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## GROUNDS, PARKS AND ROADSIDE MAINTENANCE

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### Transforming a community eyesore

How to convert a polluted 50-year-old golf course to a top-notch (and safe) regional attraction.

By [Dana Gillette, PE](#), [Christopher Marsh, PE](#)

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[Polluted golf course to regional attraction](#)

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In 2003, after almost 50 years in business, the Tradition Golf Club in the heart of Royal Palm Beach, Fla., declared bankruptcy. Designed by Mark Mahannah and built five years after the community was incorporated in 1959, the 18-hole public course was eventually surrounded entirely by homes.

After several failed redevelopment attempts, the village of 36,000 residents took the initiative to purchase and repurpose the derelict 163-acre site. Today, it's a regional recreational destination.

The transformation wasn't without challenges, however. In addition to coming up with \$25 million for redevelopment and working with adjacent

landowners to develop an acceptable mix of amenities and activities, the most difficult was cost-effectively mitigating soil and groundwater contamination that had accumulated since the course was built in 1954.

#### Economic crash equals opportunity

During the economic boom in 2004, the village government had no debt and considerable reserves. Once the financing was in place, the village bought the property for \$4.5 million. Then—and this is crucial—both construction and future operating costs were planned and budgeted for.

Even the Great Recession, which hit when construction was underway, became an advantage when interest rates and material and labor costs fell.

In 2006, the engineering department set about finding the right team of players to begin permitting and

design. Department managers realized the park had to reflect residents' needs and recreational preferences. A lengthy community involvement process involving workshops, meetings, and mailers pinpointed expectations and ranked potential activities. This feedback was used to develop a detailed site master plan.

Transforming the site would be done in three phases:

- Clean up contamination and earthmoving: \$2 million
- Construction: \$23 million
- Get support for future improvements that could include a dog park, disk golf (Frisbee golf), an arts center, community gardens, senior housing, and civic buildings. Cost will depend on their size and complexity.

With the first two phases complete, the park opened to the public in March with bike and walking trails; a new lake for kayaking; a great lawn area with playgrounds, sand volleyball courts, picnic pavilions, docks, and bridges to trails; a central plaza with a wedding pavilion, sporting center, banquet garden, and interactive fountain; a lighted driving range and 18-hole putting golf course.

## Significant arsenic issues

Developers had rejected the property because of suspected soil and groundwater contamination, and they were right. The rolling landscape and natural vegetation looked benign, but there was significant arsenic contamination from herbicides and pesticides that were applied to the course in the 1960s to the 1980s, a standard practice for the time.

This meant that whoever bought the site would have to remediate it according to Florida's 62-780 law, which requires that concentration of these constituents of concern be low enough to be safe for residential land uses.

An environmental site assessment identified arsenic-impacted soil and groundwater, as well as dieldrin and toxaphene. Soil borings of various depths were taken generally within the confines of the old golf course holes. Arsenic levels in some areas exceeded residential direct-exposure values. The soil contamination was generally limited to the uppermost soil layers (from 6 inches to 24 inches) of previous golf tees and greens, where herbicides and pesticides were most used. Groundwater contamination was higher in the fairway areas, where runoff from tees and greens had accumulated and percolated into the ground.

With potential visitors running the gamut from toddlers to the elderly, and with many activities involving contact with the soil, ensuring that the site was safe for all uses became paramount. The department hired a toxicologist to develop a cleanup target level for each proposed use. Based on the expected exposure to visitors, construction workers, and maintenance staff, a standard for arsenic concentration in the soil was developed and approved by the state:

- 5.5 mg/kg in portions to be used as a park
- 12 mg/kg in portions used for golf, commercial, or industrial activities
- 31 mg/kg for soil contained onsite under an impervious cap.

All three exceed the state's residential limit of 2.1 mg/kg. To give the village as much future flexibility as possible, the design team decided to apply the park standard of 5.5 mg/kg across the entire site.

There were no changes to the concentration levels allowed in the water, and the state standards of 10 µg/l (groundwater) and 50 µg/l (surface water) remain the goal.

Supplemental testing included wells drilled along the property line, offsite groundwater samples, and offsite surface water tests. Some groundwater contamination had migrated offsite. Therefore, extensive coordination with the state occurred and residents who were affected were made aware of the issue. Engineers developed a design that draws groundwater back toward the site to eventually lower offsite

## Project team and costs

**Owner:** Royal Palm Beach, Fla., Engineering Department  
**Project manager/civil engineering:** Erdman Anthony  
**Environmental/geotechnical testing:** Dunkelberger Engineering & Testing  
**Toxicology:** HSWMR  
**Environmental lawyer:** Lewis, Longman & Walker  
**Golf course design:** Bates Golf Design Group  
**Planning/architecture/landscape architecture:** IBI Group  
**Property (163 acres):** \$4.5 million  
**Contamination remediation:** \$2 million  
**Construction:** \$23 million  
**Funding:** \$1.4 million in grants from the South Florida Water Management District and the Florida Department of Environmental Protection

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contamination to acceptable levels.

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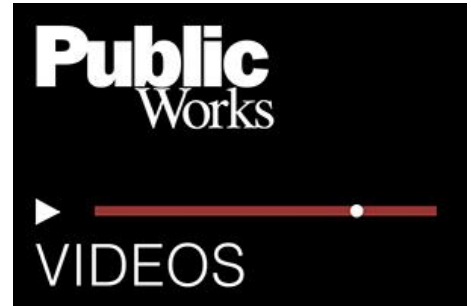
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