One Size Does Not Fit All –
EoR Legacy Design and Scalability

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Where are we?

A Declining Resource Base?

- A small professional community
  - Small niche skill group
- Inherent dearth of resources
  - Cyclic Industry with attrition during down markets
  - 1990s dot-coms
  - Deemphasis of engineering as a profession
    - Past declining enrollment
    - Current movement to State and Federal positions
- Ongoing Senior attrition (Father Time)
- Requires continues “on-the-job” training
Figure 2-12

Thousands

NOTE: Enrollment data include full- and part-time students.

Science and Engineering Indicators 2012
Current Trends

• Changing state of the practice driven by
  • Improved understanding and tools
  • Recent failures have forced paradigm change
  • Building higher and larger
  • Corporate reputation and risk awareness

• Tailing renaissance ahead?
  • Reduced hydromet
  • Abundant deep sulfides

• Increasing mine life (+30 years)
EoR Program Support – Current Minimums

- Operations
  - Qualified internal engineering support
  - Corporate commitment and investment
  - Increased operations investment
  - Tailing stewardship programs
- External 3rd party review
  - Increased investment
  - Stewardship teams
  - Guidance accountability
- External review boards
  - Qualified leadership
Tailing Stewardship – Typical Profile

• Owner Team
  • Program Director, a “corporate champion”
  • Internal experienced civil engineers (geotechnical and water resources)

• External Review Team
  • EoR (design and/or operations) direct engagement
  • Multiple external supporting teams
  • Annual 3rd party Review

• Technical Review Board
  • 2 or more members from academia or private practice
  • Renowned experts in respective fields (geotechnical and water resource engineering, seismologist, etc.)
  • 5-year interval and major projects
Strategy for EoR Teams

- External professionals
  - Qualified senior professionals
  - Focus on geotechnical and operations experience
  - Internal training programs
  - Sustainability cycle
- Consider multiple EoR groups
  - Built-in peer review
  - Improved attrition planning
  - Resource base diversity
- Scalable
  - Start small; go big
EoR Legacy Planning and Scalability

EoR requirements need to be sufficiently flexible to

• Accommodate all project sizes
  • Accommodate teams and multiple EoRs
• Account for project length
  • Attrition planning
• Maintain qualified personnel and expertise
• Continuing education of all stakeholders
• Utilize team approach to leverage resources