



Case History - City of Bloomington

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Energy Systems Group





Introduction

Overview

- City of 69,000 population
- 20 Mgd wastewater facility
- City Had done two previous PC projects
- Preliminary engineering completed for project but never implemented
- Customer identified several additional needs as part of project
- RFP in May 2003
- Construction
 - Start Oct 2003
 - Complete Dec 2004

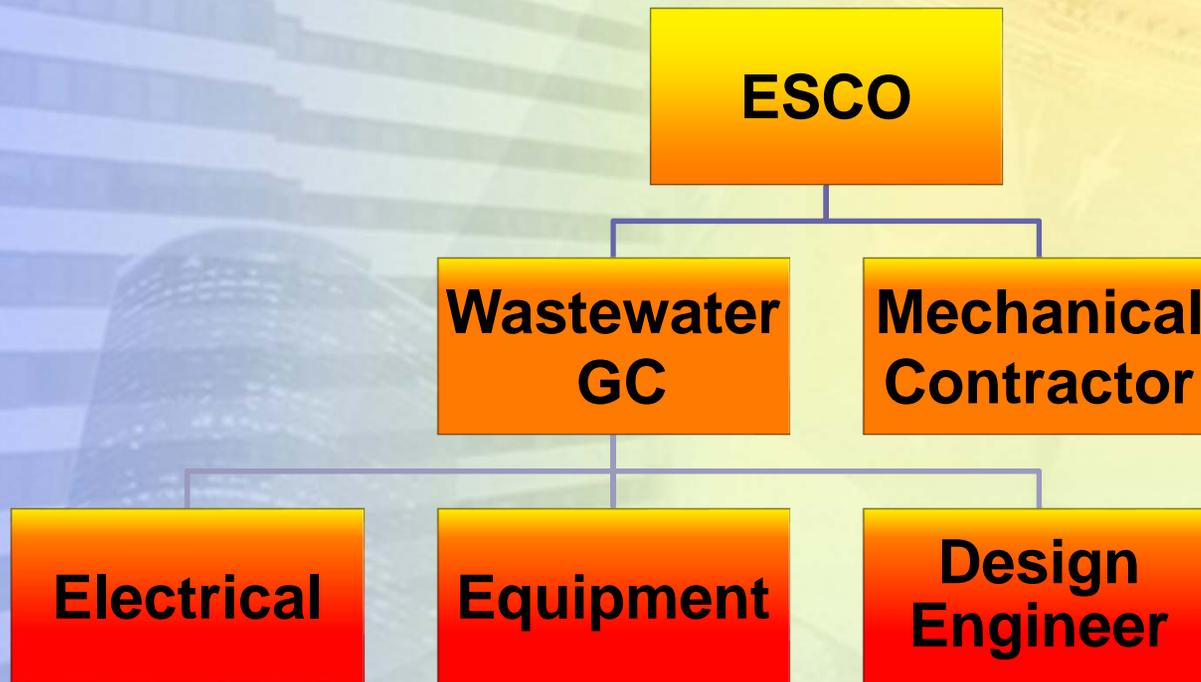




Procurement

- Concept Introduction February 2003
- Feasibility April, 2003
- Request for Proposals May 2003
- Negotiation and scope verification June 2003
- Utility Board Approval June 2003
- City Council Approval July 2003
- Contract Authorized August 2003

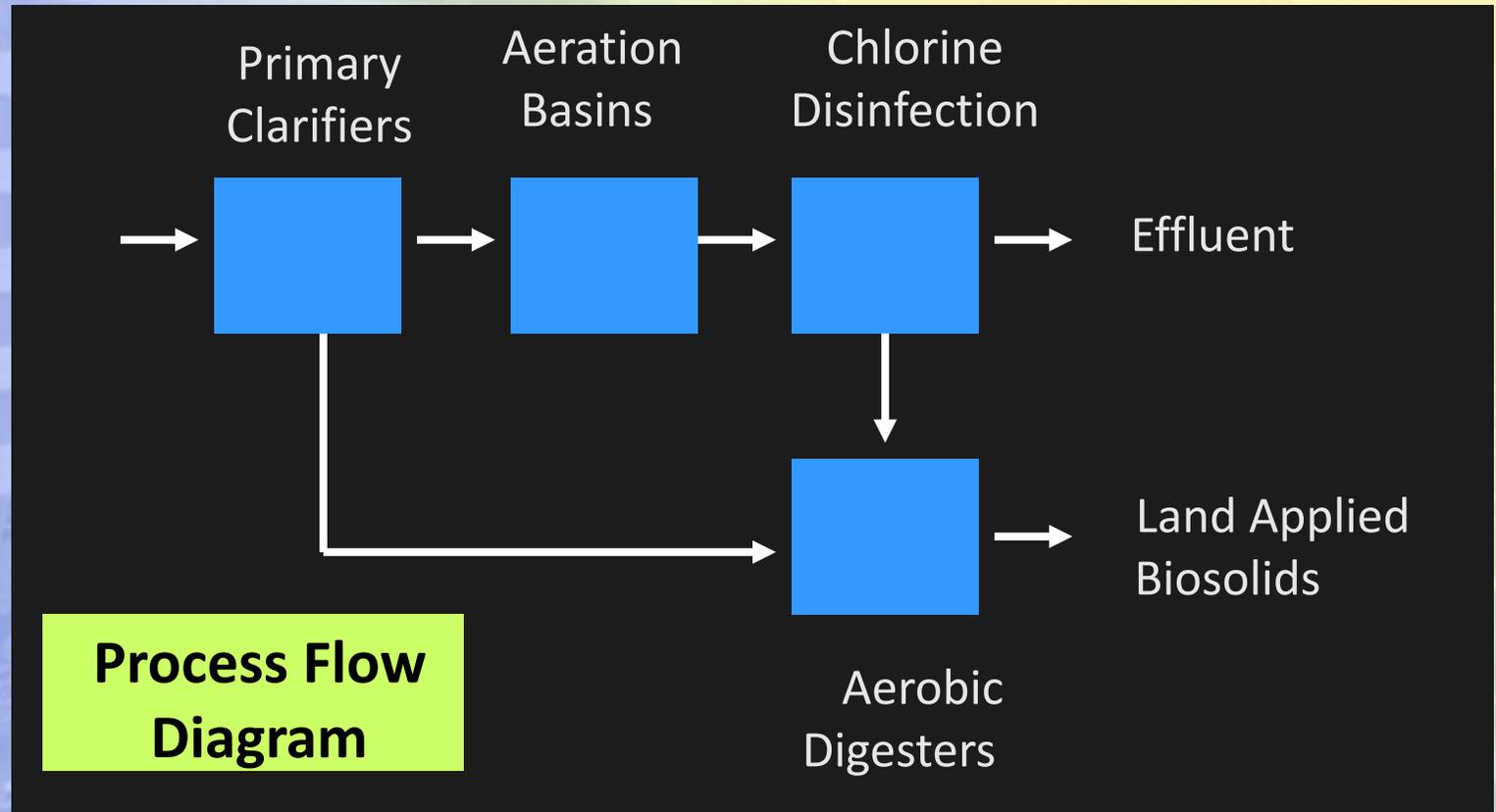
Project Team





Dillman Road Wastewater Facility

Conventional activated sludge

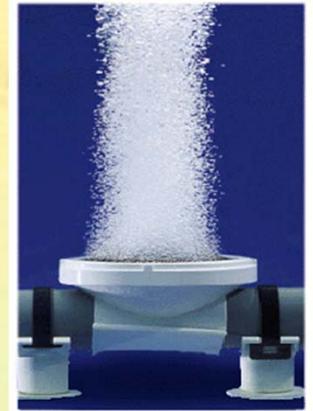




Scope of Work

Aeration

- Convert from coarse bubble to fine bubble diffusers in six aeration basins and two aerobic digesters
- 12,600 diffusers replaced
- Digester tank modifications to improve mixing





Scope of Work

Aeration

Note nearly
plugged aeration
piping

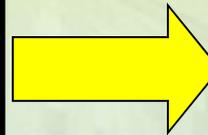




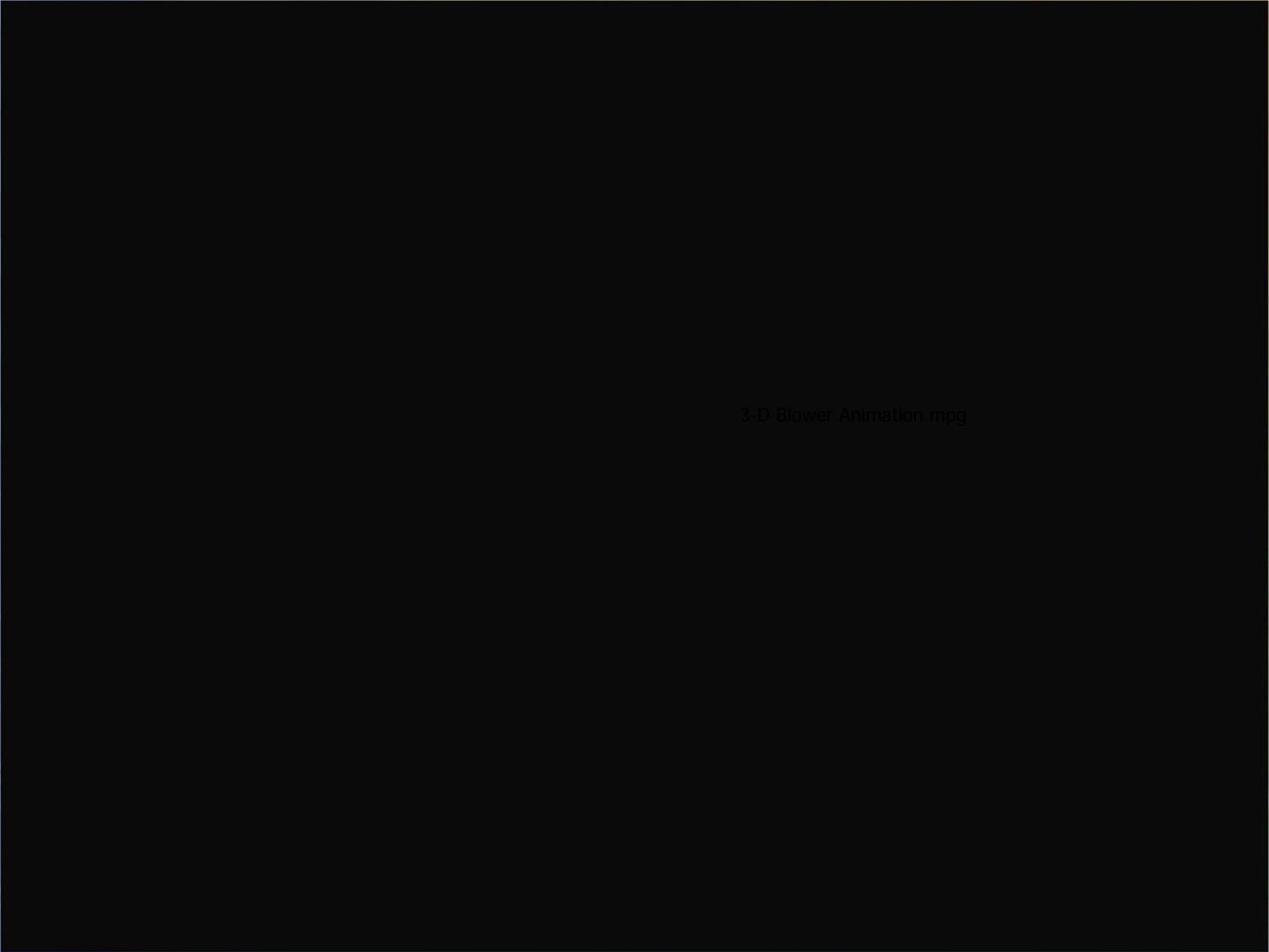
Scope of Work

Blower

- Replace existing 400 hp multi-stage centrifugal with variable vane, variable flow Turblex Blower
- Reduced air requirements allowed for a new trim blower to optimize energy
- The other units remained for backup and baseload



Variable vane, Variable flow Turblex Blower





Scope of Work

- HVAC Improvement – replace existing electric makeup air unit with gas fired unit

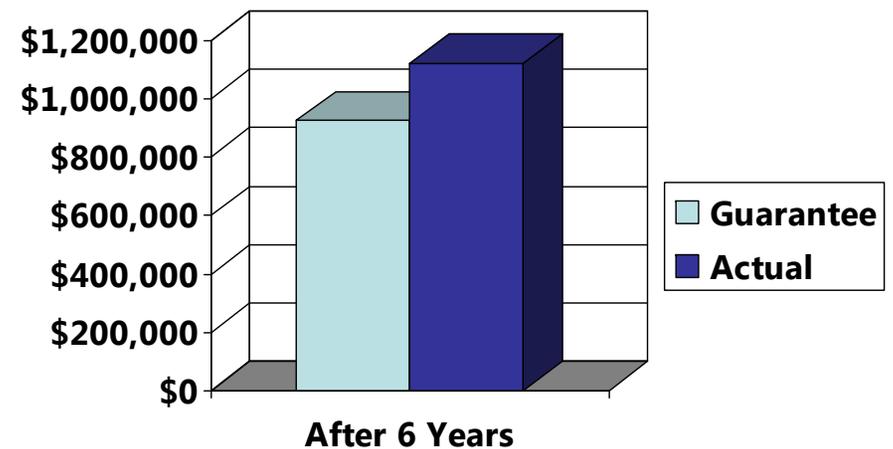




Financials

- Contract Price \$2,371,493
- Financed 10 years at 3.90% Interest
- 7.93 year simple payback
- Savings thru year 6
 - Guarantee = \$925,782
 - Actual = \$1,124,263

Refined previous project loans for additional \$39,600 in total savings.





Sustainability

- This Project Reduced the City of Bloomington's Carbon Footprint by
- 13,413,163 kWh Over the Guaranteed Period to Date
- 10,428 Carbon Monoxide Metric Tons
- Greenhouse Gas Emissions from 1,910 Passenger Vehicles Annually
- Carbon Monoxide Emissions from Electricity from 1,381 Homes for 1 Year



Why Do it?

- External funding accelerated project
- Single source accountability
- Performance guarantees
- Trusted delivery team
- No rate increases required





Do Different?

Issue

- Customer decided not to do dissolved oxygen control which would have improved performance
- Foaming issues during startup of digesters caused concern, but it settled down after three weeks
- Blower went down after operator turned off oil pump and began rotating backwards

Next Time

- More education / visit other sites where it's working
- Anticipate and warn
- Installed valve to prevent reverse rotation



Thank You

Questions?



Case History - City of Winchester

Dan Sanders

Director of Energy Technology, R&D

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Introduction

Overview

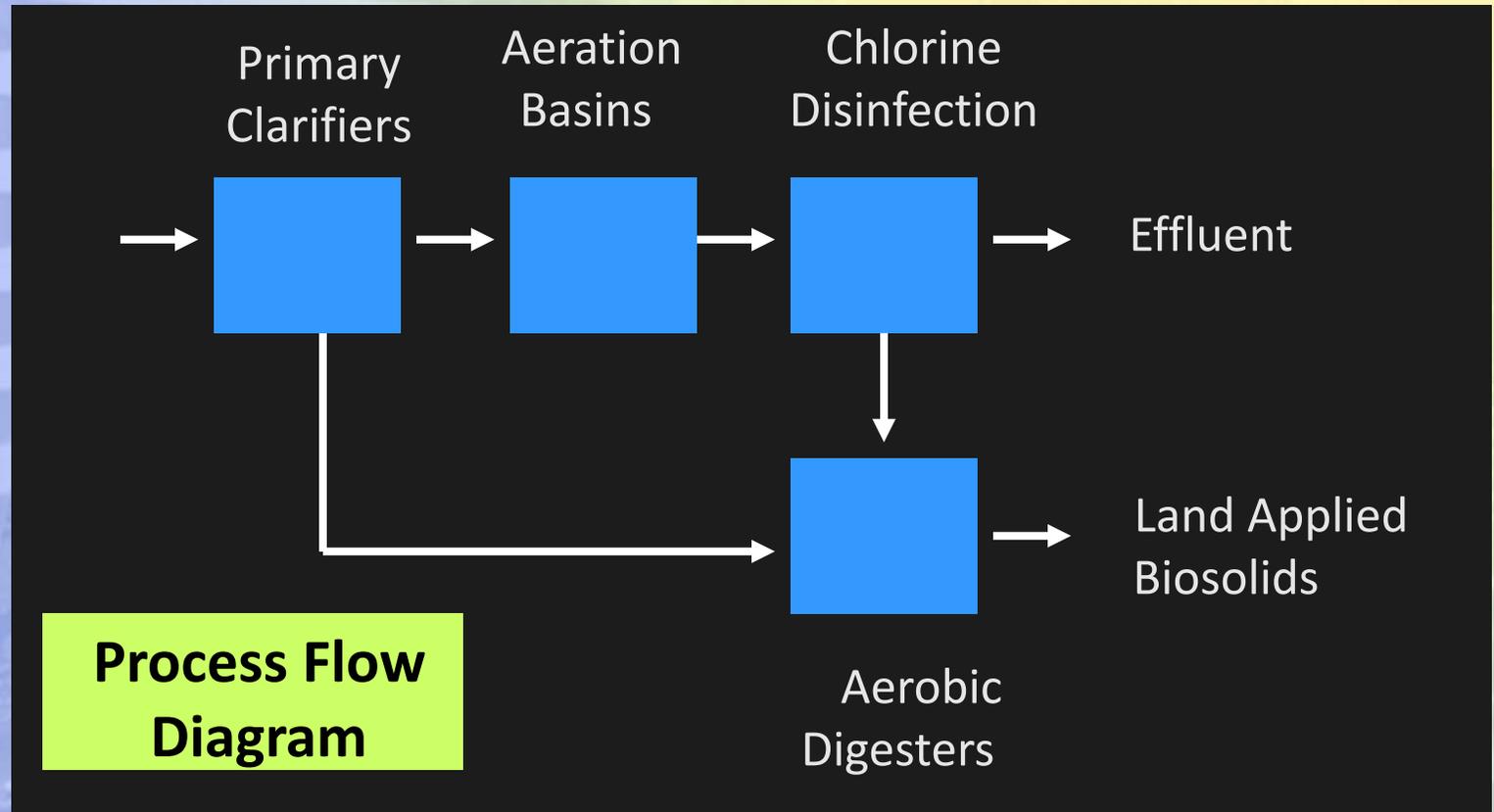
- City of 5,000 population
- 2 Mgd wastewater facility
- Had never done a PC project
- Customer was experiencing blower failures and had no backup
- RFP in March 2005
- Construction
 - Start July 2005
 - Complete Jan 2006





Dillman Road Wastewater Facility

Conventional activated sludge



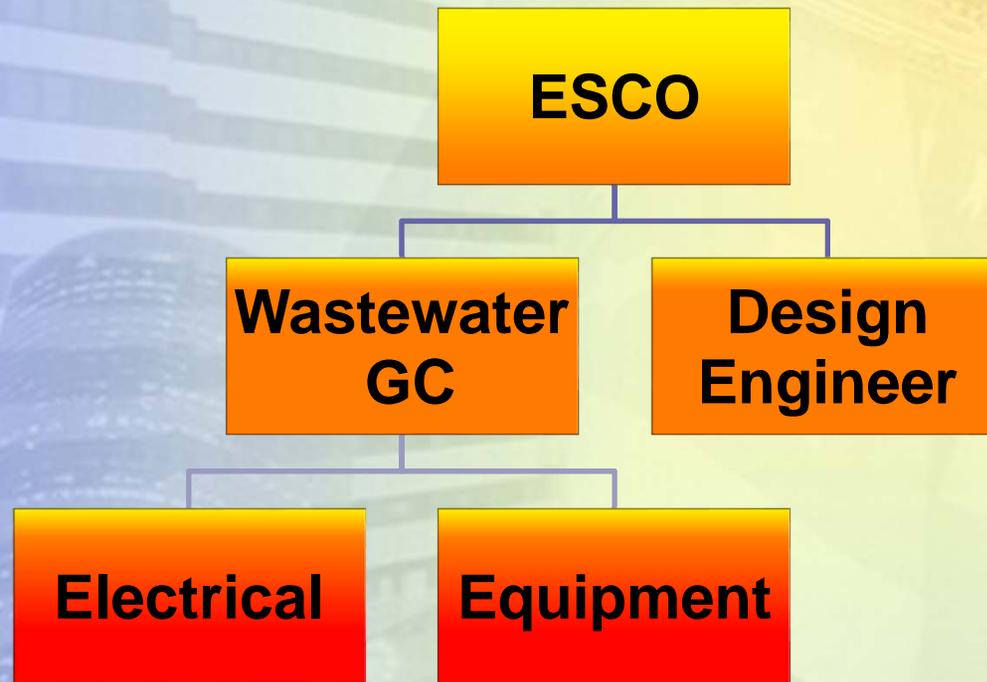


Procurement

- Concept Introduction September 2004
- Feasibility December 2004
- Request for Proposals January 2005
 - One Response
- Negotiation & Scope Verification March 2005
- Board of Works Approval May 2005
- Contract Authorized June 2005



Project Team

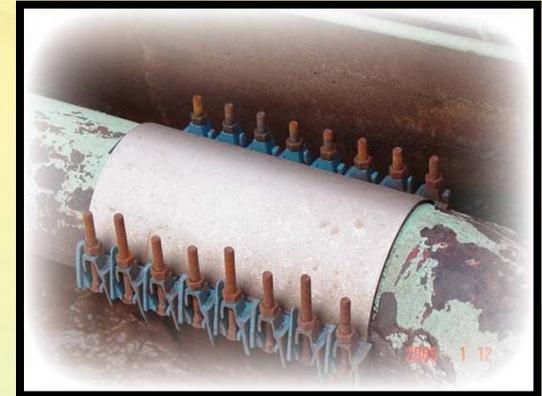




Scope of Work

Aeration

- Convert from coarse bubble to fine bubble aeration in four basins

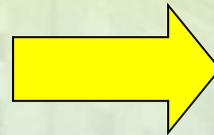




Scope of Work

Blower

- Replace existing 150 hp positive displacement with 75 hp variable speed, PD blowers
- Reduced load allowed for smaller blowers

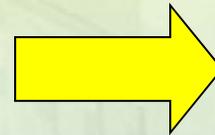




Scope of Work

Aeration

- Floating dissolved oxygen sensors along with new valves along the air pipe header allowed for active DO control.
- Pre-project levels were between 5 to 8 ppm
- After project was near steady 2 ppm

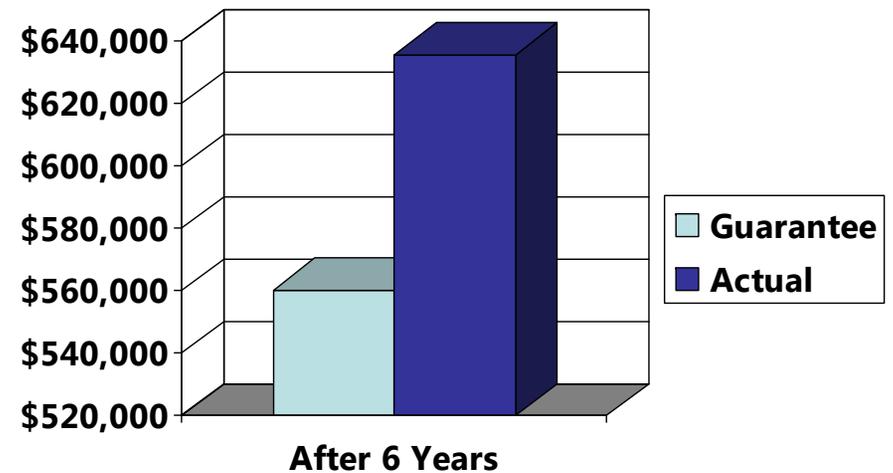




Financials

- Contract Price \$795,472
- Financed 10 years at 4.40% Interest
- 7.1 year simple payback
- Savings thru year 5
 - Guarantee = \$ 560,192
 - Actual = \$ 635,746

Excess savings allowed for additional reinvestment into collection system improvements





Sustainability

- This Project Reduced the City of Bloomington's Carbon Footprint by
- kWh Over the Guaranteed Period to Date
- Carbon Monoxide Metric Tons
- Greenhouse Gas Emissions from Passenger Vehicles Annually
- Carbon Monoxide Emissions from Electricity from Homes for 1 Year

no values available for this



Why Do it?

- External funding accelerated project
- No change order from GMAX price
- Partnered with incumbent engineering firm
- No rate increases required



Do Different?

Issue

- Several items were not addressed due to fiscal limits

Next Time

- Phase 2 in development



Thank you
Questions?