



DENTON  
INDEPENDENT  
SCHOOL DISTRICT



## ANNUAL UTILITY REPORT – JULY 2018 TO JUNE 2019

Paul Andress – Executive Director of Operations – DISD

Debbie Monschke – Assistant Superintendent – DISD

Angela Alfonso – Utility Specialist – DISD

Arnoldo Villarreal – Project Manager – TD

Orland Hilliard, CEM – Account Manger – TD

Bob Wilken, CEM – Executive Account Manager – TD

Brandon Hoke, EIT – Engineering – TD

Jess Holbert – Intern – DISD/TD

# Utility Performance Trends



Comparison by Utility

	July 2017 - June 2018	July 2018 - June 2019	% Change	Cost Change (\$)
Electric	\$5,847,825	\$5,536,548	-5%	(\$311,277)
Gas	\$472,276	\$376,491	-20%	(\$95,785)
Irrigation Water	\$602,788	\$488,382	-19%	(\$114,406)
Potable, Sewer & Storm Water	\$863,370	\$807,530	-6%	(\$55,840)
Refuse	\$794,518	\$837,767	5%	\$43,250
<b>Total</b>	<b>\$8,580,777</b>	<b>\$8,046,719</b>	<b>-6.22%</b>	<b>(\$534,058)</b>

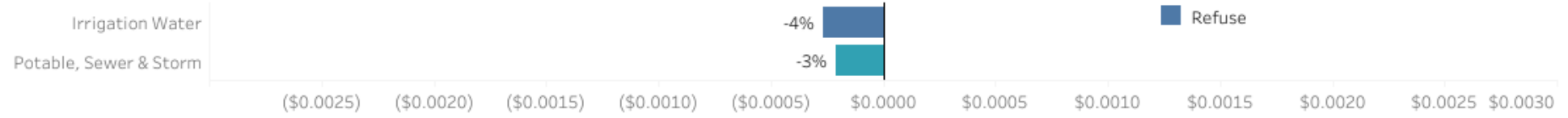
# All Schools Energy Performance Change Compared To Last Year



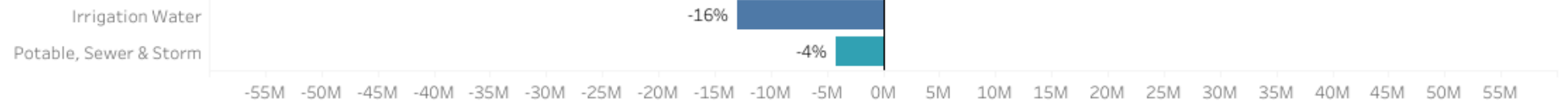
# Water and Refuse Performance Change Compared To Last Year

- Irrigation Water
- Potable, Sewer & Storm
- Rainfall
- Refuse

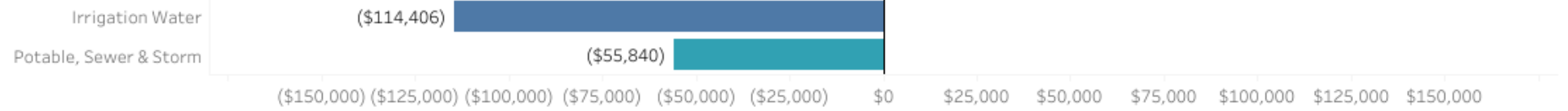
## Effective Rate



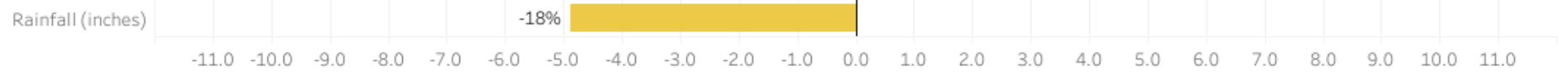
## Consumption



## Cost



## Rainfall

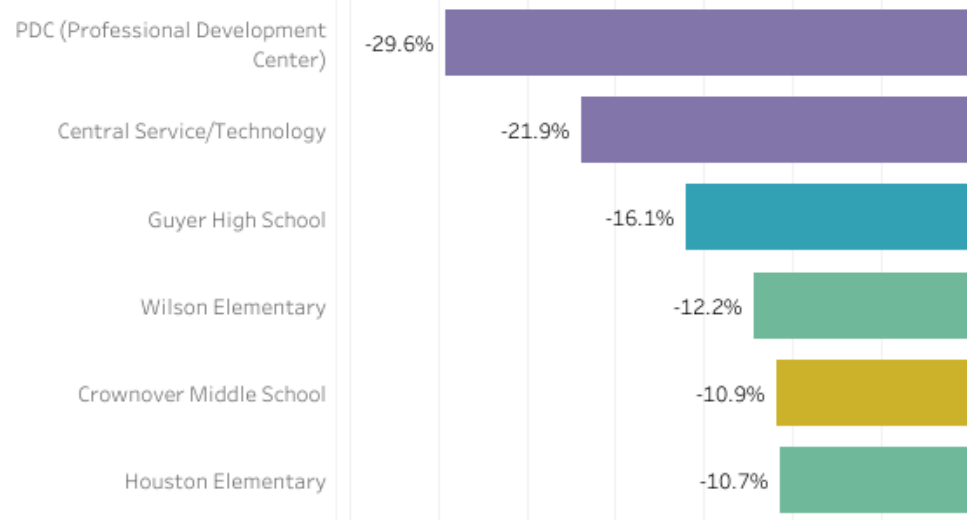


## Refuse

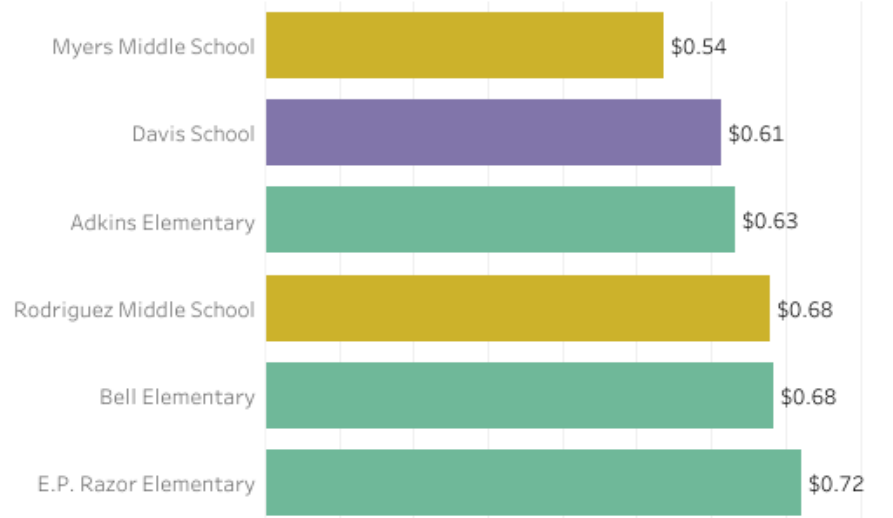


# Electric - Top Performers

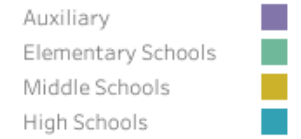
## Largest % Decrease in Usage



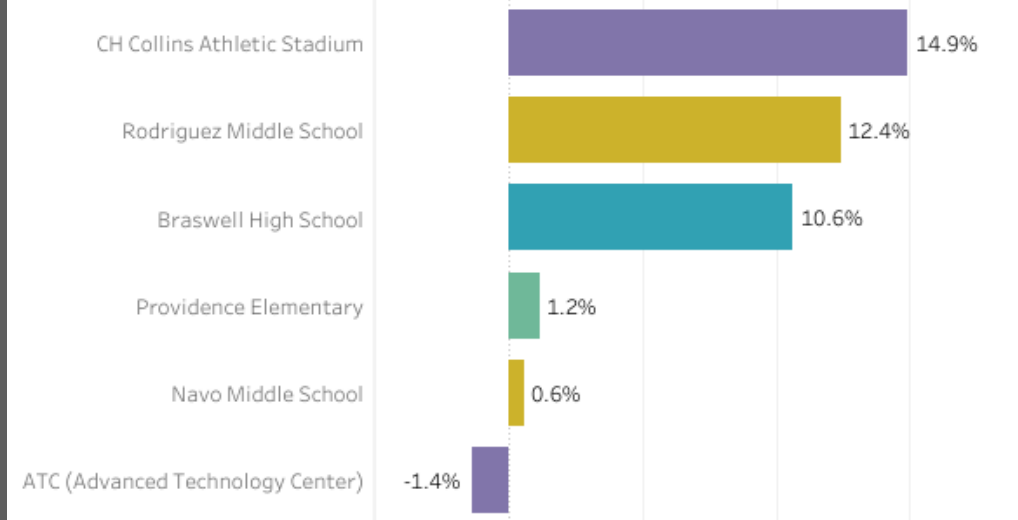
## Lowest Cost per SqFt



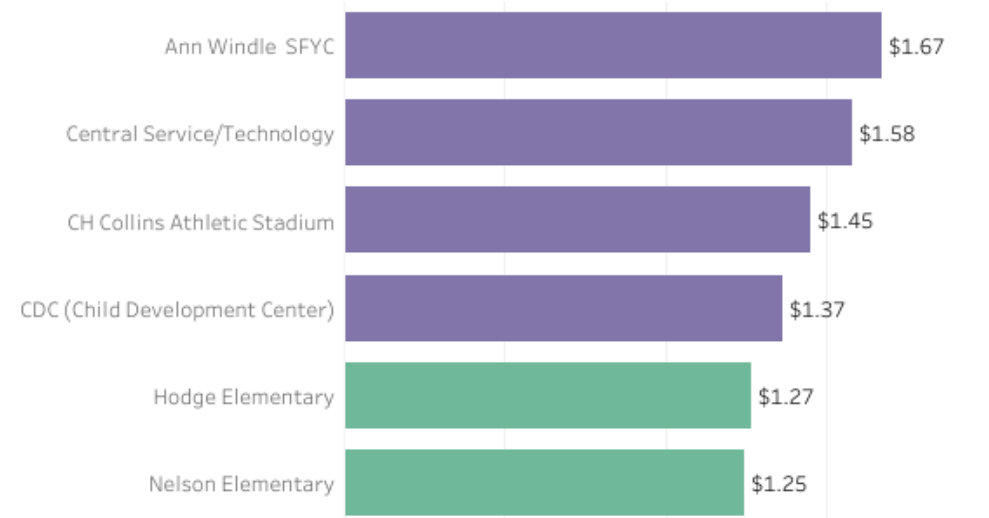
# Opportunities



## Highest % Increase in Usage

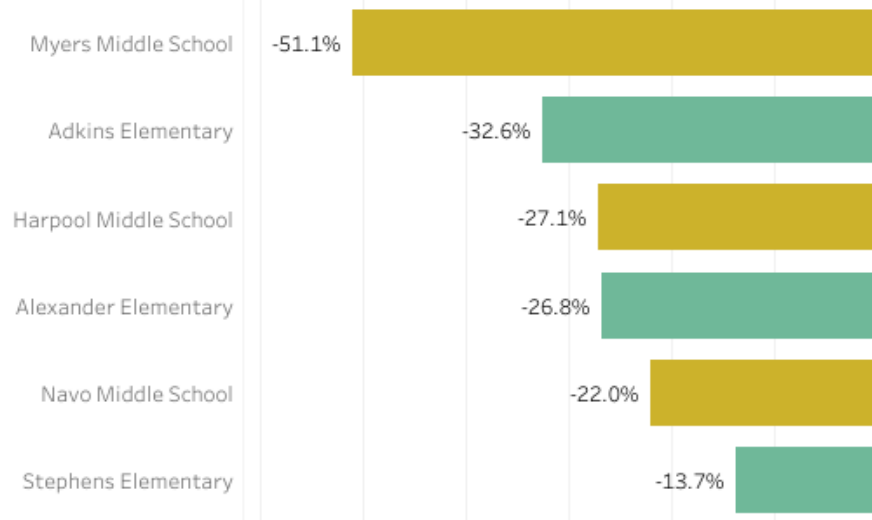


## Highest Cost per SqFt

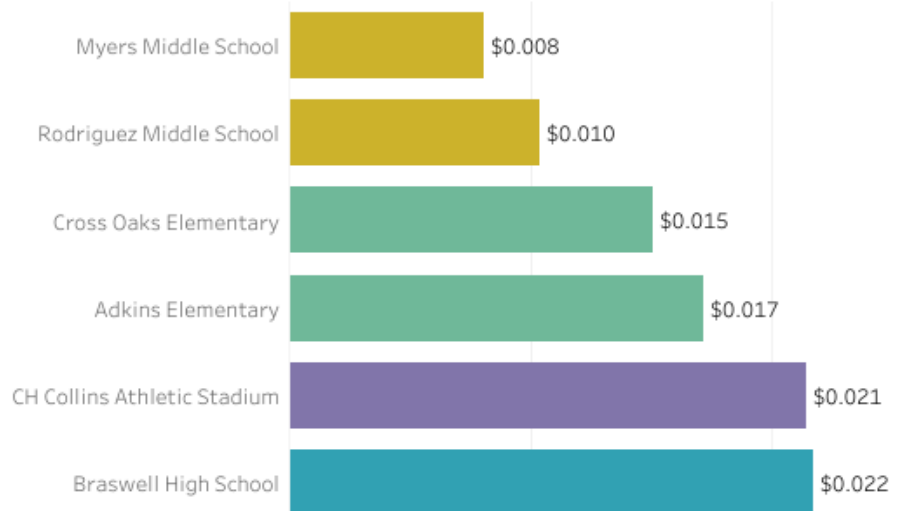


# Gas - Top Performers

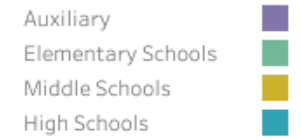
## Largest % Decrease in Usage



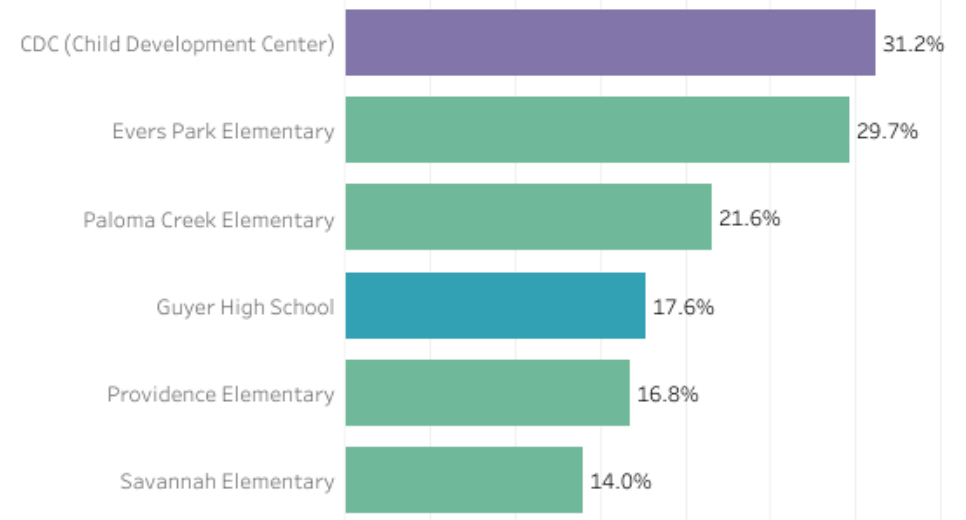
## Lowest Cost per SqFt



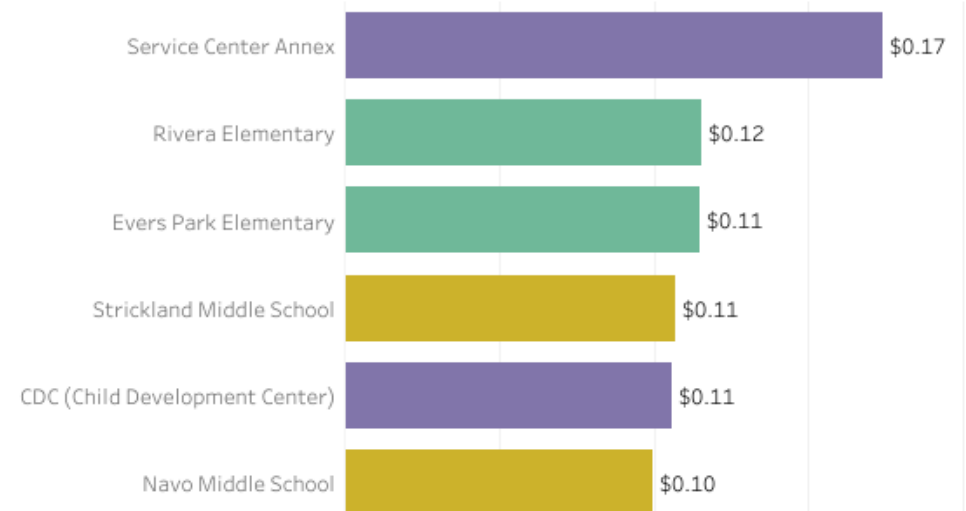
# Opportunities



## Highest % Increase in Usage

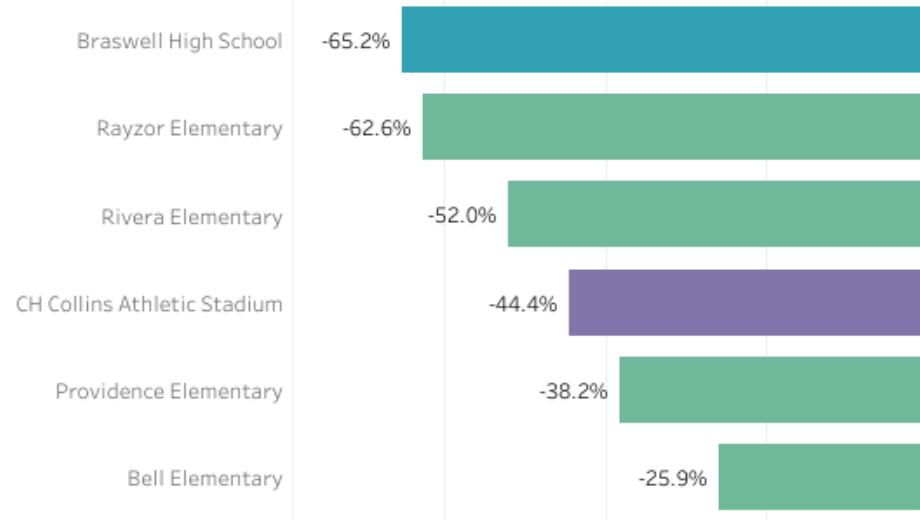


## Highest Cost per SqFt

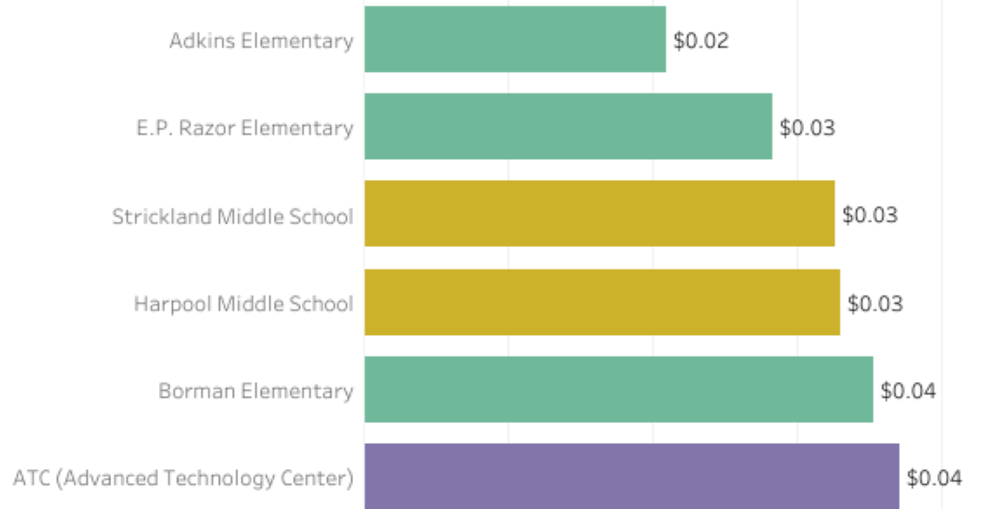


# Potable Water - Top Performers

## Largest % Decrease in Usage



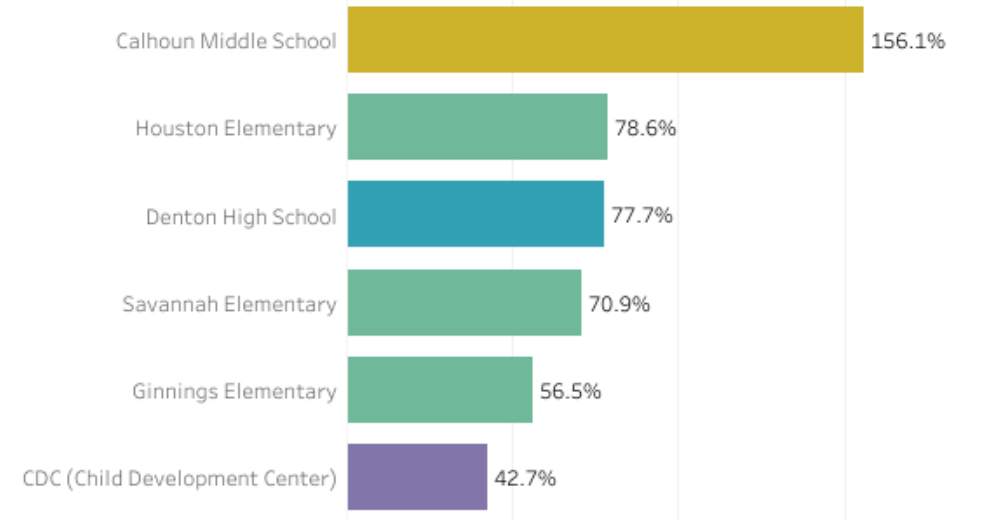
## Lowest Cost per SqFt



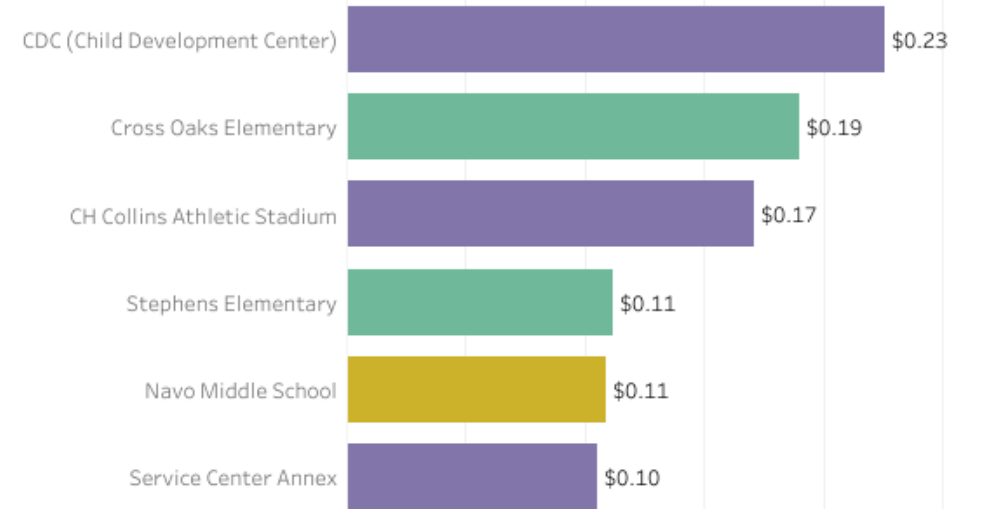
# Opportunities

- Auxiliary ■
- Elementary Schools ■
- Middle Schools ■
- High Schools ■

## Highest % Increase in Usage



## Highest Cost per SqFt





# SAVINGS OVER TIME

**CUMULATIVE SAVINGS TO DATE**  
**\$28,287,020.46**



	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19
SQUARE FEET	3,553,417	3,916,124	3,996,458	4,318,052	4,499,603	4,648,225	4,660,667	4,761,856	4,943,330	5,032,004	5,032,004	5,619,746	5,817,287	5,957,294
\$/SF	\$1.96	\$1.68	\$1.65	\$1.66	\$1.47	\$1.50	\$1.53	\$1.43	\$1.50	\$1.48	\$1.58	\$1.49	\$1.46	\$1.35
SAVINGS	\$-	\$1,096,514.7	\$1,238,901.9	\$1,295,415.6	\$2,204,805.4	\$2,138,183.5	\$2,004,086.8	\$2,523,783.6	\$2,273,931.8	\$2,415,361.9	\$1,912,161.5	\$2,641,280.6	\$2,908,643.5	\$3,633,949.3

# SCHEDULING

## *Sam Houston Elementary*



Rms 9-18 Occp	ON		Cafe Occp	ON	
Rms 1-8 Occp	ON		Gym Occp	ON	
Rms 7A-8B Occp	ON		Stage Occp	ON	
Rms 27-38 Occp	ON		Kitchen Occp	ON	
Rms 19-26 Occp	ON		Offices Occp	ON	
Library/Music Occp	ON		Computer Rms Occp	ON	
Art/RR Occp	ON				

Outside Air Humidity 53.9

Outside Air Temperature 88.2

# SCHEDULING



## Denton ISD HVAC October Update DHS Hierarchy Path October 2019



### Executive Summary

TDIndustries looked at the HVAC scheduling changes since the initial March 2019 HVAC scheduling inspection. The changes in hours of operating time is tied to the increase or decrease of start or stop times, the dividing or combining of different day schedules, and even some days were added or subtracted. The quarterly report contains a fourth of the schools tied to the two HVAC systems, Niagara and Inet.

Operating System	School	Total Change (hours)
Inet	McMath	110.88
Inet	DHS	85.84
Inet	Evers	(1.42)
Inet	Rayzor	(4.33)
Inet	Calhoun	(11.65)
Inet	Alexander	(17.41)
Inet	WS Ryan	(22.75)
Inet	Borman	(23.01)

Only McMath and DHS showed an increase in operating time. McMath increased its operating time due to the change of most of their start times earlier in the day by one or two hours. Denton High School increased their operating hours with moving back their start times by half an hour for schedules and moving forward the end times for other schedules forward as much as four hours. The increase of operating times for the HVAC was expected with the need to climate control the buildings for the start of the school year.

# BI-WEEKLY UTILITY AUDIT

Cost Dashboard Usage Dashboard ENERGY STAR Rank Electric Overview Demand Overview Gas Overview Potable Water Overview Irrigation Water Overview Configurable Overview Alerts

Property: (All) Reference Line: 15% Energy Type: Potable Water

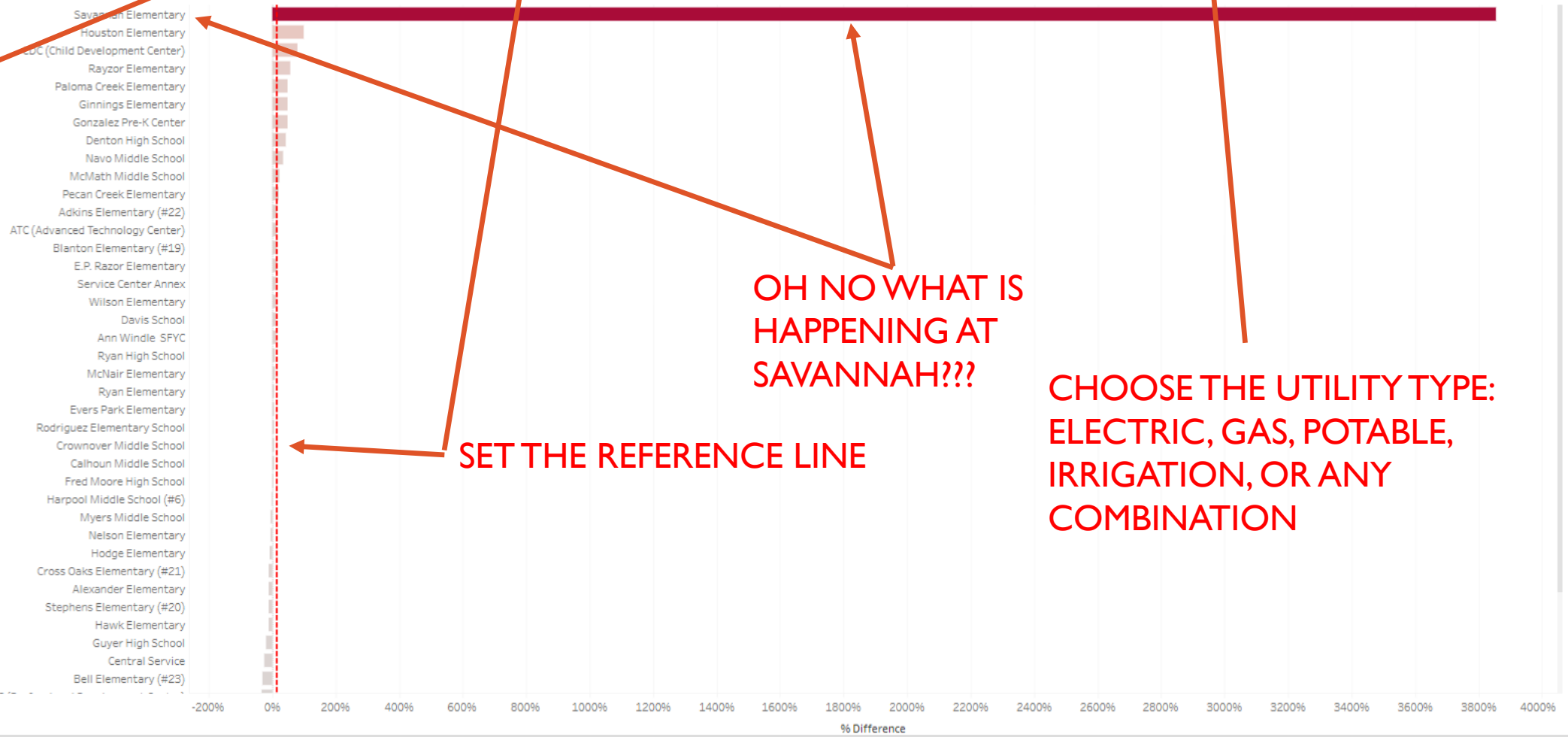
Usage: February, 2018 - February, 2018 compared to February, 2019 - February, 2019

Beginning Month A  
February, 2018

Ending Month A  
February, 2018

Beginning Month B  
February, 2019

Ending Month B  
February, 2019



COMPARE CURRENT TIME FRAME TO PREVIOUS YEAR

OH NO WHAT IS HAPPENING AT SAVANNAH???

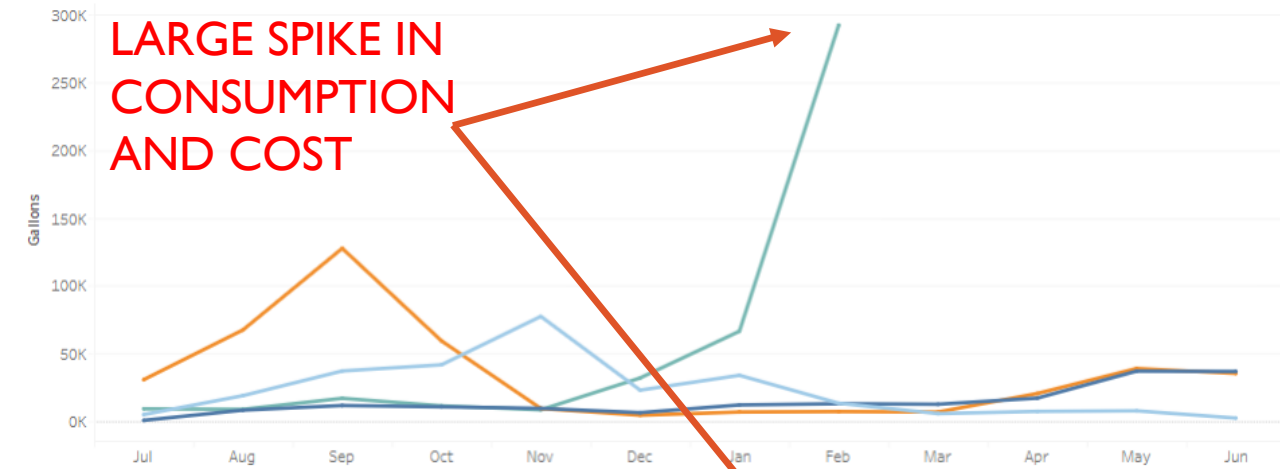
SET THE REFERENCE LINE

CHOOSE THE UTILITY TYPE: ELECTRIC, GAS, POTABLE, IRRIGATION, OR ANY COMBINATION

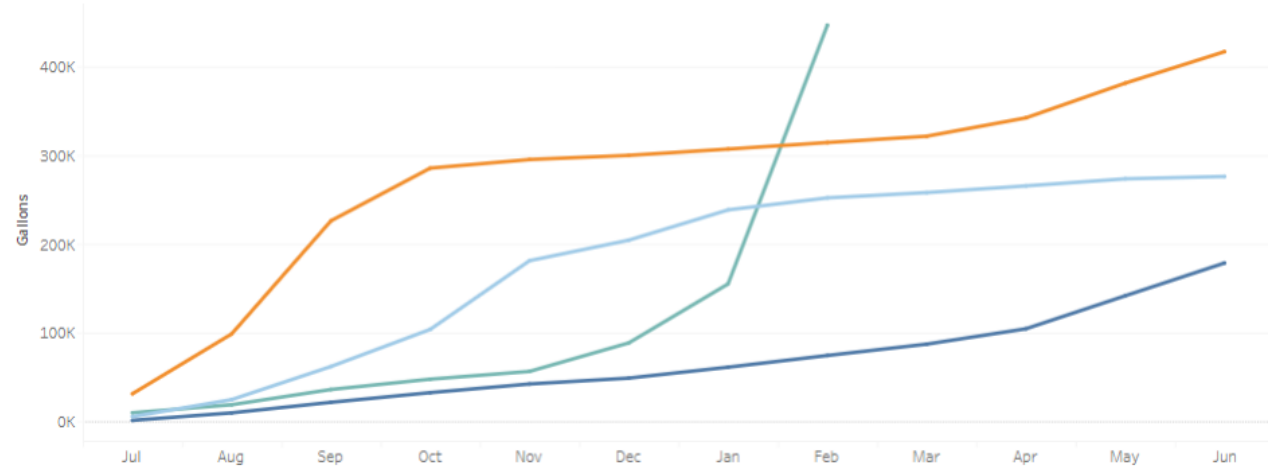
# BI-WEEKLY UTILITY AUDIT

Select Property: Savannah Elementary | 
 Select Years to View: (Multiple values)

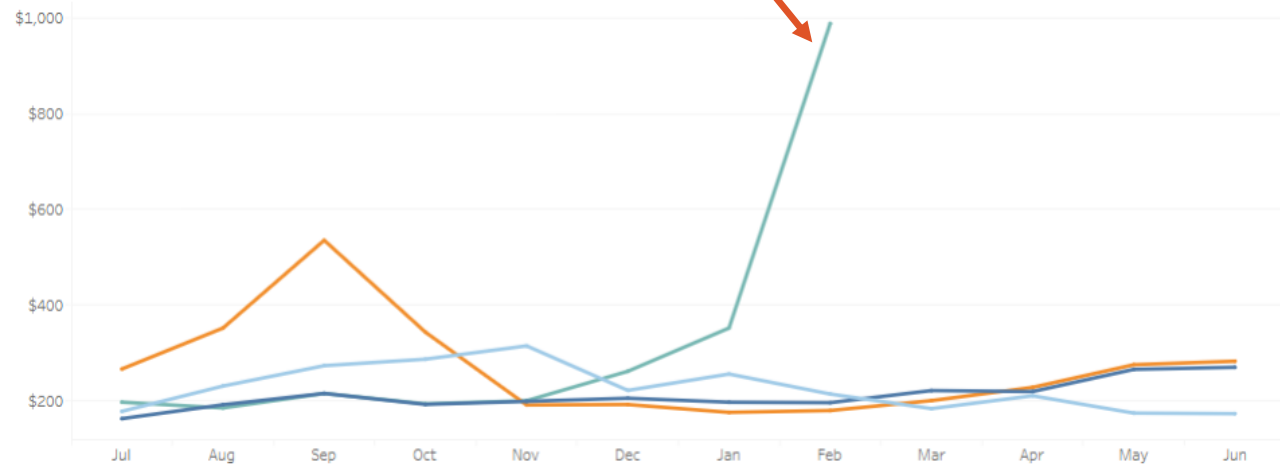
Potable Water Consumption



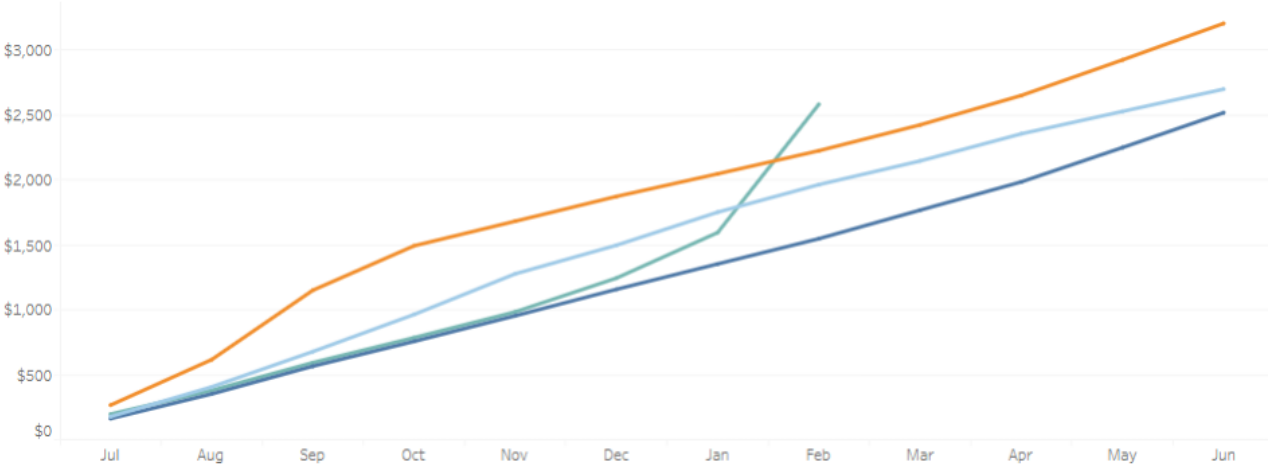
Potable Water Running Total Consumption



Potable Water Cost



Potable Cost Running Total



# BI-WEEKLY UTILITY AUDIT

January Denton ISD Monthly High Usage Report - Message (HTML)

File Message Help BLUEBEAM Tell me what you want to do

Ignore Delete Archive Reply Reply Forward IM More

Eng Team To Manager

Team Email Done

Rules OneNote

Assign Mark Categorize Follow Up

Policy Unread Tags

Translate

Find Related Select

Read Aloud

Zoom

Create PDF

Change Settings

Select Folders

Bluebeam

Dynamics 365

Mon 3/25/2019 4:21 PM

BH Hoke, Brandon

January Denton ISD Monthly High Usage Report

To Villarreal, Arnoldo; pandress@dentonisd.org; Townsend, James H; Ettredge, Austin; aalfonso@dentonisd.org

Cc Wilken, Bob; Hilliard, Orland

You replied to this message on 4/29/2019 8:40 AM.

2019 - 01 Jan Denton ISD Degree Days and Rainfall.pdf 129 KB

2019 - 01 Jan Denton High Usage Report.pdf 63 KB

All,

See the attached pdf's and below summary of the high usage schools in the district for the month of January 2019.

**Overview:**  
This month saw very mild temperatures which caused the majority of electric and gas usage to be below the normal values. Rainfall totals were 1.4" this month and we did not see any high usage with irrigation. The schools in the report are those that were beyond the average increases we saw throughout the district.

**ELECTRIC**  
- No high usage buildings to report.

**GAS**  
- No high usage building to report

**IRRIGATION**  
- No high usage buildings to report.

**POTABLE**  
**CDC:**  
- Usage has been trending high all year. Could be due to changes in student population or school operating hours.  
- Any ideas on what could be causing the usage to increase at this location?

**Savannah ES:**  
- Usage continued to increase at Savannah well above the typical range.  
- Suggest checking the meter for abnormal usage.

**Denton HS:**  
- Usage spike from Aug-Nov 2018 appears to have been a billing issue as the costs were offset in December and January 2019.  
- Can we confirm that this was a billing issue and not a leak? Costs were offset but the usage was not.

Thank you,

Brandon S. Hoke, E.I.T. | Mechanical Designer  
TDIndustries | [www.tdindustries.com](http://www.tdindustries.com)  
O: 972-888-9460 | F: 972-888-9676 | C: 214-912-9654

EMAIL SENT OUT TO TEAM WITH INFORMATION ON HIGH USAGE ITEMS

SAVANNAH LISTED AS ONE TO CHECK THE METERS FOR AN ISSUE

# BI-WEEKLY UTILITY AUDIT

**From:** Deborah Oxnem <[deborah.oxnem@energyprint.com](mailto:deborah.oxnem@energyprint.com)>

**Sent:** Friday, March 29, 2019 1:38 PM

**To:** Hoke, Brandon <[Brandon.Hoke@TDIndustries.com](mailto:Brandon.Hoke@TDIndustries.com)>

**Subject:** High Usage - Savannah Elementary

Hi Brandon,

You may have already seen this – but wanted to reach out to you

Mustang Special Utility District - 010-0169000-002) for Savannah Elementary.

The Data team noticed a high usage when they were entering this bill data today and asked me to alert you. Speculating there could be a billing issue perhaps.

Thank you,  
Deb

**Deborah Oxnem**  
**Strategic Accounts Director**

Find. Track. Prove.  
**ENERGYPRINT.**

Direct 651-357-9047  
Main 651-357-9100 | Fax 651-357-9001  
[www.energyprint.com](http://www.energyprint.com)

Follow us on [LinkedIn](#)  
Follow us on [Twitter](#)

 ENERGY STAR  
AWARD 2018  
 PARTNER OF THE YEAR  
Sustained Excellence

EMAIL SENT OUT FROM  
PARTNER AT ENERGY  
PRINT ENSURING WE  
NOTICED THE SPIKE.  
MAYBE A BILLING ISSUE?

# BI-WEEKLY UTILITY AUDIT



Tue 4/2/2019 7:07 AM

Villarreal, Arnoldo

RE: January Denton ISD Monthly High Usage Report

To: Andress, Paul E; Hoke, Brandon; Ettredge, Austin; 'aalfonso@dentonisd.org'

Cc: Wilken, Bob; Hilliard, Orland

You replied to this message on 4/2/2019 8:36 AM.

Crue Baker check the water meters for DHS & Savanna & CDC the report I got from him meter are not moving at all.

**From:** Andress, Paul E [<mailto:pandress@dentonisd.org>]  
**Sent:** Tuesday, April 2, 2019 5:30 AM  
**To:** Villarreal, Arnoldo <[Arnoldo.Villarreal@TDIndustries.com](mailto:Arnoldo.Villarreal@TDIndustries.com)>; Hoke, Brandon <[Brandon.Hoke@TDIndustries.com](mailto:Brandon.Hoke@TDIndustries.com)>; Ettredge, Austin <[Austin.Ettredge@TDIndustries.com](mailto:Austin.Ettredge@TDIndustries.com)>; 'aalfonso@dentonisd.org'  
**Cc:** Wilken, Bob <[Bob.Wilken@TDIndustries.com](mailto:Bob.Wilken@TDIndustries.com)>; Hilliard, Orland <[Orland.Hilliard@TDIndustries.com](mailto:Orland.Hilliard@TDIndustries.com)>  
**Subject:** RE: January Denton ISD Monthly High Usage Report

Please let us know asap this morning the outcome of the meter checks last night.

**From:** Andress, Paul E  
**Sent:** Monday, April 1, 2019 1:09 PM  
**To:** 'Villarreal, Arnoldo' <[Arnoldo.Villarreal@TDIndustries.com](mailto:Arnoldo.Villarreal@TDIndustries.com)>; Hoke, Brandon <[Brandon.Hoke@TDIndustries.com](mailto:Brandon.Hoke@TDIndustries.com)>; Ettredge, Austin <[Austin.Ettredge@TDIndustries.com](mailto:Austin.Ettredge@TDIndustries.com)>; 'aalfonso@dentonisd.org'  
**Cc:** Wilken, Bob <[Bob.Wilken@TDIndustries.com](mailto:Bob.Wilken@TDIndustries.com)>; Hilliard, Orland <[Orland.Hilliard@TDIndustries.com](mailto:Orland.Hilliard@TDIndustries.com)>  
**Subject:** RE: January Denton ISD Monthly High Usage Report

I thought Crue checked them on Saturday.

Savannah really looks like there is a leak so we need to get on this asap.

**From:** Villarreal, Arnoldo <[Arnoldo.Villarreal@TDIndustries.com](mailto:Arnoldo.Villarreal@TDIndustries.com)>  
**Sent:** Monday, April 1, 2019 1:06 PM  
**To:** Andress, Paul E <[pandress@dentonisd.org](mailto:pandress@dentonisd.org)>; Hoke, Brandon <[Brandon.Hoke@TDIndustries.com](mailto:Brandon.Hoke@TDIndustries.com)>; Ettredge, Austin <[Austin.Ettredge@TDIndustries.com](mailto:Austin.Ettredge@TDIndustries.com)>; 'aalfonso@dentonisd.org'  
**Cc:** Wilken, Bob <[Bob.Wilken@TDIndustries.com](mailto:Bob.Wilken@TDIndustries.com)>; Hilliard, Orland <[Orland.Hilliard@TDIndustries.com](mailto:Orland.Hilliard@TDIndustries.com)>  
**Subject:** RE: January Denton ISD Monthly High Usage Report

EMAILS BETWEEN  
FACILITIES TEAM  
COORDINATING THE  
CHECK. METERS DO NOT  
INDICATE A LEAK.

**CAUTION:** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.



# BI-WEEKLY UTILITY AUDIT

**From:** Alfonso, Angela K <[aalfonso@dentonisd.org](mailto:aalfonso@dentonisd.org)>  
**Sent:** Tuesday, April 9, 2019 1:57 PM  
**To:** Hoke, Brandon <[Brandon.Hoke@TDIndustries.com](mailto:Brandon.Hoke@TDIndustries.com)>  
**Cc:** Andress, Paul E <[pandress@dentonisd.org](mailto:pandress@dentonisd.org)>  
**Subject:** RE: January Denton ISD Monthly High Usage Report

Just got an answer from the water provider. They audited it and found that we were being under billed due them missing a number on the reads. They made the adjustment sometime between Dec-Jan.

Hope this helps.

Angela

**From:** Hoke, Brandon <[Brandon.Hoke@TDIndustries.com](mailto:Brandon.Hoke@TDIndustries.com)>  
**Sent:** Friday, April 05, 2019 11:55 AM  
**To:** Alfonso, Angela K <[aalfonso@dentonisd.org](mailto:aalfonso@dentonisd.org)>  
**Cc:** Andress, Paul E <[pandress@dentonisd.org](mailto:pandress@dentonisd.org)>  
**Subject:** FW: January Denton ISD Monthly High Usage Report

**CAUTION:** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Angela,

Here is the email thread on Savannah. Can you contact the city to see if they can check on their side? Arnoldo's team went out and did not see any movement on the meter after hours which makes a leak less likely.


010-0169000-002 > Meter with issue

010-0168900-002 > Meter with issue

Thank you,

**Brandon S. Hoke, E.I.T.** | Mechanical Designer  
TDIndustries | [www.tdindustries.com](http://www.tdindustries.com)  
O: 972-888-9460 | F: 972-888-9676 | C: 214-912-9654

REACHED OUT TO PROVIDER AND FOUND THAT THEY HAD BEEN INCORRECTLY READING THE METER PREVIOUSLY AND USAGE SPIKE WAS DUE TO THEM READING CORRECT VALUES GOING FORWARD.



# BI-WEEKLY UTILITY AUDIT

- MORAL OF THE STORY:
  - THROUGH A **TEAM EFFORT** ANY **OUTLIERS** IN DISTRICT UTILITY USAGE ARE **DETECTED, INVESTIGATED, AND RESOLVED AS SOON AS POSSIBLE.**
- RECENT ITEMS DETECTED:
  - RP LEAKING – REPAIRED – POTABLE, CALHOUN
  - VALVES LEAKING – REPAIRED – IRRIGATION, SAVANNAH
  - ROAD WORK DAMAGE, LEAK – SYSTEM TURNED OFF – IRRIGATION, PALOMA CREEK
  - FLUSH VALVE IN RESTROOM STUCK OPEN – REPAIRED – POTABLE, PECAN CREEK
  - BROKEN HEADS – REPAIRED – IRRIGATION, STEPHENS
  - BILLING ISSUE – POTABLE WATER, SAVANNAH

# UTILITY TEAM EFFICIENCY INNOVATION MEETING

- MET IN AUG 2018 AND IN SEP 2019
  - ALL PARTIES INVOLVED WITH UTILITIES AT DENTON ISD.
  - CHALLENGED EACH OTHER TO COME UP WITH WAYS TO SAVE THE DISTRICT MONEY
    - IMPLEMENTED A SCHEDULE REDUCTION OF 1 HOUR PER DAY DISTRICT WIDE.
    - PERFORMED DETAILED SCHEDULE REVIEW TO ENSURE ALL SCHEDULES WERE WORKING CORRECTLY.
    - CHANGED TIMING OF MONTHLY REPORTING TO BE TWICE PER MONTH TO REDUCE SIZE OF REPORT AND GET TO ISSUES QUICKER.

# IRRIGATION NORMALIZATION REPORT



Irrigation Normalization Project

September 2019



Denton ISD - Irrigated Property Area Summary						
Building			Sports Field			
Name	Sq-ft	Acres	Sq-ft	Acres	# of Fields	
1	Alice Moore Alexander Elementary School	149,127	3.4	-	-	-
2	Ann Windle School for Young Children	243,134	5.6	-	-	-
3	Betty Myers Middle School	480,697	11.0	97,281	2.2	1
4	Billy Ryan High School	796,547	18.3	433,777	10.0	4
5	C.H. Collins Athletic Complex	413,277	9.5	-	-	-
6	Calhoun Middle School	214,534	4.9	43,908	1.0	1
7	Carroll McMath Middle School	204,788	4.7	80,695	1.9	1
8	Chester O. Strickland Middle School	97,527	2.2	97,527	2.2	1
9	Denton High School	359,112	8.2	185,766	4.3	3
10	DISD Stephens Administration Building	28,387	0.7	-	-	-
11	Dorothy P. Adkins Elementary School	277,220	6.4	17,320	0.4	1
12	Dr. Annie Webb Blanton Elementary School	260,799	6.0	-	-	-
13	Eugenia Porter Rayzor Elementary Schools	253,247	5.8	-	-	-
14	Eva Swan Hodge Elementary School	145,906	3.3	-	-	-
15	Evers Park Elementary School	76,035	1.7	-	-	-
16	Fred Moore High School	43,761	1.0	-	-	-
17	Ginnings Elementary School	76,673	1.8	-	-	-
18	Gonzalez School for Young Children	203,609	4.7	-	-	-
19	John H. Guyer High School	1,042,548	23.9	251,542	5.8	3
20	L.A. Nelson Elementary School	392,313	9.0	-	-	-
21	LaGrone Advanced Technology Complex (ATC)	376,619	8.6	-	-	-
22	Mildred M. Hawk Elementary School	365,342	8.4	-	-	-
23	Navo Middle School	301,736	6.9	100,473	2.3	1
24	Olive Stephens Elementary School	374,461	8.6	-	-	-
25	Paloma Creek Elementary School	292,630	6.7	-	-	-
26	Pecan Creek Elementary School	271,531	6.2	-	-	-
27	Ronald E. McNair Elementary School	201,120	4.6	-	-	-
28	Ronny W. Crownover Middle School	381,193	8.8	104,047	2.4	1
29	Sam Houston Elementary School	337,420	7.7	-	-	-
30	Savannah Elementary School	285,095	6.5	-	-	-
31	Tom Harpool Middle School	525,267	12.1	94,244	2.2	1
32	Tomas Rivera Elementary School	105,317	2.4	-	-	-
33	Wayne Stuart Ryan Elementary School	266,890	6.1	66,815	1.5	1
34	Woodrow Wilson Elementary School	41,548	1.0	-	-	-
<b>Total</b>		<b>9,493,149</b>	<b>217.9</b>	<b>1,573,395</b>	<b>36.1</b>	<b>19</b>

Appendix A - Irrigation Report

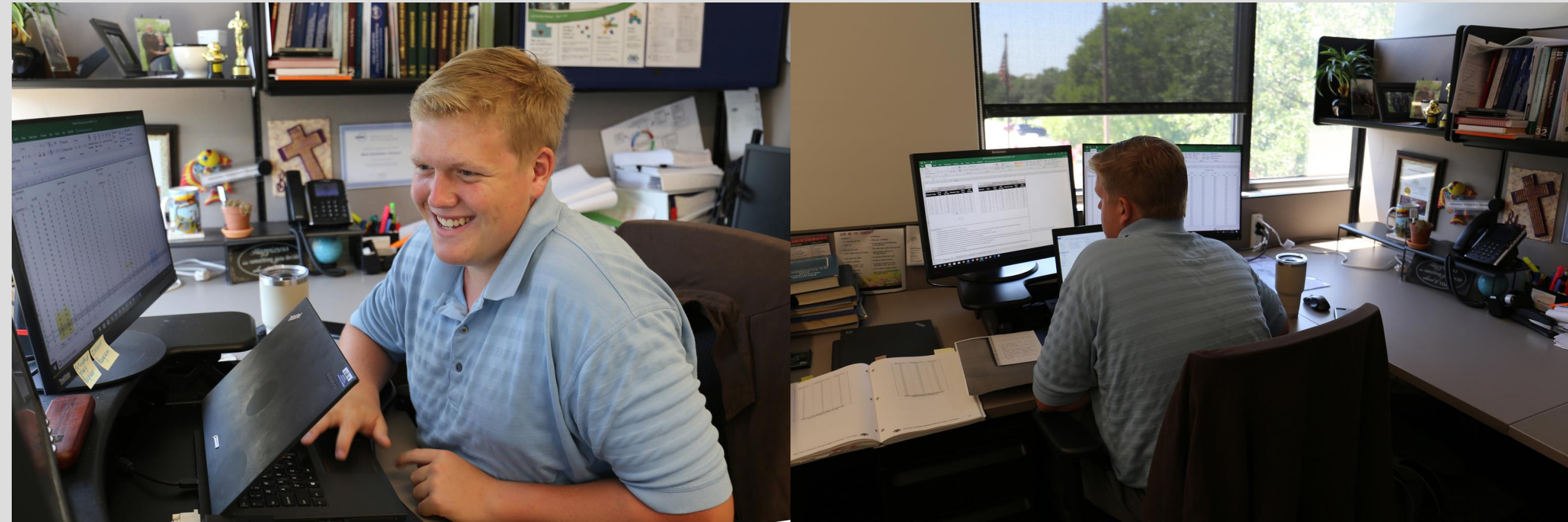


Denton Independent School District			
Location	John H. Guyer High School		
Address	7501 Teasley Ln, Denton, TX 76210		
	Square Footage	Acres	# of Sports Fields
Irrigated Sports Fields	251,542	5.8	3
Total Irrigated Property	1,042,548	23.9	





# IRRIGATION NORMALIZATION REPORT



JESS HOLBERT – SENIOR - GUYER HIGH SCHOOL

## RECENT ACCOMPLISHMENTS - SUMMARY

1. Utility Team Efficiency Innovation Meetings.
2. Analyzed various solar power options available to Denton ISD.
3. Monthly reports have had a beneficial impact.
4. Implemented HVAC scheduling audits to ensure systems operate efficiently year round.
5. Completed irrigation normalization project.

## LOOKING AHEAD

1. Incorporating the solar panels at Union Park into reporting.
2. More Frequent Scheduling Audits.
3. Implementing VRF at Wilson and Strickland.
  1. Geothermal not a good option at these sites.
4. Controls system upgrades from INET to TRIDIUM (2018 Bond)
5. Incorporating the irrigation report into monthly reporting.