

**Executive Summary**  
**Prepared for Board of Trustees Meeting**  
**April 26, 2011**

**Utilities Cost and Usage Report**  
**Year 5 – First Half (July through December, 2010)**

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**Executive Summary**

- 1) The total utility cost for this period, increased by \$167,563 (4.9%) over the same six months in 2009. This increase is largely due to an increase in electricity use due to increased in SF and in cooling degree days for the same period in Year 4.
- 2) The utility usage for 2010 compared to 2009 is as follows:
  - a) Electric usage increased by 6.1%
  - b) Natural gas usage decreased by 9.1%
  - c) Water usage increased by 16.5%
- 3) Utility rates decreased for all three utilities, resulting in a decrease in cost of \$88,521.
  - a) Electric unit cost decreased by 1.2%.
  - b) Natural gas unit cost decreased by 12.6%.
  - c) Water unit cost decreased by 5.4%.
- 4) Weather
  - a) There was a 24.2% increase in the number of cooling degree days, and a 35.6% decrease in heating degree days.
  - b) Rainfall in this period decreased by 3.18 inches.

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**Utility Costs Comparison to Year 4 – First Half**

The total utility cost increased by \$167,563. Table 1 and Figure 1 provide a cost breakdown by category.

**Table 1**

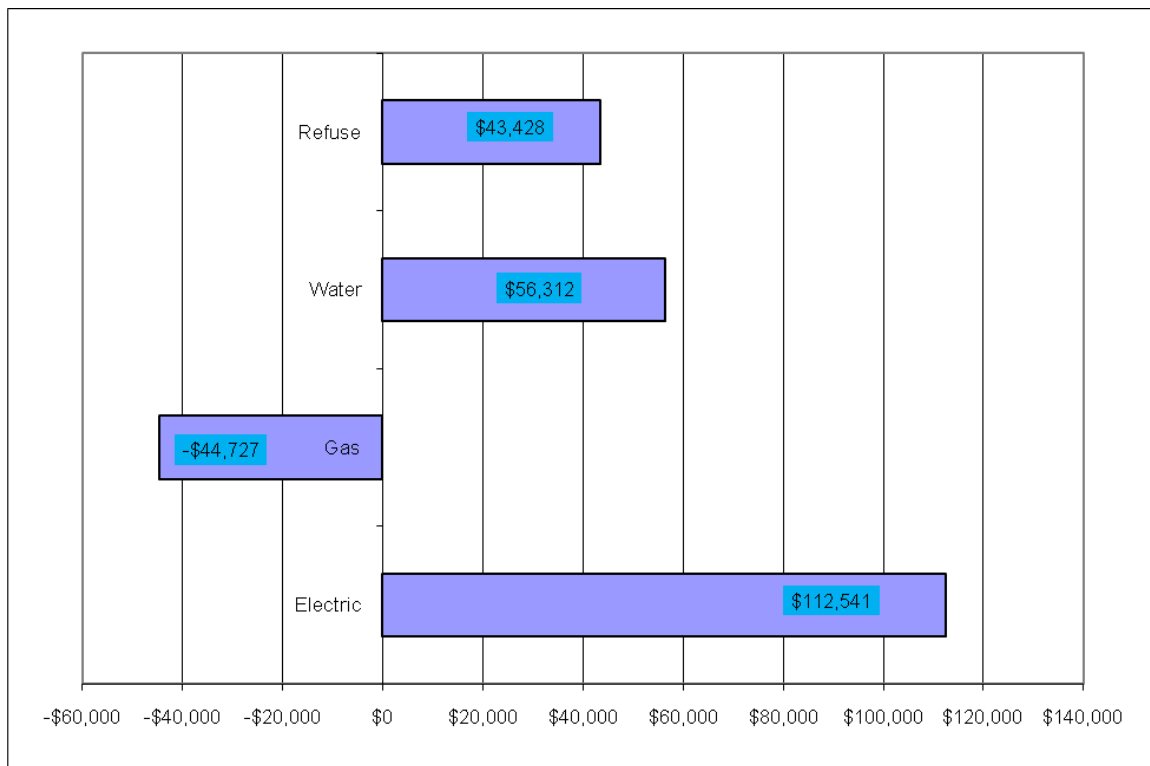
Category	Year 4 2009-2010	Year 5 2010-2011	% change Y4 to Y5	Cost Change Y4 to Y5
Electric	\$2,324,824	\$2,437,365	4.8%	\$112,541
Gas	\$218,284	\$173,557	-20.5%	-\$44,727
Water	\$552,684	\$608,996	10.2%	\$56,312
Refuse	\$312,033	\$355,461	13.9%	43,428
<b>Total</b>	<b>\$3,407,819</b>	<b>\$3,575,382</b>	<b>4.9%</b>	<b>\$167,563</b>

**Note:** The changes in the cost of utilities contributed to a decrease in cost. See tables 3 and 4 for a detailed breakdown.

**Figure 1**  
**Cost Change by Utility**

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**Utility Cost Comparison by Facility – First Half**

The facilities listed below experienced the largest increase and decrease in total utility cost.

**Table 2**  
**Utility Cost Increase/Decrease**

<b>Facility</b>	<b>% Change</b>
Borman Elementary School	29.1%
Ryan High School	14.9%
Blanton Elementary School	14.6%
Transportation Facility	-17.5%
Landfill	-23.5%
W.S. Ryan Elementary School	-33.4%

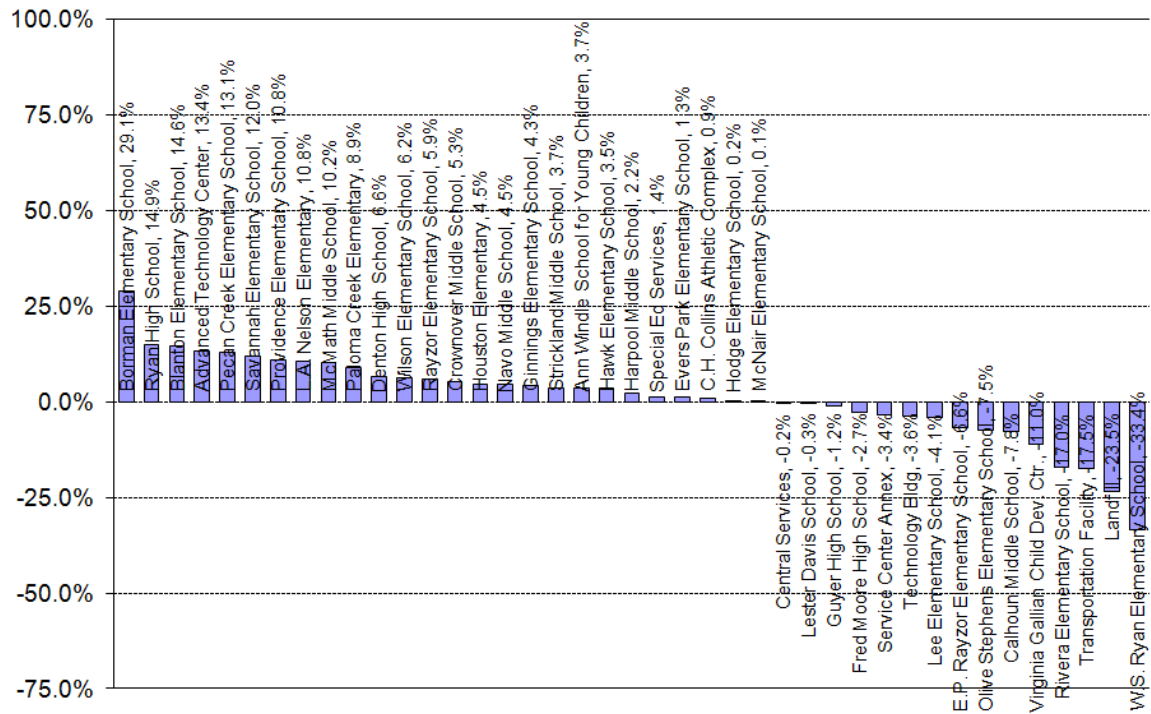
**Figure 2**

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### Utilities Cost and Usage Report Year 5 – First Half (July through December, 2010)

#### Percent Change of Utility Cost



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### Utilities Cost and Usage Report Year 5 – First Half (July through December, 2010)

#### Utility Unit Cost Comparison – First Half

Table 3 lists the average unit cost for electricity, natural gas and water.

Utility	Year 4 2009-2010	Year 5 2010-2011	Change	% Change
Electric, \$/kwh	\$0.093390	\$0.092296	-\$0.001094	-1.2%
Gas, \$ per Therm	\$0.746722	\$0.652896	-\$0.093826	-12.6%
Water, \$/CCF	\$4.910608	\$4.645882	-\$0.264726	-5.4%

**Table 3**  
**Utility Unit Cost Comparison**

Table 4 details the impact of the unit cost change on the cost of electricity, natural gas and water.

**Table 4**  
**Utility Cost Comparison**

Category	Year 5 Use	Year 5 Cost Calculated with Current Unit Cost	Year 5 Cost Calculated on Year 4 Unit Cost	Cost Difference
Electric (kWh)	26,407,999	\$2,437,365.06	\$2,466,248.33	-\$28,883.27
Gas (Therm)	265,827	\$173,557.34	\$198,498.86	-\$24,941.52
Water (CCF)	131,083	\$608,996.18	\$643,697.21	-\$34,701.03
<b>Total:</b>		<b>\$3,219,918.58</b>	<b>\$3,308,444.39</b>	<b>-\$88,525.81</b>

#### Energy Use Comparison to Year 4 – First Half

The total energy use increased by 2,517 MBtu (2.2%) from Year 4 to Year 5 for this period. This is due primarily to the increase in cooling degree days from year 4 to year 5 as well as the increased energy from the substantial additional SF added in this time frame.

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**Utility Use Comparison by Facility – First Half**

The facilities listed below in Table 5 experienced the largest increase and decrease in total energy use.

**Table 5**  
**Energy Use Increase/Decrease**

<b>Facility</b>	<b>% Change</b>
Harpool Middle School	93.3%
E.P. Rayzor Elementary School	87.9%
McMath Middle School	20.3%
Rivera Elementary School	-19.6%
Transportation Facility	-29.7%
W.S. Ryan Elementary School	-52.2%

**Figure 3**

# Executive Summary

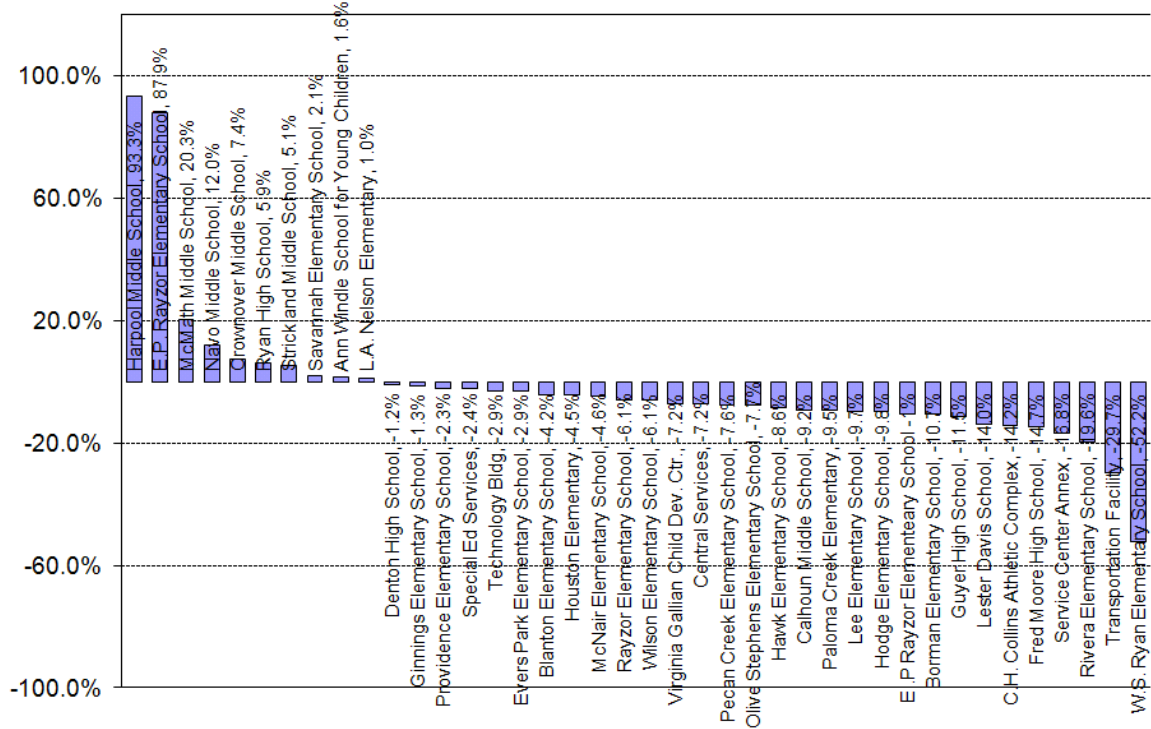
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### Percent Change of Energy Use





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**Water Use Comparison to Year 4 – First Half**

The facilities listed below in Table 6 experienced the largest increase and decrease in water use.

**Table 6**  
**Water Use Increase/Decrease**

<b>Facility</b>	<b>% Change</b>
Borman Elementary School	270.5%
Advanced Technology Center	206.3%
Providence Elementary School	91.5%
Transportation Facility	-36.1%
W.S. Ryan Elementary School	-49.3%
Olive Stephens Elementary School	-86.6%

**Figure 4**

# Executive Summary

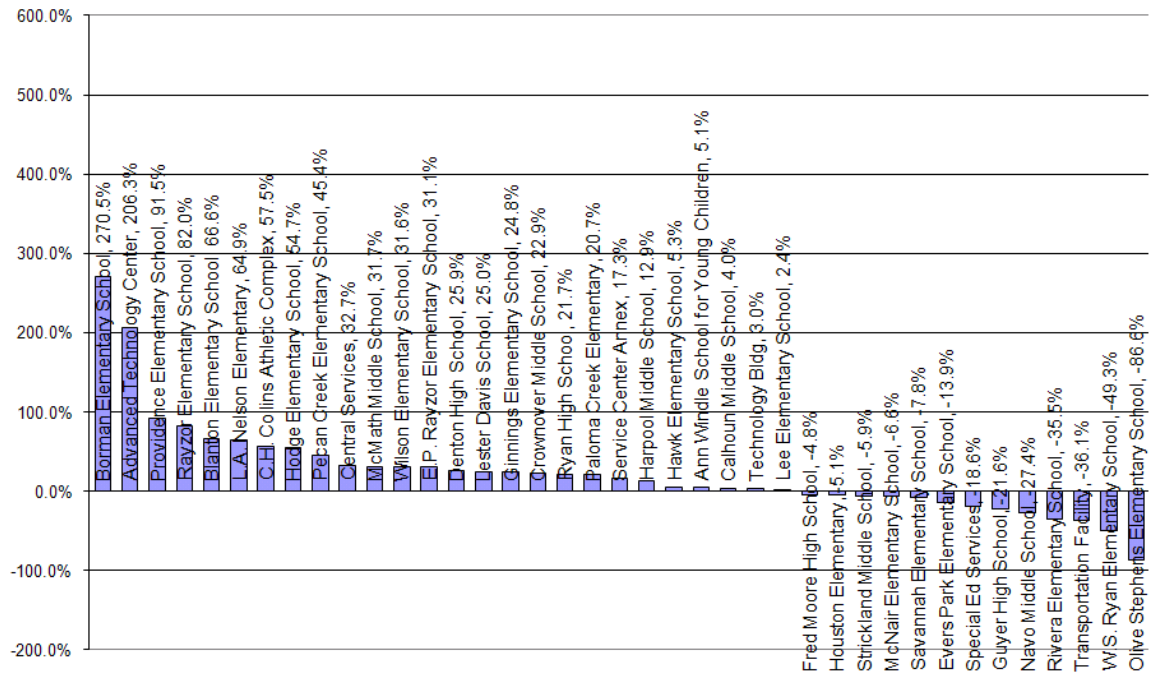
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## Utilities Cost and Usage Report

### Year 5 – First Half (July through December, 2010)

### Percent Change of Water Use



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**Weather Comparison to Year 4 – First Half**

The weather in the first half of Year 5 was warmer than in Year 4. In the first half of Year 5, there was a 24.2% increase in the number of cooling degree days, and a 35.6% decrease in heating degree days. Rainfall over the period decreased 3.18 (14.3%) inches from the prior year.

**Table 7**  
**Weather Data**

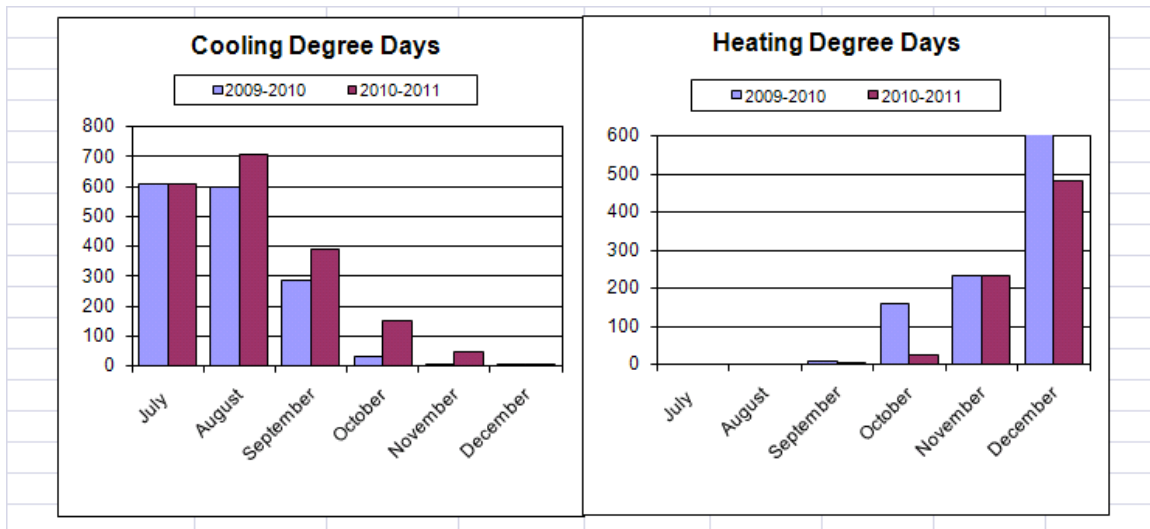
	Cooling Degree Days		Heating Degree Days	
	2009-2010	2010-2011	2009-2010	2010-2011
July	608	609	0	0
August	596	706	0	0
September	287	390	9	3
October	31	149	161	25
November	6	45	231	233
December	4	3	755	483
<b>Six Months Total</b>	<b>1,532</b>	<b>1,902</b>	<b>1,156</b>	<b>744</b>
<b>%Change</b>	<b>24.2%</b>		<b>-35.6%</b>	

**Figure 5**

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## Utilities Cost and Usage Report Year 5 – First Half (July through December, 2010)



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**Table 8  
Rainfall Data**

	Rainfall (in.)	
	2009-2010	2010-2011
July	2.55	3.95
August	1.24	1.01
September	4.59	9.32
October	12.61	1.16
November	0.48	1.5
December	1.94	2.05
<b>6 Mo. Total</b>	<b>22.17</b>	<b>18.99</b>
<b>%Change</b>	<b>-14.3%</b>	

### HVAC Systems Comparison – Y5 First Half

The District recently built two schools (Cross Oaks and Gonzalez) with geothermal heat pumps HVAC systems. This section of the report will compare the energy use and cost of these two new systems with existing schools of similar size. Table 9 and Figure 6 below show the comparison for the first half of Year 5.

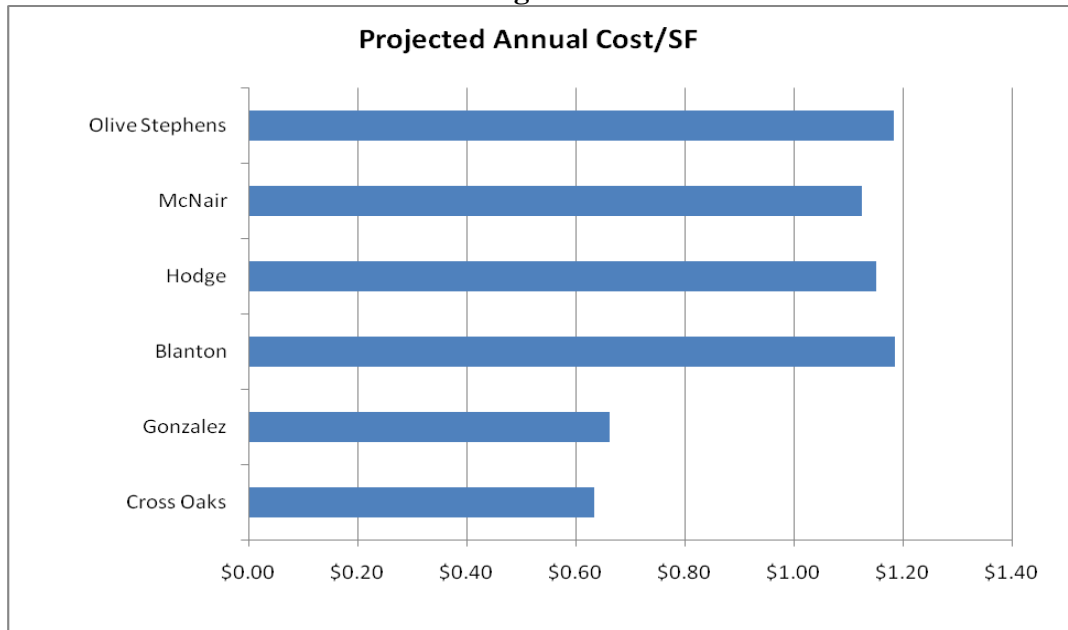
**Table 9  
HVAC System Comparison**

School	SF	HVAC System	Electricity kWh	Days	Gas therms	Days	Mbtu/Day	kbtu/SF	Projected Annual Cost	Projected Annual Cost/SF
Cross Oaks	88,231	Geothermal	182,880	113	654	112	6.11	1,219	\$55,915	\$0.63
Gonzalez	60,391	Geothermal	165,440	142	405	141	4.26	941	\$39,935	\$0.66
Blanton	80,334	RTUs	414,400	154	2,930	154	11.09	977	\$95,190	\$1.18
Hodge	87,783	Chilled Water	422,635	153	5,203	155	12.78	1,104	\$101,062	\$1.15
McNair	88,551	Chilled Water	412,855	151	4,836	155	12.45	1,101	\$99,548	\$1.12
Olive Stephens	80,334	RTUs	420,840	155	2348	155	10.78	935	\$95,081	\$1.18

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**Figure 6**



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## Facilities Report

Facility	Square Footage					
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Advanced Technology Center	120,700	120,700	120,700	120,700	120,700	120,700
Ann Windle School for Young Children	41,200	41,200	41,200	41,200	41,200	41,200
Blanton Elementary School	0	0	0	80,334	80,334	80,334
Borman Elementary School	78,624	78,624	78,624	78,624	78,952	78,952
Calhoun Middle School	216,363	216,363	216,363	216,363	239,014	239,014
Central Services	66,408	66,408	66,408	66,408	66,408	66,408
CH Collins Athletic Complex	43,457	43,457	43,457	43,457	43,457	43,457
Cross Oaks Elementary School	0	0	0	0	0	88,231
Crownover Middle School	161,200	161,200	161,200	161,200	161,200	161,200
Denton High School	451,770	451,770	451,770	451,770	484,577	484,577
EP Rayzor Elementary School	76,093	76,093	76,093	76,093	76,093	76,093
Evers Park Elementary School	78,583	78,583	78,583	78,583	78,583	78,583
Fred Moore High School	28,487	28,487	28,487	28,487	28,487	28,487
Ginnings Elementary School	82,707	82,707	82,707	82,707	82,707	82,707
Gonzalez SFYC	0	0	0	0	0	60,391
Guyer High School	418,700	418,700	418,700	418,700	418,700	418,700
Harpool Middle School	0	0	0	192,039	192,039	192,039
Hawk Elementary School	80,651	80,651	80,651	80,651	80,651	80,651
Hodge Elementary School	71,608	71,608	71,608	71,608	87,783	87,783
Houston Elementary School	75,167	75,167	75,167	75,167	75,167	75,167
LA Nelson Elementary School	0	0	80,334	80,334	80,334	80,334
Landfill/Wastewater	0	0	0	0	0	0
Lee Elementary School	83,900	83,900	83,900	83,900	83,900	83,900
Lester Davis School	32,583	32,583	32,583	32,583	32,583	32,583
McMath Middle School	158,326	158,326	158,326	158,326	158,326	158,326
McNair Elementary School	72,376	72,376	72,376	72,376	88,551	88,551
Navo Middle School	0	192,039	192,039	192,039	192,039	192,039
Olive Stephens Elementary School	0	0	0	80,334	80,334	80,334
Paloma Creek Elementary School	0	80,334	80,334	80,334	80,334	80,334
Pecan Creek Elementary School	78,397	78,397	78,397	78,397	78,397	78,397
Providence Elementary School	79,621	79,621	79,621	79,621	79,621	79,621
Rayzor Elementary School	93,269	93,269	93,269	93,269	101,869	101,869
Rivera Elementary School	74,244	74,244	74,244	74,244	86,134	86,134
Ryan High School	334,159	344,159	344,159	344,159	423,228	423,228
Savannah Elementary School	0	80,334	80,334	80,334	80,334	80,334
Service Center Annex	59,048	59,048	59,048	59,048	59,048	59,048
Special Ed Services	6,528	6,528	6,528	6,528	6,528	6,528
Strickland Middle School	192,039	192,039	192,039	192,039	192,039	192,039
Technology Building	16,173	16,173	16,173	16,173	16,173	16,173
Transportation Facility	14,336	14,336	14,336	14,336	14,336	14,336
Virginia Gallian Child Development Center	0	0	0	8,195	8,195	8,195
Wilson Elementary School	89,071	89,071	89,071	89,071	89,071	89,071
WS Ryan Elementary School	77,629	77,629	77,629	77,629	77,629	77,629
<b>Total</b>	<b>3,553,417</b>	<b>3,916,124</b>	<b>3,996,458</b>	<b>4,357,360</b>	<b>4,545,055</b>	<b>4,693,677</b>

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**Diary**

**2005-2006**

- Calhoun Middle School – Added 15, 150 square feet in January 2006.
- McNair Elementary School – Added DDC Temperature controls and replaced chiller.
- Hodge Elementary School – Added DDC Temperature controls and replaced chiller.

**2006-2007**

- Ryan HS – Added 10,000 square feet of classroom space.
  - Includes 5 PRTU E/G.
- New sites opened this year:
  - Savannah ES
  - Navo MS
  - Advanced Technical Center
- Three utility accounts were closed in the second quarter:
  - Rayzor ES – Denton Municipal Utilities – Acct #4240617-00
    - Served a ball field that is no longer in use.
  - Guyer HS – Denton Municipal Utilities – Acct #5570526-02
    - Only billed solid waste. Solid waste now billed on Acct #4290608-01 with rest of utilities.
  - Savannah ES – IESI – Acct #004036438
    - 30 yard roll off container no longer on campus.
- Six utility accounts were opened in the fourth quarter:
  - Paloma Creek ES :
    - CoServ – Acct #0000276200 – Electricity and Natural Gas
    - IESI – Acct #004040591 – Refuse
    - Mustang – Acct #010420 000 – Water



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- Mustang – Acct #010421 000 – Water
- Mustang – Acct #010422 000 – Water
- Mustang – Acct #010423 000 – Water

**2007-2008**

- Summer School was held at the following schools in 2007:
  - Strickland JH
  - Borman ES
  - Hodge ES
  - Lee ES
  - Davis School
- 3 utility accounts were opened in the first quarter:
  - LA Nelson ES:
    - Denton Municipal Utilities – Acct #4350025-01 – Electricity, Water, and Refuse
    - Denton Municipal Utilities – Acct #5580203-00 – Refuse
    - Atmos Energy – Acct #80-000201127-1750192-0 – Gas
- 2 utility accounts were closed in the second quarter:
  - Strickland MS
    - Denton Municipal Utilities – Acct #4240619-00 – Electricity
  - WS Ryan ES
    - Denton Municipal Utilities – Acct #5580109-00 – Refuse
- The unoccupied section of Fred Moore High School has been occupied by Special Education.
- Hawk Elementary School – a lighting control panel was commissioned in July 2007.

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- 2 utility accounts were closed in the fourth quarter:
  - Hodge ES:
    - Denton Municipal Utilities – Acct #4240633-00 – Electricity
  - WS Ryan ES:
    - Denton Municipal Utilities – Acct #5560938-00 – Refuse
- 1 utility account was changed during the fourth quarter:
  - Lee ES
    - Denton Municipal Utilities – Acct #4100967-01 – Electric Service Retired
- 2 electric accounts were switched from TXU to Direct Energy in the fourth quarter:
  - Crownover MS:
    - Closed: TXU Energy – Acct #893-3178-98-3 – Electricity
    - Opened: Direct Energy – Acct #995882921987-RCMS – Electricity
  - Hawk ES:
    - Closed: TXU Energy – Acct #972-1384-98-1 – Electricity
    - Opened: Direct Energy – Acct #995882921978-Hawk – Electricity

**2008-2009**

- 20 utility accounts were opened in the first quarter:
  - Blanton ES
    - CoServ – Acct #0000312515 – Electricity, Gas
    - Denton County FWSD#7 – Acct #417 – Water
    - Denton County FWSD#7 – Acct #421 – Water
    - Denton County FWSD#7 – Acct #428 – Water
    - Denton County FWSD#7 – Acct #429 – Water
    - Denton Municipal Utilities – Acct #5580385-00 – Refuse
  - Harpool MS
    - CoServe – Acct #0000314585 – Electricity, Gas
    - Denton County FWSD#7 – Acct #422 – Water

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- Denton County FWSD#7 – Acct #423 – Water
- Denton County FWSD#7 – Acct #430 – Water
- Denton County FWSD#7 – Acct #431 – Water
- Denton Municipal Utilities – Acct #5580387-00 – Refuse
- Olive Stephens ES
  - Lake Cities Municipal Utility Authority – Acct #4747-00 – Water
  - Lake Cities Municipal Utility Authority – Acct #4791-00 – Water
  - Lake Cities Municipal Utility Authority – Acct #4792-00 – Water
  - Lake Cities Municipal Utility Authority – Acct #4793-00 – Water
  - Lake Cities Municipal Utility Authority – Acct #4794-00 – Water
  - Denton Municipal Utilities – Acct #5580388-00 – Refuse
  - Atmos – Acct #80-000201127-1797665-2 – Gas
  - TXU Energy – Acct #801-7228-98-5 – Electricity

**Mechanical and Control Work completed April through October 2008:**

- DDC controls were installed on all portable classrooms
- Calhoun Middle School
  - Replace built-up chilled and hot water VAV system serving the Jones / McAllister building with new package rooftop units.
  - Replaced (4) Roof-top package units on the east side of the main building.
  - Replaced (8) Roof-top package units on the west side of the main building.
  - Replaced (13) Roof-top package units on the East building.
  - Replaced the heating boiler in the Main Building.
  - Replaced the domestic hot water heating system in the Jones / McAllister building.
- Central Services
  - Replaced all (14) new split systems.
  - Converted the controls for R-lead to DDC
- Clear Creek
  - Replace eight (8) new rooftop units and added one (1) additional unit.
  - Converted the controls for R-lead to DDC
- Denton High School

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- Replaced (36) Roof-top package units serving the spaces which have been historically called the vocational education area, excluding the cosmetology area.
- Replaced (1) Roof-top package unit to replace serving the main office area.
- Replaced the air handlers serving the main space of the auditorium.
- Replaced the domestic hot water heating system serving the kitchen.
- Replaced pneumatic controls on all fan-powered VAV boxes with DDC.
- Fred Moore High School
  - Replaced eleven (11) rooftop units.
  - Replaced thirteen (13) split heating and cooling units.
  - Converted the controls for R-lead to DDC
- Rivera Elementary School
  - Replaced four (4) rooftop units.
  - Replaced all fan powered VAV boxes and pneumatic controls with new boxes having DDC controls.
- Ryan High School
  - Replaced the cooling tower.
  - Replaced the domestic hot water heating system.
- Strickland Middle School
  - Replaced the air handling units serving the library and west classroom addition.
  - Replaced the domestic hot water heating system.
  - Replaced RTU #21 with a new RTU unit.

#### **Lighting Efficiency Retrofit completed June through August 2008:**

- Denton High School – Entire Campus was refit with all T8 lamps and electronic ballasts
- Ryan High School – Entire Campus was refit with all T8 lamps and electronic ballasts
- Elementary Schools Gyms: Replaced HID fixtures with linear fluorescent T8 high bay fixtures.
  - Borman Elementary School

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- EP Rayzor Elementary School
  - Evers Park Elementary School
  - Ginnings Elementary School
  - Hawk Elementary School
  - Houston Elementary School
  - Lee Elementary School
  - Newton Rayzor Elementary School
  - Pecan Creek Elementary School
  - Providence Elementary School
  - Rivera Elementary School
  - Savannah Elementary School
  - Wilson Elementary School
  - WS Ryan Elementary School
- 1 electric account was switched from TXU to Direct Energy in the second quarter:
    - Olive Stephens MS:
      - Closed: TXU Energy – Acct #801-7228-98-5 – Electricity
      - Opened: Direct Energy – Acct #995882925531 – Electricity
  - The Energy Cost Adjustment (ECA) was reduced in February from \$0.050 to \$0.042 per kWh.
  - Lake Cities Municipal Authority increased their minimum bill from \$25.63 to \$34.26 as of June 15, 2009.
  - Irrigation Line found broken and fixed at McNair ES on August 9, 2009.
  - Internal bill audits found overbilling at Advanced Technology Center. Credit of \$6,400.43 was applied.
  - Job office for new Pre-K center added to Advanced Technology meter as of June 17, 2009.
  - Summer School was held at the following schools in 2008:
    - Strickland JH
    - Guyer HS

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- Ginnings ES
- Lee ES
- Newton Rayzor ES

**2009-2010**

**Mechanical and Control Work completed in 2009:**

**Borman**

- Controls for (4) RTU with CO2, temperature and humidity control.
- Controls for (3) Cooling only RTU's
- Controls for (7) Exhaust Fans.

**Calhoun**

- Controls for (2) RTU's with CO2, temperature and humidity control.
- Controls for (1) VAV/RTU with all associated points per specs.
- Controls for (2) DX Split systems.
- Controls for (29) Fan Powered VAV boxes.
- Controls for (11) Exhaust Fans.
- Controls for (6) Emergency Exhaust Fans.

**DHS**

- Controls for (32) RTU's with Combination sensors.
- Controls for (1) VAV/RTU with all associated points per specs.
- Controls for (6) DX Split systems.
- Controls for (12) Fan Powered VAV boxes.
- Controls for (52) Exhaust Fans.

**Hodge**

- Controls for (12) RTU with CO2, temperature and humidity control.
- Controls for (1) DX Split systems.
- Controls for (7) Fan Powered VAV boxes.
- Controls for (3) VAV boxes.
- Controls for (7) Exhaust Fans.

**McNair**

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- Controls for (12) RTU with CO2, temperature and humidity control.
- Controls for (1) DX Split systems.
- Controls for (7) Fan Powered VAV boxes.
- Controls for (3) VAV boxes.
- Controls for (7) Exhaust Fans.

#### **Rayzor**

- Controls for (11) RTU with CO2, temperature and humidity control.
- Controls for (3) Cooling only RTU's
- Controls for (7) Exhaust Fans.

#### **RHS**

- Controls for (7) RTU's with CO2 and temperature control.
- Controls for (10) RTU's without CO2 control.
- Controls for (2) VAV/RTU with all associated points per specs.
- Controls for (3) DX Split systems.
- Controls for (33) Fan Powered VAV boxes.
- Controls for (15) Exhaust Fans. The rest of them are wired by Div 16 to a wall switch
- or hood switch
- Controls for (3) Emergency Exhaust Fans.

#### **Rivera**

- Controls for (9) RTU with CO2, temperature and humidity control.
- Controls for (2) DX Split systems.
- Controls for (7) Fan Powered VAV boxes.
- Controls for (8) Exhaust Fans.
- Summer School is planned to be as held at the following schools in 2010:
  - Strickland JH
  - Denton HS
  - Ginnings ES
  - Lee ES
  - Fred Moore HS

**2010-2011**

**Executive Summary**  
**Prepared for Board of Trustees Meeting**  
**April 26, 2011**

**Utilities Cost and Usage Report**  
**Year 5 – First Half (July through December, 2010)**

**Mechanical and Control Work completed in 2010:**

**HVAC Controls Upgrade**

- Denton High School
- Guyer High School

**Intelligent Irrigation Control**

- Guyer High School

**Lighting Retrofit and/or Occupancy Sensors and/or Hawkeye Fixtures**

- Ann Windle
- Borman
- Calhoun
- Crownover
- EP Rayzor
- Evers Park
- Fred Moore
- Ginnings
- Hodge
- McMath
- McNair
- Navo
- Pecan Creek
- Rayzor
- Rivera
- Ryan Elementary
- Service Center
- Strickland
- Wilson

**SF Added Total 187,695:**

- Borman 328 SF
- Calhoun 22,651 SF
- Denton HS 32,807 SF



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- Hodge 16,175 SF
- McNair 16,175 SF
- Rayzor 8,600 SF
- Rivera 11,890 SF
- Ryan HS 79,069 SF