

GEI CONSULTANTS SEES CONSISTENT GROWTH IN WATER INFRASTRUCTURE MARKETS; FEDERAL STIMULUS & TECHNOLOGY CAN ACCELERATE PACE OF INDUSTRY EVOLUTION

GEI Consultants has achieved strong, consistent growth over the past few years, expanding in several new geographies, namely growing its transportation practice in Dallas, Texas and expanding operations in environmental and geotechnical engineering in Toronto, Canada. In 2020 GEI ranked #53 on EBJ's list of top environmental consulting & engineering firms, #88 in Engineering News Record's (ENR) Top 500 Design Firms and also ranked in ENR's Top 20 Firms in the Water Sector. GEI currently has over 40 offices and 900 staff across the United States and Canada.

Mark W. Cowin, P.E., specializes in water resources planning and management. He has extensive experience in collaborating with federal, state, and local agencies, stemming from spending seven years as Director of the California Department of Water Resources (DWR). With DWR, he managed over 3,500 employees with the responsibility to protect, conserve and manage the state's water supply. In addition, he advised the governor and secretary for natural resources, and worked closely with the state legislature in developing and implementing water resource management policy. Mark has also consulted with members of Congress, worked with high ranking officials of the federal government, and testified before the state legislature regarding policy and budget matters. Mark served in several management positions at DWR and led the Department's efforts on a variety of complex water management issues.

Cameron Davis, JD, has spent more than three decades in the government, corporate, academic, and non-profit sectors implementing strategic initiatives for agencies, clients, and organizations. In 2018, he was elected to serve in one of the Metropolitan Water Reclamation District of Greater Chicago's part-time commissionerhip. Previously Cameron served as Senior Advisor to two U.S. Environmental Protection Agency Administrators in Washington, D.C., coordinating the work of 11 federal departments to invest more than \$2.2 billion in funding for contaminated sediment cleanups, fish contaminant matters, dam removals, wetland and habitat restoration, runoff reduction, invasive species prevention, and other related water resource matters. He is a lead author of the Great Lakes Legacy Act, which leverages federal-private funding partnerships for cleanups to rehabilitate riverside and coastal property values.

Daniel L. Wade, PE, GE, F ASCE, specializes in project and program management, planning, environmental review, design and construction of water resources/civil works infrastructure to successfully deliver complex projects for clients in the public and private sectors. His project experience includes dams, reservoirs, levees, pump stations, power plants, conveyance facilities (pipelines, tunnel and canals), treatment plants, and other related appurtenant facilities. He is experienced in controlling project cost, schedules, and management of large multi-disciplinary project teams. Daniel has extensive experience working with the California Department of Water Resources Division of Safety of Dams (DSOD), and has considerable experience working with the Federal Energy Regulatory Commission (FERC) and other federal, state, and local regulatory/resource permitting agencies. He served on the Board of Directors of the United States Society on Dams for two terms culminating in Vice President.

EBJ: GEI has a strong water practice. How has COVID affected your work?

GEI: Our water practice remains strong. Public agencies at the federal, state, regional, and local levels have all recognized the essential nature of water supply, flood control facilities, and continued planning. Nevertheless, we do anticipate that some public agencies may need to re-prioritize and defer some non-essential projects due to COVID's impact on the overall economy and agencies' budgets.

Our employees, clients, and partners have adapted remarkably well to remote office business operations. We have helped our clients move their projects forward while implementing COVID safety protocols and training programs for all employees, with a strong focus on safety for those employees who need to enter the office and for essential field activities

EBJ: How is water reuse being impacted by COVID-19?

GEI: COVID-19 has certainly created heightened awareness of water quality issues among the public and water managers. This, along with other drivers, creates more incentive for investment in advanced water purification. That being said, federal and state regulators and local water agencies have disseminated effective public messaging stating that existing treatment processes successfully disinfect wastewater containing the COVID-19 virus.

We are seeing projects that started prior to COVID-19 continuing forward. For example, GEI is currently assisting a water district in Southern California by exploring options and evaluating the feasibility of using recycled water from their wastewater treatment plant to augment their water supply portfolio.

EBJ: Can you comment on the state of U.S. water infrastructure and the impact it has on our water quality?

GEI: Most large cities in the United States have access to high-quality drinking water. Still, our drinking water quality is tied to surface and groundwater quality. It is also tied to the sustainability of our infrastructure, which is in critical need of optimization. Water affordability is also an emerging issue in rural and urban settings alike: if people can't afford to pay for drinking water, a critical revenue stream for infrastructure revitalization will wither over time. Chicago, for example, is expanding financial relief for drinking water. In Canada, where GEI recently opened offices, water infrastructure for First Nations is an increasing priority. In California, most significant drinking water quality issues are with small, disadvantaged, often rural communities. Problems stem from lack of financial resources to invest in modern technology and infrastructure improvements, as well as limited managerial and operational expertise. Lack of local government capacity limits the ability to access state and federal funding sources. Rural communities that rely on groundwater have limited choices when over-pumping in times of drought by surrounding agricultural practices that lowers water levels or mobilizes pollutants.

As the saying goes, "never waste a good crisis." Now is a good time for Congress to pass a far-reaching stimulus package that could modernize our water delivery and protection systems, put people back to work, and keep the US competitive in a global economy. While state and federal funding may be available for capital improvements, historical funding levels are not adequate to confront present and future challenges. And, some communities lack resources to operate and maintain their water systems.

EBJ: What's needed to create a more sustainable water infrastructure system throughout the country? What kind of investment would it require?

GEI: Just as the Department of Defense has the Defense Advanced Research Projects Agency (DARPA) and Department of Energy has ARPA-E, the country

could benefit from a more coordinated national approach to water infrastructure innovation, a WARPA. Simply upgrading already-antiquated infrastructure is not enough. We have to be leapfrogging several generations ahead in our water infrastructure's ability to protect, treat, and deliver. As people work more remotely due to COVID, our leadership in this area is increasingly critical. According to the American Water Works Association and American Society of Civil Engineers, water infrastructure overhauls will require more than \$1 trillion. That price tag goes up the more we delay. A more coordinated national sustainable infrastructure approach could help save the country money over time.

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EBJ: What trends do you see in investment related to water infrastructure?

GEI: Significant reinvestment in federal, state, regional, and local water systems is essential for a sustainable future. For example, more than 50 percent of the dams and levees in the US are more than 50 years old and many of those are not built to current design standards. These facilities are essential for sustainable water storage, flood control, and hydropower generation. Reinvestment is also needed in facilities that provide reliable raw water transmission, treatment, and distribution of potable water supplies.

There has been a transition from reliance on federal and state funding for improvements to local agencies stepping in to make investments to rehabilitate existing infrastructure. For example, public-private partnerships (P3s) and Community-based public-private partnerships (CBP3s) are creating ways to sustain infrastructure knowing that public financing needs to be

leveraged. The Water Infrastructure & Resiliency Center is another good example of an important step in the right direction. Also, several larger cities such as San Francisco and Los Angeles, have made recent major capital investments and improvements in their regional water systems to increase reliability and prevent major disruptions due to earthquakes, water quality issues, and extended droughts. Many cities, however, are struggling to keep up with the rate of infrastructure replacement needed to ensure reliable water systems into the future, so additional federal and state investment may be needed.

EBJ: What barriers do you see to accessing financial resources in the water infrastructure sector?

GEI: Barriers include:

- State funding provided by General Obligation Bond Propositions are subject to varying timing with changing programs and requirements for eligibility.
- Lack of alignment of federal and state cost-sharing programs.
- Difficulty in raising local cost shares due to fragmented governance, local voting requirements, and changing regulatory requirements.
- Capacity of small communities and rural water users to apply for and take state and federal grant and loan programs.
- The relatively long planning horizon for larger water resources projects can prevent application for federal and state funds that require projects to be "shovel ready" to receive funding.

Probably the biggest barrier though is Washington's failure to break through to an agreement on significant infrastructure stimulus at the federal level.

EBJ: What about regulation? Any significant changes and what changes do you foresee after the 2020 election?

GEI: We do not currently foresee specific changes in water quality regulation due to COVID-19. However, better alignment of federal, state, and local regulations is needed to enable effective planning for a sustainable future for water deliveries throughout the Country.

EBJ: Water infrastructure investment is essential, but other investment make a big difference. How can the following sectors help solve our water problems?

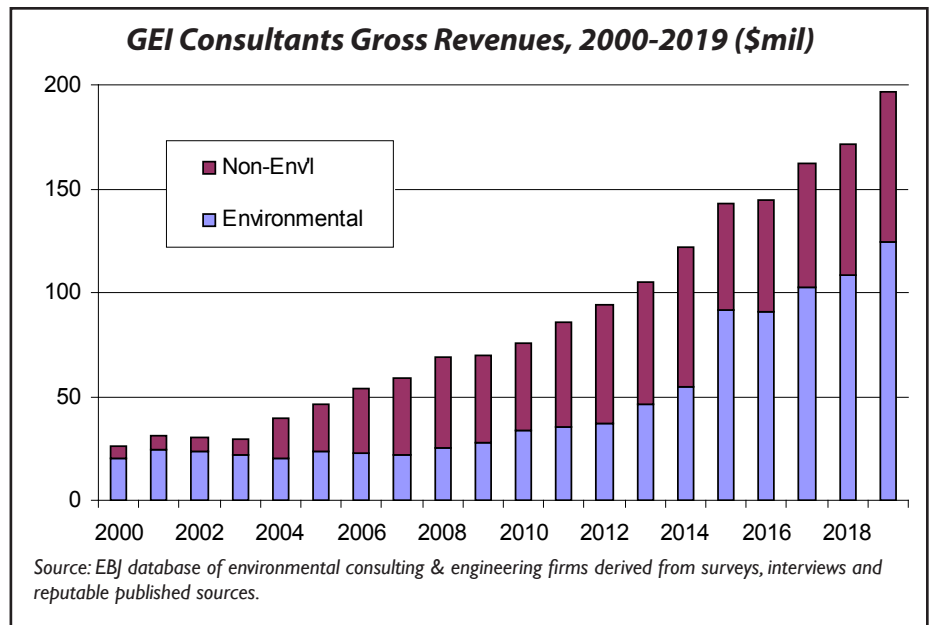
GEI: Land Use – Account for water use while regulating changing land use. For example, in California, with land going out of production due to the Sustainable Groundwater Management Act (SGMA) requirements, there is an opportunity to creatively and comprehensively minimize economic impacts.

Urban Development – More infill-focused, high efficiency development with requirements for consideration of water needs. All new development should optimize stormwater capture and limit effects on groundwater recharge. Also, dual plumbing can be incorporated into new construction for recycled water re-use to flush toilets and for irrigation.

Oil & Gas – California water agencies are exploring opportunities to treat and re-use oilfield production water.

Other Energy Sectors – Balancing water supply needs with hydropower generation needs can create synergies for re-investment in existing infrastructure where both needs are served. For example, San Francisco is currently in the process of rehabilitating its 19-mile long Mountain Tunnel which provides both water supply and hydropower generation benefits.

Agriculture – Consideration of cropping choices to provide for roll back of



water requirements during prolonged dry periods. Consideration of groundwater water management actions on rural communities.

Manufacturing – Maintaining high water quality standards is extremely important for the high tech industry as well as other industries, and the needs of these industries can drive water quality standards and treatment upgrades.

EBJ: What changes in water infrastructure do you believe will be implemented in the 2020s and 2030s?

GEI: We will continue to see a trend to move towards incorporating sustainability goals in water resources planning and

management. This is already happening: one increasingly frequent precondition to federal funding (in the US and in Canada) is a demonstration that a project will be resilient in the face of climate change. This will include modernization of existing water systems to increase redundancy, reliability, and efficiency. Water agencies will seek to continue to diversify their water portfolios to include a greater emphasis for water conservation, planning for multiple sources, including desalinization in some cases.

There will be greater consideration of the need for enduring longer periods of dryness and increased scarcity of water supplies. It is also possible that there will be a move toward less water-intensive crops (e.g., corn), similar to xeriscaping but on an agricultural scale. This will continue to reduce water demand while still facilitating increased water storage and increased levels of water reuse, including limited implementation of direct potable reuse.

There will be better incorporation of natural infrastructure (aka “green” infrastructure) in watershed and floodplain management and a trend toward more efficient groundwater recharge of floodwaters. Contaminants of emerging concern will continue to drive the need for advanced water treatment technologies.

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EBJ: What role will technology play?

GEI: It will have an impact that cannot be overstated. Technology will enable better data collection and management for water use measurement, reservoir operations, and transmission leakage rates. Technology directed at improved weather forecasting will result in improved reservoir management. More energy efficient water treatment and water reuse processes will drive the cost down enabling more rapid and widespread implementation. Drones will become more commonly used for watershed management and facility inspections. Seismically resistant new pipelines and relining systems for existing pipelines will be deployed more rapidly as technology evolves and competition increases to drive the cost of implementation downward. Tech advancement leads to exponentially more tech advancement. Coupled with policy and landscape changes, we're developing more and better tools for society to stay safe and adapt more effectively than ever.

EBJ: What are some highlights from GEI's infrastructure practice? How does your environmental practice support your infrastructure practice?

GEI: GEI is re-imagining what the society of the next 10, 25, 50, and 100 years will look like. That way, we can prepare our clients now. For example, with sea level rise and the largest fresh surface water bodies in the world—the Great Lakes—hitting new monthly highs this year, we are looking at the next generation of coastal resilience, in a practice area that has not changed dramatically over the last half-century.

Our water resources practice includes comprehensive planning, geotechnical investigations, design, environmental review, and construction services for federal, state, municipal, and rural public sector clients as well as private clients. We are often involved in the planning for water supply operations, flood control, and reservoir operation that leads to design and construction management services for implementation of specific infrastructure components such as dams, levees, and water transmission facilities (pipelines, tunnels, penstocks, canals and pump stations). Our environ-

mental practice provides comprehensive environmental review including planning, regulatory permitting, restoration, biological, cultural services, and environmental compliance services during construction which are integral components to water infrastructure planning, design, and construction compliance. GEI's multidisciplinary team of engineers, scientists, project managers, planners, and technicians bring consulting services to support every aspect of a project lifecycle, from planning and feasibility to design, permitting, and construction.

EBJ: How are drivers changing infrastructure markets in the United States?

GEI: Population Growth – The 2020 census will show growth in some areas and reductions in others. Thus, in some areas of the US, the stress water infrastructure will increase – while in other areas it may decrease.

Reurbanization – Reurbanization projects, sustainable development, and higher density housing will result in lower overall water needs, while improving opportunities for water reuse.

Sustainable Development – Trends include changing outdoor landscaping to drought tolerant landscaping, stormwater capture to include “green” infrastructure, groundwater recharge, and water reuse.

Climate Adaptation – In the dam safety industry current standards include the use of extreme theoretical storm events for planning and design of new facilities and for modifications to existing facilities. There is already considerable conservatism built into these extreme storm events therefore climate change studies are not widely used to add additional conservatism.

However, for reservoir operations, we are using climate change studies to plan for future operational flexibility and resiliency to effectively manage water supplies, flood protection, and hydropower generation. Reliance on snow melt for water supply in California has traditionally been the primary storage “reservoir.” Future water supply reservoir operations may not be able to rely on this. Planning for sea level rise in coastal cities is receiving significant fund-

ing and attention. Large investments will be required to ensure future reliability and resiliency of water and wastewater systems in coastal communities. □

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