The Challenging and Rewarding Career of Environmental Consulting

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The field of environmental consulting, specifically the work performed by geologists and hydrogeologists, remains a viable employment option for students graduating in 2004-2005. Environmental consultants are hired by industrial, commercial, or governmental agencies to provide guidance and recommendations on a wide variety of environmental problems, such as the characterization, delineation, and remediation of contamination from pollutants, toxic substances, and hazardous materials. Environmental consulting firms normally employ a multi-disciplined staff of scientists, including a large number of geologists and engineers, and other specialists such as biologists, database managers, and field technicians with expertise in the construction, operation, and maintenance of remediation systems.

As typically defined, the position of a geologist or hydrogeologist in an environmental consulting firm would involve:

- initially performing tasks such as soil boring logging, monitoring well installation and development, soil and groundwater sampling, aquifer testing, and data reduction and tabulation;
- making a gradual transition into larger task and project management, letter and report writing, local client interaction, and immersion into a specific technical specialty such as groundwater modeling, groundwater sampling techniques, or risk assessment; and,
- ultimately reaching a career maturation that would involve program management, involvement in direct regulatory negotiations on behalf of clients, corporate client interaction, large-scale proposal development, business development, expert witness testimony and litigation support, supervision of a staff of less experienced professionals, and a position within your company as the reigning technical expert on investigation/remediation methodologies or industrial practices.

Although colleges and universities have well-established curricula that prepare students in the technical basics of geology or hydrogeology, the graduates that I have encountered in the past five-to-ten years have been unprepared in certain critical skills necessary to succeed in environmental consulting. Additionally, and by no fault of their own, these graduates were ill equipped for the business dynamics and non-technical challenges posed by this profession. As such, I offer the following counsel and advice to young geologists who are currently assessing whether they want to enter the environmental consulting field as a geologist or hydrogeologist. Let us start with the top five tacit, dispiriting aspects of this profession:

- **Itinerant Job Changes**: You will probably change employers at least three or four times throughout your career, for a multitude of reasons. There are the twin plagues of billability and backlog. Like attorneys, environmental consultants bill their time back to their clients and there will be an expectation early in your career that you will achieve at least a 90-95% billable goal. This translates into a normal working week of 45 to 50 hours to ensure that your billable goal is met; this is not necessarily an issue if your company is winning a lot of work and you are willing to work 10-hour days, but it can develop into a major problem in winter months and during economic downturns when your company’s backlog of work is low. You may find yourself released by your employer because of lack of billable work or you may leave on your own accord seeking a less stressful billable goal. Even after becoming a project manager later in your career, you are vulnerable to employment instability. Because environmental consulting is fundamentally a business, your company may become dissatisfied that your revenue generation has hit a plateau, perhaps because you decided to focus on delivering a quality product to a select group of clients, not building an ever-increasing empire that you ultimately have little direct control over. Lastly, my personal experience has been that you can lose your job when you expose unethical behavior (see Unethical Consultants below); this loss of employment occurs because the powerful forces orchestrating such deceit will seek to destroy your career and reputation and your company lacks the conviction and courage to stand behind you.

- **Loss of Projects Unrelated to Your Performance**: We would all like to think that if we do a good job and meet a client’s expectation, the projects we are working on would remain securely under our auspices. Unfortunately, this is not always the case. The corporate office of your favorite local client might implement a “contractor convergence” program that results in loss of work because these projects were awarded to a less expensive and/or larger environmental consulting firm who offered your corporate client an economy-of-scale cost reduction. Remember, the industries that hired your company generally consider envi-
rors and pedantic comment. You can also lose projects when the site that you have been working on is sold to another company who decides not to implement the necessary investigations and remediations that you have recommended. It is also very possible that your current company can not provide you with the qualified staff you need to execute your projects successfully and your client decides to transfer your projects to a firm with a deeper “bunch strength”. All of these scenarios will be out of your control, despite the excellent work you are performing.

The Achilles Heel of Regulatory Oversight and Enforcement: We all had a vision coming into this profession that the Federal and state governments provided both the road map and stimulus that generated environmental work; however, you will find that environmental regulations and USEPA/state regulators hired to enforce those laws will not be the primary incentive for environmental progress. With environmental regulations being eased (or not reauthorized) and many regulators unable or unwillingly to be a positive influence on the process, it will be real estate transactions that are the true impetus for environmental investigations and cleanups. This is because businesses looking to purchase a contaminated property need to identify and document the pre-existing environmental problems at a site in order to be relieved of the liability for such impacts. Sites can be characterized and in some cases remedied as part of a real estate transaction in the time it takes some regulators to review a single report and issue a comment letter, if they issue one at all. The job of an environmental regulator is a largely thankless and low-paying occupation. Most regulators are earnest individuals who are completely overwhelmed by caseloads that preclude them being actively involved in any one case. However, there are also some regulators who are simply unmotivated to initiate positive change or are so morally compromised that they are sycophants and enablers of the very industries they should be regulating. On the other hand, there are some regulators who desire to extend the life of projects for their own job security and so they will repeatedly issue redundant and pedantic comment letters that reopen issues that were thought by your client to have been resolved. Unfortunately, if your projects are being overseen by such regulators, do not expect to be able to successfully close out sites in a timely fashion.

A Confederacy of Mediocrity: In a perfect project, each participant would be equally caring and informed about the progress of the work and equally vested in its success. However, you will likely be the most committed person working on a contaminated site and the one who will receive a disproportionate amount of blame should the project go awry and virtually no credit should the project succeed. Regulators will view you as a soulless mercenary who seeks only to help your client avoid complying with the law. Your clients, even the good ones that you enjoy working for, will have difficulty accepting the amount of money it will take to retain you; as such, most clients will seek to reduce the necessary scope of work to an absolute bare minimum, even though these reductions will result in extending the life of the project, perpetuating the environmental problem, and leave gaping deficiencies that will ultimately have to be addressed later at an increased cost. Should you interact with attorneys, expect them to pressure you to rewrite your investigative findings until they are utterly devoid of meaning. And be prepared to be retained by clients who actively, but subtly, seek to circumvent compliance with the law, a task that they fully expect you to handle without implicitly being instructed to do so, so that they can appear to be guiltless should such a tactic fail.

Unethical Consultants: Despite the aforementioned challenges, it would be nice to believe that every environmental consultant would conduct themselves in an ethical and professional manner. Sadly, this is not true and in fact, you will probably devote an enormous amount of time both defending your work and critiquing the work of others that you know to be laced with falsehoods. Perhaps the most disappointing aspect of this commonplace corruption will be the eventualty that you will face off against other licensed geologists who will knowingly omit essential context in their reports to regulatory agencies. They will pick and choose data to support a predetermined result and craft their reports to be meaningless and vague, using words such as “apparently” and “ostensibly” that are intentionally illusory and misleading. One of the most commonly encountered ploys is the double-entendre statement “There is no data that indicates an impact to the subsurface.” These consultants will want the regulatory agencies to read such a statement and conclude that there is no environmental problem although the truth is that there is no data. I know this sounds implausible, but keep in mind that these consultants are knowingly taking advantage of either overtaxed or morally compromised regulators who do not attempt to verify the veracity of such nebulous statements. I am continually amazed how often this gambit is used and how successful it is. So be prepared to encounter opposing geologist reports rich with rhetorical license that push, but do not quite break through into reportable unethical behavior since these geologists can always claim that their reports were misread or misunderstood by the reader.

Provided that you have gotten this far in the article and have not run out to change your major, you may be asking what are the positives about being a geologist or hydrogeologist in the field of environmental consulting?

• True Talent Will Prevail: There is a shortage of detailed oriented, dynamic, organized professionals who write well and have the requisite geological and interpersonal skills to enable them to interface successfully in an industrial setting with a diverse group of people from PhD’s to maintenance workers. Come into this profession with this nascent skill set and you will succeed immediately. Continue to develop these skills and you will be managing your own projects in 5-10 years, forming a cadre of younger professionals around you to form a highly effective team, and, with a few breaks, you will have more work than you can handle. This profession, and the regulatory community as well, needs an infusion of talented, dedicated, and motivated individuals to elevate the quality of environmental work being performed across the country. This is also a profession where you, as an individual, can be the single most constructive influence for positive progress on a project; in fact, your involvement and your unique talents may truly be the only difference between action and inaction at a contaminated site.

• A National Problem: Given the pandemic state of environmental impacts, you can find employment in virtually
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Employer Checks and Balances:

There are few scientifically-based professions that are as geographically unrestricted as environmental consulting. Every state has a combination of abandoned and active industrial sites and perhaps an additional burden of government, military, and mining sites, which have traditionally lagged behind private industrial sites in terms of characterization and remediation. Not only have few sites been successfully remediated and closed, most sites are being investigated for the 2nd and 3rd time, a result of improved investigative techniques, new cleanup standards, and the general inadequacy of the initial site characterizations that were performed in the 1970s and 1980s.

The Further You Go, The Deeper It Gets: Throughout your career, you will continue to learn about an eclectic array of environmental issues/methodologies from asbestos abatement to x-ray diffraction. You could work on a site for your entire career and still continue to uncover nuances about its history and hydrogeology. The number of divergent career paths within environmental consulting that you could pursue are quite numerous and it is likely that one of these paths will converge with your personal and professional interests. Perhaps it will be computer modeling of groundwater and LNAPL, remedial well and trench design, database management, GIS applications, risk assessment, geochemistry, or contaminant degradation and attenuation. Being an expert in one or more of these sub-disciplines will help ensure that your services remain valuable to your company and your clients.

Employer Checks and Balances:

There is a unique benefit to having two “employers”; although you technically work for the consulting company that employs you, you are ultimately paid by the clients you serve. Each of these parties can curb the excess of the other; an unjustified negative review from your employer can be counterweighted with glowing testimonials from your clients. Having such strong client support will help insulate you from capricious, narrow-minded supervisors who, for one reason or another, are unable to recognize your true talents and potential. There are few professions that offer such a reliable check-and-balance system that can ameliorate unfair and unrepresentative opinions of your job performance.

Every Day is Different: And last, but not least, this job is never boring. Expect to “multi-task” on numerous technical, political, and economic issues on a daily basis. And if you desire to do so, there will be multiple opportunities to write professional papers and articles, participate in the advancement of new investigative and remediation techniques, and be considered as a leader and expert in your chosen discipline and sub-disciplines both within and outside your company.

If, after weighing the aforementioned pros and cons, you have decided to give environmental consulting a try, how can you adequately prepare? My advice would be to initiate the development of the following skills prior to entering this profession:

Proficiency in Geological Description:

Despite its emphasis in geological curricula, understanding how sediments and rocks are deposited is unimportant in environmental consulting. What is indispensable is the accurate and consistently uniform description of the physical characteristics of subsurface deposits. Logging soil borings and monitoring wells will likely be your first formative and significant experience in environmental consulting. As such, it will be absolutely essential for you to able to distinguish between closely allied lithologies (e.g., a silty clay versus a clayey silt) and accurately record the plasticity, dry strength, dilatancy, toughness, consistency, and moisture content of samples. As such, you need to be well versed in the Unified Soil Classification System and the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), ASTM D 2488-90. You will also need to know how to take organized and readable field notes. These notes are the foundation of every piece of data generated at a site so start with the Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock, ASTM D 5434-97. And remember, details are what distinguish average field notes from excellent field notes so get accustomed to accurately observing and recording your actions in the field.

Monitoring Well Construction and Testing:

It is likely most of you have not installed, developed, or conducted tests on monitoring wells, but this will be one of the most common tasks you will perform upon entering this profession. Familiarize yourself with the techniques specified in the Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers, ASTM D 5092-90, the Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers, ASTM D 5521-94, and the Standard Test Method (Field Procedure) for Instantaneous Change in Head (Slug) Tests for Determining Hydraulic Properties of Aquifers, ASTM D 4044-96. You will also be tasked with the direct supervision of drilling subcontractors; therefore, it will be essential that you are familiar with drilling techniques, particularly hollow stem auger, air hammer, mud rotary, and rotosonic.

Knowledge of Environmental Regulations:

Become a student of the environmental regulations applicable in the state or states that you have selected to work in. Fortunately, many state regulatory agencies and the USEPA have created on-line resources that have links to the current controlling regulations so it is no longer necessary to track down paper copies of Federal or State Registers to obtain this information. Knowledge of what work your clients are required to do, the investigative methodologies and sampling frequencies that are required (such as those described in the Technical Requirements for Site Remediation in New Jersey), and how variances that streamline these requirements can be negotiated will make you a very valuable asset for your company and your clients.

Computer Skills:

It is likely that you are already proficient in word processing programs such as Microsoft® Word, which is advantageous because you will be given a computer on your first day of employment and you will be expected to know how to use it. Not only will you be typing up your own letters and reports, but you will be managing environmental data using Microsoft® Excel and/or Access. Knowledge of software commonly used to process pump and slug tests results (e.g., Aqtesolv™) and produce report-ready boring logs (e.g., LogPlot™ or gINT®) would be helpful, too.
Preparing Students for the “Real World”

Richard Schultz, CPG-10188

For the second year in a row, Elmhurst College in suburban Chicago, Illinois, has been ranked among the top 10 comprehensive colleges in the Midwest, according to “America’s Best Colleges 2005,” the influential survey by U.S. News & World Report magazine. Elmhurst is the only college in Illinois to appear in the top 10 in this category. One of the reasons for this is that Elmhurst College adequately prepares students for the “real world”.

How is this accomplished? First off, many of the faculty have experience in industry and consulting and can pass along their practical experiences and knowledge to the students. Secondly, graduates and alumni are an extremely important resource for us. We listen to what they have to say about improving our programs and what tools are necessary for our current students to obtain employment.

At a recent Homecoming celebration, a number of returning former students commented on how the Department of Geography and Environmental Planning had prepared them for employment. They cited several instances where faculty had taken the time to apply classroom theory and scientific concepts to real world situations.

Among the comments: (these serve as valuable wisdom for current students in what to be prepared for in the “real world”)

- “Take as much chemistry and computer science applications courses as possible”.
- “Although the hard sciences are most difficult, get as much experience as you can with them, you won’t be sorry later.”
- “Learn GIS!”
- “Attend conferences and conventions as a student and learn what networking is all about”.
- “Practice writing as much as you can. Being a good scientist is all about being a good writer also”.
- “Take it upon yourself to learn about the major “players”, both companies and individuals.”
- “Learn to work well in teams and groups.”
- “While in school, strive for practical experience and obtain an internship.

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- The Right Way to Write: If there is one particular skill where students of geology (and scientists in general) have a weakness, it is writing. My advice would be to write, write, and write, and when you think you are proficient with the written word, you should keep on writing some more. Along with monitoring wells and the construction of remediation systems, the most common deliverable that every environmental consultant generates are written, including reports, correspondence letters to regulatory agencies, and recommendations to buyers and sellers of contaminated properties. The only way you can truly communicate the findings of your investigations or propose solutions to the problems you discover is through the written word. You will need to fully understand the difference between the description, narrative, exposition, instruction, and persuasion writing styles because you will need to utilize each of these methods to some degree in every letter or report that you develop for your clients. Only by practice and effort will you be able to gain a confidence and competence to write well; this is truly a skill that you will work on throughout your entire career.

In summary, it has been my experience that environmental consulting is not for everyone but it can be an ideal job for a select few. Those with a cynical view might say it is an “enabler” job that permits industry to pollute the environment to the maximum extent allowable by law. I would rather view it as a profession that can restore impacted properties to some semblance of their original condition and, as importantly, keep industries from moving to, and ultimately befouling, pristine locations. Remember this, you will come into this job wanting to save the world. You can not, of course, but if you are diligent, resilient, and can weather the slings and arrows of other consultants who seek to undermine your work and effectively manage clients who will resist spending money to correct problems they either bought into or caused themselves, by the end of your career, you may be able to restore a couple hundreds acres of land back to a condition where it no longer poses a threat to human health and the environment. It does not sound like much of an accomplishment for a lifetime of work, but if everybody in this profession aspired to that reasonable goal in this new century, we could achieve a sweeping reversal of the polluting legacy of the last century. Should you chose this profession, I wish you a long and successful career applying your geological skills to this challenging, but rewarding and honorable, work.

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