

# Adventures in Environmental Engineering

The last 30 years have been an exciting journey. Now get ready for the future.

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As I reflect on a 30 year career in the practice of environmental engineering, it is remarkable how the landscape has changed. From an academic perspective, one

of the most recognizable signs is that at the time I pursued my master's in engineering in the mid-1980s, a separate concentration of environmental engineering did not exist at my university; only a master's degree in civil engineering could be pursued with a dominant underpinning of environmental engineering core curriculum. In contrast, today there are numerous accredited bachelor's, master's, and doctoral environmental engineering programs with abundant research options, such as air quality, water quality, remediation, industrial ecology, sustainable engineering, energy, and nanotechnology.

Working in the industrial sector for the majority of my career, I have seen frequent organizational changes that have significantly enhanced the role of the environmental engineer. In fact, 30 years ago, very few people identified themselves as environmental engineers. Most possessed the title of either civil or sanitary engineer. My first title did have the words "environmental engineer," and at the time, it was deemed forward looking.

Functional reporting lines have also changed. Early in my career, environmental and health and safety teams had separate reporting mechanisms; typically the environmental team reported to facilities engineering while the health and safety team reported directly to human resources. Currently, the majority of environmental engineering and health and safety teams are fully integrated into a single environment, health, and safety (EHS) function that typically reports into legal, supply chain, or operations.

Independently, health and safety and environmental engineering have always had close alignment. Integrating the function into one streamlines that interdependency. For example, industrial hygiene

assessments performed to evaluate possible employee exposure can be used to develop environmental engineering controls to eliminate potential exposure sources. Additionally, there are several benefits and efficiencies realized when operating as an integrated EHS function, including enhanced career opportunities catalyzed by diverse subject-matter interactions.

Presently, other adjacent disciplines have either migrated directly into the integrated EHS function or are closely aligned organizationally. For example, sustainability, energy and water conservation, product stewardship, medical, and security are just a few. Environmental engineers working in these disciplines now have extensive latitude to expand their expertise into other facets of an organization and can report into R&D, engineering, or marketing organizations, compared with the traditional EHS operations role. These organizational enhancements now provide development opportunities for environmental engineers across several business sectors and an increased demand for environmental engineering talent.

Environmental engineers have advanced from being identified years ago only as specialized, technical resources to possessing broad, overarching leadership accountability. In addition to technical competency, other skills such as communication, business acumen, collaboration, conflict management, organizational agility, negotiating, dealing with ambiguity, and finally, maintaining a sense of humor, are essential building blocks to shape successful executives with backgrounds in environmental engineering. Some of my most impactful development opportunities have been those that allowed me to communicate complex, technical environmental engineering matters in a concise, understandable manner without diluting the importance of the message to audiences from diverse functional backgrounds.

Another key experience during the span of my career was providing leadership for diverse, global teams. Key aspects of these leadership responsibilities included managing multimillion dollar budgets and

remedial liability reserves, enhancing collaborative relationships both internal and external to the organization, leading organizational restructuring activities, and maintaining technical capacity through licensure as well as certifications that weren't available 30 years ago. As a licensed professional engineer with additional technical certifications, I, like others, have been able to establish technical leadership credibility, both internally and externally to an organization. Whether weighing in on the efficacy of a proposed wastewater treatment plant upgrade for a site or communicating with external regulatory agencies or nongovernmental organizations on proposed regulations, possessing a PE license and/or other related certifications provides a level of confidence and demonstrates important technical knowledge.

The last 30 years has proven to be a dynamic, exciting journey for the environmental engineer. With environmental issues continuing to dominate headlines in global media and influencing public awareness and activism, the future holds countless opportunities for environmental professionals, and specifically, for the environmental engineer. Product design employing industrial ecology principals, sustainability considerations for construction projects, future water and energy nexus strategies, alternative remediation technologies, proactive risk identification and mitigation strategy development, and practical solutions to provide potable water in emerging regions, are just a few of the many challenges that will demand the technical leadership of environmental engineers over the next century.

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