GEOPROFESSIONAL BUSINESS ASSOCIATION

CASE HISTORY DIGEST

NUMBER	TITLE, DESCRIPTION, & LESSONS LEARNED	INDUSTRY

1 BEWARE! A FRIEND'S SMALL PROJECT CAN BE HAZARDOUS TO YOUR FIRM'S HEALTH — GEO

The Member Firm performed a preliminary geotech study to estimate foundation-construction costs for a small housing development. The project stalled and years later the developer sold the land with the geotech report to another developer. The new owner retained a different firm for a geotech study for the new project. When the new geotech firm identified problematic soils necessitating a deep foundation system, the new owner filed a $650,000 claim against the Member Firm alleging negligent misrepresentation. Adamant that the suit was unjustified, the Member Firm's CEO finally acquiesced and accepted a $70,000 settlement offer from the new owner rather than risk the uncertainty of a jury trial.

Lessons Learned:

- Some Preliminary Studies Can Be Dangerous
- Make a Study's Limitations Clear
- Use the Term "Confirmation-Dependent Recommendations"
- Project Risk Is Inversely Proportional to Project Size and Complexity
- Construction-Cost Estimates
- Claims Are a Business Issue

2 CLIENTS WHO DON'T FOLLOW ADVICE SHOULD BE SOMEONE ELSE'S CLIENT — GEO

The Member Firm performed a geotech study for a repeat client, a custom-home builder, to identify potential groundwater problems for construction of a two-story home near the flank of a ridge. It was a hand-shake deal. Despite recommendations for drainage provisions and construction monitoring, the client went silent. Two months after completion, the basement began experiencing cracking, buckling, and water seepage. While admitting he ignored important recommendations, the client representative wanted the Member Firm to contribute money to help pay for repairs. In exchange for a full release, the Member Firm contributed a token amount for the repairs and quickly walked away.

Lessons Learned:

- Residential Projects Pose High Risk
- Foolish Clients Create Risks
- Lack of a Written Agreement Creates Risk
- Use the Term "Confirmation-Dependent Recommendations"
- Settle and move on
- Be Wary of Groundwater Issues

3 IF YOUR CLIENT WON'T LISTEN...GET OUT YOUR CHECKBOOK — GEO

The civil engineer retained the Member Firm to perform a geotechnical-engineering study for a major municipal wastewater-treatment facility but dictated a generalized scope despite a challenging site. After learning of unfavorable foundation conditions (near-surface rock), the civil engineer relocated a portion of the facility and directed the Member Firm to perform additional study but, against the firm's recommendations, ignored the rock. The firm completed the additional study and the final report and construction began. Predictably, the Member Firm learned that the contractor had encountered rock and had submitted numerous change orders (CO) for rock excavation. Because the COs were rejected by the civil engineer, the contractor filed a claim for damages based on unforseen subsurface conditions. (Resolution was not reported.)

Lessons Learned:

- Make Sure Roles Are Defined
- If It Isn't in Writing, It Didn't Happen
- Survey Boring Locations When Possible
- Relying on Exculpatory Provisions Is Dangerous
- Relying on Others to Protect Your Interests Is Unwise

4 COMPROMISE MUST BE PART OF YOUR BUSINESS STRATEGY — GEO / CoMET

The Member Firm performed a geotechnical-engineering study for a major structure and recommended drilled shafts that would require permanent casing. The drilled-shaft constructor offered an innovative "value-engineered" approach to remove the casing and save money. Unfortunately, construction problems developed and resolution required extensive investigation, testing, redesign, and big dollars. Surprisingly, by sharing responsibility and costs, litigation was avoided.

Lessons Learned:

- Looks Can Be Deceiving
- Compromise When Appropriate
- High-Risk Procedures Often Go Awry

5 IF THE BUS DRIVER DOESN'T HAVE A LICENSE, GET OFF THE BUS — GEO

The architect for the church retained the Member Firm to perform a limited-scope geotech study for a federally-funded retirement home. Only boring logs and a brief letter report to the structural engineer were needed for the design of a pile foundation. Unfortunately, the design was not within the budget and the structural engineer refused to change the design and withdrew from the project. The replacement structural engineer redesigned the foundations and satisfactory load tests were performed but the federal agency balked until a geotech study was provided for the revision. A new geotech was retained but after the agency reviewed their report, the agency directed that a mat foundation be used. The church filed suit against the original Member Firm for the new costs.

Lessons Learned:

- Professional Firms Must Respond in a Professional Manner
- Professional Firms Need to Be Compensated Appropriately
- Take Heed When Others Withdraw
- Cheap Can Be Expensive
- Develop a Deliverables-Issuance Protocol
- Writing-Skills Improvement Should Be an Important Element of Professional Development
- Avoid Litigation

6 THIS WILL GIVE YOU NIGHTMARES! — GEO / CoMET

The housing developer retained the Member Firm to perform a geological and a geotech study for 200-unit apartment in slide-prone terrain. Following construction, the project was plagued with technical and political problems that culminated in various claims against the project participants, including the Member Firm.

Lessons Learned:

- Residential Projects Create Risk
- Consider People in Go/No-Go Decisions
- Cultivate Relationships

7 HIRED GUNS CAN MISS A TARGET BUT YOU MIGHT STILL HAVE TO PAY — GEO

The developer retained the Member Firm to perform a preliminary-geotech study for a residential subdivision, partially on hilly terrain. After a 10-year hiatus, a new developer emerged with the preliminary report in hand. When problems developed and the homeowners discovered the developer had filed for bankruptcy, the attorney retained a hired gun to go after the Member Firm. Settlement was reached with the parties splitting the damages.

Lessons Learned:

- Preliminary Geotechnical-Engineering Reports Can Be Dangerous
- Beware of Third-Party Reliance
- Residential Projects Are Risky
- Hired-Gun Experts Are Always Available
- Being Part of Your Professional Community Can Be Important

8 CHEAP CONTRACTOR PAVES WAY FOR PROBLEMS — GEO

The Member Firm was retained by an out-of-town contractor to perform a geotech study for a light manufacturing facility including surrounding pavement. After several discussions (with no documentation) about pavement-design recommendations and temporary vs. permanent pavement sections, the "final" pavement was installed before opening the plant. Within a year, heavy traffic caused pavement failures and the lawsuits followed. Once again, a cheap project turned expensive for the Member Firm.

Lessons Learned:

- Do It Right or Don't Do It at All
- If It Isn't in Writing, It Didn't Happen
- Out-of-Town Constructors Can Be Problematic
- Cheap Professional Services Often Are Expensive
- Professional Acts Create Negligence-Liability Exposures
- Keep the Scope of Service in Mind

9 DON'T OVERLOOK THE DETAILS OR BE READY TO PAY THE BANK — GEO / CoMET

After performing the geotech study and CoMET services during initial construction for a four-story building, the Member Firm's services were interrupted for the relocation of utility lines. Because of the delay, fill was being placed simultaneously in several locations and density testing was limited. As the steel erection began, one row of footings began settling. Investigation revealed inadequate fill compaction and loss of soil into the sewer lines that had been abandoned and left unplugged. The repair costs were shared by all parties.

Lessons Learned:

- Do Not Overlook Any Design Issues with Geotechnical Implications
- Do It Right or Don't Do It at All
- Do Not Understaff an Assignment
- Distinguish between the "Urgent" and the "Important"
- Stay Involved

10 IT CAN BE A COSTLY DAM, SHAME IF CLIENTS WON'T TAKE YOUR ADVICE — GEO

The local governmental agency asked the Member Firm to assist during final design and construction of a recreational lake system but then restricted the Member Firm's scope to only geotechnical engineering. A variety of problems plagued the project and the recommendations of the Member Firm were routinely rejected. Ultimately the governmental agency filed suit against the designers and constructors culminating in a 5½-year legal ordeal with the Member Firm settling for just short of $1MM.

Lessons Learned:

- Trust Your Gut Instincts
- Be Wary When Geoprofessional Services are Assigned to or Assumed by Others
- Protect Yourself; Don't Rely on Others

11 IN-HOUSE GEPROFESSIONAL SERVICES CAN END UP IN THE OUTHOUSE — GEO

The Member Firm was retained by the municipality to conduct a forensic study into settlement of elements of a new water treatment facility. The firm found that the new facility had been built over "highly structured volcanic ash," a soil structure not identified by the design geotechnical engineer. The municipality had to abandon the facility and filed a significant claim against the original design firm. The forensic study afforded the Member Firm with a compensated, front-row seat for some important lessons.

Lessons Learned:

- Do Not Be Penny-Wise and Pound-Foolish
- Consider Soil-Structure Interaction, Particularly When Hydraulic Conditions Are Involved
- Be Sure to Educate Your Client Representatives

12 CLEAR COMMUNICATION SAVES BIG BUCKS — GEO / CoMET

The Member Firm performed a geotech study and limited COMET services needed for a below-grade tennis court covered by parking deck. Poor contract documents allowed an out-of-town contractor to proceed with foundations without installing the needed retention system. Soon after construction began, a 100-footwide landslide occurred taking out the bottom of the unreinforced concrete retaining wall, then rolling into the excavation and demolishing the work completed to date. The contractor attempted to reconstruct the damaged project but was forced into bankruptcy. The contractor's surety filed claims against the developer and the design team but the Member Firm was able to settle for a nominal sum.

Lessons Learned:

- Volunteer-Managed Organizations Often Comprise High-Risk Clients
- Some Constructors Bid Low Because They Assume
- They're Just Geotechs
- Avoid Ambiguity
- Conduct a Preconstruction Meeting
- Note That Recommendations Are Confirmation-Dependent

13 LITIGATION FOR COLLECTIONS...A LOSE-LOSE SCENARIO — GEO

The Member Firm provided two oral proposals for geotech studies to the architect for a 10-story building – one assuming spread footings beneath the one-story basement while the other proposed deeper borings for possible deep foundations. The owner authorized the former and the firm provided appropriate recommendations plus mentioned an alternative for deep, drilled-and-underreamed piers to potentially save money although excavation and construction problems might develop. Construction of deep drilled piers began and caving problems developed requiring multiple but smaller piers for which the owner suggested the Member Firm help with the additional costs. The Member firm pushed back and the owner dropped the issue. Months later, the same owner began a second project and after submitting the geotech report, the owner went silent. The Member Firm filed a claim against the owner to collect their fee and the owner, in response, filed a claim against the Member Firm for negligence on the first project. The Member Firm and owner settled with the owner accepting "defense costs" and paying the Member Firm their fee.

Lessons Learned:

- Do Not Submit Oral Proposals
- Do It Right or Don't Do It at All
- Insist on Effective Communications
- How Dare They! Does Not Apply
- Professional Firms Should Respond Professionally
- Don't Rely on Others to Protect You
- Use the "Confirmation-Dependent Recommendations" Label When Appropriate
- Do Not Sue a Client to Collect Money Owed

14 SHOULD COST DRIVE YOUR PROJECT STAFFING DECISIONS...THINK AGAIN — GEO / CoMET

The Member Firm performed a geotech study and developed recommendations for dike construction on a multi-cell sewage lagoon located in an agricultural area. The Member Firm agreed to a reduced scope of service in order to accommodate the client's budgetary problems. However, construction shortcuts and bad decisions by the civil engineer led to embankment failure. Fortunately, the parties were able to negotiate a reconstruction settlement.

Lessons Learned:

- Do It Right or Don't Do It at All
- Provide Effective Project Oversight
- Assign Qualified Staff at Every Level (Details Matter)
- Unconventional Circumstances May Require Unconventional Responses
- If It Isn't in Writing, It Didn't Happen
- Provide CoMET Services
- Do Not Permit Field Representatives to Provide Recommendations on Site: Field

15 DOCUMENTATION IS ONLY WORTH THE PAPER IT'S WRITTEN ON — GEO

After the Member Firm provided a geotech study to the developer for a housing-project recreation center, construction proceeded but was halted for the winter after spread-footing installation. In a meeting with the developer and his design and construction team, the firm's Project Manager recommended protecting the footing to avoid risk to frost-susceptible soils. The inevitable occurred with remedial underpinning costing $350,000, which, not unexpectedly, the developer asked the Member Firm to pay because the footings were inappropriate; no written warning about the need for winter protection was issued; and because the PM had recommended the underpinning. The firm avoided the claim but lost the client.

Lessons Learned:

- Do It Right or Don't Do It at All
- Beware of the Unsophisticated Client
- Lack of a Written Agreement Creates Severe Risks
- Assign the Right People
- Create a Project-Communication Plan
- If It Isn't in Writing, It Didn't Happen
- Be Wary of Client/Constructor Relationships

16 ROCK BY ANY OTHER NAME CAN BE TROUBLE — GEO

The Member Firm performed the geotech study in support of the design of a 135-acre new college campus. Despite the architect-estimated 81,000 cubic yards of rock excavation, the college chose to forego construction observation by the Member Firm and instead provide a (novice) member of their staff to provide these services. After the earthwork contractor excavated and removed 190,000 cubic yards of earth and rock under the watchful eye of the owner representative, and got paid for it, the contractor filed a claim against the college, which led to a chain of third-party claims. While the contractor's claim was dismissed on summary judgment, the resolution was not without considerable legal expenses to all parties.

Lessons Learned:

- Take an Active Interest in the Project
- Bedrock Contour Maps Should Include Important Advisories
- Learn about Construction Observation Up-Front
- Advise about the Importance of Construction Observation
- Include Appropriate Advisories in the Report

17 POOR COMMUNICATION CAN LEAD TO HIGHER SETTLEMENT LOSS! — GEO

The Member Firm provided the geotech study with foundation recommendations for an oil-sand processing plant's support structures founded on the oil sands. The Member Firm stressed the need to continually observe construction and review movement. The client rejected the firms' offer of construction observation but then reacted indignantly when minor settlement occurred. After a contentious meeting between engineers of the Member Firm and client, the client not only discharged the firm from the project but dropped the firm from consideration for future projects.

Lessons Learned:

- Establish Relationships
- Learn about Construction Observation Up-Front
- Don't Guess
- Be Wary about Settlement Estimates
- Eliminate Emotional Responses
- The Loss of a Client Can Be Devastating

18 SOMETIMES STICKING TO YOUR GUNS WORKS — GEO

The Member Firm performed a geotech study for a pump station to be built by the local county government on a reclaimed marsh. The firm provided four specific recommendations for the construction requiring a deep, braced excavation. Most of the firm's recommendations were followed; some were not. An adjacent home settled; the owners complained. The home was repaired but the owners sued the county, who sued the Member Firm, who counter-sued the county. After multiple attempts to settle, the county and Member Firm finally agreed to drop their suits. (But the lawyers got paid.)

Lessons Learned:

- Prepare a Complete Proposal
- Label Confirmation-Dependent Recommendations as Such
- Recognize That If It Isn't in Writing, It Didn't Happen
- The Client Needs to Understand the Risks
- Learn about Construction Observation Up-Front
- Be Wary of Delays

19 YOU CAN WIN BUT STILL LOSE...MAKE SMART BUSINESS DECISIONS — GEO

The Member Firm performed the geotech study and observed drilled-shaft installation for a multi-family residential-rental project. After the developer rejected the recommendation to relocate some buildings to avoid peat, things went badly including numerous delays, redesign of the foundations, replacement of foundation constructor, and an economic recession. The developer filed suit against the architect and Member Firm based upon frivolous allegations of the developer's hired gun. At trial, the jury rejected the developer's claims. Nevertheless, the Member Firm spent $500,000 in legal fees .

Lessons Learned:

- Be Wary of Residential Projects
- Take Aim at Shoddy Experts
- Make Wise Business Decisions
- Recessionary Periods Increase Risks
- Be Wary of Delays

20 IF YOU DON'T HAVE $13M SITTING AROUND YOU NEED TO READ THIS — GEO / CoMET

The Member Firm was retained to provide supplemental geotech recommendations and CoMET services for construction of two chemical tanks on a challenging site. The firm's recommendations for instrumentation were rejected by the owner despite predictions of significant settlement. After settlement began, the owner decided to retrofit the tanks with deep foundations and sued the Member Firm for negligence and negligent misrepresentation. At the conclusion of a lengthy, very technical trial, the jury found the Member Firm solely responsible and awarded the owner most of their alleged damages.

Lessons Learned:

- Experience Counts
- Be Clear about Risks
- If It Isn't in Writing, It Didn't Happen
- Cutting Corners Leads to Problems
- Don't Accept Foolishness
- Apply Personal Diplomacy
- A Project-Intervention Team Is Worthwhile

21 UNSOPHISTICATED CLIENTS CAUSE SOPHISTICATED AND EXPENSIVE PROBLEMS — GEO

The Member Firm performed the geotech study for a one-story elementary school but, because of budget restrictions, had to include warnings about subsurface variations, excavation difficulties, and the importance of monitoring foundation excavation and fill placement. As construction began without the firm's involvement, the earthwork subconstructor filed a $350,000 change order for excavation of unanticipated rock. The school board requested the Member Firm to pay. After the Member Firm's CEO argued their case, the board settled for $75,000, well below the alleged $500,000 in damages.

Lessons Learned:

- Learn about Project Principals:
- Effective Go/No-Go Analysis Is Crucial
- A Written Contract Is Essential
- Try to Establish a Relationship with the Actual Client
- Geoprofessional Recommendations Are Confirmation-Dependent
- Be Alert to Subtle Indications of Problems
- Understand Professional-Liability Insurance
- Understand Unjust Enrichment

22 DOCUMENTATION CAN PREVENT FRIVOLOUS LAWSUITS — GEO

The Member Firm performed the geotech study for a condo project located on a hillside. Architectural plans called for 12-foot deep cuts with retaining walls. Upon request, the Member Firm's project manager visited an adjacent parcel where two new buildings were planned and recommended following the previous report including observing slope grading. Nothing more was heard for 5 years until the Member Firm received a letter from the condo management about wall movement. The Member Firm's CEO consulted with the condo management and was able to avoid a lawsuit.

Lessons Learned:

- Be Wary of Clients That May Take a Casual Approach
- Consider Your Go/No-Go Analysis Process
- Failure to Communicate Is Unacceptable
- Being Blameless Is Not Always Sufficient Protection
- Propose a Complete Service
- Press Clients to Opt for Expanded Services

23 PRACTICING AFTER YOU RETIRE...BETTER HAVE PLI OR ELSE — GEO

A one-person sole proprietorship and Member Firm prepared an "inspection" report about structural integrity and stability of a 40-year-old house for the potential buyer – and the bank – without a written contract or scope of service. A year after the purchase, buyer's remorse led the new homeowner to file a claim against "all involved" including a negligence claim against the Member Firm. Following a lengthy legal battle and the death of the firm's owner, the estate settled the lawsuit for about 40 times the original fee for service.

Lessons Learned:

- Purchase Professional-Liability Insurance
- Death Doesn't Matter, nor Does Health
- Be Extremely Cautious When Dealing with Homeowners
- Charge a Reasonable Fee
- A Written Agreement Is a Must
- Prepare a Thorough Report
- Document Your Services
- Consider the Full Cost and Time of Dispute Resolution
- Consider Alternative Dispute Resolution
- Size Doesn't Matter

24 DON'T BE ON THE BLEEDING EDGE OF THE ENVELOPE! — CoMET

The Member Firm proposed three options to a assist a mining company in providing a new access point to an existing mine. The selected option involved two unique features for a tieback wall requiring "continuous QA" during construction. Although initially involved on a full-time basis, the client's site manager asked the Member Firm's representative to reduce inspection to an on-call basis. As operations began at the mine, blasting debris damaged some tiebacks and four tiebacks were ultimately not tensioned. Failures occurred and the client demanded his money back. The Member Firm paid.

Lessons Learned:

- Perform a Comprehensive Go/No-Go Analysis
- Be Wary of Innovation
- Be Wary of Cutting Corners
- Modify the Contract to Reflect Scope Changes
- Inform Clients of Likely Outcomes

25 IF YOU CAN'T DO THE RIGHT SCOPE DON'T DO IT! — GEO

After settlement at the school, the Member Firm was retained by the community school board to evaluate the feasibility of constructing a new school on the existing site over an abandoned coal mine. To avoid possible negative publicity, the board restricted the Member Firm's services to only the existing site. The firm's project manager failed to document that despite additional risks, off-site subsurface exploration had been eliminated from the scope of service at the express direction of the school superintendent. After completing the review, the firm's project manager presented his conclusions orally to the board stating that the risk of additional subsidence was slight and the site was suitable for construction, provided the new structure was designed with sufficient construction joints to accommodate minor movements. After additional services for the Member Firm were rejected, construction began with almost immediate settlement. Ultimately, the school board sued and although the Member Firm's settlement estimates were shown to be correct, the Member Firm's lawsuit settlement was huge.

Lessons Learned:

- Insist on Performing Construction-Phase Observation Services
- Review All Appropriate Plans and Specifications Prepared by Others
- Produce Comprehensive Documentation
- Advise Clients about Their Risks and Do It Effectively
- Exhibit Financial Fortitude
- Pay Attention to "Gut Reactions"
- Expand Go/No-Go Analysis by Adding Stay/Don't Stay Analysis
- Stay Involved
- Beware of Optimism and Pessimism

26 HASTE MAKE WASTE. CAN YOU AFFORD IT? GEO

The Member Firm performed a seismic survey for the consulting engineering firm working for an electric utility company and submitted a preliminary draft. Several years after construction, the constructor filed a claim against the owner and Member Firm claiming changed subsurface conditions. The firm's settlement was small; its defense costs were not so small.

Lessons Learned:

- Limited-Scope Studies Can Be Treacherous
- Haste Makes Waste
- Perform a Comprehensive Go/No-Go Analysis
- Cheap Geoprofessional Services Can Be Expensive
- Look for Discrepancies; React Promptly to Them
- The More Sophisticated the Technology,the Greater the Risk of Misinterpretation and Overreliance
- Be Cautious about Providing Data Reports
- Beware of Undisclosed Project Changes
- Do It Well or Not at All

27 YOUR FINANCIAL FORTITUDE CAN SAVE YOU TIME AND MONEY GEO

The Member Firm performed a geotech study for a small addition to an education building. The report recommended shallow foundations following removal of uncompacted fill extending 10 feet beyond the building footprint and replacing with new fill. During design, the building was extended 10 feet beyond the original plan. During construction, the architect provided "construction observations." After settlement began, the Member Firm's CEO investigated and showed the constructor's CEO that there was mutual responsibility. They agreed to split the repair costs avoiding a lawsuit.

Lessons Learned:

- Protect Yourself; Don't Rely on Others
- Financial Fortitude Is Essential
- Stay Involved
- Obtain Legal Guidance

28 THE GEOTECHNICAL ENGINEER HAS PLI...LET HIM PAY FOR IT CoMET

At the request of the municipality, the Member Firm performed a geotech study with foundation and earthwork recommendations for a library but was required by contract to be retained by the constructor for CoMET services. As construction began, the constructor's superintendent acted with disdain toward the Member Firm's field representative before encountering a problem, an error in building layout resulting in poorly compacted fill. After correcting the problem, the constructor submitted a claim for extras and the architect approved. Armed with thorough documentation, the Member Firm's CEO met with the architect and the head of the library board to explain the cause of the frivolous claim.

Lessons Learned:

- Be Wary of Conflicts of Interest
- Respond Quickly to Problems
- Include Dimension-Checking in the CoMET Scope
- Documentation Is Often Your Best Defense
- Antagonistic Attitudes Mean Trouble
- Be Assertive and Prompt When Defending Your Position

29 DOING COMET WITHOUT DOING OR CHECKING DESIGN? TREAD CAREFULLY CoMET

The Member Firm was performing CoMET services for a power plant and was asked by a corrugated-metal pipe (CMP) supplier providing pipe on the project to perform "backfilling and compaction, and to look for pipe deformations." The Member Firm's field representative issued daily written reports to the CMP manufacturer's representative. At a critical roadway crossing, the field representative observed 22 inches of pipe deflection, substantially more than observed at other sections. The CMP manufacturer directed the constructor to reexcavate around the section of pipe that had deflected excessively and replace the fill with treated fill compacted to 100% of ASTM D698, then sued the Member Firm. The Member Firm countersued for unpaid services and legal fees and, at trial, was awarded its unpaid fees, but not its legal fees.

Lessons Learned:

- Effective Go/No-Go Analysis Is Essential
- Avoid Conflicts of Interest
- Assume Nothing. Obtain Clarifications. Document.
- Document All Scope Changes
- Claims Are a Business Issue; Deal with Them Accordingly
- Select an Attorney Ahead of Time
- Pick the Right Person to Lead the Defense Effort
- Rely on *Recommended Practices for Design Professionals Engaged as Experts in the Resolution of Construction-Industry Disputes*

30 ANTAGONISTIC ATTITUDES MEAN TROUBLE — GEO / CoMET

The client accepted the Member Firm's proposal to provide a geotech study for a warehouse addition. The study found 30 to 32 feet of compressible soils and recommended pile foundations to reduce settlement of the existing structure. The architect and structural engineer believed a significant savings could be realized by surcharging the addition site and using shallow foundations, even if repairs of the existing building were needed. They instructed the Member Firm's project manager to perform the analysis needed to provide surcharging recommendations and shallow bearing pressures. The project manager provided a detailed description of construction phase services for an addition to a warehouse but estimated about two inches of settlement would occur within the existing building. He emphasized his findings four times in his report to the owner and design team. As construction began, construction and communications began to go awry. Settlement began. Initially the client refused to pay the Member Firm but then reversed its position and paid for all services but $2,500 for settlement monitoring. Two years later the client sued for settlement damages but after technical review, withdrew the suit.

Lessons Learned:

- Be Wary of Triangulated Communication
- Document Rejected Recommendations
- "The Bitterness of Poor Quality Remains Long after the Sweetness of Low Price Is Forgotten
- Preconstruction Meetings Are Almost Always Valuable
- Antagonistic Attitudes Mean Trouble
- Rely on *Recommended Practices for Design Professionals Engaged As Experts in the Resolution of Construction-Industry Disputes*
- In the Case of a Dispute, Keep Track of Time Expended
- Obtain Competent Legal Help When Needed

31 CHEAP GEOTECHNICAL ENGINEERING CAN BE EXTREMELY EXPENSIVE — GEO

The Member Firm had performed a geotech study and CoMET services for a commercial subdivision. After submitting a proposal to the architect for a site-specific geotech study with foundation recommendations for a new newspaper publication office in the subdivision, they were informed that they had lost the "bid" for the study by $600. After learning that the cheaper geotech study recommended deep foundations with a $60K price tag, the Member Firm concluded that the architect wasted roughly $40K of his client's money in order to say, "I was able to save you $600 on the geotechnical-engineering fee."

Lessons Learned:

- Pity Those Who Know the Price of Everything and the Value of Nothing
- Assess the Interprofessional Client's Attitude
- Learn How the Interprofessional Client or Owner-Intermediary Is Being Compensated
- Look before You Leap
- Beware of Triangulated Communication
- Understand Marketing
- Use What GBA Has to Offer

32 CUTTING CORNERS LEADS TO BIG CHANGE ORDERS — GEO

The Member Firm performed the preliminary geotech study for the civil engineer on a water-treatment- plant addition. The civil engineer tried to save money by rejecting a test trench to evaluate removal of soft rock. Then the civil engineer included the preliminary report in the contract documents for bidding. When soft rock was encountered, the civil engineer authorized the earthwork constructor to proceed with removal, not anticipating a $650,000 tab. At arbitration over the extra, the constructor was awarded about half, far more than if the Member Firm had completed a final report with more-appropriate recommendations.

Lessons Learned:

- Make a Study's Limitations Clear
- Use the Term "Confirmation-Dependent Recommendations"
- Beware of Subjective Modifiers
- Learn If the Client Will Choose High Quality
- Conduct a Thorough Go/No-Go Analysis
- Understand Bidding

33 YOU MIGHT HAVE THE EXPERIENCE, BUT DO YOU HAVE INTEGRITY? GEO / CoMET

The Member Firm performed the geotech study with recommendations for foundation design and CoMET services for a major school project. CoMET services included earthwork observation and testing during filling operations of the grading constructor. The Member Firm assigned a newly employed field representative to perform construction observation and testing. Five years after construction was complete, investigation of settlement revealed the firm's field representative had accepted a bribe from the constructor to falsify compaction results.

Lessons Learned:

- Don't Bite off More Than You Can Chew
- Review Your Go/No-Go Criteria
- Mind the Details
- Establish Relationships to Help Maintain Quality Criteria
- Perform Pre-employment Background Checks
- Make Personnel Assignments with Care
- Prequalify Constructors
- Deal Effectively with "Bad Apples"
- Give Special Attention to Unscrupulous Constructors
- Fool Me Once, Shame on You. Fool Me Twice,Shame on Me
- Trust Your Gut Reactions
- Don't Be Naive

34 INSURANCE POLICY FEES ARE BASED ON RISK. GEOPROFESSIONAL FEES SHOULD BE TOO GEO / CoMET

The Member Firm performed a geotech study and provided three foundation options for a new parking garage for a health clinic. The owner wanted the parking garage constructed within a year and chose to rely on a fast-track strategy. The construction-manager's site superintendent hired a pressure-injected-footing constructor who submitted a not-to-exceed bid without reviewing the Member Firm's geotech report. After three of four test piles failed to achieve required capacity, the constructor stopped construction claiming differing subsurface conditions. Problems and negotiations continued with a large claim for extras.

Lessons Learned:

- Fast-Track Projects Create Different Risks
- Beware of Triangulated Communication
- Assume Leadership
- Apply Financial Fortitude
- Monetize Risk Acceptance

35 YOU CAN BE 100% RIGHT, BUT PREPARE TO PAY TO GET OUT OF A CLAIM GEO

The Member Firm proposed to perform a preliminary geotech study for an attorney who dabbled in (very) small-scale developments. After the attorney obtained a previous geotech study for the site, the firm's principal agreed to rely on probes and the previous study for a quarter of the original fee. The three-page geotech "report" provided a description of site conditions and practical foundation options and recommended a design-phase study before further design. The report continued, " If the building were to be located near the parcel's southwest corner, the feasibility of using spread footings should be considered." Almost 4 years later, the earthwork constructor filed suit against the attorney/developer and the constructor-in-charge claiming extras for peat excavation. The constructor-in-charge filed a third-party claim against the design team including the Member Firm. At mediation, the attorney, constructor-in-charge, and the earthwork constructor settled and the suit against the Member Firm was dropped. However, legal fees and soft costs were not inconsequential.

Lessons Learned:

- No Good Deed Goes Unpunished
- Project/Firm Compatibility Is Essential
- Your Documentation Can Be Your Best Defense
- Be Professional; Follow up
- Make a Study's Limitations Clear
- Beware of Unsophisticated Clients

36 ROADBLOCKS FOR THE FIELD CREW. CREATIVE, CHILDISH OR JUST DOWN RIGHT MEAN? ENV

The Member Firm provided RCRA-related-support services to the EPA's program-management contractors via a basic ordering agreement with the EPA for a manufacturing facility. A two-step sampling visit was required. After the facility's attorney resisted, the District Court interceded and an agreement was reached to split samples with the facility owner to perform independent tests. The facility management continued to be uncooperative and sued the EPA, its director, the program-management contractor, and the Member Firm, alleging illegal entry and sampling. The Member Firm was ultimately dismissed but not without legal expenses and soft costs approaching $100,000.

Lessons Learned:

- A Project's Risk Is Often Inversely Proportional to the Project's Size and Complexity
- Respond Quickly to Changes
- Encourage Speaking Up
- Be Familiar with GBA Resources
- Check Insurance Coverages and Contracts

37 GROUNDWATER: MYSTERIOUS AND EMOTIONAL, ESPECIALLY TO LANDOWNERS AND JURIES GEO

The Member Firm performed a geotech study for a county public-works department in support of a new highway in mountainous terrain. The designers signed the county's standard agreement for A/E services that included an indemnity holding the county harmless from any liabilities arising from design services. As predicted, construction was completed without incident, that is, until a landowner filed a claim against the county alleging subsurface-water-supply disruption. The county attorney filed a cross-claim against the Member Firm seeking defense costs. Following a period of normal rainfall, the landowner dropped the suit freeing the Member Firm from battling both the landowner on technical grounds and the firm's PLI carrier on the coverage issue – assumption of the contractual indemnity.

Lessons Learned:

- Reconsider Your Position When Circumstances Change
- The Client Representatives You Deal with May Not Be the Decision-Makers When Legal Issue Arise
- Beware of Broad Indemnities
- Work to Defang Indemnities
- Local Jurisdictions Are Risk-Prone
- Preselect Legal Counsel with Construction-Litigation Experience

38 WHEN THE ARCHITECT AND THE STRUCTURAL ENGINEER IGNORE YOUR RECOMMENDATIONS, BAD THINGS HAPPEN GEO

After submitting a contract-formatted proposal that was orally accepted by the architect but never signed, the Member Firm performed the geotech study for a small one-story office building and provided recommendations for foundation and parking-lot design. And oh, by the way, the site-soils were highly expansive clays. Four years after construction, the architect called to report slab heaving and wall cracking. As the building continued to experience extensive heave of the slab and beam system, the owner sued the entire design and construction team. After the Member Firm's expert enumerated the geotech recommendations omitted by the design team, the owner dropped the claim against the Member Firm ultimately forcing settlement by the design team and contractor. Total tab in hard and soft costs for the Member Firm - $75K. Undisclosed geotech fee? Probably about $5K.

Lessons Learned:

- A Project's Risk Is Often Inversely Proportional to the Project's Size and Complexity
- Cheap Can Be Expensive
- Make Certain Services Standard
- Recommendations Should Be Confirmation-Dependent
- Retain an Experienced Construction-Claims Lawyer
- Get the Contract Signed
- Avoid Triangulated Communications
- Learn about GBA Resources and Use Them
- Document

39 COULD YOU SEND ME A BILL? I'M GOING TO GET YOU PAID — GEO

A commercial developer hired the Member Firm to provide the geotech study for a retail store. Because of up to 15 feet of subsurface peat, the firm recommended auger-cast piles with a structural slab. Then project ownership changed to a long-standing client of the Member Firm. The firm submitted new proposals for additional geotech services including pile-installation observation and CoMET services. Pile installation was completed without incident but the new developer/client self-performed the CoMET services. A year after pile installation was complete, the client's project director reported over eight in. of differential settlement. The Member Firm's CEO pledged and directed a thorough investigation while maintaining full transparency with the client and design team and never mentioning $$$. When serious construction defects were identified suggesting "willful negligence" by the constructor, he filed bankruptcy. The client's claim turned to the constructors surety who ultimately accepted full responsibility and, at the insistence of the client's attorney, paid half the Member Firm's investigation fee. The client paid the other half.

Lessons Learned:

- Financial Fortitude Pays off
- Professionalism Pays off
- Respond Promptly to Problems
- Maintain Open Lines of Communication
- Document Time and Expenses of Forensic Services
- Keep Your Professional-Liability Insurer Informed

40 ALL DUMPS ARE THE SAME...RIGHT? — GEO / CoMET

The Member Firm performed a geotech study for a seven-story tower and a several low-rise framed buildings on, according to the civil engineer's recollection, a former "building refuse dump." After encountering significant compressible organics, the firm recommended auger-cast piles (ACP) supporting a structural slab. The report also included explicit warnings of the potential for settlement of grade-supported slabs. ACP installation began with the Member firm assigning a relatively experienced engineer to observe the constructor's operations. With too little information on the geotechnical concerns, the site engineer excused excessive grout takes for some of the piles and ignored the occasional "garbage odor" during drilling. Within a year after completion, settlement was reported and the Member Firm began a monitoring program but, after three years, the client's patience wore thin and prepared to make repairs – at the Member Firm's expense and at a cost near $1MM. When the firm declined the client's offer to settle, the client sued. Litigation discovery revealed not a "building refuse dump" but a "garbage dump." Repair and litigation continued with a settlement being reached a week before trial. The Member Firm's settlement costs totaled about $600,000 plus with about $60,000 in soft costs.

Lessons Learned:

- Don't Assume the Client's Risks
- Be Cautious about Reliance
- Use Proper Research Tools
- Explain Confirmation-Dependent Recommendations
- Deal Effectively with Projects with Known Soil Problems
- Commit Information to Writing
- Be Alert to Project Changes
- Emphasize the Basics about Assumptions and Gut Reactions
- Be Familiar with Insurance Requirements
- Know the Signs of Trouble Ahead

41 DON'T WORRY. WE DON'T PLAN TO BUILD THERE — GEO / CoMET

The Member Firm performed a geotech study for a housing development and observed grading of the site during the construction of ten buildings. Six years after construction, the developer built two additional units but, because the Member Firm could not provide a representative to monitor the earthwork construction, they recommended another geotech firm. The second geotech firm monitored the placement of at least four feet of fill but without reviewing the Member Firm's report. Four years after the second phase was completed, settlement problems arose and the developer sued the two geotechs, the civil engineer, and the earthwork constructor. After claims were dropped against the civil engineer and constructor, the geotechs settled with the developer for nearly $1,000,000.

Lessons Learned:

- Small Projects Can Create Big Risks
- Geoprofessionals Who Act as Their Own Attorneys Have Fools as Their Clients
- Operating without Professional Liability Insurance Is Foolhardy
- Understand the Risks and Take Appropriate Preventive Measures:
- If It Isn't in Writing It Didn't Happen
- Use Caution When Serving Housing Developers
- Assume Nothing
- Provide Effective Guidance
- Experience Pays
- Don't Trust What You Don't Check

42 EVERY PROJECT NEEDS AN LOL — ENV

An attorney representing a US subsidiary of a foreign firm hired the Member Firm to perform a Phase-1 ESA for the purchase of an industrial facility. Due to time pressure and a lack of transparency of the original owner of the facility, soon after the sale was consummated, the air-quality management district fined the new owner for air quality infringements. Threatened with a $180,000 claim by the new owner, the Member Firm's PLI attorney pushed back and the client finally abandoned their claim.

Lessons Learned:

- Verify Hearsay and Warn People about Reliance
- Try to Be Honest with Yourself
- Maintain Relationships
- Explain Limitations
- Realize That Small Projects Can Create Big Risks
- Haste Really Does Make Waste

43 DO WE REALLY NEED ALL OF THOSE WELLS? — GEO

The Member Firm was retained by a public agency to conduct a feasibility study and then reviewed the dewatering design for a five-story underground garage near the ocean. The firm's project manager sealed the final plans. A month after construction began, the foreman for the constructor-in-charge asked the Member Firm's project manager to visit the site because the water levels were too high. The project manager found only half of the dewatering wells had been installed and others were not operating. After telling the foreman to follow the design, the project manager returned a month later and found the design still not implemented. After additional delays, the constructor-in-charge filed an arbitration claim for $3MM against the agency alleging differing site conditions and filed suit against the Member Firm alleging the firm assumed responsibility for design implementation. When the agency settled with the constructor-in-charge, the constructor-in-charge withdrew its claim against the Member Firm.

Lessons Learned:

- Understand Why No Good Deed Goes Unpunished
- Perform a Go/No-Go Analysis Even When You Know It's a Go
- Do Not Sign and Seal Documents You Did Not Prepare
- Failing to Prepare a Contract Should Be Unacceptable
- Small Projects Can Create Big Risks

44 CONFLICTS OF INTEREST ARE WHERE YOU WOULD LEAST EXPECT TO FIND THEM — ENV

The Member Firm performed a Phase-1 ESA for an industrial building developer on "greenfield site." A chlorinated solvent was discovered when the consultant performed a more rigorous study for a prospective purchaser. After reaching an oral agreement with the state regulatory agency, the agency's management refused to commit their decision in writing and the prospective purchaser backed out. After bad publicity spread, the developer's next deal had to be discounted $1MM. The developer initiated a suit against the Member Firm and the owners of two suspected contamination sources but the Member Firm was able to settle the claim.

Lessons Learned:

- Search for Conflicts of Interest
- Reveal Conflicts of Interest
- Words Always Matter

45 SMALL PROJECTS CAN CREATE BIG RISK...YET AGAIN, AND AGAIN AND AGAIN... — ENV

The Member Firm performed an ESA for a commercial real estate developer. After the Member Firm reported that laboratory tests, which indicated unacceptable levels of a contaminant, the prospective purchaser reneged and demanded a return of its deposit. After getting a second ESA from another laboratory, the Member Firm reviewed the second laboratory's results and agreed that the initial lab did not record the results correctly, and the contamination levels were not as severe. Both the developer and prospective purchaser sued the Member Firm who, in turn, sued the other laboratory. The Member Firm prevailed against the initial lab but recovered less than half the total amount of the settlement it reached with the developer and prospective purchaser.

Lessons Learned:

- Exercise Due Diligence When Hiring Chemical Analytical Laboratories
- Contract Carefully
- Keep Internal QC in Mind
- Realize That Small Projects Can Create Big Risks
- Provide Appropriate Oversight
- Try Mediation
- Written Agreements Are Essential

46 SEEING IS BELIEVING — ENV

The Member Firm performed a pre-purchase Phase-2 ESA at a manufacturing site where non-friable asbestos has been disposed, the area covered, and approved by state regulators. A year after the new owner occupied the facility, state regulators identified exposed asbestos caused by erosion along a small stream that divided the property. However, "the property" was actually two parcel, the one where the firm had conducted the ESA and the second where most of the asbestos exposure was occurring. After the EPA sent a notice of financial responsibility to the new owner, the owner sued the Member Firm. Following almost three years of negotiation, a settlement was reached.

Lessons Learned:

- Remember to Answer Who? What? Where? When? Why? and How?
- Consider Impacts Stemming from Adjacent Parcels
- Always Look Inside
- Make Principals' Responsibilities Clear
- Include a Limitation of Liability Provision in Your Agreements

47 GOOD DEEDS REQUIRE EXTRA DUE DILIGENCE — GEO

The Member Firm performed a "two-week" geotech study for a commercial developer on an office-building project. The firm's field representative reported deep fills and a gasoline odor in one boring and noted both in the field report. The firm's project manager called the client but the client rejected an ESA due to time constraints. The project manager issued the report noting the smell but did not again recommend an ESA. A year later, the owner partnership sued the Member Firm for negligence. After seeking $500,000 in damages, the partnership agreed to settle for $17,500. The firm also had to pay $22,500 in legal fees; its PL-insurance-policy deductible was $50,000.

Lessons Learned:

- Be Sensitive To "Gut Reactions"
- Act as Though No Good Deed Goes Unpunished
- Project Risk Is Inversely Proportional to Project Size and Complexity
- Be Wary of Friendships
- Haste Makes Waste
- Proposals Should Be in Writing
- Remember Who Will Read Your Report
- Make Warnings Clear, Forceful, and Inescapable
- Beware of Jargon
- Document. Document. Document
- Don't Sit Idly by When the Client Makes a Stupid Decision
- Notify Your Professional-Liability Insurer at the First Sign of Trouble

48 FAST TRACK OFTEN MEANS FAST TO FALTER — GEO

The Member Firm performed a geotech study with recommendations for design and construction of earthworks, foundations, and site development for two office buildings. Shallow bedrock excavation would be required in foundation, pavement, and drainage-cut areas. The project manager sent an agreement-formatted proposal to the client through the civil-engineering firm. The client representative signed it, but without the standard terms and conditions pages that the project manager had included. At a project meeting, the firm's project manager provided a top-of-rock topo and recommended specific design changes to buildings, roads, and detention-pond elevations, configurations, and locations to reduce rock-excavation requirements but the information was not provided to the civil engineer. As rock excavation was progressing, the amount exceeded the firm's preliminary estimate and the client sued the civil engineer and Member Firm for negligence. Counterclaims were filed and the legal battle bagan. Ultimately the Member Firm's CEO settled.

Lessons Learned:

- Review Signed Contracts for Completeness
- Be Careful about Providing Quantity and Cost Estimates
- Do Not Rely on Others to Distribute Critical Correspondence and Meeting Notes
- Be Wary of Client Representatives Who Disregard Recommendations
- Be Vigilant When Business Relationships Involve Friends
- Fast-Tracked Projects Deserve Added Caution

49 TOGETHER WE STAND, UNITED WE FALL — ENV

The Member Firm undertook the characterization of site contamination and the evaluation of remedial measures in a wetland necessitating the construction of a temporary road. Surprisingly, the firm's project manager found the road had been constructed of slag contaminated with heavy metals rather than clean gravel. Following a series of strategic meetings led by the Member Firm's CEO, the dispute was resolved without attorneys and at a "reasonable" cost to all.

Lessons Learned:

- Assume Nothing
- Don't Be an Ostrich
- Take a Lead Role
- Develop a Strategy
- Get Appropriate Help
- Be Responsive When Problems Arise
- Praise in Public; Criticize in Private

50 KNOW WHAT YOU DON'T KNOW — ENV

The Member Firm conducted a remedial investigation and feasibility study for a state water commission on a Superfund site but, due to delays at the state level, the Member Firm had to assign staff that was new to the effort. As work progressed, the firm's project manager elected to make changes to the firm's scope and procedures, all without appropriate approvals, notifications, and documentation. After field work was complete and the firm demobilized, quality questions arose. The EPA held the state water commission accountable and the state agency threatened the firm with termination. To avoid litigation, the firm's project manager offered a complete redo, but at a cost to the Member Firm of over 12,500 hours.

Lessons Learned:

- A Technically and Business-Savvy Staff Is Key
- Learn What You Don't Know
- Regulatory Requirements Must Be Followed
- Interactions between Agencies and Project Parties Can Be Challenging
- Financial Fortitude Is Essential

51 YOU CAN DO THE RIGHT THING, BUT IT CAN STILL GO WRONG — GEO / CoMET

The Member Firm performed a geotech study with recommendations for excavation and grading along with COMET services for a riverside, residential development with man-made lagoons. The developer retained a relatively inexperienced earthwork constructor who ignored the Member Firm's recommendations leading to a slope failure that he had to repair. The developer became displeased with the work of the civil engineer and retained a replacement civil firm. The second civil engineer changed design elevations after ignoring the Member Firm's guidance on soil shrinkage resulting in some lots about 2 feet below the grade of the streets. Ultimately, the problems led the developer to file a $2.5 million claim against the Member Firm for alleged soil-related damages. After a typical, lengthy legal battle, the Member Firm settled with the developer.

Lessons Learned:

- Perform a Go/No-Go Analysis
- Understand Risk
- Assert Yourself When It's Appropriate to Do So
- Communicate
- You Don't Get Sued by Stating the Obvious
- Understand Limitation-of-Liability Rules and Options
- Profit and Professionalism Can and Should Be Partners

52 DID YOUR ENGINEER REALLY SAY THAT? — CoMET

The Member Firm performed a low-budget survey to assist a local constructor in laying out column lines for an industrial building. After the constructor installed foundations in the wrong locations – they were to be offset from the column lines - the constructor's superintendent blamed the Member Firm. The firm's crew chief, without understanding the issue, acknowledged "their" mistake to the superintendent. The constructor's CEO quickly developed a claim for damages. The alleged damages continued to escalate until trial where the jury awarded the constructor about three times the amount of the original claim.

Lessons Learned:

- Project Risk Is Inversely Proportional to Project Size, Complexity, and Fee
- Always Perform a Go/No-Go Analysis
- No Signed, Written Agreement, No Project
- Standard Agreements May Not Be Best
- Do Not Admit Fault
- Avoid Jargon
- Professional Development Is Essential

53 CAN YOU SAVE MONEY WITH ADR? YOU BET YOU CAN — GEO

The Member Firm performed freeway-upgrade design services for the state DOT involving tied-back walls. After some of the anchors failed during installation, the Member Firm's recommendations were questioned and led to a claim against the Member Firm by the DOT for construction delays and consequential damages. After agreeing to a nonbinding, alternative-dispute-resolution (ADR) method involving an "expert panel," the panel recommended a resolution that was satisfactory to both parties.

Lessons Learned:

- Get the Information You Need to Establish an Accurate Geotechnical Model
- ADR Is Better Than Litigation
- Apply Financial Fortitude
- Choose Your Professional-Liability Insurer with Care

54 UNKNOWN CHANGES IN DESIGN CAN CREATE LARGE LIABILITIES — GEO / CoMET

The Member Firm performed a geotech study and COMET services for the expansion of the university's football stadium. A year after construction ended, a gap was found between a retaining wall and the wall of the stadium tunnel. After a lengthy investigation, the university's new expert concluded settlement had occurred and that it justified a costly intrusion-grouting program. The university filed suit against the design team including the Member Firm and the constructor and, although the Member Firm's principal discovered the movement of the retaining wall had occurred between construction phases, the other defendants agreed to settle with the university forcing the Member Firm to settle – for a substantial amount.

Lessons Learned:

- Obtain PLI
- Describe the Project
- Keep Go/No-go Analysis in Effect for the Project's Duration
- If It's a Big Deal, Make a Big Deal Out of It
- Establish Field-Service Protocols
- Document Limitations Placed on the Service
- Don't Wait to Fact-Find
- Develop Financial Fortitude
- Upgrade Your Professional-Development Program
- Get Crisis-Management Assistance

55 CLIENTS LOOKING FOR THE LOWEST COST HAVE HIGH EXPECTATIONS — ENV

The Member Firm performed a limited-scope investigation of an auto-parts manufacturing site on a low bid. After reviewing the remediation alternatives developed by a previous consultants, the Member Firm provided a proposal for excavation of contaminated material although the amount was unknown and may extend beyond the area readily accessible for excavation. As excavation proceeded, contamination was identified at the edge of a building. The manufacturer's manager directed the firm's project manager to backfill the excavation and submit a report to the county's department of environmental affairs (DEA). The DEA required further excavation and the CEO of the manufacturer expected the Member Firm to perform the work at no cost to the manufacturer. The Member Firm refused and the manufacturer sued. The Member Firm agreed to settle but had to forfeit part of their fee.

Lessons Learned:

- Consider Attitude
- Careful Client Selection Is Essential
- Go/No-Go Analysis Must Be Ongoing
- Educate Your Client Representatives
- Determine Who's in Charge
- Internal Communication Is Vital
- Contract Review Is Essential
- Prompt Collection of Accounts Receivable Is an Important Loss-Prevention Tool
- Identify Appropriate Counsel Before You Need Legal Help

56 "MIDNIGHT CHANGE ORDERS" CAUSE NIGHTMARES! GEO / CoMET

The Member Firm proposed a geotech and COMET services for a residential division but was stalled by the need to study a fault line on site and a water-supply canal that was near collapse. After canal repairs, the original geotech services were completed and construction began. The firm's project manager developed extensive grading specifications, requiring removal and off-site disposal of all surface organics. However, before the firm's representative was scheduled to begin observing the constructor's activities, the grading superintendent chose to save the costs of disposal and bury the surface organics in areas the proposed as backyards. When the firm's representative arrived, he failed to ask where the constructor had taken the strippings yet he reported they had been disposed of in substantial compliance with the specifications. Of course, as pier drilling began, organics were encountered. To avoid further problems, the parties agreed to cooperate and the issue was resolved.

Lessons Learned:

- Project Kick-off Meetings Are Worthwhile
- Conduct a Go/No-Go Analysis and Make It Ongoing
- Know Who's Working on the Project
- Develop and Apply Standard Operating Procedures (SOPs)
- Field Representative Briefings Are Essential
- Effective Communication Training Is Essential
- Take Charge When It's Appropriate

57 INDEMNIFICATION FOR THE LIABILITY OF OTHERS CREATES HEADACHES ENV

The Member Firm contracted with the EPA to access numerous sites to log and inspect potentially contaminated water wells. Although the EPA was contractually obligated to provide access to perform the required field work, some owners required indemnification for fear they could be held responsible for any clean-up that might be needed. The Member Firm's project manager was concerned about the risks the EPA was asking the Member Firm to assume, however, so he requested a meeting with the EPA's contract administrator. The contract administrator assured the project manager that, if problems developed, EPA would honor its indemnification but did not ask for written confirmation. The project manager also wanted to maintain a positive relationship with a local power company that owned one of the production wells. Accordingly, when the power company requested that the proposed indemnification also cover damages caused by any of the Member Firm's subcontractors, the project manager quickly agreed, pending EPA assent, which the agency quickly granted. When a subcontractor caused damage, the Member Firm had to "contribute" their part to avoid litigation.

Lessons Learned:

- Consider Potential Conflicts When Conducting a Go/No-Go Analysis
- Deal with Claims Quickly and Efficiently
- Identify Competent Counsel before One Is Needed
- "If It Isn't in Writing, It Didn't Happen"
- Track Promises
- Field-Personnel Briefings, Training Are Essentials
- Indemnifications Are Tricky

58 DOCUMENT INNOVATIVE DESIGNS CLEARLY OR GET OUT YOUR CHECKBOOK CoMET

The Member Firm developed plans for construction of new landfill cells for a private waste disposal company – one of the GBA-Member Firm's best clients – based on the boring logs and laboratory-test results that a different geotechnical-engineering firm had developed before the client engaged the Member Firm. During predesign meetings, the client asked to increase the cell capacity. The firm's project manager acknowledged the risk but agreed to steepen the cell's side slopes 2:1 rather than the 3:1 of the landfill's other cells. The Member Firm's project manager met with the client's project director to explain the risks but failed to document these discussions in writing. Because the client ignored the firm's warnings, slope failure occurred as waste began to be deposited. Despite overwhelming evidence that the client and earthwork constructor failed to comply with specifications, the client blamed the Member Firm for the failure. To avoid losing the client, the Member Firm agreed to a six-figure settlement rather than invoking their LOL.

Lessons Learned:

- Innovation Often Means Risk
- If It Isn't in Writing, It Didn't Happen
- Explain Risks and Consequences Firmly
- Oral Warnings Are Insufficient
- Use Caution When Relying on Information Provided by Others
- Don't Fall in Love with Your Good Data
- Seek Innovative Solutions Wherever Possible
- Understand the Importance of "Soft Skills"

59 ENVIRONMENTAL MOLEHILLS CAN TURN INTO MOUNTAINS — ENV

The Member Firm was retained, based on their proposal with indemnification and LOL provisions, to perform an ESA on a strip center that included a dry-cleaning store. After studying the property, the firm concluded that the study found no evidence of potential hazardous-materials contamination near the dry-cleaner's but stressed that the study was limited only to the area near the dry-cleaning shop. A prospective purchaser of the strip center performed its own research before purchasing the site and discovered that farming activities previously performed at the site, and which had been abandoned 15 years earlier, may have used above-ground fuel-storage tanks. Concerned, the prospective purchaser retained an environmental firm to perform a Phase 2 ESA – a subsurface site assessment – in the area where the tanks reportedly had been located. Six months after the GBA-Member Firm issued its limited Phase 1 ESA report, the shopping center COO notified the Member Firm's CEO that a prospective purchaser had discovered groundwater contamination in a parking area that was not included in the original ESA-study scope. After the prospective buyer threatened to back out and was willing to file a claim for earnest money, the parties were able to resolve the issues amicably.

Lessons Learned:

- Small Projects Can Lead to Big Problems
- "Just as Good" Seldom Is
- Be Wary about Performing an ESA for Just a Portion of a Property
- Advise Clients about Limitations Associated with Ephemeral Site Conditions
- Use GBA's *Important Information about Your Environmental Report*
- Take Appropriate Action When Important Material Is Missing
- Don't Let a Molehill Become a Mountain
- Be Circumspect about Running Out to a Site When Problems Are Detected

60 NO GOOD DEED GOES UNPUNISHED IN ENVIRONMENTAL WORK! — ENV

As the Member Firm was conducting a Phase II study for refrigerated warehouse, the drilling of a boring possibly caused a leak in an underground storage tank. The Member Firm responded and removed the contamination in accordance with state and federal laws. However, the client's attorney asked the Member Firm to admit responsibility for the spill, confirm that it had notified appropriate regulatory officials, attest that immediate remediation occurred, and state that all of the contaminated soil had been removed and disposed of in accordance with applicable state and local regulations. The attorney also wanted the Member Firm to indemnify the owners, any lenders included in financing the purchase of the site or any subsequent improvements to it, and all future owners from and against environmental-impairment damages. After a lengthy negotiation, the Member Firm signed a letter acknowledging that it had caused the problem, notified the proper authorities, and cleaned the site in accordance with federal and state regulations, and agreed that, if remediation or documentation was not satisfactory to regulatory authorities, the firm would provide the necessary additional documentation or remediation.

Lessons Learned:

- Understand the Importance of "Soft Skills"
- Conduct a Go/No-Go Analysis and Make It Ongoing
- Consider Potential Conflicts When Conducting a Go/No-Go Analysis
- No Good Deed Goes Unpunished
- Prepare for Known Unknowns
- When It Comes to "of the Essence," Quality Always Trumps Time
- "If It Isn't in Writing, It Didn't Happen
- Do Not Take Unilateral Action
- Never Admit Responsibility
- Respond to Changes Quickly and Effectively

61 DON'T LIE TO YOURSELF ABOUT THE RISK OF SMALL PROJECTS — ENV

A Member Firm conducted a Phase II study for gas station owner who wanted to sell the property. More than two years later, a potential buyer conducted another Phase II study and discovered subsurface contamination. Despite the agreement the Member Firm had with the original owner (to exclude any type of warranty and disclaimer for third party), the Member Firm ended up in lengthy, expensive litigation. Had the Member Firm followed GBA guidance, the entire problem could have been avoided.

Lessons Learned:

- Be Diligent about Information-Gathering
- Only Accept Assignments for Which You Are Qualified
- A Cheap Geoprofessional Service Can Be Expensive
- Project Risk Is Inversely Proportional to Project Size, Complexity, and Fee
- Don't Put Holes in Your Safety Net
- Have a Well-Qualified Attorney in Place before You Are Sued
- Make Limitations Prominent Even Though You May Not Want to
- Applying an Effective Go/No-Go Analysis Is Essential
- Don't Lie to Yourself

62 CONTRACT LANGUAGE WITH "ALL LOSSES, OF WHATEVER KIND OR NATURE"...LOOK OUT! — CoMET

A Member Firm performed earthwork testing for an earthen dam designed to create a man-made lake for an electric utility. The Member Firm quit work on the project due to non-payment and the constructor (client) hired another firm to provide CoMET services. When cracks developed in the dam as the lake was being filled, the constructor was ultimately sued by the utility company and the Member Firm got pulled into the dispute. By taking a proactive stance, the Member Firm helped the constructor win its case and came away relatively unscathed.

Lessons Learned:

- People Who Want Something in the Worst Way Usually Get It Just That Way
- When Trouble Is Lurking, Defensive Actions Are a Must
- Go/No-Go Analysis Is Essential
- Go/No-Go Analysis Should Be Ongoing
- Indemnities Can Be Deadly
- Inadequate Fees Can Breed Problems
- Beware of Owners That Plan to Use Their Own Staff to Provide Quality Assurance (QA)
- Those Retained to Guard the Henhouse Should Report to the Farmer, Not the Fox
- Have a Top-Flight Construction-Claims Attorney Available
- Insist on Doing Your Work Well
- When a Conflict Arises, Adopt a Proactive Stance

63 INEXPERIENCED CONTRACTORS CAN MEAN BIG TROUBLE! — GEO

The Member Firm performed a geotechnical engineering study to identify the cause of settlement around tunnel shafts and sewer manholes then developed several alternative solutions to correct the problem. Cement-based grout, injected at moderate pressures to fill the voids, was the option chosen. Shortly after injection started, the field representative reported large grout takes. Neither the field representative nor the Member Firm's project engineer were alarmed. Four weeks later, as it turns out, at least three sanitary sewers had been partially to completely filled with grout causing sewage backup into eight basements. Ultimately the Member Firm split the repair costs with the constructor. Thanks to the quick action of senior officials at the Member Firm, a lawsuit was avoided and relationship with the client was strengthened.

Lessons Learned:

- Be Wary of Inexperienced, Out-of-Town Constructors
- Understand What an Unusually Low Bid Means
- Something That Seems Too Good to Be True Usually Is
- Know What Your Personnel Know and Don't Know
- Plan Personnel Assignments Carefully
- Curiosity, and Acting on It, Are Important Traits
- Don't Lie to Yourself
- Ongoing Go/No-Go Analysis Is Essential
- Be Proactive
- When Problems Arise, Stem the Bleeding as Quickly as Possible
- Financial Fortitude Is Essential
- Good Business Relations Are Precious

64 GOOD COMMUNICATION IS KEY TO A SUCCESSFUL PROJECT — GEO

Working for a civil engineering firm on a county landfill project, the Member Firm performed a geotechnical investigation using a scope of services (test pits/no borings) prepared by the civil engineering firm. The scope was not sufficient which led to change orders and delays during construction. The constructor filed a claim with the county, which in turn led to the civil engineering firm and Member Firm getting involved. Working together, the dispute was resolved far faster and with less time and money than otherwise may have occurred.

Lessons Learned:

- Be Alert When Price Is Most Important to Your Client
- Perform a Complete Professional Service
- Encourage Effective Communication
- Conflicts Often Are Contagious

65 TREAT A BIG DEAL LIKE A BIG DEAL — ENV

The city retained the Member Firm only for periodic bay-water-sampling services for its "showcase" brownfields project. Different out-of-town firms performed the Geo and Env services. A construction-contract specification made the Member Firm the city's environmental inspector radically altering what the Member Firm had proposed. Unaware of this change to the "boilerplate" language, the Member Firm signed the contract and forged ahead. Problems during construction led to a suit that was settled through mediation which included monetary payments by all three consultants. The city paid nothing.

Lessons Learned:

- Beware of Contractual "Boilerplate"
- Never Assume
- Be Professionally Proactive
- Beware of Projects That Contractually Exclude Continuity of Service
- Be Mindful of Joint-and-Several-Liability Risk
- Treat a Big Deal Like a Big Deal

66 IS IT A STANDARD OR NOT? — GEO

During a deposition, the CEO of a Member Firm testified as an expert-witness regarding the design and performance of the rockery at a multi-building condominium community. Actual testimony indicates that the CEO gets "drilled" about the language used in the ARC Guidelines, prepared by Associated Rockery Constructors. A great discussion regarding guidelines, standards, Standard of Care and use of GBA materials to prepare for expert witness testimony.

Lessons Learned:

- Words Matter
- Understand and Be Able to Explain the Standard of Care
- Beware of Extralegal Standards
- Rehearse Deposition Testimony

67 $MALL PROJECT....BIG PROBLEM — GEO / CoMET

The Member Firm provided both Geo and CoMET services for a one-story manufacturing building. The shell was completed and several years later, when a tenant was identified, the floor slab was completed. Problems associated with expansive soils and floor slab support led to the constructor suing the Member Firm. After a lot of time, effort and money (or blood, sweat and tears), a federal panel reduced two prior rulings regarding Limitation of Liability.

Lessons Learned:

- Limitation-of-Liability (LoL) Provisions Hold Up in Court
- While Enforceable, Lack of a Signed Agreement Still Poses Challenges
- Despite Possible Contract Enforceability, Do Not Provide Services with Just an Oral Understanding
- Effective Management Procedures and Training Are Always Important
- Small Projects Can Be Costly

68 HAVE INSURANCE COVERAGE FOR COLLUSION? GEO / ENV

The Member Firm was retained by an owner to design a landfill and perform "related services" that included a variety of marketing and public relations functions. When the owner decided to offer the land and landfill-design materials for sale by bid, he rejected all of the bids believing that they were too low. The bids included one from a major landfill developer who was also a good client of the Member Firm. Although no evidence of collusion between the Member Firm and major landfill developer existed, the owner assumed that collusion occurred and sued.

Lessons Learned:

- Tailor the Contract to the Project and Client
- No Good Deed Goes Unpunished
- Be Wary of Conflicts of Interest
- Maintain Go/No-Go Analysis

69 COST ESTIMATE VS ENGINEER'S ESTIMATE OR PROBABLE COST GEO / ENV

A Member Firm performed a Phase I ESA and preliminary geotechnical engineering design study for a major retailer on a site previously occupied by industrial laundry. In addition to the proposal, the project engineer also submitted estimated costs for remediation of the contaminated site. When the actual cost of removing the contaminated soil significantly exceeded the estimate, the client sued. Because of the Limitation of Liability clause in the contract, the Member Firm avoided a larger penalty but still had to pay legal fees.

Lessons Learned:

- Limitation-of-Liability Provisions Work
- Avoid Breach-of-Fiduciary-Duty Claims
- Explain and Apply the Observational Method
- Haste Makes Waste
- Avoid Making Cost Estimates
- Document, Document, Document
- Destroy Drafts
- Don't Be Naive
- Obtain Appropriate Representation
- Be Wary of Conflicts of Interest
- Maintain Go/No-Go Analysis
- If You Don't Know, Ask

70 EGO KILLED THE RELATIONSHIP AND ULTIMATELY THE FIRM GEO

A Member Firm designed the foundation for a cradle to hold the ship in place for a floating restaurant. Ten years after the construction, during a very strong blizzard, the ship broke away from its mooring and sank. The insurer of the restaurateur sued several entities including the Member Firm. Although the Member Firm was dismissed, the dry dock engineer was penalized after decades of disputes for a verbal warranty (uninsured) that he gave.

Lessons Learned:

- A Limitation-of-Liability Provision Is Essential
- Spoken Words Can Matter Too
- No Warranty or Guarantee, Express or Implied
- When You Do Make a Mistake…
- Ego Is the Only Requirement to Kill Any Relationship
- Sweat the Small Stuff

71 WHEN PEOPLE SUFFER DAMAGES THEY DON'T LOOK FOR FAIRNESS GEO

With the project architect as their client, the Member Firm performs a geotechnical study for the design of a National Guard armory. When the excavation constructor discovers abandoned foundations, they promptly submit a $ 200,000 change order. Subsequently, the state agency involved in the process sues the Member Firm.

Lessons Learned:

- Claims Are a Business Reality
- Definitions Matter
- ASTM Referenced Documents
- Reference Standards Carefully

72 STANDARD OF CARE....AND A WHOLE LOT MORE! ENV

The Member Firm conducted a Phase I study for a developer on the site of an automobile dealership. Underground storage tanks and other RECs were identified. When a prospective buyer decided not to purchase the property, the landowner filed a negligence claim against the Member Firm seeking to recover damages from lost opportunity and revenue.

Lessons Learned:

- Project Risk Is Inversely Proportional to Project Size and Complexity
- Consider Project Principals in Your Go/No- Go Evaluation
- Beware of Conflicts of Interest
- Identifying Potential Conflicts Is an Important Part of Go/No-Go Analysis
- If It Isn't in Writing, It Didn't Happen
- Do Not Understaff an Assignment
- Sellers Create More ESA Risks than Buyers
- Avoid Using Undefined Business Jargon
- Using GBA References Is a Must

73 THE PROFESSOR DID NOT DO HIS HOMEWORK CoMET

The Member Firm conducts a forensic investigation of duct bank concrete that was "spaded" instead of vibrated to consolidate. A professor, hired by the other side, alleged that the Member Firm's project manager was negligent in her forensic assessment. The professor's lack of field experience and the fact that he developed his own Standard of Care damaged his credibility affecting the outcome of the case.

Lessons Learned:

- Experts Should Perform the Way Experts Are Supposed to Perform
- One Good Test Is Worth a Thousand Expert Opinions
- An Expert Should Visit the Construction Site
- Relevant References Are Essential
- Establish the Standard of Care the Right Way
- Experts Must Not Be Advocates
- Be Prepared for the Hired Guns' Clichés

74 VACATION: A DOUBLE EDGED SWORD ENV

The Member Firm wanted to become involved in the design/remediation market and this project seemed to offer a solid opportunity for market entry. As the anticipated conditions changed significantly and the project manager went on vacation, the subcontractor submitted a time and materials invoice that was $75, 000 over the agreed-to-amount. Unclear, less than timely communication contributed to make the situation worse prompting legal action.

Lessons Learned:

- Pay Attention to Staff Availability
- Deputies Are Important for More Than Just the Sheriff
- Include Alternative Dispute Resolution in Your Contracts
- Make Your Go/No-Go Analysis Effective
- Preconstruction Meetings Are Essential
- Project Principals Need to Know Contract Details
- Assume Nothing, Clarify, and Document
- Communicate to Reduce Risks
- Be Wary about Sharing Subcontractor Agreements with Client Representatives
- Be Well-Prepared to Settle
- Haste Makes Waste

75 OSHA CITATIONS--THE RISK OF SHARING EQUIPMENT GEO

Member Firm is responsible for observing the construction of drilled shafts for an extension of a shopping center project. The OSHA inspector cited several violations at the jobsite. The Member Firm arranged a hearing with their attorney and reduced the fines. A good attorney can really be your "12th Man" !

Lessons Learned:

- Safety Inspectors Have Significant Authority over Site Activities
- When in Doubt, Discuss the Appropriateness of Procedures with OSHA
- Attorneys Experienced with the Matter in Dispute Are Great Assets
- Train Your Field Personnel in Proper Response to Safety Violations
- Be Proactive about Safety

76 DO IT RIGHT OR NOT AT ALL — CoMET

As a favor, a Member Firm employee performs a pre-purchase wooden-pile assessment of a private residence for an acquaintance of the Member Firm. Several years later, when the homeowner is faced with major issues in the house, the project manager gets sued for breach of contract even though there was no formal contract.

Lessons Learned:

- Do It Right... or Not at All
- Single-Family Residential Projects Always Represent an Elevated Risk
- Professional Firms Must Respond in a Professional Manner
- No Good Deed Goes Unpunished
- Understand Duty of Care
- Project Risk Often Is Inversely Proportional to Project Size and Complexity
- Make a Study's Limitations Clear
- Documentation Can Be Your Best Defense
- Documentation Is of Little Value If You Can't Retrieve It
- Avoid Admitting Fault
- Always Perform a Go/No-Go Analysis

77 RESIDENTIAL DUTY OF CARE MAY EXTEND TO THE 3RD OWNER OF THE SAME HOUSE — GEO

Member Firm conducts geotechnical report with recommendations for subsurface water control and surface grading for a new residential subdivision. During construction a homeowner in the adjacent neighborhood downhill of the new subdivision complains that she would be damaged by the drainage toward her home. Before the new project gets completed, the homeowner sues the developer, the Member Firm and the civil engineer. Then the "hired guns" enter the picture.

Lessons Learned:

- Beware of Residential Projects
- Hired Guns Are Almost Always Available to Advocate for a Client's Position
- He Opined vs. She Opined
- Better Scopes Lower Risk
- Deal Effectively with the "Mold Issue"
- Words Matter

78 YOU KILLED OUR PHONES — ENV

Member Firm performs an assessment of underground storage tanks for an expansion of a border station facility . Boring locations were checked for underground utilities through the "one-call" service and by a private locator. Unfortunately, telephone wire was encountered at a depth of about four feet.

Lessons Learned:

- Relationships Are Key to Managing Risk and Liability
- A Good Contract Contemplates Risk Allocation
- Trust Your Gut
- Know Your Limitations
- Have a Back-up Plan

79 HARSH REALITIES OF A DESIGN BUILD PROJECT — ENV

Chosen based on a Qualifications Based Selection (QBS) process, the Member Firm teamed with the demolition/construction contractor to replace underground storage tanks at a bus-fueling / maintenance/storage facility. Scope modifications requested by the city eventually resulted in the Member Firm negotiating a contract for about $300,000 LESS than originally proposed. The Member Firm created a list of expectations that were critical to the success of the project. This included prompt and genuine engagement by city staff. Most of the expectations proved to be invalid. Change orders and negotiations quickly followed.

Lessons Learned:

- Protect Yourself. Don't Rely on Others
- Know Where the Buck Stops
- Documentation Is Essential
- Avoid Ambiguity
- Pessimism/Optimism, Use Caution
- Respond Quickly to Problems
- Geoprofessional Firms Need to be Compensated Appropriately

80 TWO YEARS LATER, THE PROJECT MANAGER RECEIVED "THE CALL" — GEO / CoMET

Member Firm conducts geotechnical engineering report and provides construction observation services for the developer of a single family subdivision. To save money, a decision was made by the developer to preload the soft soil area instead of the recommended cut and fill process. Many of the homes developed large magnitudes of differential movement leading to lengthy, expensive trials.

Lessons Learned:

- Residential Projects Always Represent an Elevated Risk
- Verify the Enforceability of Your Limitation-of-Liability Provision
- Include an Alternative Dispute Resolution Provision in Your Agreement
- Document Extras
- Clients that Experience Unanticipated Expenses Look for Others to "Help"
- When a Client Dilutes Quality to Save Money, Watch Out
- Go/No-Go Analysis Must Be Ongoing during a Project
- Stay in Touch

81 SR PROFESSIONAL FORGOT THE BASICS — CoMET

The Member Firm provided COMET services during the fabrication of precast concrete components for a cooling tower. When the project was almost complete, the client refused to pay the invoices citing that some of the precast components had been rejected due to low air content in the concrete requiring that they be refabricated. Unpaid invoices and lawsuits quickly ensued.

Lessons Learned:

- Select a Top-Flight Construction-Claims Attorney before You Need One
- Learn about a Prospective Client before Preparing a Scope of Service
- Always Conduct a Go/No-Go Analysis
- Beware of Optimism
- Get the Contract Signed
- QA Is Not QC
- Communicate Effectively with Client Representatives
- Identify Services That Won't Be Performed
- If It Isn't in Writing, It Didn't Happen

82 PRACTICE, IN SMALL CLAIMS COURT, MAKES PERFECT? THINK ABOUT IT — ENV

The Member Firm conducted a Phase I and Phase II study for the developer AND later did work directly for a former tenant of the same site. After things got even more complicated, the Member Firm decided to try Small Claims Court for a resolution (where they had already been for at least 60 different projects). This Practice did NOT make perfect.

Lessons Learned:

- Perform a Go/No-Go Analysis
- Project Risk Often Is Inversely Proportional to Project Size, Complexity, and Fee
- Avoid Litigation When You Reasonably Can
- Follow Policies That Work
- Do Not Give up Leverage When Dollars Are at Issue
- Understand the Cost of "Your Day in Court"
- If You Cannot Quell Your Emotions, Rely on Someone Who Can
- Learn the Lessons of History

83 LOW FEE, LIMITED SCOPE, "GREEN" PERSONNEL: RECIPE FOR DISASTER — GEO

The county school district hired the Member Firm to conduct a geotechnical engineering study and a seismic analysis for a new site. When construction started, unsuitable materials (including wooden logs, peet and tree roots) were discovered in several areas of the site including the building pad. This unwelcome surprise resulted in delays, cost overruns and a major lawsuit. Ultimately everyone lost, including the client.

Lessons Learned:

- Be Cautious When Responding to Fee- Based Solicitations
- Skimpy Scopes Require the Involvement of Top-Flight Personnel to Help Reduce Risk
- Make No Assumptions about Subsurface Conditions
- A Team Approach Works Best
- Project Risk Can Be – and Often Is – Inversely Proportional to Project Size, Complexity, and Fee
- Routinely Offer to Perform a Complete Geotechnical-Engineering Service
- Know Who's "Driving the Car"

84 PRELIMINARY RECOMMENDATIONS ARE GOOD FOR FINAL DESIGN....CORRECT? GEO

Trying to position themselves for followup design level geotechnical work for a new hotel along the coast, the Member Firm provided preliminary pile driving criteria for budgeting purposes but failed to mention their limitations. The structure, designed using these preliminary recommendations with even higher loads than originally expected, began to exhibit significant settlement less than a year later.

Lessons Learned:

- Risk Often Is Inversely Proportional to a Project's Size, Complexity, and Fee
- Proceed on a Project Only with a Signed, Written Agreement
- Make Limitations Unmistakably Clear
- A Report Is a Report
- Make No Assumptions about Subsurface Conditions
- Don't Stick Your Head in the Sand
- Deep Pockets Often Pay the Most

85 BEING PREPARED FOR "THE CALL" LED TO A HAPPY ENDING CoMET

The Member Firm provided COMET services which included in-place moisture/density testing during compaction of backfill in the utility line trenches in a residential subdivision. Ten months after the completion of construction of the infrastructure, significant settlement was observed beneath several sidewalks and along utility line trenches. The Member Firm and the constructor worked together to solve the issue.

Lessons Learned:

- Half a Loaf Is Not Necessarily Better than None
- Do Not Rely on Others to Safeguard Your Interests
- Experience Knows No Substitute
- Address Problems Aggressively
- Research Problems Thoroughly and Objectively
- Be Prepared for Accusations
- Human Relations Are Important
- Keep Your PLI Insurer Informed
- Maintain a Pragmatic Outlook

86 DREAM HOME OR NIGHTMARE INSTEAD? GEO

The Member Firm was hired by a builder to provide geotechnical engineering services on a single family home in an area where expansive shales are interbedded with sandstone. The Member Firm recommended a slope-stability analysis but the client declined. Eight months after the construction, the foundation started to move creating distress in the slab and walls. Attempts to remediate the distress were unsuccessful. Litigation was the next step.

Lessons Learned:

- Residential Construction Creates Significant Risks
- Explain Options
- Make Recommendations That Respond to the Risks
- More Testing = Lower Risk
- Keep Track of To-Dos
- Do "Standard of Care" and "Standard of Practice" Mean the Same?
- Make Warnings Clear, Forceful, and Inescapable
- Project Risk Varies Inversely with Project Size and Complexity
- Definitions Are Valuable
- Litigation Can Turn Any Molehill into a Mountain

87 THREE DIFFERENT SUPERINTENDENTS ON THE SAME PROJECT. NEED I SAY MORE?! GEO / CoMET

The Member Firm provided geotechnical engineering and COMET services for a new grocery store and replacement parking lot in a small town about 3 hours away from the Member Firm's office. Against the recommendations of the Member Firm, the owner allowed the substitution of a geotextile for the recommended geogrid in the parking lot. Substandard, unbound granular base material was also used. Supervision by the general contractor was "spotty" at best as was communication with the Member Firm. Not surprisingly, the new asphalt pavement began to deteriorate before construction was completed. The subsequent dispute was settled through formal mediation.

Lessons Learned:

- Avoid Litigation
- Make the Go/No-Go Analysis Thorough
- Make the Go/No-Go Analysis Open-Ended
- Respond Quickly to Problems
- Speak up. Be Forceful
- An Effective Submittal Process Is Essential
- Cheap Engineering Can Be Expensive
- Educate Client Representatives
- Apply Financial Fortitude
- Do It Right or Don't Do It at All
- Never Waste a Teachable Moment
- Use Photography and Video

88 ALL TOO FAMILIAR SLIPPERY SLOPE. GO TO THE SITE YOURSELF GEO

A Member Firm performed a geotechnical engineering study including recommendations for earthwork, cut-and-fill slopes, trench excavation and roadways for a site located in area known for instability and "ancient landslides". Over time, a new developer for the site hired different geotechnical engineers and constructors. When problems developed, the Member Firm was contacted by mistake and got entangled in the dispute.

Lessons Learned:

- Recognize and Respond to Risk
- Always Perform a Go/No-Go Analysis
- Keep the Go/No-Go Analysis Open
- Project Risk Is Often Inversely Proportional to the Fee
- Avoid Taboo Words
- Do It Right or Don't Do It at All
- Be Cautious about What You Inherit
- Mediation Works

89 DON'T RUSH GO ALONG TO GET ALONG. DON'T GET BULLIED GEO / CoMET

The Member Firm's scope of services included a geotechnical engineering study and COMET services for a medical office building in area with old fill, expansive soil and shale. During construction, the Member Firm was discouraged ("if we want your opinion we will ask for it") from making suggestions and was only responsible "to enforce the plans and specifications as written and recommend alternative approaches only if specifically requested to do so". A few months after the construction ended, sidewalks began to move due to frost heave. The Member Firm and constructor in charge got the blame which eventually led to mediation. The client's former project engineer "spoke highly" of the Member Firm which got them released from the litigation.

Lessons Learned

- A Limitation-of-Liability Provision Is Essential
- Don't Use Two Contracts When One Will Do
- Understand the Personalities Involved: Use Personal Diplomacy
- Don't "Go Along to Get Along"
- Know the Limits of Your Authority to Deviate from the Plans and Specifications
- Professional Performance Is Essential
- Document

90 PROJECT MANAGEMENT MUCH MORE THAN JUST TECHNICAL COMPETENCE — GEO

Member Firm performs geotechnical engineering study including evaluation of undocumented fill for a for heavy-truck factory. The client hires another excavation contractor with the COMET services and, in order to cut costs, they do not follow the cut and fill recommendations of the project manager. Four months later the building's floor slab began to exhibit distress and Member Firm had to pay for repairs.

Lessons Learned:

- Project Managers Require Self-Control
- Project Managers Require Self-Respect
- Putting Lipstick on a Pig Should Not Be in Your Scope of Service
- Keep the Go/No-Go Analysis Open
- Demonstrate Financial Fortitude
- Respond to Problems Promptly

91 IS THERE VALUE IN VALUE ENGINEERING? BEWARE OF THE PANIC MODE! — ENV

Member Firm conducts forensic evaluation of mold in a crawl space of a 180 unit nursing home and gives an "Engineering Opinion of Probable Cost" for the remediation of mold condition. When the owner investigated the construction records, it was found that the constructor- in- charge was at fault.

Lessons Learned:

- Follow-up Is a Professional Essential
- Effective Communication Is Essential
- Emphasize the Value of Construction-Materials Engineering and Testing (CoMET) Services
- Cheap Engineering Can Be Expensive
- Residential Projects Create Elevated Risks
- Use *Important Information about This Geotechnical-Engineering Report*
- Risk and the Go/No-Go Analysis
- Understand Why You Should Not Issue Cost Estimates
- Be Cautious When Design-Team Members Lack Experience

92 PAY OUR SUB OR BUY A NEW CAR? BEWARE OF THE MIDDLE MAN — GEO / CoMET

Member Firm participates in the design of renovations of airport hangars with a small civil engineering firm. The civil engineer never pays for the service, even though the airport authority had approved and paid for the geotechnical engineer's plans months before. This leads to small claims court where the Member Firm wins the case, but never gets paid.

Lessons Learned:

- Perform a Go/No-Go Analysis
- Keep the Go/No-Go Analysis Open
- No Good Deed Goes Unpunished
- Include Payment Terms in Your Agreement
- Geoprofessionals Are Not Bankers
- Know When to Cut Your Losses
- Don't Ignore the Benefits of ADR

93 DO WHAT YOU HAVE TO DO. I TRUST YOU — GEO / CoMET

Member Firm performs a geotechnical engineering study to support design of a foundation system for a high-rise building and provides recommended earth pressures for the design of shoring, basement walls and permanent dewatering systems. The Member Firm also serves as the client's representative for earthwork operations on a two level below grade parking garage. As the excavation was near completion, two of the soldier piles plunged downward and rotated toward the basement excavation. As the constructor was trying to fix this problem and prevent further damage, the north wall shoring plunged downward toward the basement excavation, rupturing a water pipe, and damaging adjacent properties.

Lessons Learned:

- Use Root-Cause Analysis
- Demonstrate Financial Fortitude
- Don't Become Overly Defensive
- Safety First
- Words Matter
- Consider the Risks and Consequences
- Develop and Maintain Strong Client-Professional Relationships
- Question the Possible Results of Your Own Decisions

94 POWER PLAYS, HIDDEN AGENDAS, BAD FEELINGS...OH MY!! ENV

Member Firm performs archaeological site excavation for the construction of a new levee. The Member Firm gets Notice to Proceed 16 months after their proposal has been accepted. Unexpected soil conditions and unusually severe weather leads to cost overruns, delays and litigation.

Lessons Learned:

- Implement a Go/No-Go Procedure
- Establish a Project-Intervention Team (PIT)
- Read and Understand the Contract
- Lump-Sum Pricing Can Be Beneficial But...
- Professional Firms Must Respond in a Professional Manner
- Use Active Listening to Cultivate Strong Relationships
- Most Wisdom Comes from Bad Judgment
- Respond Quickly to Problems
- Avoid Litigation

95 $150M NEAR MISS CoMET

Working for the supplier, the Member Firm evaluates test welds on connections for a sample rack-system and tells the client that design is deficient. Later the client sues the Member Firm for a rack collapse in a warehouse which causes the death of a warehouse employee.

Lessons Learned:

- Project Risk Is Inversely Proportional to Project Size
- Go/No-Go Analysis Is Critical for Small Projects
- Details Matter

96 "BALANCED EARTHWORK" SOUNDS EASY AND CLEAR. RIGHT? GEO / ENV

Member Firm provides environmental, geotechnical, civil engineering/surveying services for a school project. Shortly after ground breaking for the project, the constructor asks for design changes to achieve an earthwork balance for the project. As the number of associated problems multiply, so do the costs. A lawsuit within the parties made things even worse.

Lessons Learned:

- Do Not Undervalue the Contract-Formation Process
- Maintain Your Relevance
- Communications Training Is Essential
- Be Proactive. Get Involved
- Avoid Conflicts of Interest
- Include Definitions in Your Proposals and Reports
- Don't Litigate Disputes
- Do Not Specify Means and Methods of Construction
- Trust Your Gut Instincts
- Do Not Let Misunderstandings Fester
- Develop and Enforce Effective Records-Retention Policy
- Document Effectively
- Become Familiar with Alternative-Dispute-Resolution Options
- Appropriately Label Confirmation-Dependent Recommendations
- Assume Nothing

97 WHERE DID THE GROUT GO? GEO / CoMET

Member Firm provides geotechnical and COMET services to a construction management company on a canopy structure at a building entrance. While installing one of the auger cast piles (ACP), the grout penetrated a sewer line, leading to expensive repairs, pipe replacement and a lawsuit.

Lessons Learned:

- Do Not Enter a Project without a Clear Agreement
- Understand Indemnities
- Optimism Is Dangerous
- If a Large Loss Occurs, All Project Participants Are Likely to Be Named
- Mediation Is Not Perfect, but It's Better Than Adversarial Alternatives
- In Field Reports, Words Matter
- Remain Professional and Maintain Relationships
- Read between the Lines

98 HOW DID THAT GET THERE? GEO / CoMET

Member Firm provides geotechnical engineering services and COMET for a new project on the site of an existing shopping center. COMET services were provided "as needed" for demolition of the shopping center. A few years after the completion of construction, one of the three new retaining walls deflected significantly. Investigation of the backfill led to some surprises. On cue, the owner sued to reclaim the repair costs.

Lessons Learned:

- Beyond the Go/No-go Analysis
- Quality Assurance Is Not Quality Control
- Defining Terms Is Essential
- No Good Deed Goes Unpunished
- Spot-checking Elevates Risk
- Reusing Existing Materials May Create Special Risks
- Constructors May Not Implement Adequate QC
- Effective CoMET Documentation Describes What Was and Was Not Observed
- Communication at All Levels Can Be Critical
- Rely on Experienced Legal Guidance
- "Agreeable" Experts Are Always Available
- Claims Are a Business Issue
- Alternative Dispute Resolution Works

99 THE OWNER CAN'T AFFORD TO BUILD THIS ---NOW WHAT? GEO / CoMET

Member Firm provides geotechnical engineering and COMET services for a two story office building on a 60 ft tall fill-slope. When the owner's budget was not sufficient, things got interesting and project quality suffered.

Lessons Learned:

- Always Conduct a Go/No-Go Analysis
- Learn about Your Client
- Be Sure Project Managers Are Qualified
- Understand and Explain the Standard of Care
- Respond to Red Flags
- Be Aggressive about Solving Problems, No Matter What Their Cause
- Do Not Relax Client-/Project-Acceptance Procedures
- Quality Always Wins
- Part-time CoMET Leads to Part-time Quality
- Beware of Complacency
- If it Isn't in Writing, It Didn't Happen
- Demonstrate Financial Fortitude

100 $250 FEE---$2M LOSS----SIZE DOES MATTER!! GEO

Member Firm developed pile driving criteria and responded to questions on a project for a riverfront hotel. Their proposal was verbal only with small fee which was never paid. Four years after completion of construction, a hurricane related flood washed away part of the hotel's foundation revealing settlement issues. Three years later, the ensuing lawsuit for all the parties involved was settled.

Lessons Learned:

- How Small Is Too Small
- Perform a Go/No-go Analysis
- Deep Pockets Make Big Targets
- Contract Formation Is a Vital Process
- If It Isn't in Writing, It Didn't Happen
- When You Want Something in the Worst Way, You'll Usually Get It Just That Way

101 QUALITY PROVIDERS MAKE IT RIGHT--KEEP POUNDING THE ROCK!! — CoMET

Member Firm samples and tests bagged non-shrink grout used under structural steel column base plates during construction of a seven-story military hospital. Non-compliant testing procedures and testing equipment necessitated innovative sampling and testing of the in-place grout. As the result of proactive, hands-on involvement by the Member Firm's management staff, the issue was successfully resolved without impact to the construction schedule.

Lessons Learned:

- Run toward Your Problems to Meet Them Head on
- Assume Nothing
- Follow Specified Standards to the Letter
- Learn and Adhere to the Organizational Structure
- Credibility Is Critical

102 ONE SIZE DOES NOT FIT ALL — GEO

Although they completed the field and laboratory portion of the geotechnical services, the Member Firm was never authorized to complete the report to evaluate the stability of the slopes proposed for a new stormwater detention facility. The Member Firm's project manager left the firm and the project was forgotten. Responding to a frantic call from the civil engineering client, the new project manager for the Member Firm completed the report. However, about 20 months after the Member Firm submitted its report, 5 sections of the slope paving moved and buckled.

Lessons Learned:

- Be Wary about Close Business Relationships
- Do Not Rely on Others to Safeguard Your Interests
- Be Prepared for Accusations, Even from Friends
- Educate the Inexperienced
- Understand the Design Criteria Applicable to the Project
- Identify Your Support Team before You Need It
- Include an LOL Provision in Every Contract You Can
- Address Problems Aggressively
- Inform Your Professional-Liability (PL) Insurer Immediately
- Mediation Is Usually Far Preferable to Litigation or Arbitration

103 FROM BROKEN TO A "MODEL FOR THE INDUSTRY" — PRACTICE MANAGEMENT

The Member Firm faced several civil penalties/violations and was threatened with revocation of their license to own and/or operate nuclear moisture-density gauges. Such a consequence would have a huge impact and perhaps put the company out of business. After paying $150,000 to settle the issues, the Member Firm developed a successful compliance program .

Lessons Learned:

- Identify, Understand, and Comply with All Applicable Regulations
- Violation of a Government Regulation Is, by Definition, a Serious Problem
- Senior Management Must Demonstrate Its Concern
- Invest in Staff Training and Professional Development
- Use Technology to Your Advantage
- Monitor What's Important

104 THE WRANGLER — GEO

Member Firm performs pre-acquisition and preliminary geotechnical engineering study for residential subdivision on a 87 acre of land that was being used for cattle grazing. The wrangler that worked the property claimed his horse was injured when it stepped into a backfilled boring that had settled.

Lessons Learned:

- Develop a Culture of Trust
- Do Not Overlook Teaching and Reinforcement Opportunities
- Don't Discount Gut Reactions
- Respond Promptly to Potential Claims
- Develop and Implement Plans When Circumstances Change
- Demonstrate Financial Fortitude
- Inform Your Insurance Agent or Company
- Documentation Can Be Your Best Defense

105 FRIENDS DON'T SUE FRIENDS...MOST OF THE TIME — GEO / CoMET

Member Firm provides subsurface exploration and COMET services for residential subdivision. Failed communication between the MSE wall designer and the Member Firm's project manager related to the design and construction of the wall quickly led to distress in the wall and cracks in the nearby building slab.

Lessons Learned:

- Residential Construction Projects Involve More Risk
- Project Risk Is Inversely Proportional to Project Size and Complexity
- Perform Initial and Ongoing Go/No-Go Analysis
- If It Isn't in Writing, It Didn't Happen
- Project Managers Must Stay Engaged with Their Projects
- Following up on Recommendations Is Essential
- Field Reports Need to Be Treated As the Important Documents They Are
- Reduce Risk through Active Communication
- Reduce Risk by Establishing Relationships with Client and Constructor Representatives
- Jeopardized Relationships Can Be Mended

106 A PIPELINE FULL OF PROBLEMS — ENV

An oil and gas company retains a Member Firm for a Phase I ESA. The client never provided the promised chain-of-title information that would have contained important historical information about pipeline easements. The oil and gas company sells the property to the developer, which is a sister company, and the Member Firm granted the requested reliance in a letter without an agreement limiting liability. During the earthwork portion of the project (a large, mixed-use residential development), the developer encountered soil saturated with crude oil in cuts excavated for a proposed street.

Lessons Learned:

- It's risky to work for both the seller and buyer of real estate
- Inappropriate verbal communications can increase risk of liability
- When the client agrees to provide important project information, make sure you receive it. And if you don't, report it
- Understand what scope is minimally acceptable to meet the project objectives
- Check if your firm has done a previous study on or in the vicinity of a new project site
- Make appropriate staff assignments

107 ENGAGE HUMAN RESOURCE PROFESSIONALS EARLY ON! — PRACTICE MANAGEMENT

An employee, who suffers from anxiety and panic disorder, performs poorly and misses several days of work . After several counseling sessions with her supervisor, the firm terminates her employment. In return she sues for alleged violations of the Family and Medical Leave Act (FMLA) and the Americans with Disabilities Act (ADA)

Lessons Learned:

- Managers Must Be Trained in Human- Resources (HR) Issues
- Implied References to "Qualified Conditions" under FMLA and ADA Must Be Taken Seriously
- Documentation Must Be Accurate, Complete, and Consistent
- Engage the Subject-Matter Expert
- Explore Accommodations, If Reasonable
- Employment-Practices-Liability (EPL) Insurance Can Be an Important Safety Net
- Trust but Verify
- Supervisors Need Training
- Tolerance Is a Virtue, But...

108 OUT OF SCOPE ASSISTANCE CAUSES PROBLEM — GEO / CoMET

Member Firm provides A geotechnical engineering report and COMET services, including earthwork and foundation construction observation, for the construction of 5-story, wood frame senior living facility on undeveloped land known for expansive clay soils. About four years after construction was completed and the facility was occupied, sanitary sewer lines began backing up and the lower-level floor slab began to show heaving-related distress. After very costly repairs were completed, the client filed construction-defect claims against all the design firms involved.

Lessons Learned:

- No Good Deed Goes Unpunished
- Prevent Recommendations from Becoming Requirements
- Do Not Unilaterally Deviate from the Scope of Service
- It Pays to Be Your Brother's Keeper
- Documentation Can Be Your Best Defense
- E-mail Is an Inappropriate Means of Communicating Professional Judgment
- Hired Guns Seldom Establish the Standard of Care as They Should
- Consider Limitation of Liability during Your Go/No-Go Analysis

109 WE WERE HACKED — PRACTICE MANAGEMENT

Member Firm with multiple offices became the victim of foreign hacking enterprise. It started when an employee of the firm innocently opened an email from an unsuspected contact and clicked on a link allowing the hackers to access the Member Firm's management systems. Unbeknownst to anyone, the infiltrators spent months learning about the Member Firm's operations, information storage and data. After obtaining and securing the information that they were after, the hackers locked out the Member Firm keeping them from accessing their IT systems, including emails and project files. They promptly demanded seven-figure sum of money for the key to their lock.

Lessons Learned:

- Purchase Cyber/Ransomware insurance
- Replace old computers,update/upgrade security software and apps
- Train staff on cyber security and anti-phishing protocols; test regularly
- Bring in an outside cyber expert to evaluate your systems and get recommendations to address weak points
- Leadership, employee and client resilience

110 SUSPICIOUSLY VARIABLE TEST RESULTS? TAKE A CLOSER LOOK...THE SOONER THE BETTER. — GEO

The public-school district (the "District") retained the Member Firm to perform geotechnical-engineering studies for several buildings at two sites. The Member Firm's geotechnical reports both contained identical recommendations for "select" fill to be used in constructing the building pads for the schools.

The District retained different design teams for the two schools and the Project Specifications for the two schools, not surprisingly, differed significantly. Neither were completely consistent with the recommendations that the Member Firm provided in their geotechnical-engineering report.

A field representative testing compaction of the building pad fill identified inconsistencies and discovered onsite mixing of native soil with import material, a clear violation of the geotechnical recommendations. The earthwork sub-contractor was forced to remove and replace the structural fill for nearly all of completed pads which triggered a legal dispute. The Member Firm avoided losses emphasizing the importance of field representatives that knew project specifications, observed daily field activities closely, and communicated with project management to identify construction defects and potential risks.

Lessons Learned:

- Project Risk Is Inversely Proportional to Project Size and Complexity, and Budget
- Trust Your Gut
- If You See Something, Say Something
- Half a Loaf Isn't Always Better than None
- Protect Yourself. Don't Rely on Others
- Words Matter
- Opposing Legal Counsel Is an Advocate.
- Claims Are a Business Issue

111 INCOMPLETE CHARACTERIZATION OF SITE CONDITIONS COSTS EVERYONE! GEO/ENV

Working as an expert consultant, the member firm found evidence of incomplete geotechnical and environmental characterization of the subsurface conditions at a site adjacent to a river. Also disturbing were the stated findings of a third-party independent consultant.

Lessons Learned:

- Understand and consider the geologic setting before beginning a project.
- Complete investigations using methods appropriate for the site conditions. Standard split spoon sampling does not give appropriate data in soils with cobbles and gravel.
- Don't skimp on lab tests.
- Be careful in statements regarding dewatering unless the designer has experience in this analysis.
- Local regulations may require specific environmental laboratory testing for a variety of reasons. Make sure the engineer understands all the requirements and completes appropriate sampling and testing especially if they are responsible for permitting.
- Train staff not to do work that is beyond their experience or expertise.
- Understand the Standard of Care.

112 "GLUE...WHO KNEW?" GEO

The Member Firm provided field support for a mining client drilling two holes to characterize the subsurface and install instrumentation. After installation, the instrumentation was found to be partially blocked and not usable. Conflicting proposal, contract, and legislative language – particularly around the term "supervisor" – contributed to unclear roles and responsibilities, and a claim from the client for compensation from the Member Firm. A geoprofessional member of the client's senior management (with prior experience in consulting) worked with Member Firm senior management to settle the claim with a compromise.

Lessons Learned:

- Question Assumptions: Complacency can set in over a long-standing client-consultant relationship. Routinely and objectively examine your assumptions.
- Clarify Roles and Responsibilities: Clarity is important among multiple parties, especially when field staff from different companies are working together on a task. Understanding the contracted scope of services for all involved in the project is critical to the execution of the work and managing risk.
- Words Matter: This case reinforces the importance of caution when using language such as "supervise", which can have a historical connotation that differs from the contractual or legislated meaning.
- Build Strong Relationships: Rapport and trust with people within the client organization who understand geoprofessional services pay off in cases of a misunderstanding or disagreement. Procurement professionals are often focused on the bottom line without a complete understanding of the work of and relationships with geoprofessionals.

113 CHALLENGE YOURSELF...BE A CONSULTANT...SERVE YOUR CLIENT...THE GBA STORY COMET

A GBA-Member Firm performed construction materials engineering and testing (CoMET) services for a new nine-story hospital. Another firm's geotechnical report recognized the pavement subgrade would include poorly graded soil-rock fill and recommended a bearing ratio that the GBA Member Firm recognized as a "worst case" for design purposes. It became apparent early in the grading process that the fill should produce a higher bearing ratio. This conclusion, based on field observations made during construction, proved to be correct. Despite a lack of precedent, the GBA-Member Firm recognized an opportunity to save the owner a significant amount on asphalt paving costs by reducing pavement section thickness. This resulted in hundreds of thousands of dollars of savings. The result fostered a great relationship with a new client. Unfortunately, the Member Firm overlooked an opportunity to be fairly compensated for the additional risk and value derived.

114 GEOPHYSICS PROVIDES THE CONFIDENCE TO BUILD GEO

A school district hired a non-GBA Member Firm to assess subsurface conditions at the proposed location for a new campus structure. Initial exploratory borings suggested the area contained adverse geologic conditions consisting of shallow basalt bedrock containing large voids. The preferred location for the structure was judged to be "un-buildable." The school district hired a GBA-Member Firm for a second opinion. The Member Firm suggested a new approach and teamed with another GBA Member that specializes in geophysics. The findings from an electrical resistivity survey were used to further evaluate the subsurface conditions and guide the placement of additional exploratory borings. The geophysics firm went above and beyond in assuring the client and project team that the results would be reliable by conducting a preliminary survey at a nearby test site with similar known conditions. The results from the geophysical survey and additional borings did not identify any significant basalt voids within the proposed building footprint. The stakeholders were delighted that the new team of GBA Member Firms were able to refute the original findings using innovative methods. As a result, the construction at the preferred location for the structure proceeded with confidence.

115 DON'T DROWN YOUR SORROWS...YET — GEO

A GBA-Member Firm was hired to assess whether a proposed facility was buildable. The original project scope did not include final design or construction observation services. The Member Firm was later contracted to assess the exposed subgrade at the project site, where static groundwater was observed, consistent with the Member Firm's prior report. The Member Firm was told that they didn't do enough to call out the issues related to the groundwater and that they were reserving the right to hold the firm responsible for the additional costs incurred.

The Member Firm remained involved in the project and took steps to strengthen the client relationship. The Member Firm's suggestions along the way resulted in considerable savings and the project was finished within budget – and the Member Firm avoided a lawsuit.

116 WENT FISHING...CAUGHT A WHALE — GEO

A GBA-member firm was hired to evaluate and design the repair of a sheet pile dock at a food processing plant. The owner was pleased with the design but did not have the capital to construct the full repairs and tasked the engineer with devising a temporary solution.

In the early morning hours on the first day of mobilization for the project, the dock collapsed and the project immediately shifted from repair to replacement. Daily, it seemed, new problems or concerns arose, and the geotechnical engineer was on-site to make observations, answer questions, and present solutions.

Through the extraordinary efforts of the contractor and trust from the owner, the project was completed before the plant's operating season began and the geotechnical engineer was made to look like a hero.