Review of Pre-Workshop Survey Results & Discussion

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Pre-Workshop Survey

Pre-Workshop Survey on the Engineer of Record (EOR) role for Tailings Storage Facilities (TSFs) was developed to:

- Obtain information on the current state of practice
- Identify concerns within the engineering community
- Receive opinions regarding EOR issues

TSF should be considered a mine or mineral processing tailings dam and impoundment, or a coal combustion residuals or coal refuse impoundment. EoR services include formal designation as the Engineer of Record, as well as situations where an engineer’s certification of the design and/or construction are required.
Pre-Workshop Survey

The survey was developed by members of the Geoprofessional Business Association (GBA) Tailings EoR Task Force, with input from the US Society on Dams (USSD) Committee on Tailings Dams for use and presentation at GBA’s Tailings EoR Workshop on January 26, 2017. GBA administered the survey and provided compiled results for this presentation. The following slides present a summary of the results for many of the questions.
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Survey Response
• Period: Jan. 9-24, 2017
• 45 Responses Received
• 21 Engineering Firms
• 2 State Regulatory Agencies
• 2 Mining Companies

Repondents
- State Regulator Rep.
- Mining Co. Rep.
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Background on Respondents Involvement with TSFs in last 5 years (3 & 4)

Relative No. of TSFs

- Coal Refuse
- Metal Tailings
- Combustion Residuals
- Other Tailings

- Personal Involvement
- Organization Involvement
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Respondents Geographic Distribution of Practices (5)

- United States: 35
- Canada: 22
- Other Countries: 28

No. of Respondents
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Respondents Years of Experience (6 & 7)

Years of Professional Experience

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<th>Years of Experience</th>
<th>No. of Respondents</th>
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Years of TSF Experience

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Relative Proportion of TSF that are Incrementally Expanded over long period (9)

- Virtually all raised incrementally: 21 respondents
- Most raised incrementally: 14 respondents
- About half raised incrementally: 4 respondents
- Few raised incrementally: 3 respondents
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TSF Elements Incorporated into Projects requiring EOR services (1 of 2) (12)

- Issued for Const. Plans and Specs.: 32 [Frequently or Always: 32, Occasionally: 6, Infrequently or Never: 0, Don’t Know or N/A: 0]
- Geotechnical Site Characterization: 35 [Frequently or Always: 35, Occasionally: 0, Infrequently or Never: 0, Don’t Know or N/A: 0]
- Conceptual / Feasibility Level Design: 33 [Frequently or Always: 8, Occasionally: 0, Infrequently or Never: 10, Don’t Know or N/A: 10]
- Borrow Material Characterizations: 33 [Frequently or Always: 10, Occasionally: 0, Infrequently or Never: 10, Don’t Know or N/A: 10]
- Dam Safety Reviews: 30 [Frequently or Always: 2, Occasionally: 0, Infrequently or Never: 9, Don’t Know or N/A: 10]
- Surface Water Mgt. Plans: 28 [Frequently or Always: 10, Occasionally: 0, Infrequently or Never: 10, Don’t Know or N/A: 0]
- Operational & Maintenance Manual: 25 [Frequently or Always: 10, Occasionally: 0, Infrequently or Never: 10, Don’t Know or N/A: 5]
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Additional Element: Corrective Action Plan
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TSF Project Participants (14)

- **Regulatory Agency Design Review**
  - Frequently or Always: 30
  - Occasionally: 9
  - Infrequently or Never: 2
  - Don't Know or N/A: 2

- **Third-Party Design Review**
  - Frequently or Always: 12
  - Occasionally: 17
  - Infrequently or Never: 8
  - Don't Know or N/A: 2

- **Independent Board for Design**
  - Frequently or Always: 9
  - Occasionally: 14
  - Infrequently or Never: 10
  - Don't Know or N/A: 5

- **Independent Board for Construction / Operation**
  - Frequently or Always: 8
  - Occasionally: 13
  - Infrequently or Never: 10
  - Don't Know or N/A: 6

- **Client Only (no interaction with other participants)**
  - Frequently or Always: 10
  - Occasionally: 10
  - Infrequently or Never: 13
  - Don't Know or N/A: 4
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Contract Provisions Included in EOR Services (16)

- Professional Liability Insurance Coverage: 29 (Frequently or Always), 2 (Occasionally), 3 (Infrequently or Never), 6 (Don’t Know or N/A)
- Commercial General Liability Insurance: 27 (Frequently or Always), 4 (Occasionally), 2 (Infrequently or Never), 7 (Don’t Know or N/A)
- Safety & Health: 22 (Frequently or Always), 7 (Occasionally), 4 (Infrequently or Never), 5 (Don’t Know or N/A)
- Participation of Key Personnel: 22 (Frequently or Always), 10 (Occasionally), 4 (Infrequently or Never), 4 (Don’t Know or N/A)
- Dispute Resolution RE: EOR Recommendations: 9 (Frequently or Always), 14 (Occasionally), 9 (Infrequently or Never), 6 (Don’t Know or N/A)
- Termination & EOR Transition: 6 (Frequently or Always), 8 (Occasionally), 17 (Infrequently or Never), 7 (Don’t Know or N/A)
Identify the Tasks or Services that are included in your EOR design services projects (18)

- Engineering Design Analyses: 36 (Frequently or Always), 4 (Occasionally)
- Construction Plans & Specifications: 35 (Frequently or Always), 4 (Occasionally)
- Geotechnical Site Characterization: 34 (Frequently or Always), 6 (Occasionally)
- Dam Safety Review Plans: 33 (Frequently or Always), 7 (Occasionally)
- Borrow Material Investigations: 31 (Frequently or Always), 8 (Occasionally)
- Operation & Maintenance Manual: 26 (Frequently or Always), 9 (Occasionally)
- Closure Plans & Cost Estimates: 22 (Frequently or Always), 14 (Occasionally)
- Env. Impact & Protection Plans: 13 (Frequently or Always), 20 (Occasionally)
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Identify the tasks or services that are included in your EOR construction and/or operations projects (19)

- Construction Monitoring
- Dam Safety Review
- Const. Report with As-Built Doc.
- Engr. Support Services for Plan Mod.
- Construction Certification by PE
- Updating of Closure Plans & Costs
- Operational Monitoring
- Environmental Monitoring

Legend:
- Frequently or Always
- Occasionally
- Infrequently or never
- Don't Know or N/A
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Indicate if you view the following as concerns for your EOR Services (1 of 2) (22)

- Process to Implement EoR Recommendations
- Documentation on Tailings Production and Processing
- Verification of Tailings Charact. & Design Parameters
- EoR approval of design mod. during const. / operations
- Definition of Scope of Work
- Documentation on Work Performed by the Preceding EoR

No. of Respondents

- Frequently or Always
- Occasionally
- Infrequently or Never
- Don’t Know or N/A
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Indicate if your view the following as concerns for your EOR services (2 of 2) (22)

- **Process for Continuation of EoR Services**: 13 (Frequently or Always), 20 (Occasionally), 6 (Infrequently or Never), 3 (Don't Know or N/A)
- **Tailings Variability**: 12 (Frequently or Always), 20 (Occasionally), 7 (Infrequently or Never), 3 (Don't Know or N/A)
- **Capabilities of Other TSF Project Participants**: 11 (Frequently or Always), 22 (Occasionally), 5 (Infrequently or Never), 3 (Don't Know or N/A)
- **Environmental Issues**: 9 (Frequently or Always), 22 (Occasionally), 9 (Infrequently or Never), 2 (Don't Know or N/A)
- **PE (or PEng) Certification Requirements**: 10 (Frequently or Always), 12 (Occasionally), 5 (Infrequently or Never), 5 (Don't Know or N/A)
- **Idling or Closure with hiatus in operation**: 6 (Frequently or Always), 20 (Occasionally), 10 (Infrequently or Never), 5 (Don't Know or N/A)
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What do you consider to be the responsibilities of the Owner on TSF Projects (24)

- Providing Qualified Personnel: 38
- Safety & Health Program: 39
- Qualifications-Based Procurement: 34
- Risk Management Program: 36
- Reg. Comp. & Auditing Program: 34
- Independent Review Board: 22

Additional Responsibility:
Procedure to address EOR concerns and corrective actions recommendations
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Awareness of challenges of providing EOR services (26) and development of internal policy for EOR services (27):

- 95% of respondents are somewhat aware to very much aware
- 40% of respondents indicate that an internal policy has been or is being developed at their firm

Is there a need for an industry document that clarifies the EOR role and the responsibilities of both the Owner and EOR (28):

![Bar chart showing responses to the question.]

- Yes: 40
- No: 5
- I don't know or No Opinion: 10
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View of Owner’s Perspective on the EOR’s Role (30)

Comments:

- Ranges significantly
- Dependent on site and owner’s qualifications and understanding
- Takes time to build support
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Need for separate designation/definition of the EOR relative to design, construction and/or operation (32):

28 – yes

9 - no

Comments:

• Current definition of Designer of Record and distinction from EOR for construction
• Different qualifications and responsibilities
• Recognition of need for transition given facility life
• EOR needs to take responsibility for design through operation for consistency, safety, and holistic terms, and other professionals support the EOR on certain design or construction issues
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How have you addressed design responsibility and professional liability when retained for EOR design service (33):

• Defined scope of services, responsibilities, obligations
• Documentation of identified risks and concerns
• Contract language and limitation of liability
• Design reviews, QA and QC checks
• Communication
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How have you addressed design and professional responsibility when retained to take over EOR services from another party on a TSF under operation? (34)

• Conduct dam safety review, previous design review as part of the transition
• Contact previous party to ensure having historical documents
• Independent assessment of potential risks
• Contract language, exclusion of previous work from current liability, limitation of liability, scope of work
• Design reviews, QA and QC checks
Are there risks of angering clients if the engineering community advances and promotes EOR responsibilities?(36)

- Most “Yes” responses are qualified as worth the risk
- Some “No” responses indicate that the risk is from not acting

Comments:
- Enormous risk to all if this is not done
- Care needs to be exercised to avoid it looking like a “make-work” project for consultants
- Recommend soliciting input from ICMM and owners about guidance before distributing widely
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Additional Feedback:

• Any definition of EOR should be clear on the objective, but leave flexibility as to how accountabilities are divided and the responsibilities are discharged.

• With many different groups are working on this same initiative, raising concern for consistency in terminology and potential for contradictory guidance.

• Concern that defining the EOR role provides a clear path for civil and criminal liability, which needs to be considered.

• Survey responses are individual opinion and not necessarily the policy or position of the respondent’s organization.