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Dredging Up Results On Land and Underwater

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Abstract

Upon meeting Under 40 in Construction Equipment Award winner Greg Smith, director of the environmental group for J.F. Brennan Co., La Crosse, Wis., it's instantly apparent that he approaches his job with great enthusiasm. Considering everything on his plate, he needs to. Smith's most immediate challenge is supporting the equipment deployment requirements the Brennan team faces working on the largest environmental cleanup now underway in the U.S., a \$1 billion, 37-mile-long effort to remove and/or mitigate PCBs in sediment in the Fox River near and in Green Bay, Wisconsin. Brennan is a \$100 to \$120 million a year full-service marine contractor doing everything from dredging to diving inspections to bridge repair to underwater surveys. Smith seems to be in the midst of much of it.

Full Text

Upon meeting Under 40 in Construction Equipment Award winner Greg Smith, director of the environmental group for J.F. Brennan Co., La Crosse, Wis., it's instantly apparent that he approaches his job with great enthusiasm. Considering everything on his plate, he needs to.

"I'm a very positive, energetic guy, so I like to try to bring that to work and keep everybody upbeat," Smith says. "There are a lot of things that we can get stressed out about, but when you're working in these types of jobs, we have so many things going for us that there's no reason to be depressed. Let's stay positive about it."

It can be tough to stay positive in the environmental cleanup business due to some clients' view of the work.

"In the environmental world, clients are paying for something they don't want," Smith says. "And that creates a difficult working challenge because they're being forced to do a cleanup. Dollars are coming directly out of their bottom line that they are getting nothing for. When you're working for the DOT and you're building a new road, they're excited to get a new road. The majority of our clients are not excited for the project to even take place."

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Brennan is a \$100 to \$120 million a year full-service marine contractor doing everything from dredging to diving inspections to bridge repair to underwater surveys. Smith seems to be in the midst of much of it.

"If it's any kind of construction on the water, we do it," Smith says. For the Fox River cleanup, which started in 2004 and is expected to run until 2018, Brennan is attacking the project in two ways; dredging to remove contaminants, and/or applying a sand cover or cap to cover the contaminants and keep them out of circulation. Different underwater conditions and pollution levels call for different tactics.

"Typically, we will remove the contaminants with mechanical or hydraulic dredging," Smith says. "We also have several processes where we will high-speed dewater it, sending thick, muddy water coming through the pipeline, and separating the water and the silt to then make it suitable for a landfill."

The Fox River sand cap effort involves a patented system, including specialized equipment, that Smith helped invent. It's called the Broadcast Capping System (BCS), or as Smith terms it, "A salt spreader on steroids."

"One of the great things about environmental projects in the dredging industry is it's a relatively young industry and there's a lot of room for creativity, so we're constantly innovating new ways to be able to overcome challenges," Smith says.

One challenge was the old way of spreading. If it had a name, it might have been called "spray and pray."

"With the traditional method, you would use a bucket and drop or try to sprinkle the material out there," Smith explains. "Well, when you're trying to do several hundred tons an hour of this, the only thing that would happen is you would drop it and the soft sediment would engulf the sand. It would either take twice as much material, or you'd never get it done."

"We are placing sand on top of very soft sediment," Smith says. "I like to describe the sediment that we are working with as tomato paste or yogurt, now we want to put 6 inches of sand on top of that, and potentially a layer of gravel on top of that."

The BCS system uses GPS positioning and metering equipment to construct the covers and caps in thin layers, without disturbing the sediments underneath.

"It places a cap, or sand cover, and the sand acts as a filter layer; the sand will filter contaminants and keep them from coming out," Smith says. "We also accurately install different amendments mixed with sand, which acts like a filter on top of a filter, to keep sediment down. These include granular activated carbon and organoclay, to name a few."

"What we do is spread the material and allow each individual particle to hit the water surface, utilizing the water column to allow the sand to slowly fall to the bottom on top of the soft sediment, and that's how we build our bed of material," Smith says.

"That's very important in shallow water because there's not a lot of water column to disperse or reduce the velocity of the sand--if you're doing this in 50 feet of water, an excavator bucket might be fine," he says.

The BCS must gauge how much ground cover (and speed/passes) is necessary for vast areas, not too unlike landfill compaction and cover methods. In addition, it has to figure in variables such as current and boat traffic.

"We also place a layer of gravel to keep the sand there," Smith says. "We have a large 130,000-pound excavator placing quarry spall. That's placing large 9- to 18-inch stone as the final layer of our cap. A layer of sand, a layer of gravel, and this stone on top. This is usually in areas where there could be extra erosion or ice scour."

Brennan also uses smaller excavators, tug boats and barges to help maintain and support the equipment on site, all part of Smith's equipment deployment duties. The whole process starts with a team approach during the estimate--and proper preplanning.

"I help estimate the environmental projects and then provide support to the project managers afterward," Smith says. "During the estimating phase, our team will work together to decide which equipment we should use on a project, we'll put that into the bid, and there's a lot of strategizing when it comes to that, such as which size dredge, its production capabilities, and whether the project should be hydraulically or mechanically excavated."

Even though the majority of his work takes place on or under water, there are many parallels to earthmoving.

"How we win work is all about production," Smith says. "How can we be as accurate as we can possibly be and as productive as we can possibly be?"

He outlines just how precise Brennan has to be in its work. "We typically have to pay a penalty on environmental projects for any overdredging. Most [projects] are given a 6-inch allowable overdredge, so here's the design that you can dig to plus 6 inches below, but if you remove on average a volume below that 6 inches, you have to pay the clients their disposal cost for that," Smith says.

"That's their T&D, trucking and disposal costs. Depending on where that project's at, that can be anywhere from \$30 to \$100 a cubic yard, when you're doing that underwater, you have to be very accurate or you're going to spend a lot of money."

Brennan's overall fleet is a diverse group that includes everything from wheel loaders and excavators to dewatering plants and dredges with specialized cutting edges. The company is working on several cost-control practices and performing an analysis of the life cycles and costs of equipment in the fleet in order to determine the "sweet spot," the optimum time to dispose of assets and acquire new ones, as well as branching into telematics.

"We have a couple of [telematics] systems that we are testing out, we are using them on barges and boats, and we just started recently putting a handful on vehicles and some mobile equipment like excavators," Smith says.

"Because of the types of areas we work in, they're usually very industrial and therefore high theft areas, so we're looking at it for theft control," he says.

"We're also asking, 'How can it help the safety of our company with driving and operating?'"

In addition, Brennan is testing how telematics data might aid in equipment maintenance. As of now, most of their maintenance decisions rely largely on manual efforts. To gather hours on a machine, someone physically has to check the hour meter. "Part of our test is how the system relates to equipment maintenance--how can we tie that all together?"

Another area in which Smith is helping lead J.F. Brennan into the future is in training and mentoring.

"One of the biggest challenges in the construction industry is bringing in and keeping good people," Smith says. "The majority of the labor force in the construction industry is going to be retiring here in the next decade or so, and the workload is only going to be increased because of the issues with our infrastructure right now. It's not bonding capacity or equipment that's going to keep a company from growing, it's going to be the people that they have and whether they're able to do the jobs."

That makes the need for training vital and constant, according to Smith.

"It's hard when you're spread out on jobs across the country, but you try to work with the guys as close as you can so that you know the talents and strengths of all your employees, and together you work with them on what we need to do to be world class, including identifying any skills gaps that are there," Smith says. "I help line up training for all of us within the division, on what we can do to make ourselves better, more efficient, safer and to be the best we can."

He also dispenses as much advice as he can along the way. "Because of our recruitment efforts, we are bringing in a lot of great young project managers, engineers and personnel. The thing I like to remind them to prepare for is that you have to have a plan A and a plan B; you can do all the planning in the world, and sometimes it works out great, but you have to be able to adapt and adjust and have a back-up plan ready to go. It will keep your project moving along," Smith says.

"Another one of the biggest things is how to work, teach and grow with all kinds of different people," Smith says. "That can be a challenge for a young guy in the industry working with older guys, and vice versa. The senior construction guys in the industry have a tremendous amount of knowledge and anyone that's young, that's new to the industry, should be a sponge."

"They should try to absorb as much as they can and learn as much as they can from those senior guys--their knowledge is priceless. Respect them."

Credit: Frank Raczon, Senior Editor

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