ASTM New Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting

July 10, 2023

Yong-Li McFarland, Chair

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Agenda

- New EOGT
  - Discuss procedure updates
  - Update on received donated oils
  - Confirm Pilot Study details
  - Report Form update
- Next meeting

EOFT and EOWTT Surveillance Panel Membership and Scope

19 members

Beth Schwab, Afton Chemical
Michael Kunselman, Center for Quality Assurance
Robert Stockwell, Chevron Oronite
Dennis Gaal, Exxonmobil
Ron Shah, Infineum
Joe Franklin, Intertek
Karina Gil, Intertek
Michael Johnscher, ISP
Litchi Xie, Lubrizol Additive (Zhuhai) Co., Ltd.
Victoria Fein, Lubrizol
Jason Bowden, OH Technologies Inc
Greg Miiller, Savant Group
Maggie Smerdon, Savant Labs
Sean Alston, SGS North America
Jared Cavaliere, SwRI
Becky Grinfield, SwRI
Yong-Li McFarland*, SwRI
John Loop, TMC
Amy Ross, Valvoline

*Chair

Scope and Objective

- It is the responsibility of this panel to provide surveillance over Test Methods D6794 and D6795 bench tests used in the ILSAC and API passenger car oil categories. The surveillance panel will review data semi-annually supporting the precision for each bench test and when necessary, conduct workshops to bring the bench tests within accepted limits. The surveillance panel will function with the support of the ASTM Test Monitoring Center (TMC) to monitor the bench tests and maintain appropriate and adequate supplies of reference oils for the monitoring process. The panel will maintain a liaison with the "expert groups" in ASTM, which may help in the maintenance and improvement of the bench test methods used in support of the current ILSAC and API categories. The surveillance panel will make recommendations for appropriate action through Subcommittee D02.B, Section 7.

New EOGT WK86363, ILS# 1854

- Ford request for a new Engine Oil Gelation Test (EOGT): request to add a new test filterability test to better screen oils for field issues
- Current status
  - Method: 2 drafts (large volume (600g) and small volume (200 g)) updated on ICP method and uploaded on ASTM Collaboration Area
    - Homogenization in method: ask labs to note procedure
  - Oils: likely **12** potential reference oils offered, different viscosity grades and base oils being considered, waiting for arrival at TMC
  - Pilot and ILS Labs: 4 labs for Pilot study and 6 labs for ILS currently (added Valvoline); need to finalize report form
  - Timing: Estimate Pilot Study data analysis to complete end of Sept 2023, ILS tests to be run between October and February, and final method ballot in March or April 2024

Oil Matrix Table

Participant	Potential Reference Oils Offered	Comments
Ford	2 oils (low and high known ref oils)	Suppliers to send, not confirmed
Toyota	2 oils (2 technologies, 0W-20)	Not confirmed
Afton	**4 oils (1 technology, 2 vis grades, 2 base oils)**	Confirmed
Lubrizol	**4 oils (2 technologies 2 treat rates, 1 vis grade, 1 base oil)**	Confirmed
Infineum	**2 oils**	Confirmed
Oronite	4 oils (4 technologies, 1 vis grade, 1 base oil)	Not confirmed
Subaru	1 or 2 oils	Not confirmed
Total Confirmed	**10 oils**	

John L to update Oil Sample Information as needed,
participants please respond to request on sample info

Oil Matrix	Volume received at TMC (gallons)	Comments
Oil 1 (known previous low performance "good")	19.5	Arrived
Oil 2 (known previous high performance "poor")	20	Arrived
Oil 3 (unknown performance)	10	From Company A
Oil 4 (unknown performance)	10	From Company A
Oil 5 (unknown performance)	10	From Company A
Oil 6 (unknown performance)	10	From Company A
Oil 7 (unknown performance)	10	From Company B
Oil 8 (unknown performance)	10	From Company B
Oil 9 (unknown performance)	10	From Company B
Oil 10 (unknown performance)	10	From Company B
Oil 11 (unknown performance)	10	From Company C
Oil 12 (unknown performance)	10	From Company C
Oil 13 (unknown performance)	20	From Company D (from Japan) - enroute
Oil 14 (unknown performance)	10	From Company D (from Japan) - enroute
Oil 15 (unknown performance)	0	From Company E (from Japan) - enroute
Oil 16 (unknown performance)	0	From Company E (from Japan, maybe) - enroute
Oil 17 (unknown performance)	0	From Company F
Oil 18 (unknown performance)	0	From Company F
Oil 19 (unknown performance)	0	From Company F
Oil 20 (unknown performance)	0	From Company F

Pilot Study Matrix (suggested)

Test Number	Lab A	Lab B	Lab C	Lab D
1	Sample 1 (LV)	Sample 1 (SV)	Sample 1 (LV)	Sample 1 (SV)
2	Sample 2 (LV)	Sample 2 (SV)	Sample 2 (LV)	Sample 2 (SV)
3	Sample 3 (LV)	Sample 3 (SV)	Sample 3 (LV)	Sample 3 (SV)
4	Sample 4 (LV)	Sample 4 (SV)	Sample 4 (LV)	Sample 4 (SV)
5	Sample 5 (LV)	Sample 5 (SV)	Sample 5 (LV)	Sample 5 (SV)
6	Sample 6 (LV)	Sample 6 (SV)	Sample 6 (LV)	Sample 6 (SV)
7	Sample 7 (LV)	Sample 7 (SV)	Sample 7 (LV)	Sample 7 (SV)
8	Sample 8 (LV)	Sample 8 (SV)	Sample 8 (LV)	Sample 8 (SV)
9	Sample 9 (LV)	Sample 9 (SV)	Sample 9 (LV)	Sample 9 (SV)
10	Sample 10 (LV)	Sample 10 (SV)	Sample 10 (LV)	Sample 10 (SV)
11	Sample 11 (LV)	Sample 11 (SV)	Sample 11 (LV)	Sample 11 (SV)
12	Sample 12 (LV)	Sample 12 (SV)	Sample 12 (LV)	Sample 12 (SV)
13	Sample 1 (SV)	Sample 7 (LV)	Sample 7 (SV)	Sample 1 (LV)
14	Sample 2 (SV)	Sample 8 (LV)	Sample 8 (SV)	Sample 2 (LV)
15	Sample 3 (SV)	Sample 9 (LV)	Sample 9 (SV)	Sample 3 (LV)
16	Sample 4 (SV)	Sample 10 (LV)	Sample 10 (SV)	Sample 4 (LV)
17	Sample 5 (SV)	Sample 11 (LV)	Sample 11 (SV)	Sample 5 (LV)
18	Sample 6 (SV)	Sample 12 (LV)	Sample 12 (SV)	Sample 6 (LV)
19	Sample 1 (LV)	Sample 7 (SV)	Sample 10 (LV)	Sample 4 (SV)
20	Sample 2 (LV)	Sample 8 (SV)	Sample 11 (LV)	Sample 5 (SV)
21	Sample 3 (LV)	Sample 9 (SV)	Sample 12 (LV)	Sample 6 (SV)
22	Sample 4 (SV)	Sample 10 (LV)	Sample 7 (SV)	Sample 1 (LV)
23	Sample 5 (SV)	Sample 11 (LV)	Sample 8 (SV)	Sample 2 (LV)
24	Sample 6 (SV)	Sample 12 (LV)	Sample 9 (SV)	Sample 3 (LV)

Total LV	15	9	15	9
Total SV	9	15	9	15

1. Do we really need look at 12 samples or reduce number? ILS precision matrix likely 4-6 samples with repeats Response: try to reduce with info on low & high performance oil runs
2. Do we want to give more weight on Low and High performance oils than other? If so, then reduce number of samples or add more tests

SV volume ship out: 600 mL
LV volume ship out: 1500 mL

Total 10 L (~2.5 gallons) per sample for all labs & tests to TMC for Pilot Study
? Weeks to complete pilot

Group would like to run LV tests on low and high performance oils at all 6 labs before starting Pilot Study. This determines if lab is fit to run Pilot and ILS.

TMC can ship out samples week July 10 to all 6 labs in LV quantities
Labs to start testing week July 17

Example report form

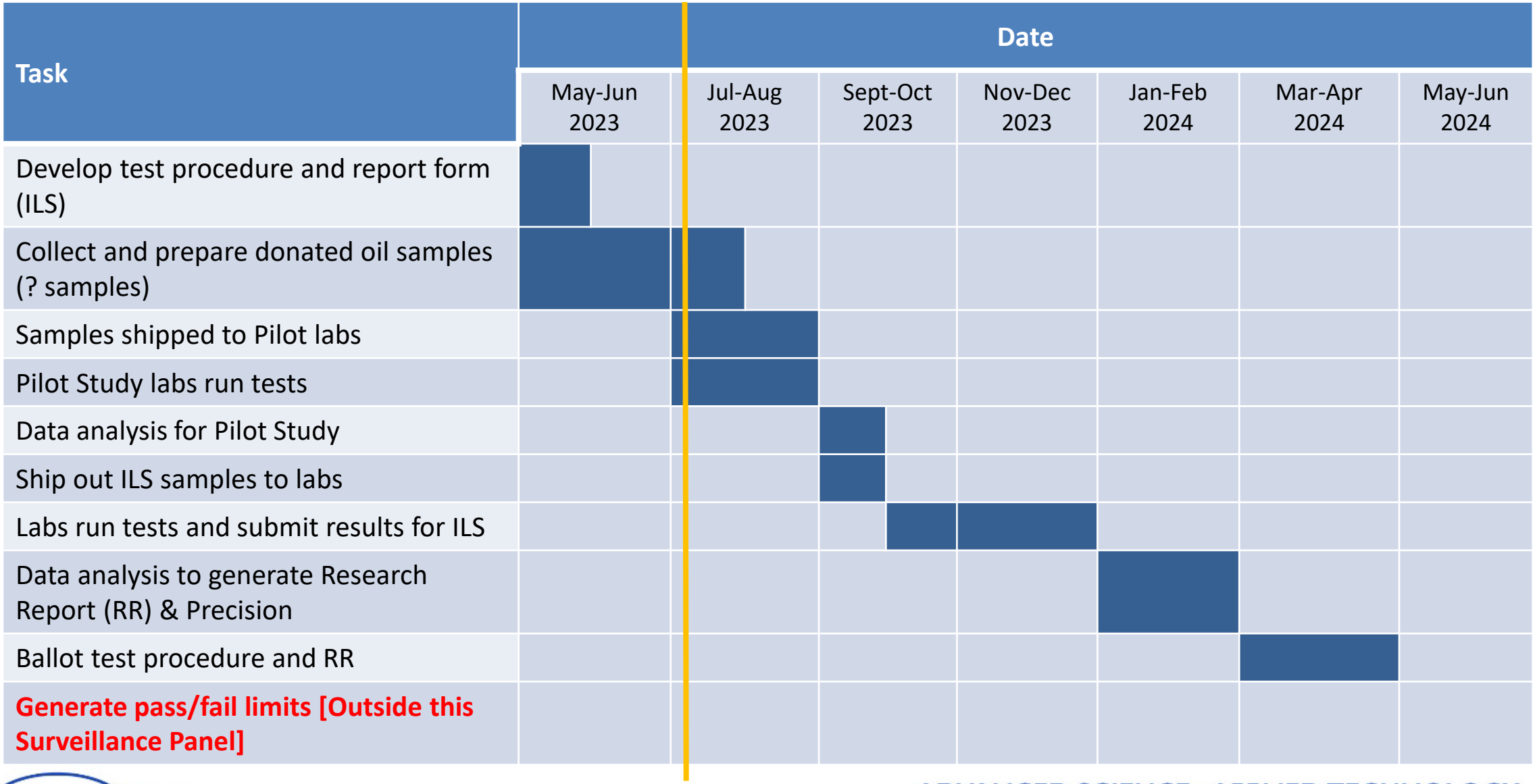
Test	Sample	Lab	technician initials (blend, bubble, filter, ICP, KV)	glassware volume (mL)	Sample volume	SOT, 0hr, 72 hr, 168 hr, 240 hr, 336 hr for ICP Ca, Mg	SOT, 0hr, 72 hr, 168 hr, 240 hr, 336 hr for KV40	72 hr, 168 hr, 240 hr, 336 hr for Filter rate change	Homogenization technique summary	CO2 grade	Heating apparatus (Bath, mantle, etc)
1		a			600	4	323				
2		a			200	123	23				
3		a				3	434				
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Fields requested to collect: email Yongli
Other comments?

Next Steps

- Comments to latest SV and LV Drafts?
- Finalize Pilot Study and ILS report form by Friday July 14
- Oils donation participants to send oils and Oil Matrix Info to TMC
- TMC to ship out samples to all ILS labs (6 labs, 2 LV samples) week July 10
- All labs (SwRI, ISP, Intertek, Afton, Valvoline, Savant) run LV tests on high and low performance oils

Draft Timeline (realistic)



Action Items and Next Meeting

- Yongli M to work on Pilot Study and ILS Report form with Mike Deegan and John Loop, and Beth to review,
- All, please email any suggested report form fields to Yongli by July 13
- Labs please email Yongli estimate of timing to complete Pilot Study (24 tests currently estimated)
- Oil Participants to email Yongli and John L on how many samples eligible as reference oil by July 13
- John L to confirm how many samples arrived at TMC and still eligible as reference oil
- Yongli M to send out data report form to lab contacts by Monday July 17

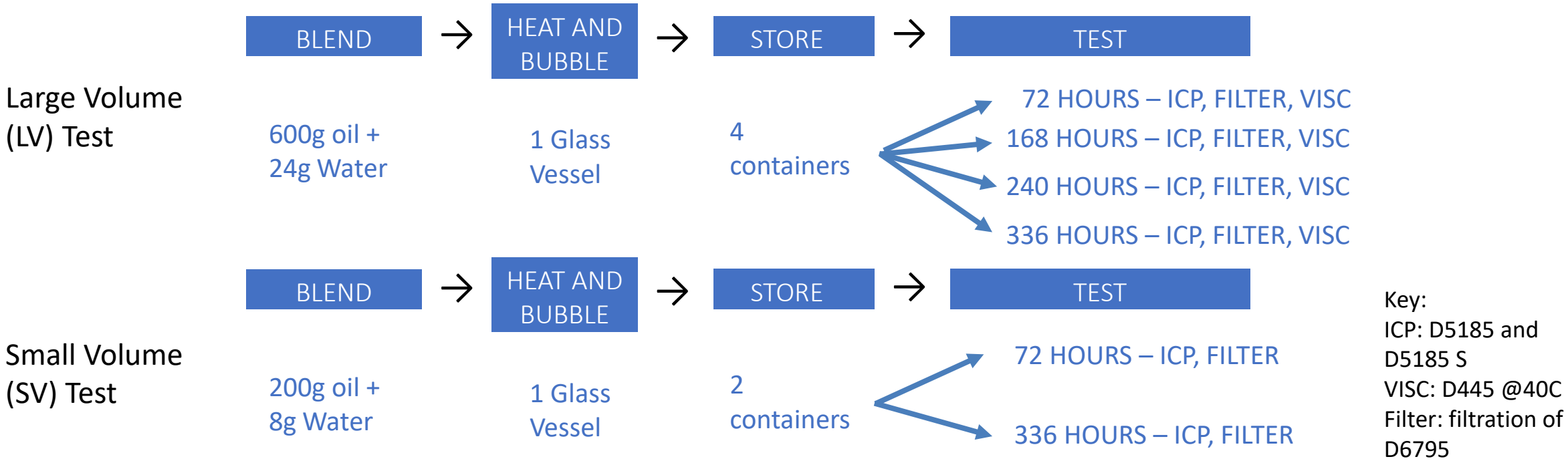
- Next Meeting: July 24 at 8:30AM CDT and every 2 weeks

Thank you for your support!

Participants		
Method Development	Oil Donations	Testing Labs
Afton ExxonMobil Ford Infineum Intertek ISP Lubrizol Oronite Savant SwRI TMC	Afton Ford Infineum Lubrizol OH Technologies (donate filters only) Oronite Subaru TMC (collection, shipping only) Toyota	Afton (Pilot and ILS) Intertek (Pilot and ILS) ISP (Pilot and ILS) Savant (ILS) SwRI (Pilot and ILS) TMC (monitoring system only) Valvoline (ILS)

Backup slides

New Filterability Test Flow



Key:
ICP: D5185 and D5185 S
VISC: D445 @40C
Filter: filtration of D6795

New Oil

Test ICP, VISC, Filter LV (@72 hours, 168 hours, 240 hours, 336 hours), Filter SV (@72 hours, 336 hours)

Zero Hour (SV & LV only)

Blend 30g oil + 1.2g Water (no heating or bubbling) → Test ICP, VISC (LV only)

Pilot Study and ILS Test Matrix

- ILS goals: 1) determine reference oil performance level, 2) precision (repeatability and reproducibility) of possible samples, and 3) select sample volume for final test
- As a TMC monitored test, this ILS needs to include high quality reference oil tests. Require running potential reference oils many repeats by labs. Target a low and high reference oil with some flexibility. Consider a border line reference as well. Will consider any existing reference oils if donated.
- Test precision: target 4-5 samples representative of current fluids to look at variance in results
- Pilot study: suggest 2-3 labs run offered potential reference oil samples to see initial expected performance on both SV and LV procedures. Data then determine which samples are included in full ILS with repeats.

- Oils Donation Volunteers: we are only looking for fluids that could be supplied as reference fluid for this test for the next 3-5 years, sample volume estimate around 330 gallons (for 5 year supply). Confirmation from Afton, Infineum, Lubrizol on oil samples provided.
- Determine sample volumes to be shipped to TMC: ?
- Determine sample volume per sample to ship to lab: ?