CCQTA

Canadian Crude Quality Technical Association

CCQTA BITUMEN DEWATERING AND VOLUMETRIC CORRECTION

COQA San Antonio 2016

Agenda

- Background
- Blend Study
  - Samples
  - Blends
  - Data Vetting
  - Correction Factor
  - Before – After
  - Conclusions
- Next Steps

Background

- Development of a standard dewatering and solids removal procedure to prepare bitumen for analysis.
  - Stems from AB Energy Bitumen Assay Program
  - Data and results provided to CCQTA to report findings
- Development of improved blend prediction calculations
  - AB bitumen outside the limits of API 12.3
  - API 12.3 known to be inadequate from practical experience in the Western Canadian Sedimentary Basin
  - CCQTA project initiated to perform blend study

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Blend Study

Samples

- Clean bitumen samples provided by AB Energy
  - Cover the range of density found in Alberta (6 – 12 °API)
  - Cover the major regions of production (Athabasca, Cold Lake, Peace River)
- Diluent samples provided by CQI
  - Custom blended diluents to cover a range of densities (60 – 74 °API)
  - One super light diluent (83 °API)
  - One blend of sweet synthetic crude

Blends

- Final blend matrix included
  - 4 different bitumen samples
  - 6 different diluent samples
  - 7 different diluent concentration levels

= 168 individual blends

Data Vetting

- Initially attempting to observe extremely small variance in density measurements
- Numerous re-blending and measurement before acceptance based on observed trends, spacing, linearity, etc.

Correction Factor

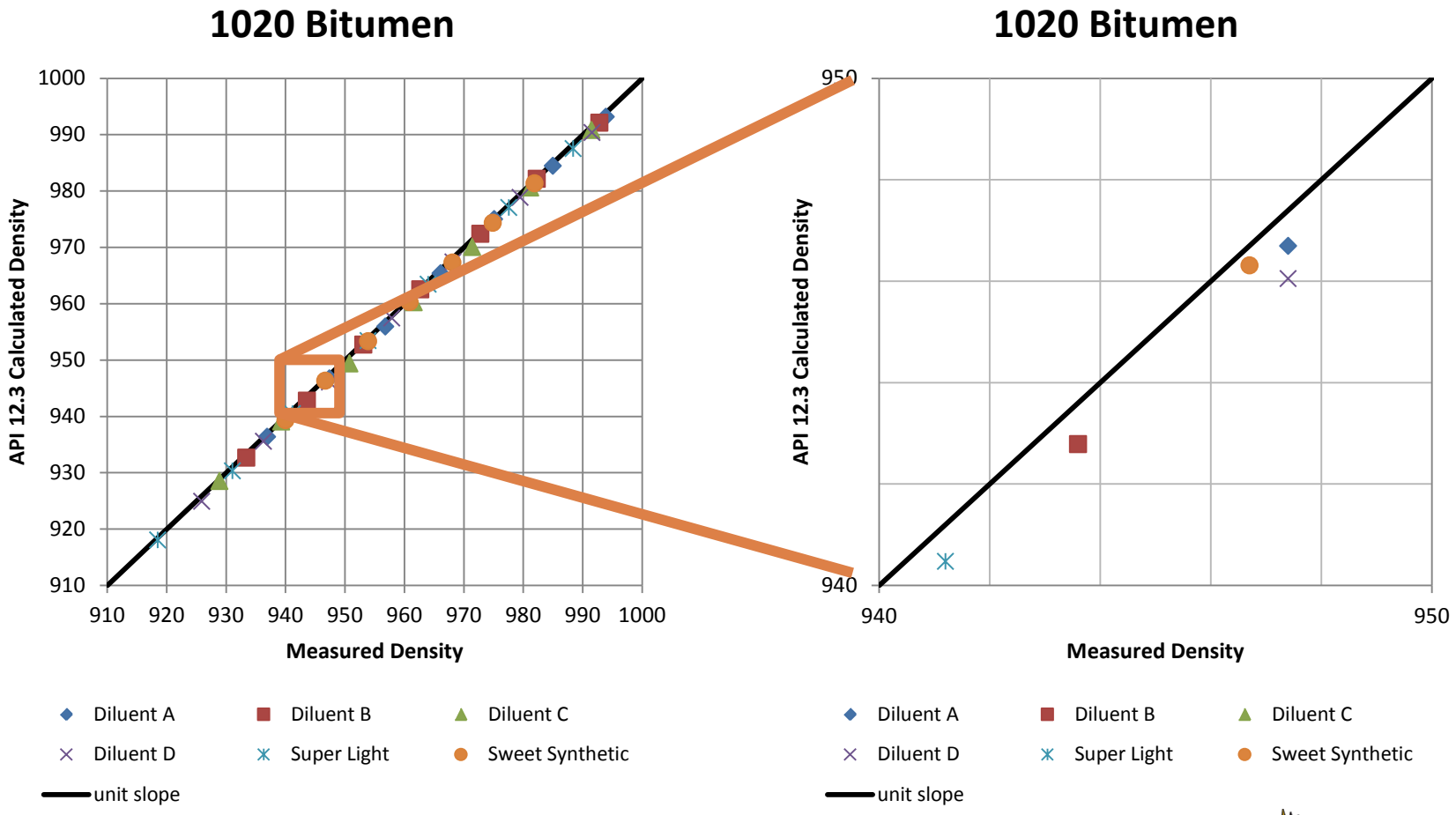
- Rather than establishing a new equation, the simplest solution was to modify API 12.3 with a correction factor
  - API 12.3 was consistently under predicting blend density so a correction factor made sense

$$S_{API\ 12.3} = 4.86 * 10^{-8} C(100 - C)^{0.819} G^{2.28}$$

$$S_{AB\ Bitumen} = 5.73 * 10^{-8} C(100 - C)^{0.819} G^{2.28}$$

Before

Diluent A ≈ 741 kg/m^3
Diluent B ≈ 724 kg/m^3
Diluent C ≈ 708 kg/m^3
Diluent D ≈ 690 kg/m^3
Super Light ≈ 663 kg/m^3
Sweet Synthetic ≈ 863 kg/m^3



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After

Diluent A ≈ 741 kg/m^3
Diluent B ≈ 724 kg/m^3
Diluent C ≈ 708 kg/m^3
Diluent D ≈ 690 kg/m^3
Super Light ≈ 663 kg/m^3
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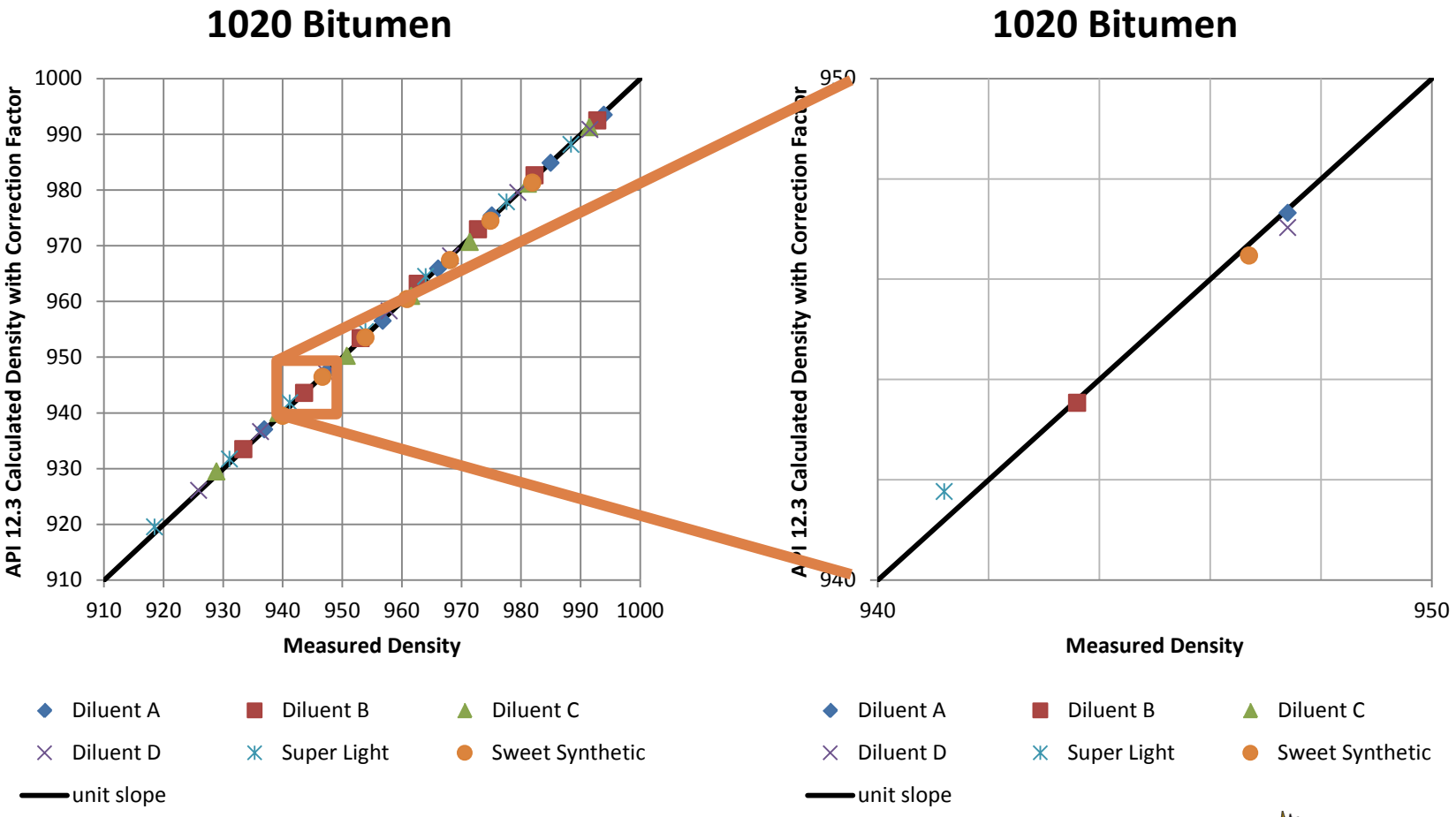

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Conclusions

- Prediction calculation precision improved when using the correction factor
- Recommend these findings be made available for public access

Next Steps

- Final report in completion/review stage before posting to CCQTA website for open access
- Establish communication with API
  - Obtain API dataset and review as a whole
  - Best method to publicize (amendment, extension, exception…?)
- Viscosity blend model