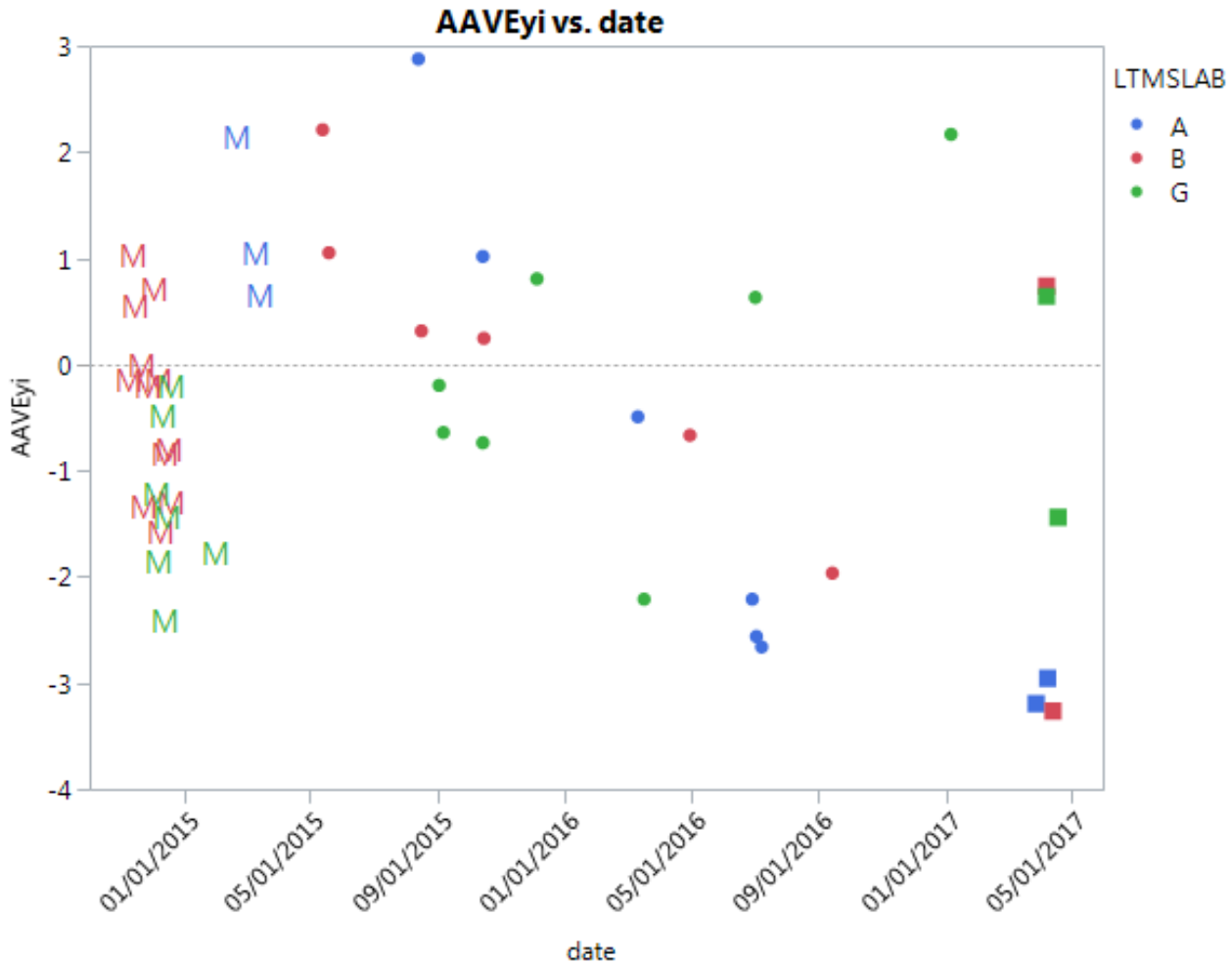
	Oil	
Lab	833	832
SwRI	11.03	10.07
IAR	11.53	10.8
LZ	11.01	10.82
Average	11.19	10.56
LTMS target	11.94	10.67
Target/ Avg	1.067024	1.010098
Std	0.2946	0.4274

Average Aeration yi vs. date by Lab and Oil

“M” represents matrix data
 Square symbol represents New MM cal & Filter



Average Aeration yi vs. date by Lab



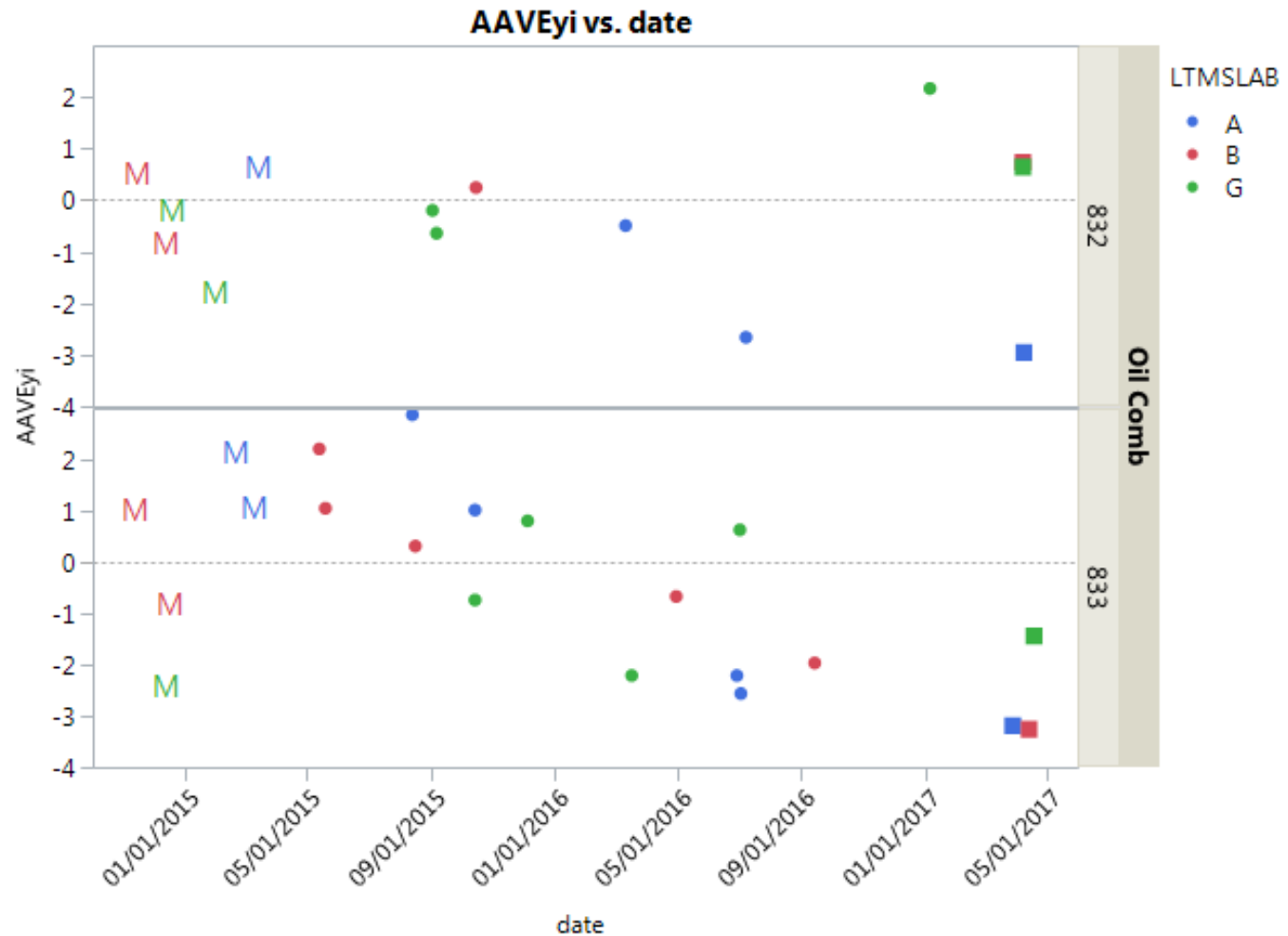
“M” represents matrix data

Square symbol represents New MM cal & Filter

Average Aeration y_i vs. date by Lab and Oil (subset of oils 832 and 833)

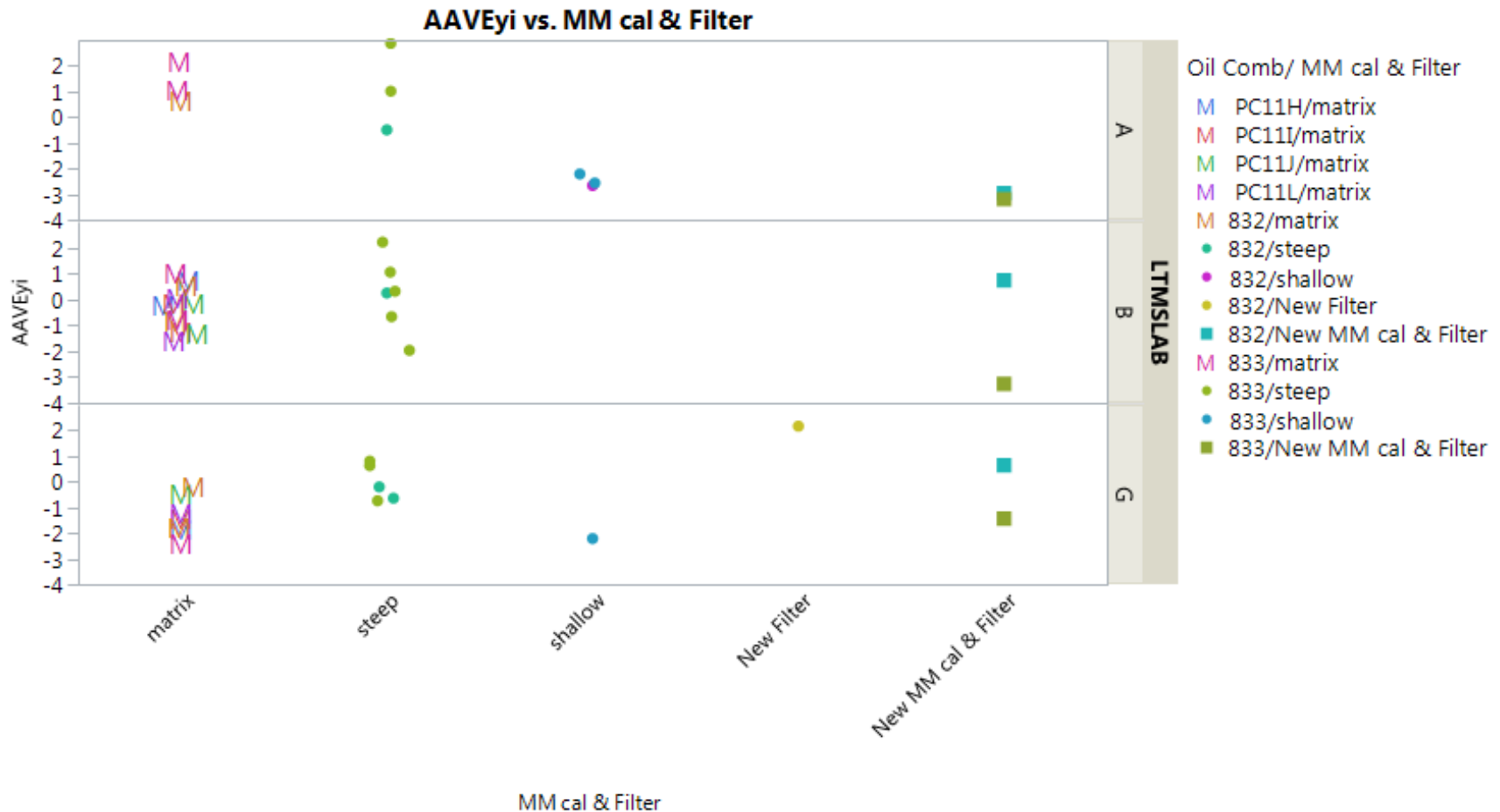
“M” represents matrix data

Square symbol represents New MM cal & Filter



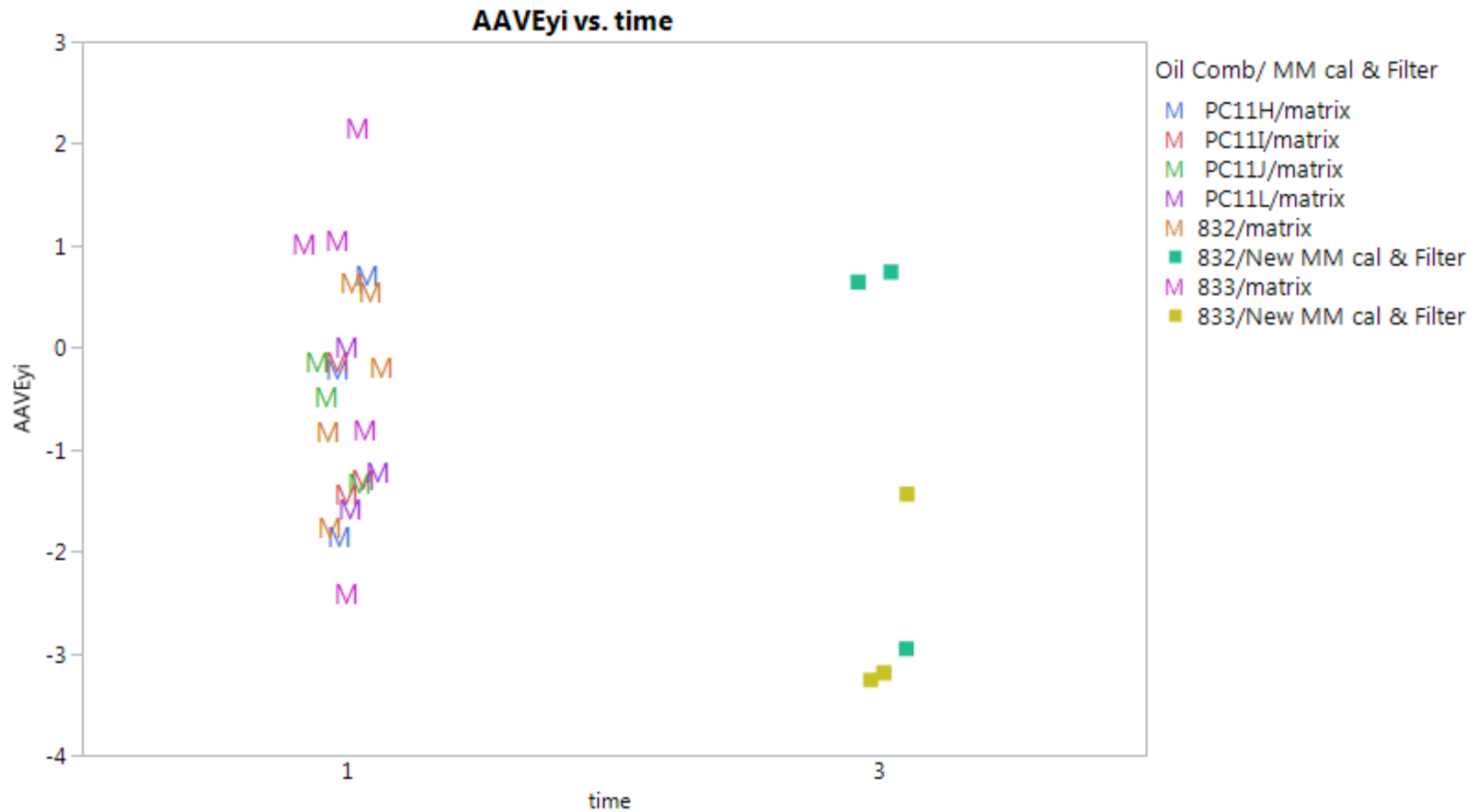
Average Aeration y_i vs. “time” by Lab

another way to look at time



Average Aeration y_i vs. “time”

Matrix versus “New MM cal and Filter”



“M” represents matrix data

Square symbol represents New MM cal & Filter

APPENDICES

Appendix 1:

COAT: Proposal for introducing new filters

- Proposal:
 - Run two tests at each laboratory: one test with reference oil 833 and one test with reference oil 832
 - Level 2 alarm system in place
 - Lab runs a third test if **second** test result triggers level 2 alarm
 - Correction factor implemented if all three labs have level 2 alarms in the same direction
 - Allocation:

	Lab		
Run #	A	B	G
1	833	832	832
2	832	833	833
3	832	833	833

- Additional information
 - Test 111343 (01/04/2017) has been run on oil 832 (11.11% aeration); filter NONOUL => 08/08/2016 filter); Severe

Appendix 2: Aeration profiles for the 6 tests (updated MM calibration and 08/08/2016 filters) by Lab

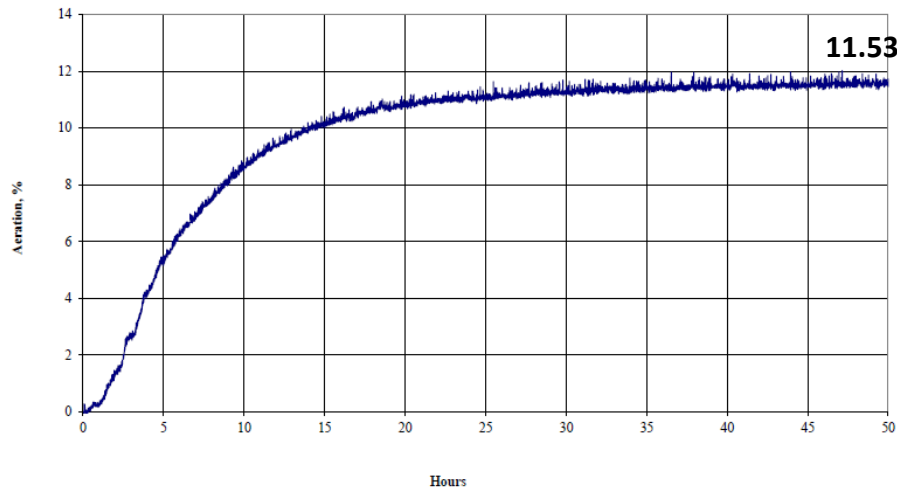
Intertek

Oil 833

Caterpillar Oil Aeration Test
Form 5
Oil Aeration Plot

intertek

Lab	EG	EOT Date	20170419	EOT Time	12:52
Test Number	8-85-0				
Oil Code	EG-0034/CMIR-116607				
Formulation Stand Code					



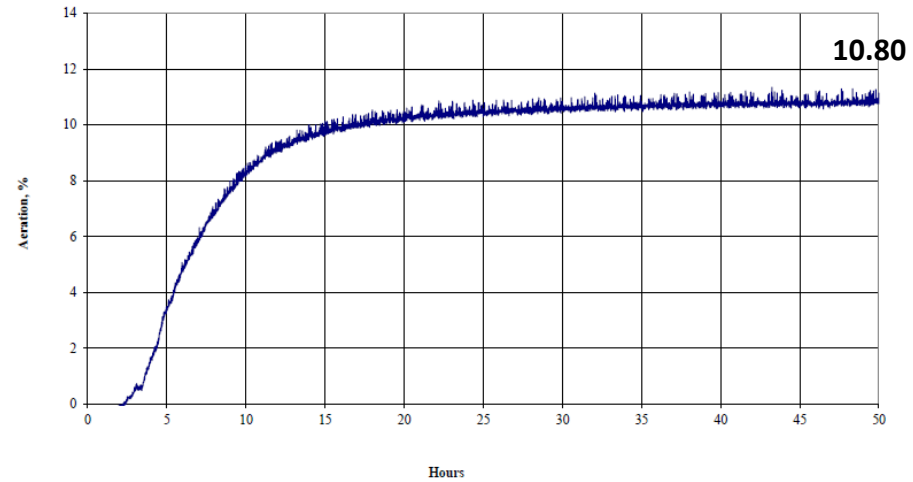
40-50 Hr Aeration Slope	0.0108
-------------------------	--------

Oil 832

Caterpillar Oil Aeration Test
Form 5
Oil Aeration Plot

intertek

Lab	EG	EOT Date	20170408	EOT Time	20:24
Test Number	8-84-0				
Oil Code	EG-0023/CMIR-111344				
Formulation Stand Code					

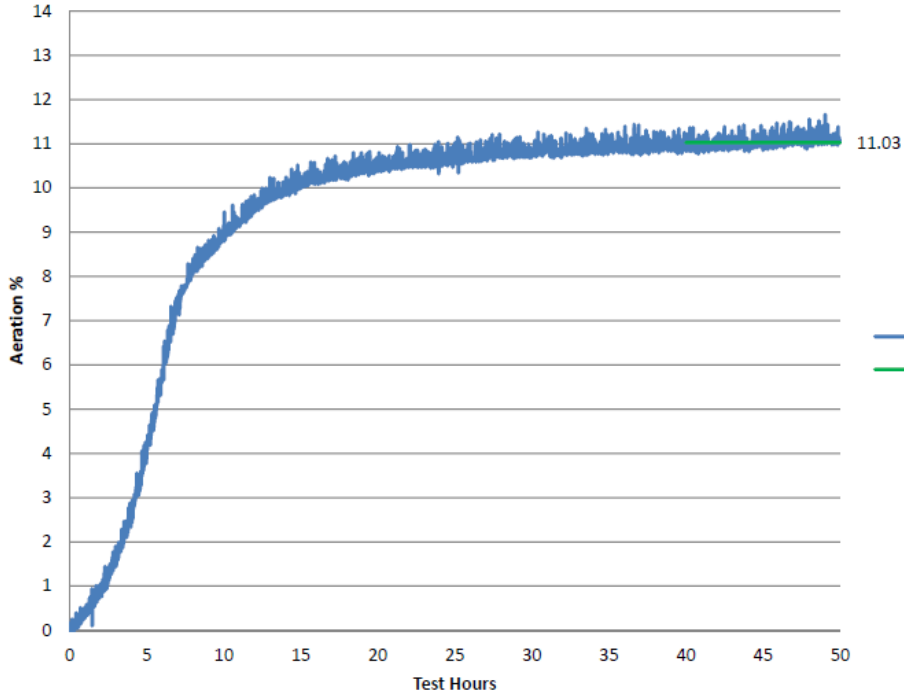


40-50 Hr Aeration Slope	0.0077
-------------------------	--------

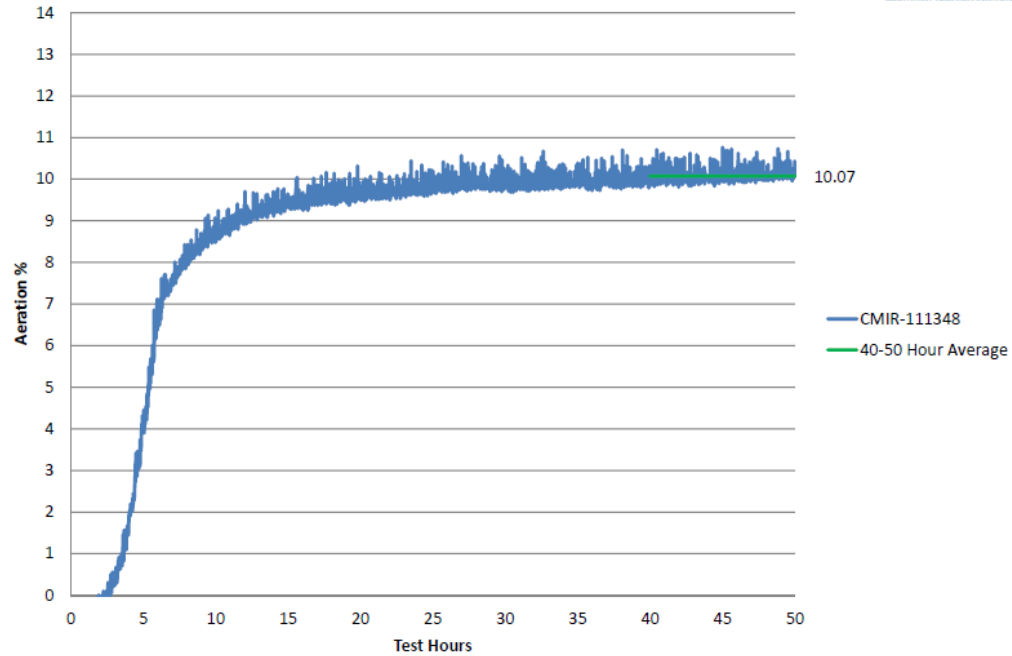
COAT 1R-1808 NONOUL Filter Matrix Test 1
833 Reference Oil Aeration



SwRI

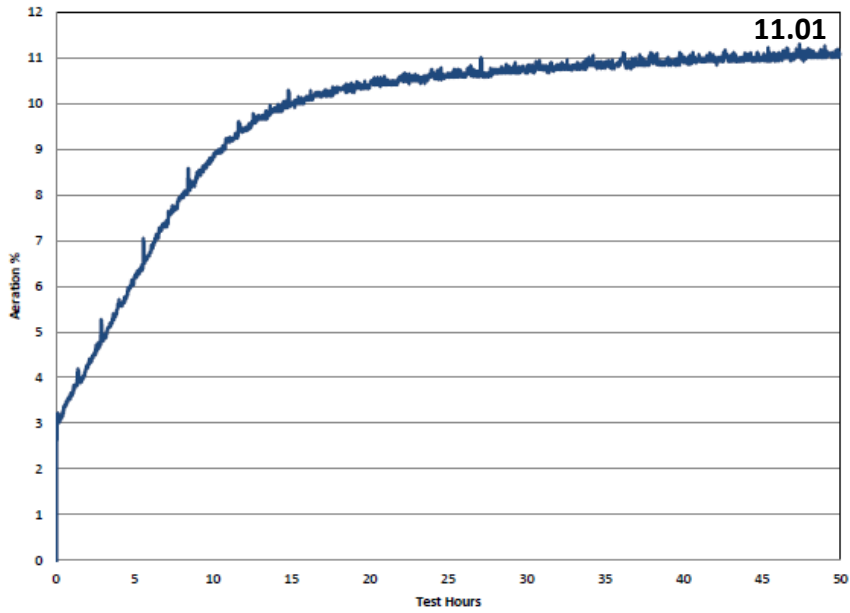


COAT 1R-1808 NONOUL Filter Matrix Test 2
832 Reference Oil Aeration



Lubrizonol

Oil 833



Oil 832

