



Quality Standard's Modeling Annex

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The Real Credit Goes to:

- **John Smaldone**, Region 1, the author
- **Gerry Sotolongo**, R 1, primary editor
- **CREM** members who gave comments and had produced the CREM guidance
- Environmental Data Standard Work Group led by Gary Johnson and Connie Thoma
- Reggie Cheatham, Director, Quality Staff, for supporting use of CREM expertise

What's This Talk About?

- **Modeling** in the context of EPA's QA program
 - Quality policy letters and numbers
 - QA policy and the CREM

- QA requirements for **modeling**
 - Environmental data standard organization
 - Emphasis of Annex D

QA Policy: ABCs and 123s

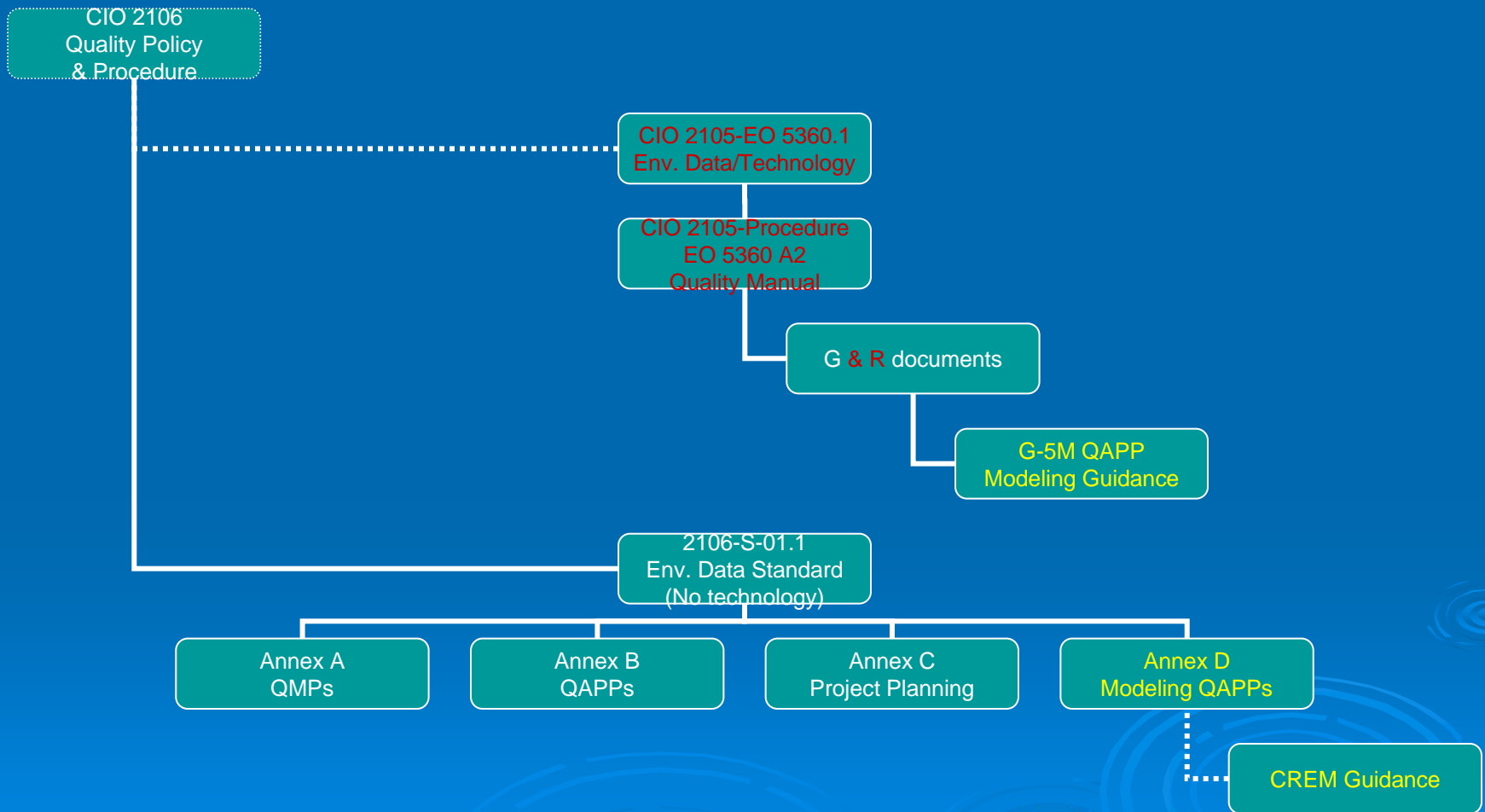
- CIO 2106 (“Quality Policy”)
 - “Umbrella”; signed 10/2008
 - External products & services
- CIO 2105 (QA Order 5360.1)
- & Procedure (Order 5360 “Quality Manual”) and G & R documents
 - **Collection/evaluation/use of environmental data**
 - Design/construction/operation of environmental technology



Draft Environmental Data Policy

- To replace CIO 2105 Policy & Procedure & possibly requirements and guidance
- **DRAFT #7ab(2106-S-01.0) – Quality Standard for Environmental Data Collection, Production, and Use**
 - Annex B – Requirements for a QAPP
 - Annex D – Guidelines for Satisfying QAPP Requirements for **Models**

Modeling guidance is not new!



QA Policy and the CREM



- Quality Staff and CREM history is long
- **Annex D** [& B] is based upon CREM guidance
 - Began summer 2009
 - Many drafts
 - Expert peer review for each draft, including ORD & regions

QA Requirements for **Models**

- Organization of the Draft Standard
 - Annex A Requirements for Quality Management Plans
 - Annex B **Requirements** for QA Project Plans (QAPP) [includes models]
 - Annex C Guidelines for Project Planning
 - Annex D Guidelines for Satisfying QAPP Requirements for **Models**

Annex D's 7 Sections

- Purpose; Background; References (last)
- Life-cycle evaluation of models (& graded approach)
- Development and/or modification of computational models
- Satisfying project plan requirements for
 - Model *development* and/or *modification*
 - Model *application*



Annex D Emphasizes

- Evaluate early & often - during *all* phases
- 6 types of evaluation to consider
 - peer review
 - test cases
 - corroboration of model results with observations
 - benchmarking against other models
 - sensitivity and uncertainty analysis
 - model resolution capabilities
- Use a graded approach

Modeling at EPA

- EPA modeling is primarily
 - Development and/or modification, and
 - Application of existing models
- A graded approach to documentation is recommended [ORD is referenced]
- Examples from Annexes B & D
 - Purpose, scientific basis, data requirements
 - Algorithms, assumptions, data base specs

Conclusion

QA policy for modeling is a model for leveraging practitioner expertise for continuous improvement at EPA

