

**BOTH**

**Before Signing Contract**

- Define a clear and concise scope of work.
- Ensure that the governing document is clearly identified; is it the consultant's contract or the driller's proposal?
- Determine whether project is governed by a different contract which is included by reference, such as an owner contract with conflicting clauses. Are additional clauses for insurance and prevailing wage included? If there are conflicting clauses, clarify conflicts before mobilizing to site.
- Determine if a site-specific health and safety plan is required.
- Define who has the authority to stop work if an unexpected development occurs.

**Before Initiating Drilling Operations**

- Determine if special handling and disposal procedures for waste generated or material used at the site are required. Some subsurface exploration uses nuclear or explosive material.
- Have a signed contract before starting work, regardless of history with client/vendor.
- Define borehole abandonment procedures.

- Define equipment decontamination procedures and disposal methods for generated waste.
- Ensure all utilities, both public and private, are located.
- Ensure an emergency response plan is in place in the event of an injury or encountered utility and conduct daily safety meetings.

**During and After Drilling Operations**

- Be prepared to use change orders in the field if differing site conditions warrant such documentation.
- Photograph changes to original boring location, and document reasons for offset — who was notified and who approved change in location.
- Compare results of previous boreholes to current hole for depth of refusal, strata elevation and discuss anomalies.

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# RISK BULLETIN

## Subsurface Hazards For Drillers

Subsurface exploration and construction operations can represent substantial environmental and professional liability hazards. For example, one firm was involved in two claims totaling more than \$600,000 in a 12-month period. A second firm assumed the edge of a concrete pad extended beyond the end of a buried tank. The



firm was wrong and workers subsequently drilled through the tip of the tank releasing a significant volume of gasoline into the porous subsurface. Another firm drove a dozen steel “H” piles through a buried large diameter water pipe during a highway construction project.

These are just a few of the hundreds of potential hazard scenarios faced by drillers and environmental consultants. Following are controls for mitigating these concerns from a consultant and a driller’s point of view. A third category of concerns that both parties should be wary of is also included.

### CONSULTANT

#### Prior to Hiring Driller

- Require owner to provide all past environmental information, including, but not limited to, Phase I and II Environmental Site Assessments (ESAs) and geotechnical reports.
- Review and evaluate all available information prior to locating boreholes, i.e. terrain, old blue prints, state One Call and private utility locator services for private property, interviews with maintenance department personnel.
- Document work that went into selection of boring locations.
- Require owner to (1) be responsible for locating utilities on the portion of their property not covered by the state One Call service and (2) approve boring locations prior to commencement of drilling operations.
- Determine if traffic or pedestrian controls need to be in place during mobilization and drilling/construction operations.
- Define whether special allowances/notifications are required in height-sensitive or environmentally-sensitive areas such as near airports, overhead utilities, or government parks.
- Determine driller’s experience and training with method of drilling required. For example, direct push, hazardous waste, rock coring, wet environs, and enclosed spaces.

## 2 | SUBSURFACE HAZARDS FOR DRILLERS

- Determine client type and familiarity with subcontracted services.
- Determine whether proposed work requires special licensing or certification of the driller, such as well installation or hazardous waste operations. If so, require driller to provide copies of valid and current licenses and/or certificates.

### Prior to Initiating Field Operations

- Perform a site walk through with owner and driller to become familiar with proposed borehole locations. Identify utility shut-off locations and establish owner notification protocol in the event a buried utility or system is encountered.
- Maintain a library of tank charts to ascertain various tank dimensions.
- Ensure the driller has adequate insurance coverage, including pollution, general liability, workers' compensation, and automobile coverages.
- Determine whether contract with driller covers property damaged as a result of drill rig accessing boring locations. If so, limit liability to total contract value.
- Determine potential of aquifer cross contamination.
- Check known USTs for contents and estimate amount of contents prior to initiating drilling operations, or drain if possible.
- Consider putting in the contract's scope of work that the upper five feet of the boring is to be cleared with hand tools if buried utilities are suspected.
- Agree on drilling schedule with the owner.

### During and After Field Operations

- Provide disclaimer language in final report of geotechnical findings about the lack of exactness of subsurface drilling and what is not known about the area between borehole locations.
- Include in the contract that the driller is responsible for the safe operation of the rig and that proposed drill rig is capable of performing specified tasks.
- Survey location and elevation of boreholes for project records and ensure that the benchmark utilized is included in the contract's scope of work. Ensure borings are located within property boundaries.
- Report changes in scope of work or unusual conditions to driller.
- Monitor samples and borehole for potential contaminants to ensure worker safety as well as proper handling and disposal of cuttings and fluids.



## DRILLER

### Prior to Contract Signing with Consultant

- Strive to determine financial strength of environmental consultant and owner if working in a state that has strict liability. In the event of an incident, the environmental consultant may not be able to pay for remediation and cost would be passed down to driller.
- Define cost allocation during downtime for repairs or answers to questions, and costs for broken or lost drill stem parts.
- Review contract for reasonable payment terms, indemnification, liability, safety and scope of

work clauses. Review for familiarity and fairness if working with a new client or consultant.

### Prior to Initiating Field Operations

- Have lead driller evaluate the borehole location for adequate accessibility, proximity to buildings, obvious subsurface features (tank pads, vent pipes, pavement patches, utilities, etc.).
- Look up for obstructions before raising boom on drill rig.
- Ensure that site engineer has obtained a “One Call” confirmation number regarding utility locations and notifications prior to initiating drilling operations. Obtain copy of confirmation number.
- Ask consultant what methods were used to locate underground obstructions. Magnetometer surveys do not locate fiberglass tanks and piping.
- Determine if previous intrusive (boreholes and borehole logging, test pits, direct push, cone penetrometer) or non-intrusive (ground penetrating radar, x-ray, magnetometer) subsurface explorations have been conducted.
- Ensure drilling equipment is in satisfactory working order and there are no leaky hoses, loose cylinders or tanks.

### During Drilling Operations

- Stop work if directed to work in an unsafe manner by environmental consultant. Lead driller needs to be supported by management if this decision is to be made.
- Consider probing upper-most five feet to determine if there is evidence of any recent grade changes that may ultimately alter the depth below grade of the subsurface utility or structure.

- Report unusual conditions encountered during drilling to consultant, such as hard drilling, lack of resistance, loss of drilling fluid or high groundwater.
- Conduct and document safety talks specifically related to site conditions and operations.
- Have lead driller evaluate route of travel between boreholes for rough terrain, ruts, soft ground, steep grades or other difficulties. Have assistant provide guidance over difficult areas.
- Determine whether the borehole location conforms to project plans and specifications, e.g. Is it on a reinforced concrete slab instead of soil? If not, request clarification and approval from site owner and responsible professional.
- Avoid casual conversations and suggestions for offsets of borehole locations in field and do not relocate or alter boring locations without written consent of a responsible professional or the client.
- Require the consultant and/or client to be on site during drilling operations.
- Use the proper PPE.
- Never move the drill rig with the boom in the upright position as overhead utilities may be encountered.
- Avoid operating testing or monitoring equipment on the behalf of the consultant unless it is part of your contract.
- Ensure good housekeeping of drill rig and surrounding area.

