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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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Unapproved Minutes of the July 16, 2009 Sequence III Surveillance Panel Teleconference

The teleconference was called to order at 2:00 pm by Chairman Dave Glaenzer. The attendance is show in **Attachment 1**. Note, there was one participant that is not shown in the attendance. Allison Rajakumar (sp?) of Lubrizol will be added upon receipt of her contact information.

WPD Task Force Update

Pat Lang summarized the July 14, 2009 WPD Task Force conference call. The XOM proposal was reviewed and discussed by the task force. A Lubrizol report was also reviewed and the task force discussed other possibilities as well. With no clear consensus, a statistical group, with Pat Lang leading, was formed to re-examine the issue. Pat mentioned that they may be looking for ways the LTMS system can be used to address the issue.

Sequence IIIGB

Dave Glaenzer opened discussion of the IIIGB, noting that the establishing of targets was a prerequisite for test registration. ACC TAG has reached a consensus opinion, which was presented by Doyle Boese of Infineum. The presentation is included as **Attachment 2**. A period of questions and discussion followed, resulting in a motion:

Motion (Boese, Seman): To accept the test targets, correction factor, RSME (as the SA std. deviation) as contained in the presentation. This motion passed 11-0-1.

It was noted that to establish accurate severity adjustments, the TMC will be applying these to old reference data to bring the charts up to date. This understanding was followed by some brief discussion and another motion:

Motion (Leverett, Lang): To use the same control chart constants for the IIIGB as in the IIIG and to apply severity adjustments to candidate tests; however, IIIGB results do not determine calibration status. This would be effective 7/24/09. This motion passed 12-0-0.

Following this motion was a brief discussion regarding the status of the IIIGB research report. Dave Glaenzer offered to find out what the next steps would be and Rich Grundza offered to post the report on the TMC site.

Oil 434-1 Targets

Rich Grundza summarized the data from runs on 434-1 (**Attachment 3**). PVIS and ACLW look reasonable, however, WPD has shown a great deal of change. Rich suggested going forward using 434 targets for oil 434-1. This was agreed to and the following motion was made:

Motion (J. Bowden, Altman): Update lab charts at the next reference; all past 434-1 runs will then be added to a lab's charts. This would be effective on or after 7/24/09. This motion passed 12-0-0.

Oil 435-1 Update

This reblend is available and Rich Grundza will have it shipped to the labs. Rich noted the logistical difficulties imposed by the 8-test requirement in the IIIG LTMS and made the following motion:

Motion (Grundza, J. Bowden): Drop the 8-test requirement in the LTMS for reblends. Reblends will be introduced using the previous blend's targets until sufficient data is developed to establish new targets. This motion passed unanimously and will be effective 7/30/09.

The teleconference adjourned at 3:45 p.m.

Attachment 1

| Name/Address | Phone/Fax/Email | | Signature |
|---|--|-------------------|---------------------|
| Ed Altman Afton Chemical Corporation P.O. Box 2158 Richmond, VA 23218-2158 USA | 804-788-5279 804-788-6358 ed.altman@aftonchemical.com | Voting Member | Present _____√_____ |
| Zack Bishop Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249-3423 USA | 210-877-0223 210-690-1959 zbishop@tei-net.com | Non-Voting Member | Present _____ |
| Doyle Boese Infineum 1900 E. Linden Avenue Linden, NJ 07036 USA | 908-474-3176 908-474-3637 doyle.boese@infineum.com | Non-Voting Member | Present _____√_____ |
| Adam Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA | 440-354-7007 440-354-7080 adbowden@ohtech.com | Non-Voting Member | Present _____√_____ |
| Jason Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA | 440-354-7007 440-354-7080 jhbowden@ohtech.com | Voting Member | Present _____√_____ |
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| Timothy L. Caudill Ashland Oil Inc. 22 nd & Front Streets Ashland, KY 41101 USA | 606-329-1960 x5708 606-329-2044 tlcaudill@ashland.com | Voting Member | Present _____√_____ |
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| Name/Address | Phone/Fax/Email | | Signature |
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| Joe Franklin Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238 USA | 210-523-4671 210-523-4607 joe.franklin@intertek.com | Non-Voting Member | Present _____ |
| David L. Glaenzer Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23218-2158 USA | 804-788-5214 804-788-6358 dave.glaenzer@aftonchemical.com Surveillance Panel Chairman | Non-Voting Member | Present _____√_____ |
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| Richard Grundza ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA | 412-365-1031 412-365-1047 reg@astmtmc.cmu.edu | Voting Member | Present _____√_____ |
| Larry Hamilton The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA | 440-347-2326 440-347-4096 ldha@lubrizol.com | Non-Voting Member | Present _____ |

| Name/Address | Phone/Fax/Email | | Signature |
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| Tracey King Chrysler LLC 800 Chrysler Drive CIMS 482-00-13 Auburn Hills, MI 48326-2757 USA | 248-576-7500 248-576-7490 tek1@chrysler.com | Voting Member | Present _____ |
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| Josephine G. Martinez Chevron Oronite Company LLC 100 Chevron Way Richmond, CA 94802 USA | 510-242-5563 510-242-3173 jogm@chevrontexaco.com | Non-Voting Member | Present _____√_____ |
| Bruce Mathews GM Powertrain Mail Code 483-730-472 823 Jocyn Avenue Pontiac, MI 48340 USA | 248-830-9197 248-857-4441 bruce.mathews@gm.com Test Sponsor Representative | Voting Member | Present _____√_____ |
| Timothy Miranda Castrol Technology Center 240 Centennial Avenue Piscataway, NJ 08854 USA | 732-980-3634 973-686-4039 Timothy.Miranda@Castrol.com | Voting Member | Present _____√_____ |

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| Ron Romano Ford Motor Company Diagnostic Service Center II Room 410. 1800 Fairlane Drive Allen Park, MI 48101 USA | 313-845-4068 313-32-38042 rromano@ford.com | Voting Member | Present _____ |
| Jim Rutherford Chevron Oronite Company LLC 100 Chevron Way Richmond, CA 94802 USA | 510-242-3410 510-242-3173 jaru@chevrontexaco.com | Non-Voting Member | Present _____ |
| Philip R. Scinto The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA | 440-347-2161 440-347-9031 prs@lubrizol.com | Non-Voting Member | Present _____√_____ |
| Greg Seman The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA | 440-347-2153 440-347-4096 greg.seman@lubrizol.com | Voting Member | Present _____√_____ |
| Matt J. Snider GM Powertrain General Motors Corporation MC - 483-730-322 823 Joclyn Rd. Pontiac, MI 48090-9055 USA | 248-672-3563 248-857-4441 mathew.j.snider@gm.com | Non-Voting Member | Present _____√_____ |

| Name/Address | Phone/Fax/Email | | Signature |
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| Mark Sutherland Chevron Oronite Company LLC 4502 Centerview Drive Suite 210 San Antonio, TX 78228 USA | 210-731-5621 210-731-5699 msut@chevrontexaco.com | Voting Member | Present _____√_____ |
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| Joe Vujica The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA | 440-347-2058 440-347-4096 jsvu@lubrizol.com | Non-Voting Member | Present _____ |
| Jerry Wang Chevron Oronite Company LLC 7080 Colchester Lane Ypsilanti, MI 48197 | 734-48- 3806 none jwdy@chevron.com | Non-Voting Member | Present _____ |

Attachment 2



Sequence III GB Analysis

D. Boese

June 26, 2009

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Summary

- Analysis of the Sequence IIIG reference oil data indicates that Phosphorus Retention appears to have become severe relative to that included in the initial study of Phosphorus volatility.
- On average, the reference oil Phosphorus Retention decreased 0.8% in the period of November 2006 through November 2008 relative to the period over which the initial dataset was collected (April 2003 through November 2006) and an additional 0.8% since the inception of the new procedure (November 2008).
- Recommended targets ([and individual oil standard deviations](#)) for the reference oils based on the initial data set are:
 - ❑ 434: 76.0% ([2.02%](#))
 - ❑ 435: 82.4% ([2.28%](#))
 - ❑ 438: 78.2% ([2.56%](#))
 - ❑ The associated RMSE (estimated overall or pooled standard deviation) is 2.33%.
- A recommended adjustment to the results from the new procedure is the addition of 1.61% to correspond to the results in the initial study (and targets).

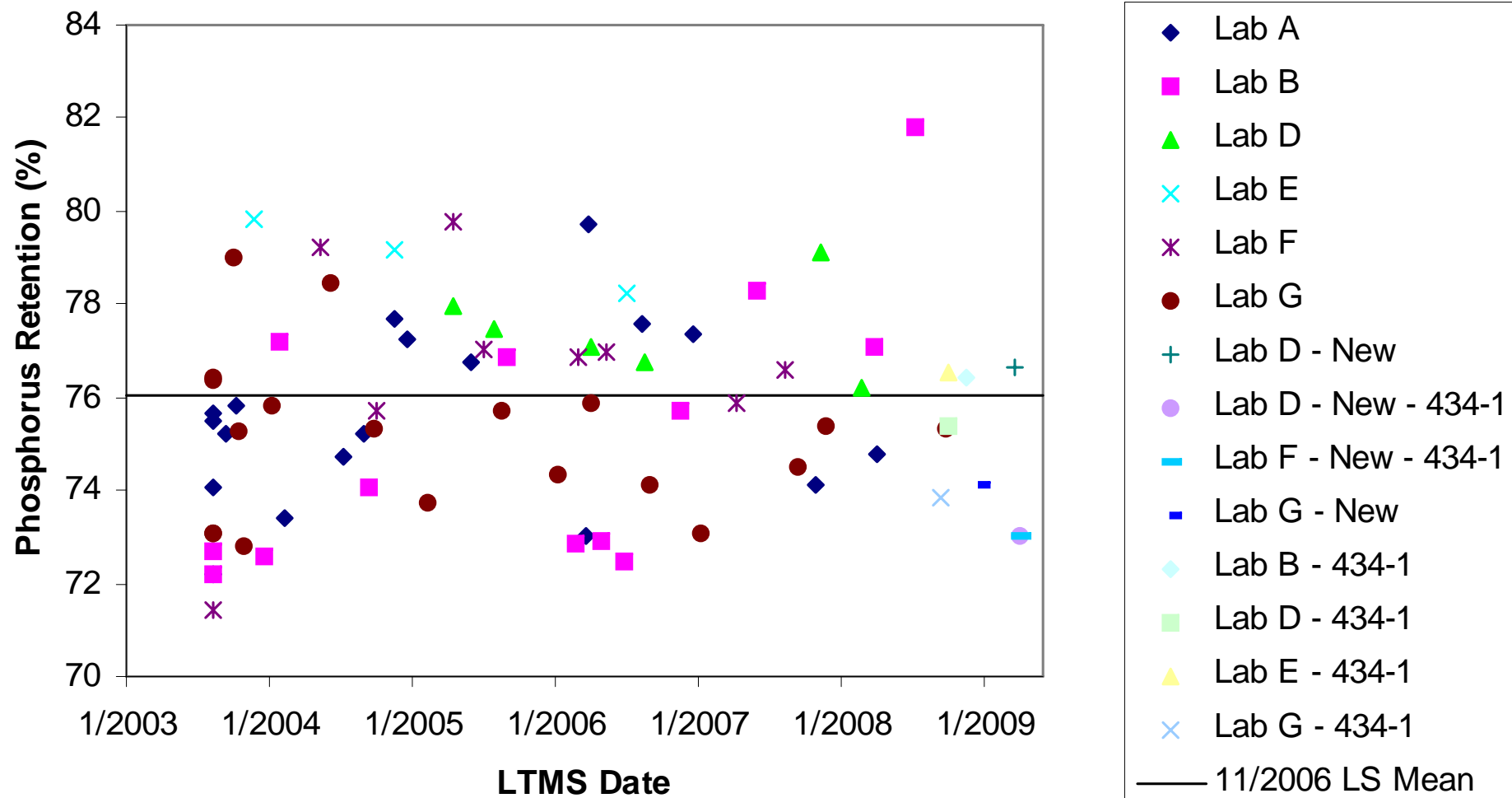
Phosphorus Retention Data

- Data was obtained from the TMC database.
- Includes:
 - 218 results using “old” measurement procedure (Old)
 - 158 through 11/20/2006 – Initial dataset (Includes Lab E data not in the 2006 TMC data set but covers the same period.)
 - 60 from 11/2006 through initiation of the “new” procedure (11/6/2008)
 - 15 results using “new” measurement procedure (New)

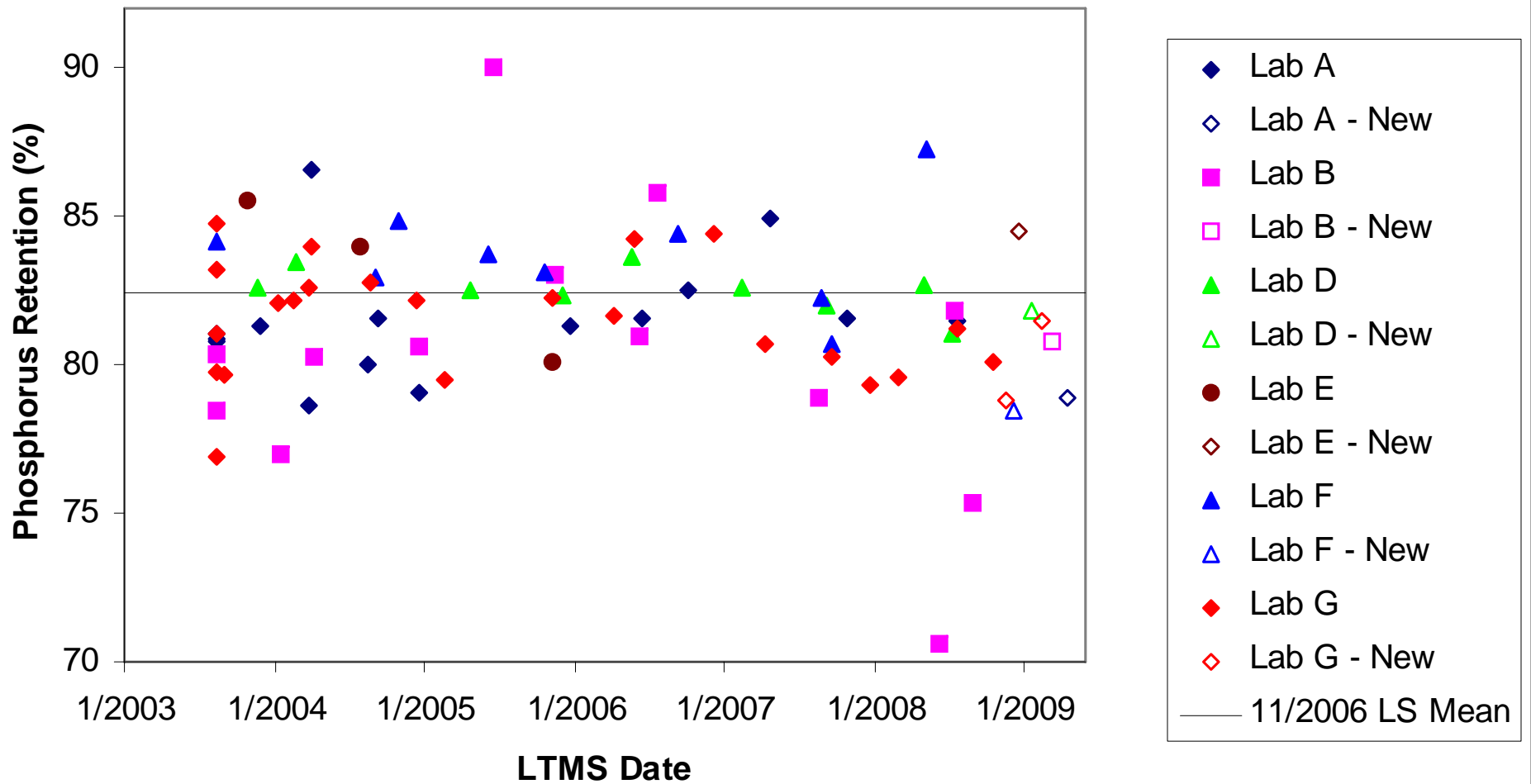
Unadjusted Phosphorus Retention

- The plots on the following three slides are unadjusted Phosphorus Retention versus Date by Oil.
- The plots indicate that 12 of the 15 New results are below the LS Means calculated from the initial set of data (through 11/20/2006).
 - Oil 434: 3 of 4 are below the LS Mean for 434
 - Oil 435: 6 of 7 are below the LS Mean for 435
 - Oil 438: 3 of 4 are below the LS Mean for 438

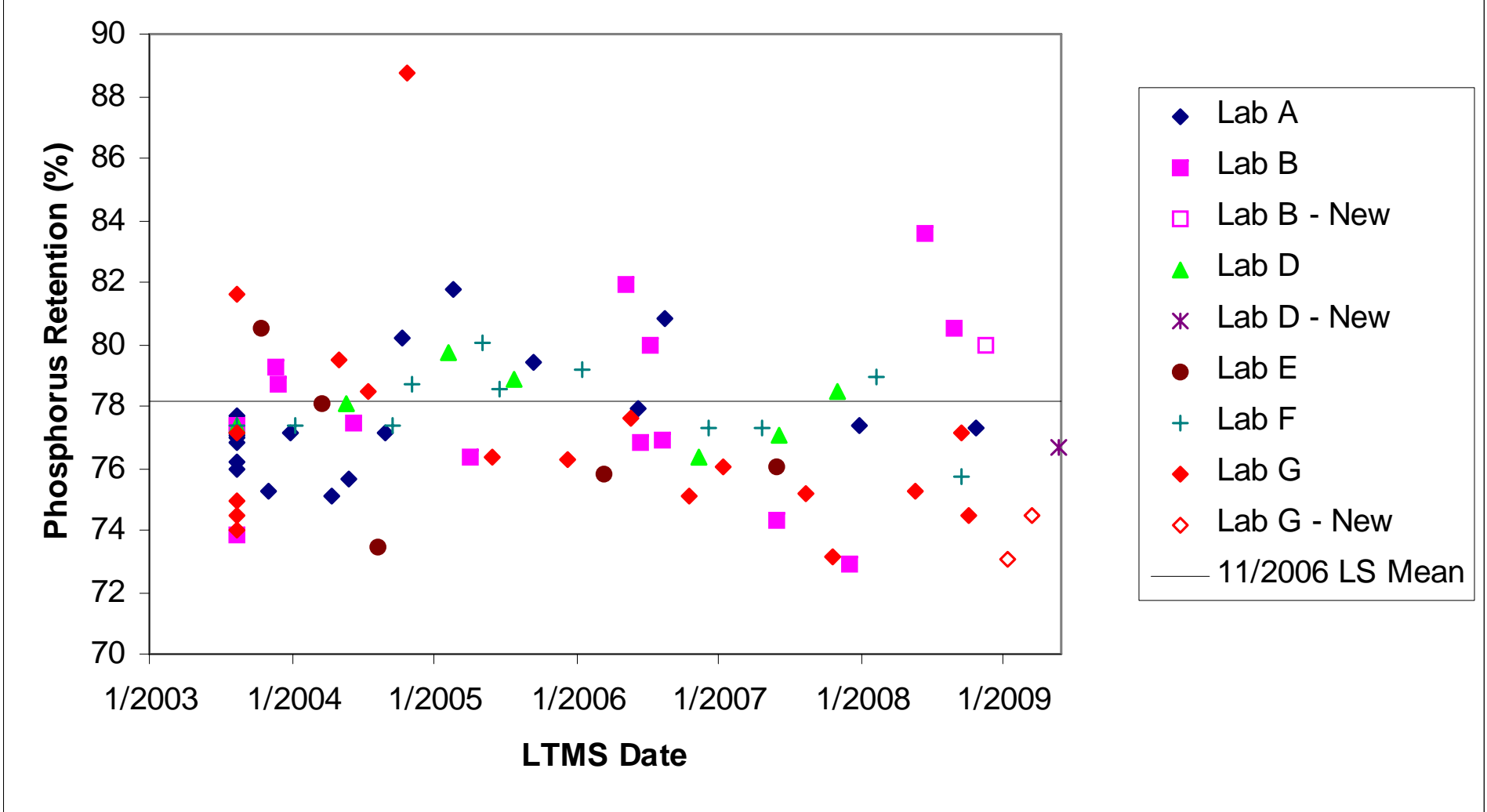
Unadjusted Oil 434 Phosphorus Retention



Unadjusted Oil 435 Phosphorus Retention



Unadjusted Oil 438 Phosphorus Retention



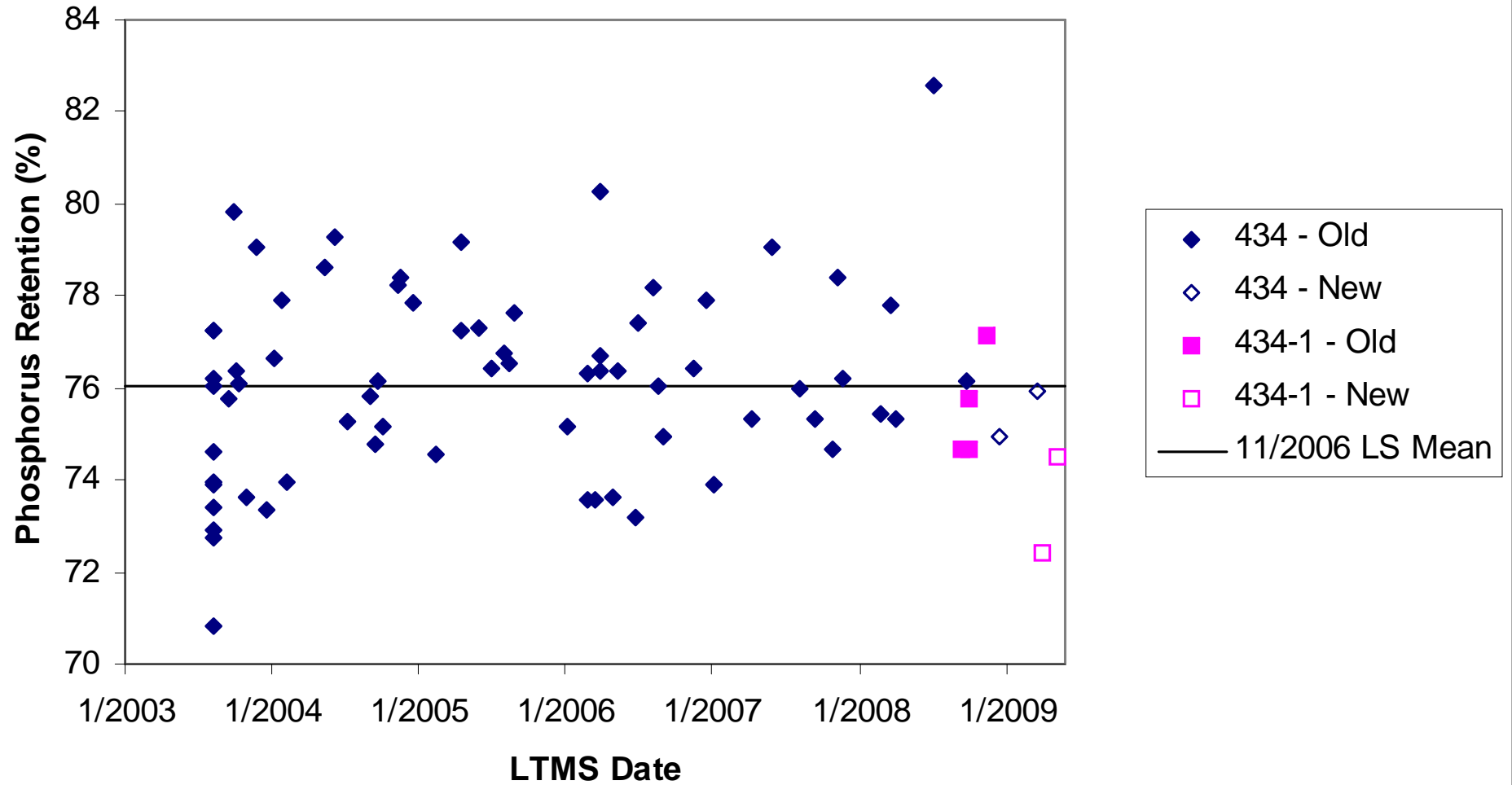
Lab Adjusted Phosphorus Retention

- Lab adjustments were determined based on regression analysis of Phosphorus Retention with predictors: Oil and Lab.
- The Lab adjustments are in the table to the right.
- The plots on the following three slides indicate that 13 of the 15 New lab adjusted Phosphorus Retention results are below the 11/2006 LS Means.

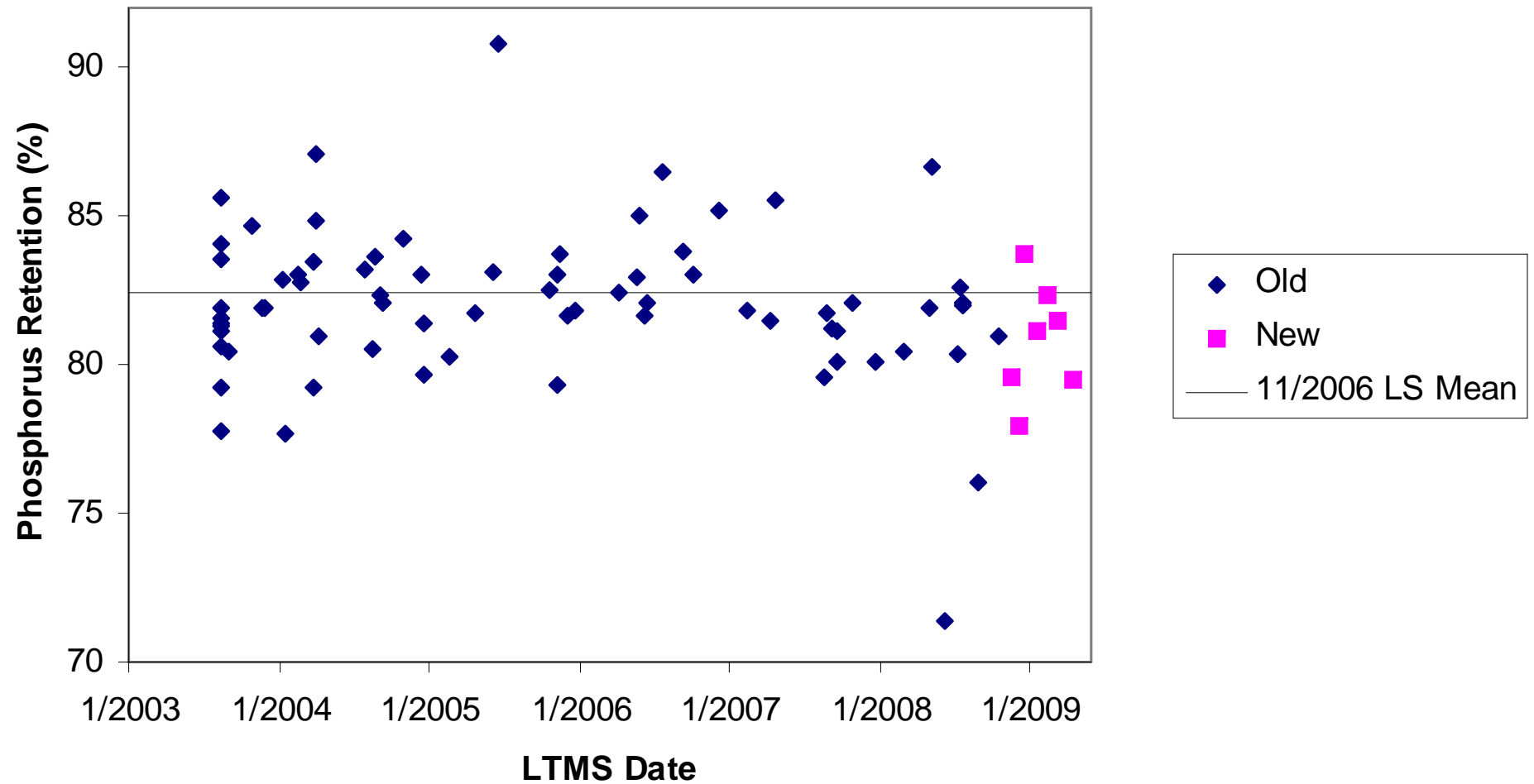
Lab Adjustments

| Lab | Adjustment |
|-----|------------|
| A | 0.55 |
| B | 0.73 |
| D | -0.72 |
| E | -0.80 |
| F | -0.59 |
| G | 0.83 |

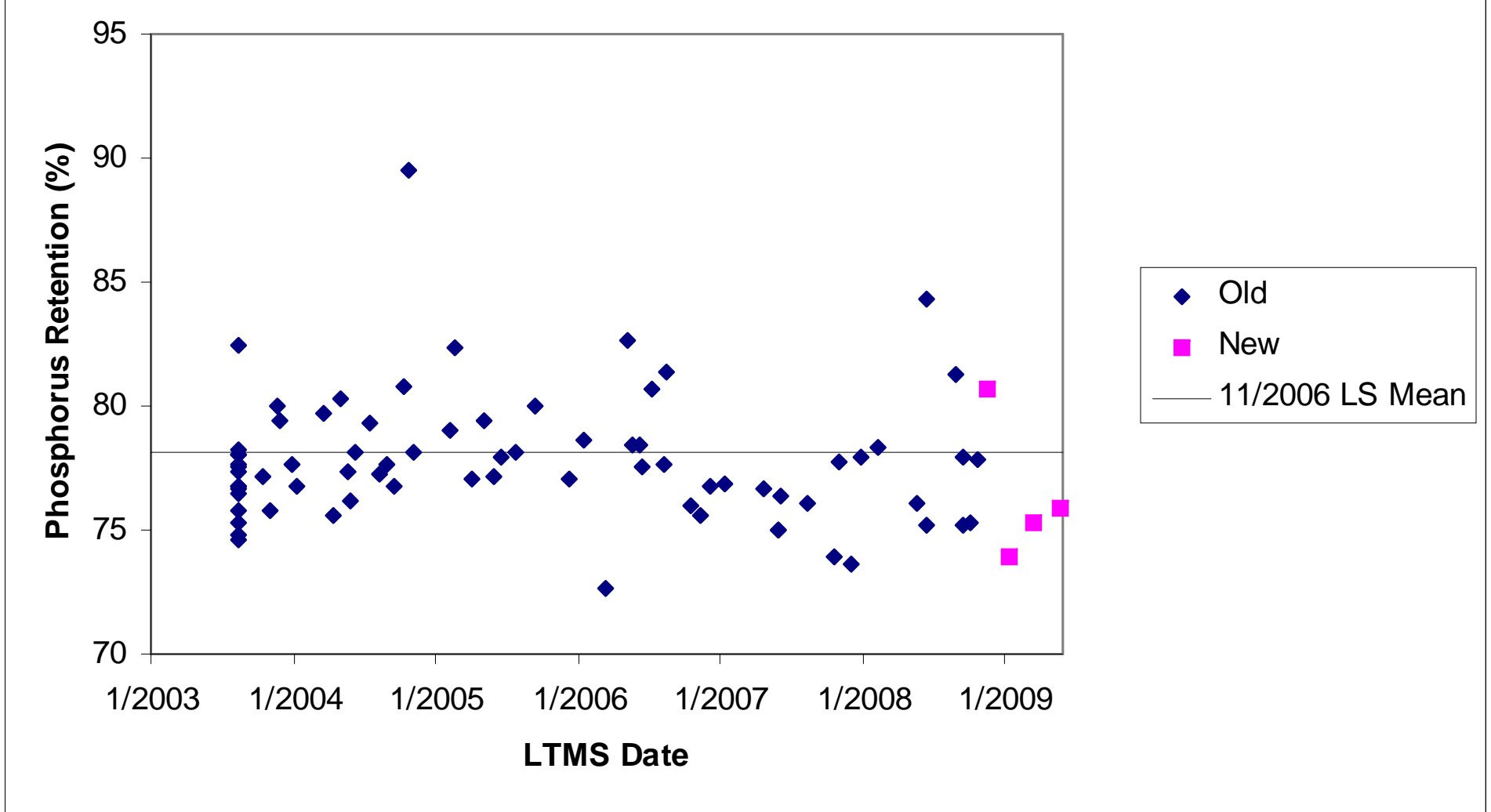
Lab Adjusted Oil 434 Phosphorus Retention



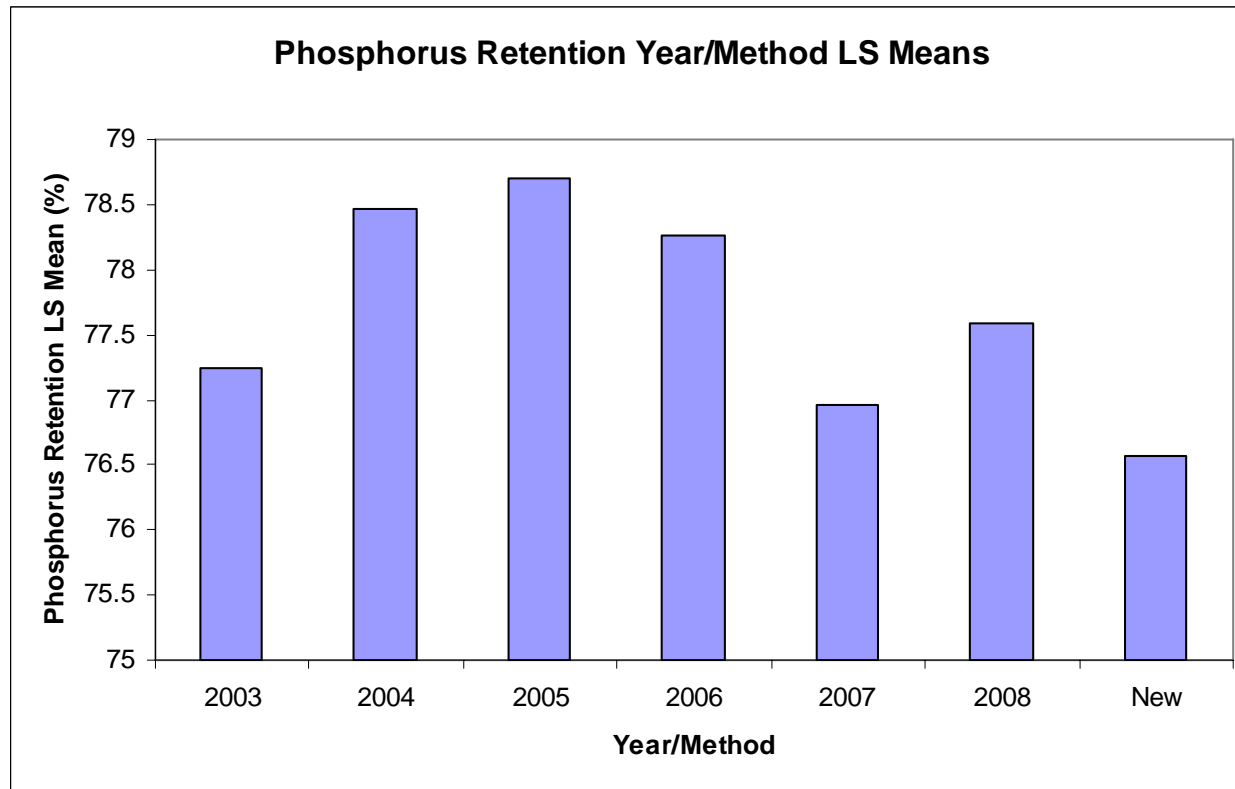
Lab Adjusted Oil 435 Phosphorus Retention



Lab Adjusted Oil 438 Phosphorus Retention

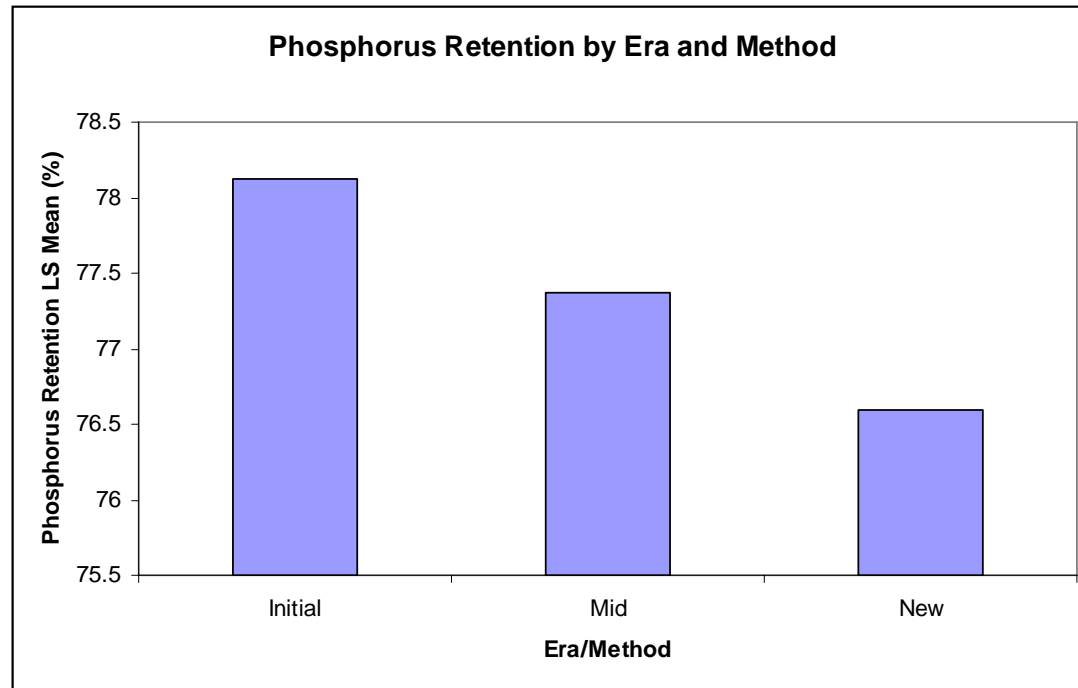


Year and Method Effects on Phosphorus Retention



- Regression analysis was performed on Phosphorus Retention with Lab, Oil and Year/Method as predictors. Results included in all numbered years are measured with the Old procedure.
- The Phosphorus Retention is directionally lower for 2007 and forward relative to 2004 through 2006.
- Utilizing Dunn-Sidak procedure, pairwise comparisons were made between New and each of the years 2003 through 2008, 2004 and 2005 are statistically significantly different from New (family-wise $\alpha = 0.1$).

Era and Method Effects on Phosphorus Retention



- Regression analysis was performed on Phosphorus Retention with Lab, Oil and Era/Method as predictors.
 - Initial pertains to data through 11/20/2006.
 - Mid pertains to data since 11/20/2006 through the initiation of the New procedure.
- On average the reference oil Phosphorus Retention decreased 0.8% in the Mid period relative to the Initial period and an additional 0.8% since the inception of the New procedure.
- Via Tukeys multiple comparison procedure, the Initial and New Phosphorus Retentions are statistically significant different (family-wise $\alpha = 0.1$).

Reference Oil Targets and Correction Factor

- Utilizing the Initial data set, Phosphorus Retention was regressed on Oil and Lab. The Phosphorus Retention LS Mean (and individual oil standard deviation) for each Reference Oil follows:
 - 434: 76.02% (2.02%)
 - 435: 82.43% (2.28%)
 - 438: 78.18% (2.56%)
- The estimated pooled standard deviation (RMSE) based on the above model and data set is 2.33%.
- These LS Means can be used as reference oil targets for the Sequence IIIGB.
- Based on the full data set, Phosphorus Retention was regressed on Oil, Lab and Era. The difference between the LS Mean of Initial and that of New is 1.61%.
 - This delta can be used to adjust the results from the new procedure to account for the shift from the Initial Era (from which the targets were derived).

Results Measured Using Old and New Procedure

- There are results from four tests which are in the Old database as well as in the New database.
- **Apparently**, both the Old and New procedures were performed on these tests.
- The New procedure yielded higher Phosphorus Retention on three of the four tests with an average delta of 0.14% (New – Old).



Attachment 3

Sequence IIIG 434-1 Targets

June 8, 2009

Status of Tests to Date

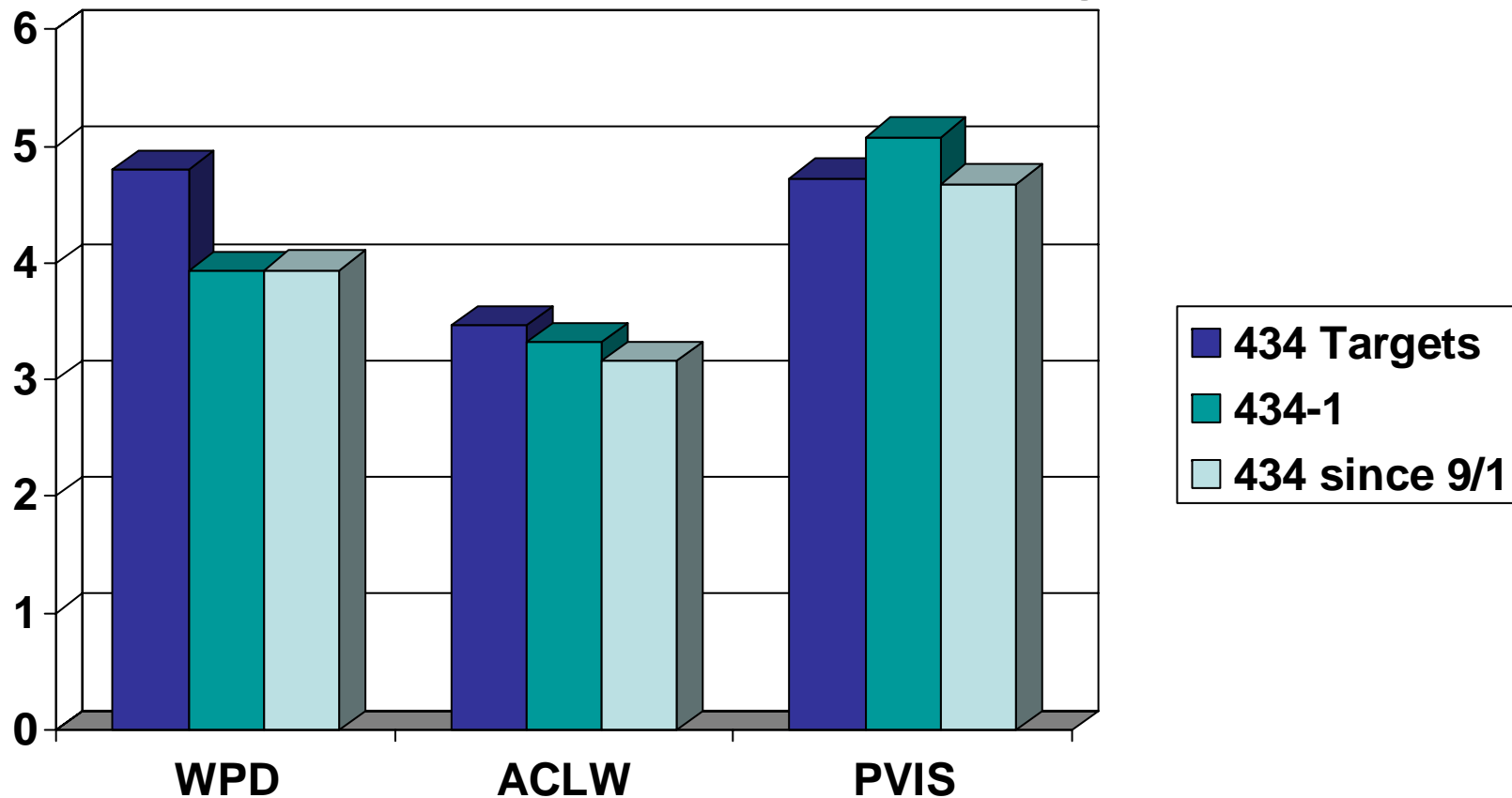
- Eight tests completed to date
- Ninth test assigned

Results to Date

| LTMSLAB | PVIS | PVIS SA | WPD | WPD SA | ACLW | ACLW SA |
|---------|--------|---------|------|--------|------|---------|
| G | 83.1 | 0 | 3.83 | 0.4756 | 13.1 | 0 |
| E | 158.5 | 0 | 3.8 | 0 | 25.8 | 0 |
| D | 67.4 | 0 | 4.01 | 0 | 22.5 | 0 |
| B | 1127.4 | 0 | 2.75 | 0.3577 | 51.7 | 0 |
| A | 73.9 | 0 | 3.37 | 0.6906 | 46.7 | 0 |
| D | 667.9 | 0 | 3.11 | 0.3301 | 22.9 | 0 |
| G | 120.6 | 0 | 3.94 | 0.4953 | 19.4 | 0.1374 |
| F | 75.5 | 0 | 4.33 | 0 | 29.2 | 0.2382 |



Comparison to Current Targets and Performance of 434



Results in Transformed units (ACLW PVIS) and severity adjusted where appropriate. Three WPD results and one ACLW result severity adjusted.

Summary of Means and Standard Deviations

| Parameter | Mean 434-1 | Std Dev 434-1 | Mean 434 | Std Dev 434 |
|-----------|---------------|------------------|-------------|----------------|
| WPD | 3.94 | 0.46 | 4.80 | 0.96 |
| PVIS | 5.0809 | 1.087 | 4.7269 | 0.3859 |
| ACLW | 3.3215 | 0.4535 | 3.4657 | 0.1993 |