“WHY SO MANY BORINGS?”
A FRAMEWORK FOR THE DAM-SITE EXPLORATION PLAN

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PRESENTATION OUTLINE

- The Problem
- Proposed Solution
- An Example
- Summary
THE PROBLEM

- Challenging communication with non-geo-folk
  - Why do we need all this exploration? Lots of time and money…
  - Way too many technical details and rationale for us to explain
  - The a-specific “it’s an investment that reduces uncertainty” is vaguely unconvincing

- Different technical perspectives exacerbate issue
  - Different technical backgrounds/project responsibilities lead to differing thoughts on what exploration is needed
  - We tend to focus on our own area of interest
PROPOSED SOLUTION: 
THE DAM-SITE EXPLORATION FRAMEWORK

1) Understanding Site Geology
   Domains, features, trends, anomalies

2) Answering Design Questions
   Constraints/parameters for design analyses and decisions

3) Informing Potential Failure Modes (PFM) Analysis
   Characteristics, variability, uncertainty, morphology re PFM

4) Evaluating Constructability
   Constraints/parameters for temporary conditions/activities

5) Supporting Construction Management
   Variability for Bid risk, CM risk, DSC claims management
EXAMPLE: HYPOTHETICAL DAM SITE

High-Voltage Lines Tower (typ)
Spring (typ)
High-Pressure Pipe
Road (typ)
Bridge

Contour
Existing Dam Footprint

Upstream Side
Boat Ramp
Building
Downstream Side
EXAMPLE: (1) UNDERSTANDING SITE GEOLOGY

Valley/foundation alluvium and rock
Abutment rock
Lineaments
EXAMPLE: (2) ANSWERING DESIGN QUESTIONS

- Characteristics of dam
- Support for fills on slopes
- Relocations of buildings, utilities, roads

Legend:
- Dam Raise Footprint
- US Army Corps of Engineers
- 09/13/17 DSM
EXAMPLE: (3) INFORMING POTENTIAL FAILURE MODES ANALYSIS

- Seepage pathways
- Landslides at/near dam
- Possible faults
- Areas not previously loaded
- Threatening morphology
EXAMPLE: (4) EVALUATING CONSTRUCTABILITY

Slope stability at haul roads, stockpiles, etc
Borrow cut stability near features to remain
Capacity of access roads at special features
EXAMPLE: (5) SUPPORTING CONSTRUCTION MANAGEMENT

- Variability across borrow sites
- Variability at rock excavations
- Variability along realignments
EXAMPLE: RESULTANT EXPLORATION NEEDS

aka You missed a spot
The Andy Warhol Plan
I think I ate the wrong brownie
SUMMARY

- Preparing the exploration plan and conveying the need for explorations is challenging
- We can use a Dam-Site Exploration Framework
- The Dam-Site Exploration Framework consists of five categories/purposes of explorations:
  1. Understanding Site Geology
  2. Answering Design Questions
  3. Informing Potential Failure Modes (PFM) Analysis
  4. Evaluating Constructability
  5. Supporting Construction Management
QUESTIONS AND DISCUSSION