

The Nutrient Reduction Program (NRP) at the Wastewater Plant



The Nutrient Reduction Program (NRP) at the Wastewater Plant represents efforts to ensure continued improvements to the James River and the Chesapeake Bay.

The \$120 million dollar investment made by the citizens of Richmond and the Commonwealth of Virginia has resulted in the following nutrient reductions at the plant:

TOTAL NITROGEN RELEASED

2010: 2,400,000 lbs.
2016: 338,000 lbs.

86%
reduction!

TOTAL PHOSPHORUS RELEASED

2010: 69,000 lbs.
2016: 38,000 lbs.

45%
reduction!

NRP Contract 1

Phosphorus Controls Improvements, Methanol Addition Facility and Effluent Filtration Upgrades

General Contractor:
Mid Eastern Builders



Start Date:
April 6, 2009

Engineer:
Greeley & Hansen



Completion Date:
December 30, 2010

Construction Manager:
Arcadis



Total Project Cost:
\$19,500,304





Contract 1 consisted of adding ferric chloride chemical storage and metering pump feed systems to the primary and secondary sedimentation tanks; methanol storage tanks, metering pumps and controls; and upgrading existing filters to reliably remove particulate phosphorus and nitrogen.

NRP Contract 2

Ultraviolet (UV) Disinfection Facility and Main Plant Electrical Switchgear Upgrades

General Contractor:

T.A. Loving



Engineer:

Greeley and Hansen



GREELEY AND HANSEN

Construction Manager:

Arcadis



Start Date:

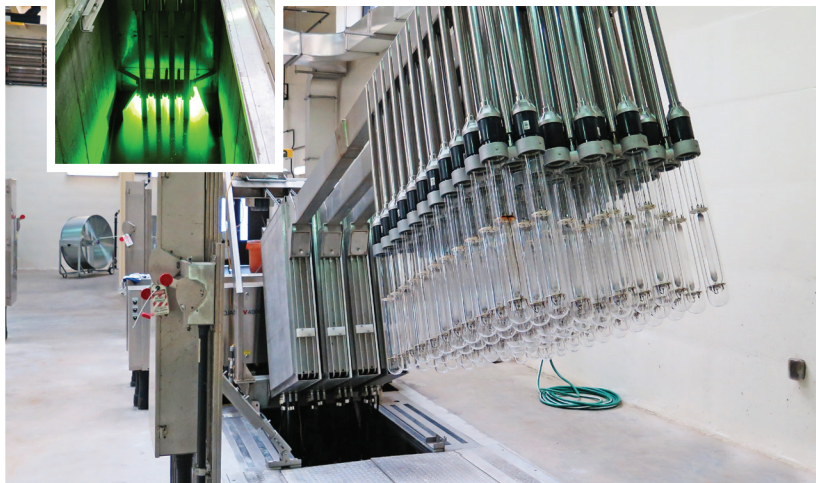
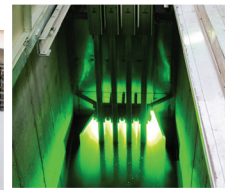
December 6, 2010

Completion Date:

December 27, 2012

Total Project Cost:

\$21,819,879





Contract 2 consisted of the construction of a new ultraviolet (UV) disinfection facility to replace the existing chlorine gas disinfection and sulfur dioxide dechlorination system and the upgrading of the main plant switchgear and electrical distribution system to improve reliability of power feeds to all plant facilities.

NRP Contract 3

Primary Sedimentation Tanks Scum Control Upgrades

General Contractor:
Southwood Builders



Engineer:
Greeley and Hansen



GREELEY AND HANSEN

Construction Manager:
Arcadis



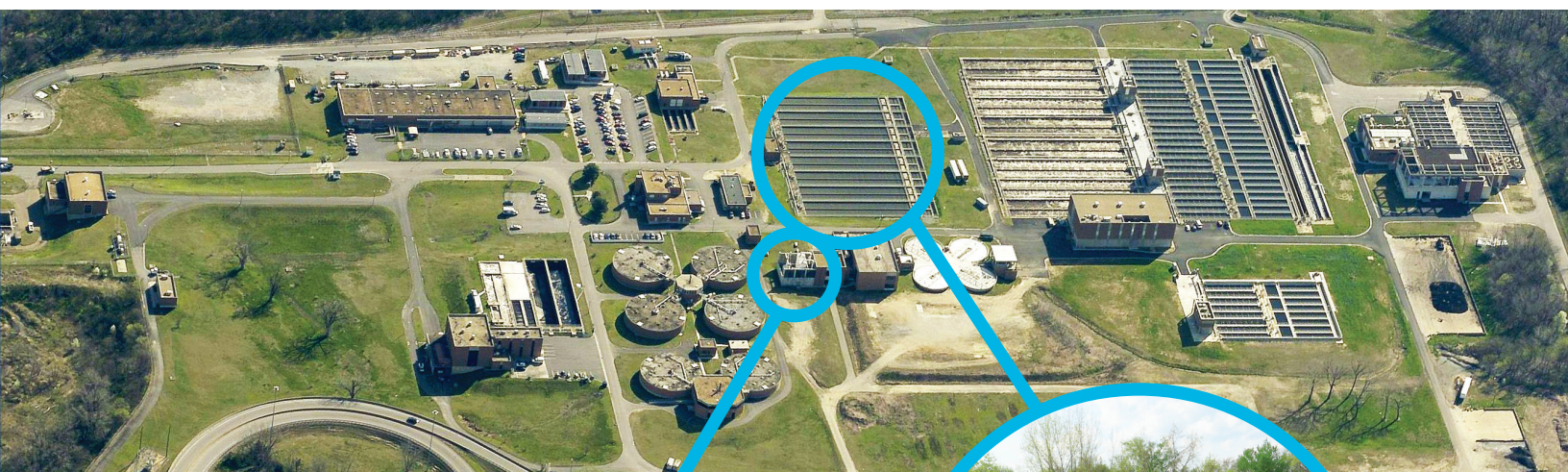
ARCADIS | Design & Consultancy
for natural and
built assets

Start Date:
June 1, 2009

Completion Date:
April 15, 2011

Total Project Cost:
\$8,415,299





Contract 3 consisted of the construction of scum collection troughs and motor-operated scum gates in the preliminary sedimentation tanks for scum removal, installation of scum chopper pumps, and the construction of a new two-story building to house new scum concentration equipment and bio-trickling filter and activated carbon odor control equipment.

NRP Contract 4

Scum Control Upgrades, Aeration Upgrades, RAS Capacity Upgrades and Bio-Augmentation Process Facility

General Contractor:
Southwood Builders



Engineer:
Greeley and Hansen



GREELEY AND HANSEN

Construction Manager:
Arcadis



Start Date:
September 7, 2010

Completion Date:
May 21, 2013

Total Project Cost:
\$29,947,299





Contract 4 consisted of equipment upgrades to the treatment system in order to more efficiently remove carbon and nitrogen-containing compounds. This equipment includes aeration tanks, pumps, diffusers and floatables removal. Also included in this contract were side-stream reactors for bio-solids production.

NRP Contract 5

Additional Final Sedimentation Facilities and Fermentation Process Facilities

General Contractor:
English Construction



Start Date:
June 18, 2012

Engineer:
Greeley and Hansen



Completion Date:
June 5, 2015

Construction Manager:
Arcadis



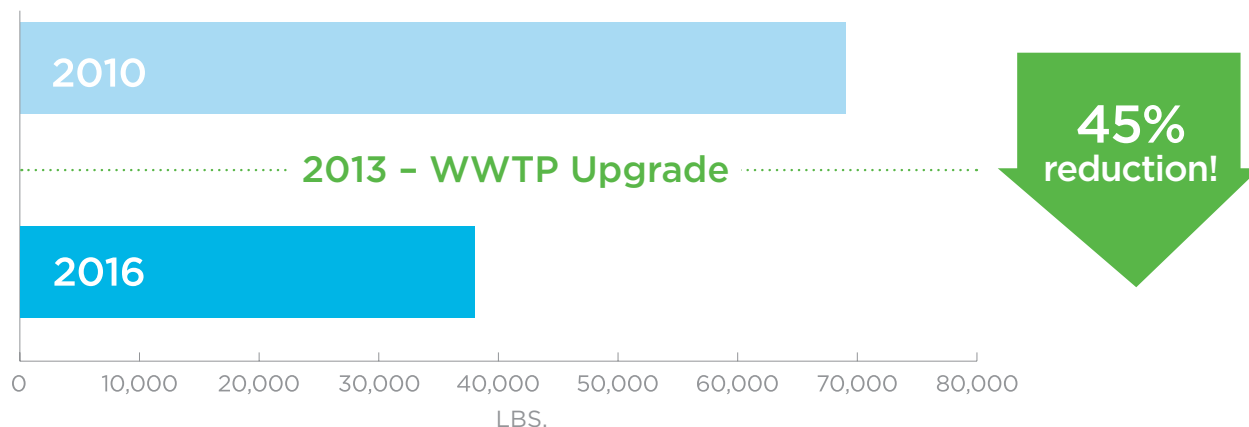
Total Project Cost:
\$25,535,922



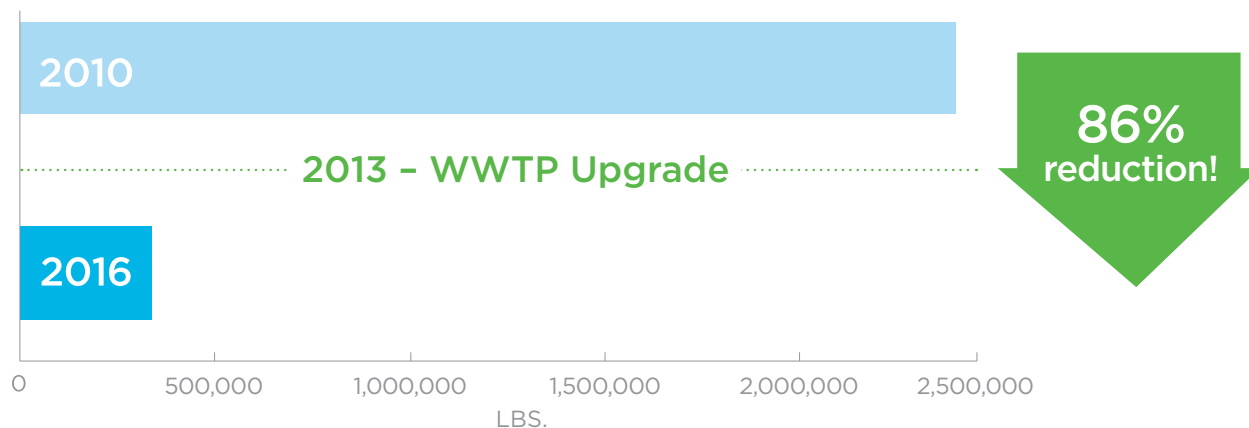


Contract 5 consisted of the construction of two new final sedimentation tanks and the conversion of one existing digester to a fermentation reactor.

Total Phosphorus Released



Total Nitrogen Released





The WWTP Nutrient Reduction Upgrade
Program was made possible by the following:

Funding by:

Citizens of the City of Richmond
Department of Environmental Quality
Virginia Water Quality Improvement Fund
Virginia Clean Water Revolving Loan Fund

Contractors:

Mid Eastern Builders
T.A. Loving
Southwood Builders
English Construction

Engineer:

Greeley and Hansen

Construction Manager:

Arcadis