EXPLORATIONS IN ENVIRONMENTAL GEOLOGY

AEG Webinar

July 30, 2020
Hello! Nice to meet you all
AEG’s First Ever Virtual Annual Meeting!

- Technical Sessions and Symposia
- Corporate Business Meeting
  - Student Events
  - Awards Ceremony
- Special Event Wine Tasting
  and more....

September 16-18, 2020
Registration:
$100 for AEG members
$200 for non-members and
$25 for students
All sessions will be recorded, with registration you can view them at any time.

Visit [www.aegannualmeeting.org](http://www.aegannualmeeting.org) for all the details!
“Bueller…Bueller….Bueller….”
QUIZ TIME

“1.21 gigawatts!?!?”
PHASE I

SITE STUDIES, ENVIRONMENTAL ASSESSMENTS, ETC.
ASTM Phase I

- Current: ASTM E1527 – 13
  - Up for renewal 2021
- Typically performed for real estate transactions
The Proposal

- Key to Everything that follows
  - State what you will do
  - If you are doing anything outside of 1527-13 state that here
  - Do what you say and explain why.

From Technical Aspects of Phase I/II ESAs 3rd Ed.
GET ORGANIZED!

- Schedule
  - Client Timeline
  - Existing Projects
  - Personal Obligations
  - Access Restrictions
  - EDR, FOIA, File Search
    - Radius search, use the boundary feature
- File Management
Site Reconnaissance – On-Site

- What to look for to maximize field efficiency
- PICTURES!!!
  - Documentation is key.
  - Battery Backup
- H2O
You won't know how good your report is until it is tested

In 2, 5, 10 years – will this make sense?

TELL YOUR STORY!

State what you did and why
EXAMPLE 1

Real Estate/Property Transaction

Portfolio of Industrial Sites, in North Carolina, South Carolina and Georgia
GET ORGANIZED!

- People
  - Build your teams
    - Where are they located?
    - What is their availability?
    - What are their roles?
      - Allocate people by their strengths
  - Don’t backseat drive from the office
Site Reconnaissance - Planning

- **Schedule**
  - Team Home Base
  - Distance between Sites
  - Dates/Timeline
  - File Review Locations
  - Once on site
    - Split up vs. one group?
    - Interview(s)
    - Roles
EXAMPLE 2

Regulatory Driver

Site - Rural North Carolina
SITE DETAILS

- Closed Landfill (1971-1993)
- Consistent historical monitoring occurs semi-annually at groundwater monitoring locations, surface water monitoring points and quarterly at landfill gas probes
- Change of Regulator

Closed Landfill,
Photo date 2/26/19
MONITORING WELLS

- Groundwater and Surface Water monitoring since 1993
- Identified consistent detections of both volatile organic and metals compounds – 3 Monitoring Well Locations
- Residential wells sampled annually (since 1985) by County Health Department, no detections
Creek samples were collected downgradient to the three primary areas of concern and multiple locations

Facility almost completely bounded by creeks and streams

NO detections over Surface Water (2B) Standards in collected surface water samples
- Discovered during historical records search
- Likely installed 1970s prior to waste disposal
- Collected samples on related tributary to determine influence on site surface water
  - NO detections above surface water standards
“Excuse me. I believe you have my stapler.”
How to write good...

1. Avoid alliteration. Always.
2. Prepositions are not words to end sentences with.
3. Avoid clichés like the plague. (They’re old hat.)
4. Eschew ampersands & abbreviations, etc.
5. One should never generalize.
6. Comparisons are as bad as clichés.
7. Be more or less specific.
9. Exaggeration is a billion times worse than understatement.
10. Parenthetical remarks (however relevant) are unnecessary.
11. Who needs rhetorical questions?
Before Writing. THINK!

- What are you writing about?
- Who are you writing to?
- Who else might read it?
- 5 Years from now, what will people need to know?
Why?

- Used for:
  - Reports
  - Memos
  - Press Releases
  - Letters/Letter Reports
  - Email
  - Field Notes
  - Proposals
  - Any written communication
Get Organized

1. Plan
   - Understand the Narrative before you begin
   - Who, What, Where, When, Why? Must be answered in the first paragraph, or the Background Section
   - Keep it Simple
   - **AIM**: By the conclusions section the reader should be able to write your conclusions themselves.

2. Chunk
   - Be Brief
   - Most Important Information First
   - Like topics together
   - Compound Sentences

3. Active Voice
   - **Avoid Bureaucratic Writing!!**
     - Identified by wordiness, specialized vocabulary, noun stacking, too much “to be” and passive voice.
Findings, Conclusions and Recommendations

- **Findings**
  - Specific Facts and Supporting Details

- **Conclusions**
  - Answer “What do the Facts mean?”
  - Generally follow Findings
  - Never brand new information, only contain information supported by findings

- **Recommendations**
  - Answer “What do we do now?”
  - Generally follow Conclusions
  - Should never appear “out of the blue”.
  - Must follow conclusions which are based on findings
REMEMBER

- Understand your audience
- Keep Related Ideas Together
- ACTIVE VOICE!!!
- Figures, Tables and Appendices are ALWAYS in Order from beginning to end of document.
  No jumping around.
  (e.g. the first paragraph of a document should not reference Table 3.)
- ALWAYS: Define the Acronym the 1st time used
MORE TIPS

➢ REMEMBER:

➢ NO ONE wants to read what you have written.

➢ Most will skim or more likely only read Findings and Conclusion sections.

➢ Your Main Point should be subtle as a sledgehammer.
“My God, Are We Gonna Be Like Our Parents?”
Site & Area of Investigation

- Actions that follow the site investigation
- Drilling
- Sample Collection
- Results
The Site:
Sample Collection
Sample Preparation
Sample Analysis
## Analysis Results

**Client:**

**Address:**

**Contact:** MADELINE GERMAN

### Hydrocarbon Analysis Results

<table>
<thead>
<tr>
<th>Matrix</th>
<th>Sample ID</th>
<th>Dilution used</th>
<th>BTEX (C6 - C8)</th>
<th>GRO (C5 - C10)</th>
<th>DRO (C10 - C16)</th>
<th>TPH (C16 - C50)</th>
<th>Total Aromatics (C10-C36)</th>
<th>% EPA PADs</th>
<th>DaP</th>
<th>Ratios</th>
<th>HC Fingerprint Match</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td>SAMPLE 6-A-2'</td>
<td>16.8</td>
<td>&lt;0.04</td>
<td>&lt;0.42</td>
<td>18.1</td>
<td>18.1</td>
<td>3.4</td>
<td>0.14</td>
<td>&lt;0.017</td>
<td>0 77</td>
<td>Deg Fuel (FCM) 34.3%</td>
</tr>
<tr>
<td>s</td>
<td>SAMPLE 6-B-2'</td>
<td>12.8</td>
<td>&lt;0.64</td>
<td>&lt;0.82</td>
<td>14.4</td>
<td>14.4</td>
<td>3.1</td>
<td>0.64</td>
<td>&lt;0.019</td>
<td>0 84.2</td>
<td>Pyrogenic HC 41%</td>
</tr>
<tr>
<td>s</td>
<td>SAMPLE 6-C-2'</td>
<td>16.1</td>
<td>&lt;0.81</td>
<td>&lt;0.41</td>
<td>12.6</td>
<td>12.6</td>
<td>2.6</td>
<td>0.11</td>
<td>&lt;0.016</td>
<td>0 77.3</td>
<td>Deg Fuel (FCM) 33.8%</td>
</tr>
<tr>
<td>s</td>
<td>SAMPLE 6-A2-2.5'</td>
<td>19.1</td>
<td>&lt;0.48</td>
<td>&lt;0.48</td>
<td>0.19</td>
<td>0.19</td>
<td>&lt;0.22</td>
<td>&lt;0.02</td>
<td>&lt;0.019</td>
<td>0 60</td>
<td>Background Organics</td>
</tr>
<tr>
<td>s</td>
<td>SAMPLE 6-B2-2.5'</td>
<td>19.1</td>
<td>&lt;0.96</td>
<td>&lt;0.46</td>
<td>0.27</td>
<td>0.27</td>
<td>0.27</td>
<td>0.03</td>
<td>&lt;0.019</td>
<td>0 72</td>
<td>Background Organics (P)</td>
</tr>
<tr>
<td>s</td>
<td>SAMPLE 6-C2-2.5'</td>
<td>14.6</td>
<td>&lt;0.37</td>
<td>&lt;0.37</td>
<td>5.9</td>
<td>9.9</td>
<td>1.4</td>
<td>0.05</td>
<td>&lt;0.019</td>
<td>0 62.6</td>
<td>Deg Fuel (FCM) 21.7%</td>
</tr>
</tbody>
</table>

Initial Calibrator QC check: OK

Final FCM QC Check: OK 105.1%

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification. The abbreviations are: FCM = Results calculated using Fundamental Calibration Mode; % = confidence for sample fingerprint match to library; (S5B) or (LB5) = Site Specific or Library Background Subtraction applied to result; (PPM) = Poor Fingerprint Match; (T) = Turbid; (P) = Particulate present.

**QED 5219**

**Environmental Engineering Geologists**
QUIZ TIME

"It's just a flesh wound."
Connecting with Non-Scientists
Why is this Important?

The general public needs to understand complex scientific ideas to make informed decisions

Speaking above their head creates distrust

To Do List

1. VERY VERY IMPORTANT STUFF
2. VERY IMPORTANT STUFF
3. OTHER IMPORTANT THINGS
4. DON’T FORGET TO EAT
5. SLEEP WOULD BE GOOD
Why is this a Challenge?

- Scientists and engineers are generally smart people
- No training to convey complex scientific topics to a general audience
- Increased specialization over time
Determine Your Message

- Taylor to the Audience
  - Children, Students, General Public
- Make it Memorable
  - Mnemonic Devices
  - Physical Examples
  - Local Examples
Talking to the Public

- Practice Public Speaking Skills
  - Be Direct
  - Avoid Jargon
  - Use Relatable Examples
- Toastmasters
- Present at Annual Meeting
- Schools
- Citizen Groups
Please Support Geoscience Education

AEG Foundation provides opportunities to support Students, Practitioners and the Foundation.

https://www.aegfoundation.org/

- ONLINE APPLICATION ONLY
- APPLICATION DEADLINE FEBRUARY 1st EACH YEAR
- EASY TO DONATE ONLINE
- READ ABOUT AND SELECT YOUR FAVORITE FUND
QUESTIONS

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