OCTOBER 2013

IHS Dredging and Port Construction

The leading international magazine for the World of Marine Civil Engineering

dpcmagazine.com

Environmental dredging
The first dustpan dredger in 30 years and much more

Pride of the nation
Inai Kenanga is Malaysia's first mega trailer

Race to dominate
Djibouti's building a bulk freight hub

Luedtke's *Lucille T* at work
Buffalo Niagara Riverkeeper

When a river can flow backwards...

…then implementing its $32M second phase dredging won't be easy but, as **Scott Berman** found out, many people are determined to succeed in cleaning up New York's Buffalo River

The 13km-long Buffalo River drains into Lake Erie – one of the Great Lakes lying between Canada and the United States – and is currently on the US Environmental Protection Agency's (EPA) Great Lakes list of 'Environmental Areas of Concern' (EAC), hence the $40M public-private project to help clean it up.

The successful first phase, which ran from 2011–12, cost about $5.4M, and preparing and repairing the US Army Corps of Engineers' (USACE) nearby confined disposal facility number four (CDF4) cost another $2.6M. The second phase will add another $32M to those figures.

Restoration partnership

Dredging is a key part of the project and progress to date is giving participants hope that it could serve as a model for other EACs.

I recently spoke with some of the major players driving this innovative effort to remove the beneficial use impairments from the river and, eventually, remove the waterway and the city's ship canal from the EPA's EAC list.

A coalition called the Buffalo River Restoration Partnership has initiated and implemented the programme, which is made up of federal and state agencies, plus the not-for-profit Buffalo Niagara Riverkeeper, and Fortune 100 company Honeywell.

For phase one, the federal government's Great Lakes Restoration Initiative, administered by the EPA, funded about $4.6M of the cost; standard operations and maintenance funds provided the remainder.

Dredgers arrived in September 2011, when Michigan-based contractor Luedtke Engineering started removing about 420,510m^3 of material from the river's federal navigation channel – officials and technicians had targeted an 8.8km stretch of the river bearing plenty of old contaminants, namely PCBs (polychlorinated biphenyls), PAHs (polycyclic aromatic hydrocarbons) and various metals, explained engineer Michael Asquith of USACE's Buffalo District.

Asquith and the Corps' district's public affairs officer, Bruce Sanders, described a relatively standard approach with a closed clamshell, oil booms, debris removal, and few surprises. Luedtke used its *Lucille T* pump out rig to move dredged materials from barges into the Corps' local confined disposal facility – more about that below.

Dredgers wrapped up the overall project in January 2012 – officials and technicians are now looking ahead to the much larger second phase – funded through the Great Lakes Legacy Act, also under the auspices of the EPA – that will remove 305,800–344,000m^3 of contaminated material from outside the navigation channel, basically from the channel to the shoreline, including areas that may never have previously been dredged. The project will also see some contaminated areas in the city's ship canal capped with clean material.

Next step

Phase two is tentatively planned to start by the end of 2013 and take two years to complete. The EPA will spearhead the work, while the Corps will take on a limited role.

Officials are optimistic about phase two getting under way promptly. Martin Doster (see *Round Table* p58), regional remediation engineer for New York State's Department of Environmental Conservation (NYS DEC), expects a bid for phase two to have been awarded and preliminary work to have started by the time you read this.

It won't necessarily be easy: firstly, as technicians in phase one discovered, there's the nature of the river itself, which snakes its meandering way through the region, with


Aerial view of CDF4
USACE


Redeveloped canalside area
USACE

areas where scouring happens and, conversely, where sediment collects.

Further, in certain stormy conditions, the river flows backwards. It makes for a unique river dynamic that dredging technicians will have to continue to deal with when phase two gets under way.

As Doster said: "When you're doing design and modelling, from an engineer's perspective it drives us crazy trying to get our heads around it, because we like certainty and this river certainly doesn't give us certainty."

Even though both phases are expected to remove roughly the same amount of material, the second phase is even more exacting. It has a higher price tag because there's a need for precision dredging on either side of the channel where dredgers will be working close to the foundations of some structures. And there's another crucial component: restoring river habitat at several points on the river. Projects to do that will backfill the dredged areas with clean material and plant aquatic vegetation.

Just as in phase one, barges will carry dredged sediment to the Corps' nearby CDF4. Back in 2010, it was prepared and repaired: technicians grouted and otherwise upgraded the sheet pile wall separating the 43.3ha facility from Lake Erie – Zoladz Construction of Alden, New York, was the repairs contractor and Intelligrout was the subcontractor.

The CDF should prove useful for some time – it has enough space remaining to hold 2.3M m^3 of material. As Asquith explained, that's enough capacity for the next 20 years – even with phase one and two dredging, as well as normal navigation channel maintenance work to follow.

Finally…

Given today's tough funding environment – and that there are 40 such areas of environmental concern along the Great Lakes – it could seem anything but a done deal. Yet the track record so far is a cause for optimism at Buffalo. As the river project unfolds, other related work has been undertaken recently, such as rehabilitating stretches of shoreline.

In a notable example, Doster pointed out that Buffalo Niagara Riverkeeper worked with government agencies to piece together a $1.5M grant to repair the shoreline along the site of an old steel mill, restoring it for habitat as well as, hopefully, eventual brownfield development with green infrastructure.

More broadly speaking, stakeholders believe the river clean-up is not an isolated undertaking, but rather an important marker for the city's environment. Indeed, Buffalo Niagara Riverkeeper's executive director, Jill Jedlicka, has described the river clean-up as an ecological and economic catalyst for what's happening all around Buffalo's waterfront. The local partnership making this happen is "now identified as a successful model for transforming environmental liabilities into community assets for revitalisation," she added.

And while a lot of cooks – Riverkeeper, NYS DEC, the Corps, the EPA – could be a recipe for spoilt broth, that's not been the case at Buffalo. Each entity has a clear role – the Corps, for example, handles permits and navigational dredging, while NYS DEC focuses on habitat restoration.

"Yes, there are a lot of moving parts to this restoration project," said Doster. "But the stakeholders are united by the common goal of cleaning the river. It's worked very well." He credits Riverkeeper in particular for "keeping people focused on delivering a final product," adding: "When this project's done, we'll be well on our way to de-listing this river as an area of concern, and that's the goal of the entire Great Lakes programme."

Sanders put it this way: "Our goal is to leave a legacy that people will be able to thank us for."

And at Buffalo, dredging is a key step along the way. DPC

» www.www.epa.gov


Buffalo skyline and river entrance
USACE