**PROTECTING WATER IN THE BULL CITY**

**The Business Case for a Public Cistern Finance Program in Durham, NC**

**DUAL THREAT: Increased Water Shortages and Decreased Water Quality**

![Map of Durham with water sources and cisterns]( `/<map-image-url>` )

**WATERED AREAS BY COUNTY:**

- Falls Lake
- Jordan Lake
- Lake Lomax
- Jordan Lake

**WATERCLASSIFICATION:**

- Falls Lake
- Jordan Lake

**2010**

- MGD: 28.2
- MDG: 104
- MDG: 227.10

**2020**

- MGD: 32.7
- MDG: 286.4
- MDG: 323.4

**2030**

- MGD: 38.4
- MDG: 392.4
- MDG: 408.4

**INCREASE IN TOTAL WATER DEMAND**

Despite an average decrease in water demand in recent years, the City of Durham’s total water demand is projected to increase by 15% by 2020 and by 26% by 2030, necessitating supply expansion to increase the system’s capacity by the year 2040. Rainwater harvesting presents one conservation measure that is spurred by a strong financial incentive for the water provider.

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**SCENARIO 1  PROPERTY OWNER FINANCED**

**Modeling of Dual End Water Harvesting Programs Using:**

- DUAL END WATERSHEDS
- Property Owner Perspectives

**NPV:** $2,123

**Annuity Savings (E/yr):** 1.95

**Payment (years):** 9

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**SCENARIO 2  UTILITY - INCENTIVE BASED PROGRAM**

**Utility Perspective:**

NPV: $4,425

**Property Owner Perspective:**

NPV: $1,448

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**A SCHOOL DISTRICT CASE STUDY**

Based on the background of the embedded water harvesting systems, the dual end water harvesting model can be financially and environmentally beneficial for the school district. The model can be adapted to other public schools, higher education institutions, and municipalities.

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**IMPERVIOUS SURFACE AREA OF DURHAM COUNTY PUBLIC SCHOOLS PROPERTIES**

- Small Properties: 50,000 - 149,999 sq. ft.
- Midsize Properties: 150,000 - 249,999 sq. ft.
- Large Properties: 250,000 sq. ft. or larger

**PERCENTAGE OF IMPERVIOUS SURFACE:**

- Small Properties: 32.8%
- Midsize Properties: 29.5%
- Large Properties: 26.0%

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**ALTERNATE ON-BILL FINANCE MECHANISMS**

**LOAN FIXED TO PROPERTY VALUE**

This mechanism ensures that the loan amount is fixed relative to the property value and the property owner is protected from any potential increase in water rates. It is particularly attractive for tax-exempt properties or those with low property values.

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**THIRD PARTY OWNERSHIP**

Another mechanism involves third-party ownership, where a third-party investor provides the initial capital for the project and is entitled to a contractual agreement with the property owner specifying the profit-sharing arrangement. This model can be particularly attractive for large properties or those with high capital costs.