



POUDRE SCHOOL DISTRICT

# Benchmarking and Goal Setting for Energy and Water Management

September 11, 2007



# Energy Efficiency Team

February 2006  
Summary Report  
[Full Report](#)

## Energy Efficiency Team

### Core Leadership

Sherry Gerner-Assistant Superintendent of School Services  
Jim Sarchet - Assistant Superintendent of Business Services/Chief Financial Officer  
Ron Maulsby-Assistant Superintendent of School Services

### Operations

Bill Franzen - Executive Director of Operations

### Facility Services

Pete Hall - Director of Facilities  
Jim Knauer - Building Maintenance Supervisor  
Stu Reeve - Energy Manager  
Jerry Garretson - Resource Manager  
John Holcombe- Safety/Environmental Compliance Coordinator  
Frank Rayder - Outdoor Services Supervisor  
Alan Boatright - Custodial Supervisor  
Jeff Arnold - Facilities Information Manager  
Roger Smith – Electrical Department Head  
Tom Weatherly – HVAC Department Head  
John Waldo – Plumbing Department Head

### Planning, Design, and Construction

Mike Spearnak - Director of Planning, Design, and Construction

### Financial Services

Diane Graepler – Accountant

### Food Services

Chris Rock-Director

### Materials Management

Pam Franzen - Materials Management

### School Services

Dan Cox - Science Curriculum Coordinator  
School Principals

### Transportation

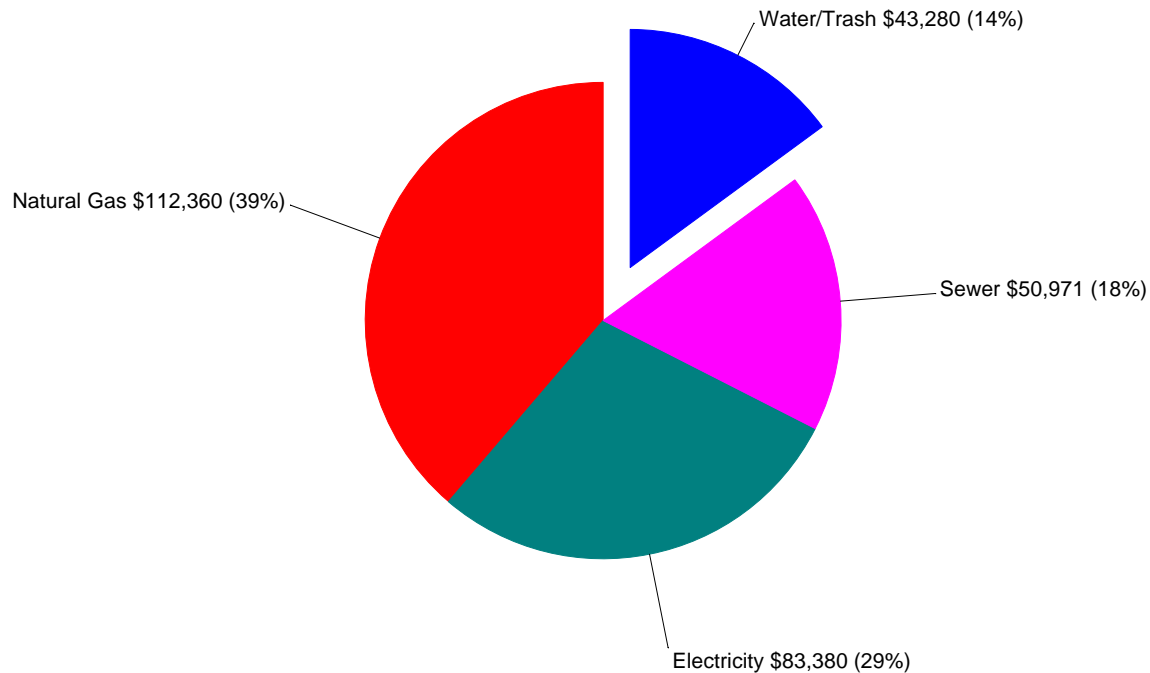
Tom Chaffin-Transportation Resource Manager

# Energy and Water Management Tools



# Utility Management Software

**Annual Total Utility Cost Breakdown  
Rocky Mtn. High School**



**\$289,991 --- Total Utility Bill for  
Year Ending July, 2007**

Utility Lost History for Poudre School District

Date	Total Elec Cost	Natural Gas Cost	Water Cost	Sewer Cost	Trash Cost	Total Cost	Recycling Revenue
Aug 04	\$99,482.29	\$17,134.66	\$38,817.49	\$57,186.10	\$10,555.97	\$223,176.52	\$6,171.25
Sep 04	\$131,078.46	\$23,383.15	\$35,898.96	\$58,375.50	\$9,401.10	\$258,137.17	\$9,815.75
Oct 04	\$125,138.38	\$77,296.97	\$20,297.05	\$61,094.15	\$10,695.35	\$294,521.90	\$6,879.50
Nov 04	\$126,123.53	\$150,195.78	\$13,632.90	\$58,590.28	\$9,845.55	\$358,388.05	\$4,253.18
Dec 04	\$115,180.51	\$184,196.88	\$13,853.47	\$57,764.66	\$9,113.65	\$380,109.17	\$4,074.57
Jan 05	\$136,754.56	\$196,857.16	\$11,381.37	\$58,498.63	\$9,472.19	\$412,963.91	\$4,253.75
Feb 05	\$129,073.47	\$155,956.77	\$11,758.45	\$57,464.39	\$9,460.95	\$363,714.03	\$3,756.00
Mar 05	\$117,402.14	\$133,073.78	\$12,582.35	\$63,280.47	\$9,244.68	\$335,583.43	\$4,198.50
Apr 05	\$125,780.66	\$98,861.32	\$15,829.59	\$60,697.26	\$9,582.50	\$310,751.33	\$4,101.50
May 05	\$126,121.01	\$52,867.16	\$27,534.07	\$60,540.91	\$9,864.72	\$276,927.87	\$3,674.75
Jun 05	\$76,791.22	\$17,223.89	\$40,719.75	\$57,897.07	\$9,322.65	\$201,954.58	\$4,841.75
<b>Annual Total</b>	<b>\$1,385,224.33</b>	<b>\$1,121,771.17</b>	<b>\$280,349.30</b>	<b>\$708,780.21</b>	<b>\$117,092.57</b>	<b>\$3,613,217.61</b>	<b>\$60,052.15</b>
Jul 05	\$74,341.38	\$13,747.93	\$58,078.67	\$58,476.70	\$532.70	\$205,177.38	\$2,055.75
Aug 05	\$103,202.18	\$15,984.95	\$52,269.32	\$58,908.86	\$8,299.59	\$238,664.88	\$4,297.50
Sep 05	\$170,419.59	\$19,865.74	\$47,735.45	\$55,748.97	\$11,620.86	\$305,390.61	\$6,078.00
Oct 05	\$16,053.64	\$76,132.53	\$12,029.36	\$14,749.88	\$4,804.16	\$123,769.57	\$5,776.80
<b>YTD Total</b>	<b>\$364,016.79</b>	<b>\$125,731.15</b>	<b>\$170,112.80</b>	<b>\$187,884.41</b>	<b>\$25,257.31</b>	<b>\$873,002.44</b>	<b>\$18,208.05</b>

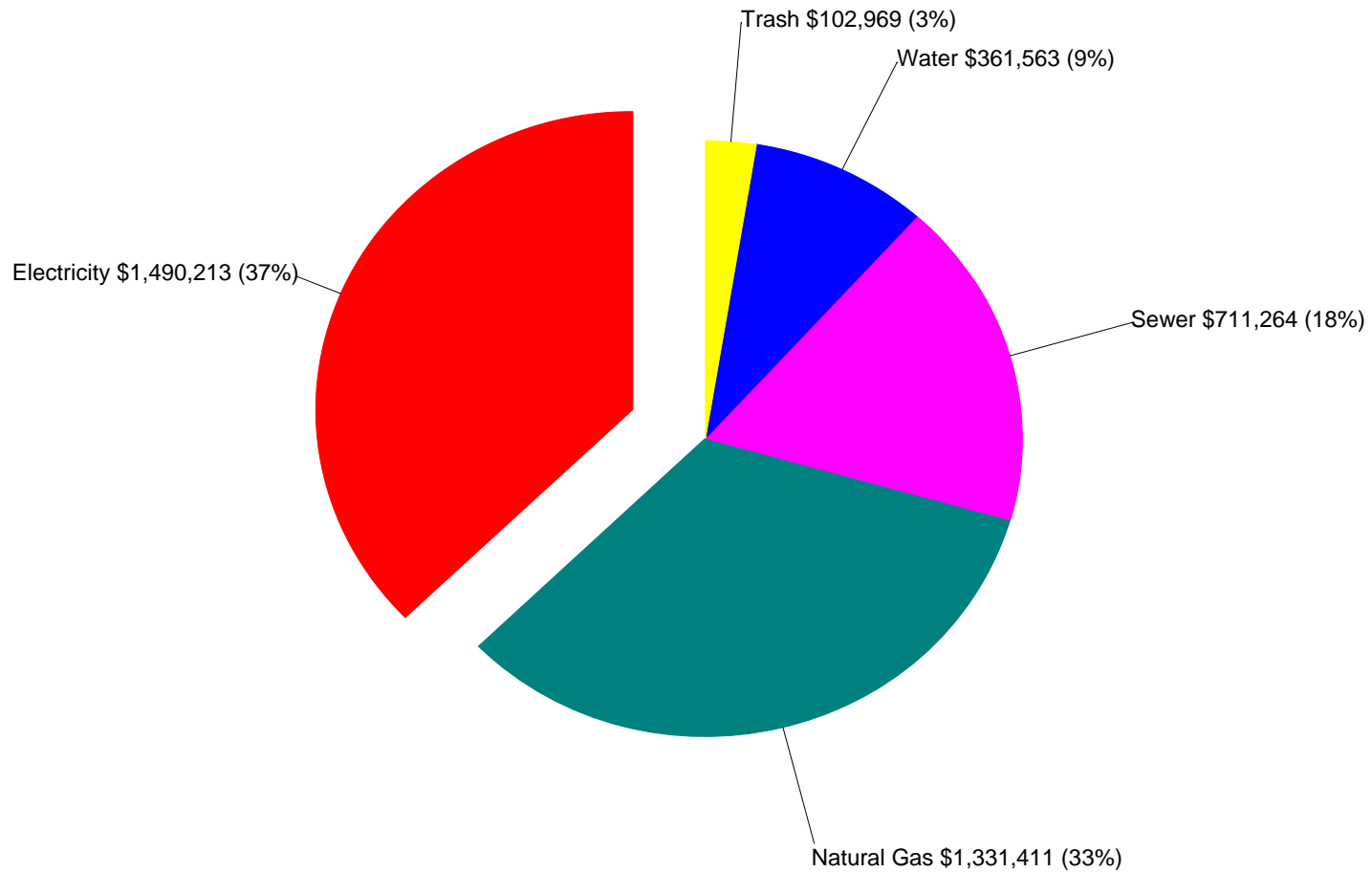
Copy Print Close

Utility Usage History for Poudre School District

Date	Electricity (kWh)	Demand (kW)	Natural Gas (CCF)	Water (Gallons)	Sewer (Gallons)	Trash (Yd)
Aug 04	1,818,509	8,074	12,846	14,891,781	0	0
Sep 04	2,302,909	8,270	26,955	13,464,994	0	0
Oct 04	2,291,898	7,966	110,731	5,329,762	0	0
Nov 04	2,321,958	7,738	228,106	3,090,143	0	0
Dec 04	2,225,001	7,458	281,538	2,568,587	0	0
Jan 05	2,434,024	7,652	304,473	2,627,745	0	0
Feb 05	2,261,451	7,602	235,482	2,852,350	0	0
Mar 05	2,269,874	7,800	201,929	2,935,091	0	0
Apr 05	2,278,096	7,878	145,869	4,151,197	0	0
May 05	2,090,962	8,318	70,384	8,493,579	0	0
Jun 05	1,081,184	6,197	11,400	14,835,000	0	0
<b>Annual Total</b>	<b>24,466,166</b>	<b>91,270</b>	<b>1,638,027</b>	<b>89,872,996</b>	<b>0</b>	<b>0</b>
Jul 05	1,077,773	6,136	5,236	23,387,694	0	0
Aug 05	1,704,126	8,020	8,279	20,811,080	0	0
Sep 05	2,231,336	8,861	15,202	18,450,044	0	0
Oct 05	158,510	589	108,207	3,776,473	0	0
<b>YTD Total</b>	<b>5,171,745</b>	<b>23,606</b>	<b>136,924</b>	<b>66,425,291</b>	<b>0</b>	<b>0</b>

Copy Print Close

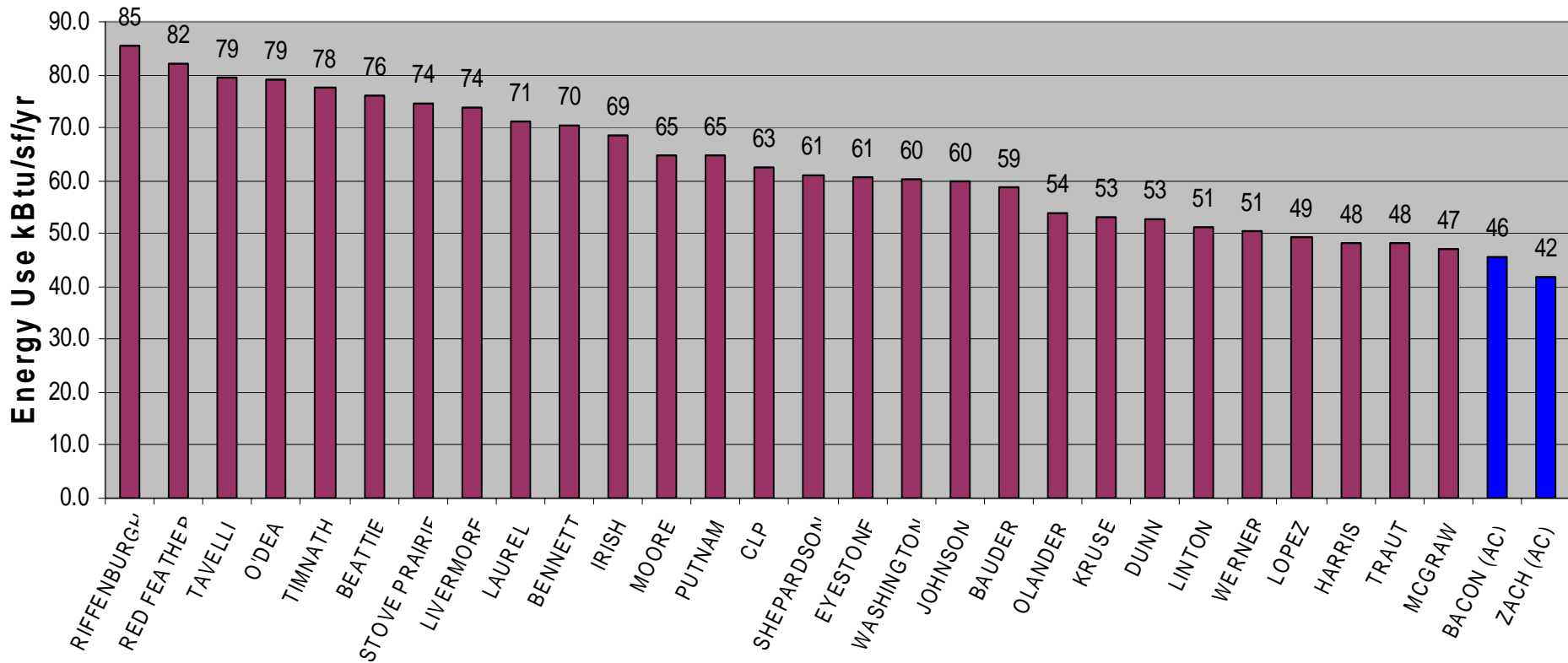
# Annual Total Utility Cost Breakdown Poudre School District



**\$3,997,421 --- Total Utility Bill for  
Year Ending July, 2007**

# kBtu/Sq.Ft./Yr.

## Poudre School District Elementary Schools FY06 Energy Use

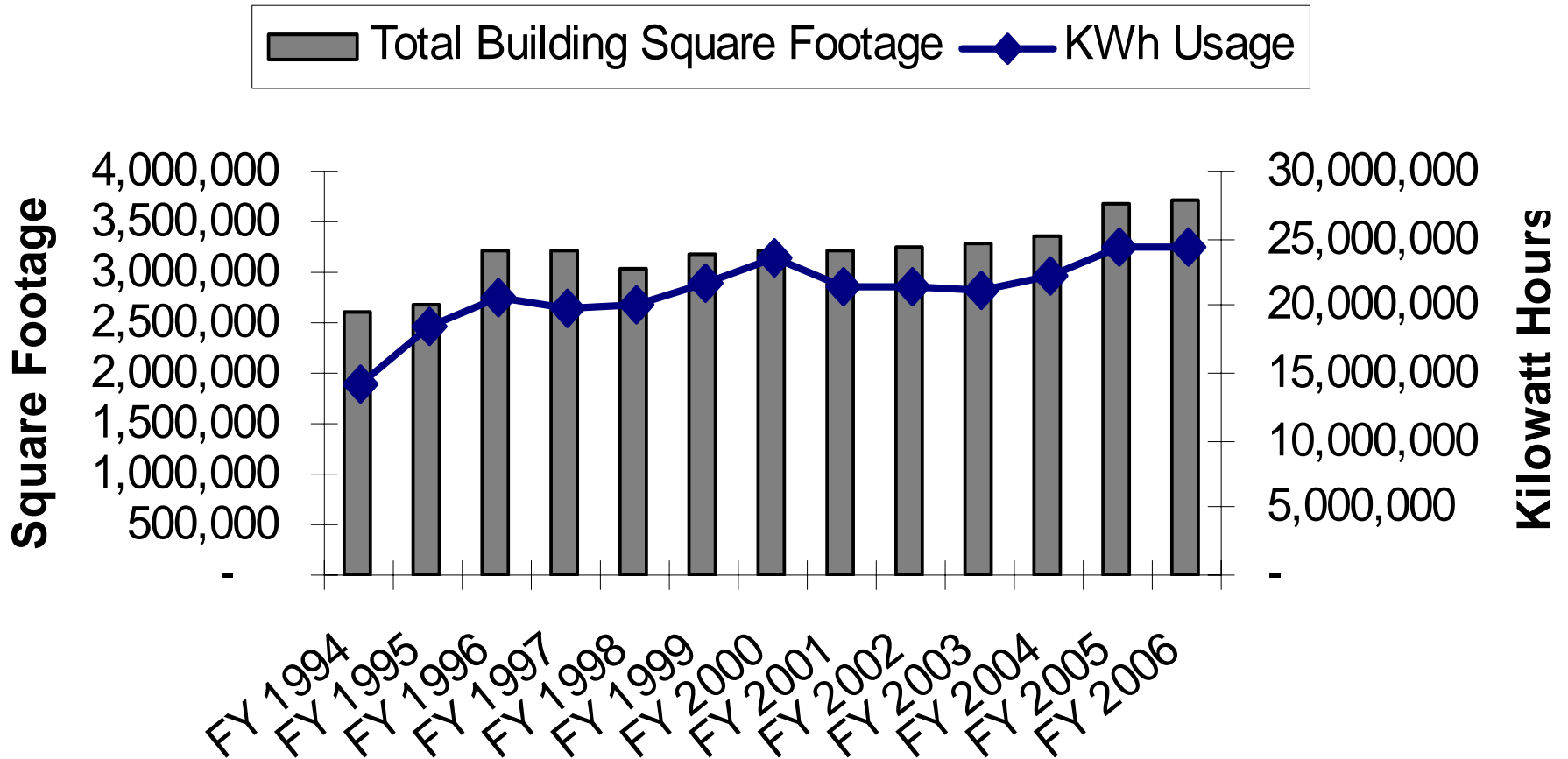


# Energy Conversions

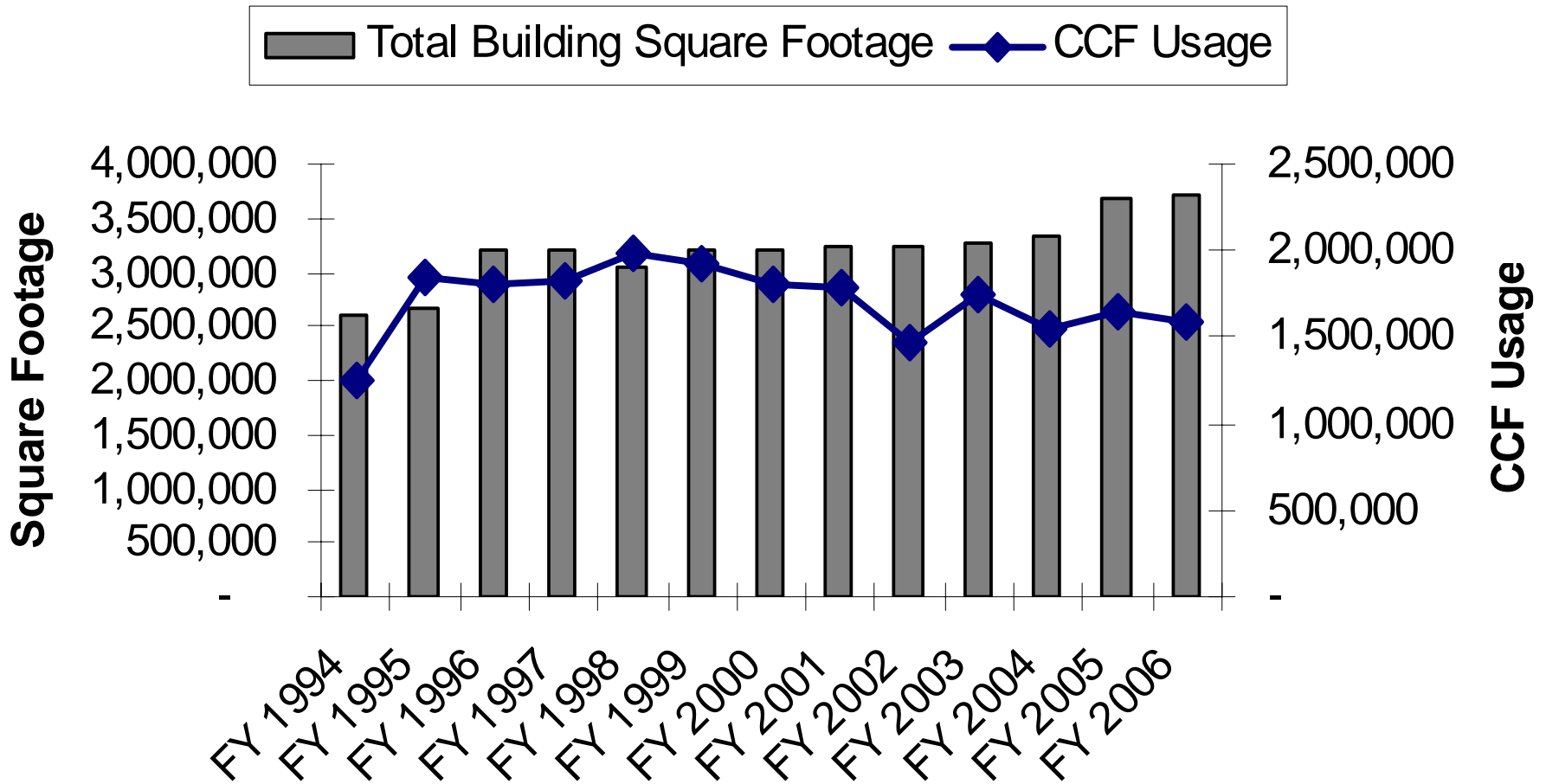
- 1 kWh = 3,412 Btu
- 1 cf NG = 1,000 Btu
- 1 Ccf NG = 100,000 Btu
- 1 Therm NG = 100,000 Btu
- 1 Mcf/Dth NG = 1,000,000 Btu
- 1 gal. Propane = 95,000 Btu



# Electricity Use



# Natural Gas Use



[Home](#) > **My Portfolio**

## Welcome: Stu Reeve

**Average Rating (for All Facilities):**

<b>Baseline Rating: 68</b>	<b>Current Rating: 67</b>
----------------------------	---------------------------

Average Ratings are weighted by Total Floor Space. Only facilities with a Rating are included. [More about Baselines](#)

Summarized below are the facilities in your account. Groups and Views are provided below to help you customize the way in which you view your Portfolio. To improve system performance, users are strongly encouraged to create multiple Groups to help manage large Portfolios of facilities. **Select a facility to view or edit more detailed information about it.**

[Add Facility](#) | [ENERGY STAR Leaders](#) | [Share Facilities](#)

[Download this View in Excel](#)

GROUP:  [Create Group](#) | [View All](#) VIEW:  [Create View](#) | [Edit View](#) | [View All](#)

Search Facility Name:

Results **1 - 48** of 48

All # [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Facility Name <input type="checkbox"/>	Total Floor Space (Sq. Ft.)	Actual Annual Site Energy Intensity (kBtu/Sq. Ft.)	Rating (1-100)	Energy Use Alerts	Period Ending	ENERGY STAR Label Eligibility	Last Modified
<a href="#">Bacon Elementary</a>	65,299	42.3	84	Data > 120 days old	05/31/2005	Not Eligible: Less than one year since last Label. Eligible again on 04/30/2006 ( <a href="#">Label Eligibility Rules</a> )	08/02/2005
<a href="#">Barton Elementary</a>	29,921	76.3	N/A	Data > 120 days old Must Have Electrical Data	06/30/2005	Not Eligible: Rating must be 75 or above ( <a href="#">Label Eligibility Rules</a> )	08/02/2005
<a href="#">Bauder Elementary</a>	63,156	52.5	82	Data > 120 days old	05/31/2005	Not Eligible: Less than one year since last Label. Eligible again on 04/30/2006 ( <a href="#">Label Eligibility Rules</a> )	08/22/2005

- open all | close all
- Poudre School District
  - Elementary Schools
  - Junior High Schools
  - High Schools
    - Centennial HS
    - Ft. Collins HS
    - Fossil Ridge HS
  - Administration Building
  - Facility Services Buildin
  - Station Functions
  - User Manuals



## Poudre School District

- |                         |                     |
|-------------------------|---------------------|
| Centennial High         | Bauder Elementary   |
| Fossil Ridge High       | CLP Elementary      |
| Fort Collins High       | Eyestone Elementary |
| CLP Junior High         | Moore Elementary    |
| Lincoln Junior High     | Putnam Elementary   |
|                         | Timnath Elementary  |
| Administration Building | Werner Elementary   |

Peak Demand In Effect ●

Test Board

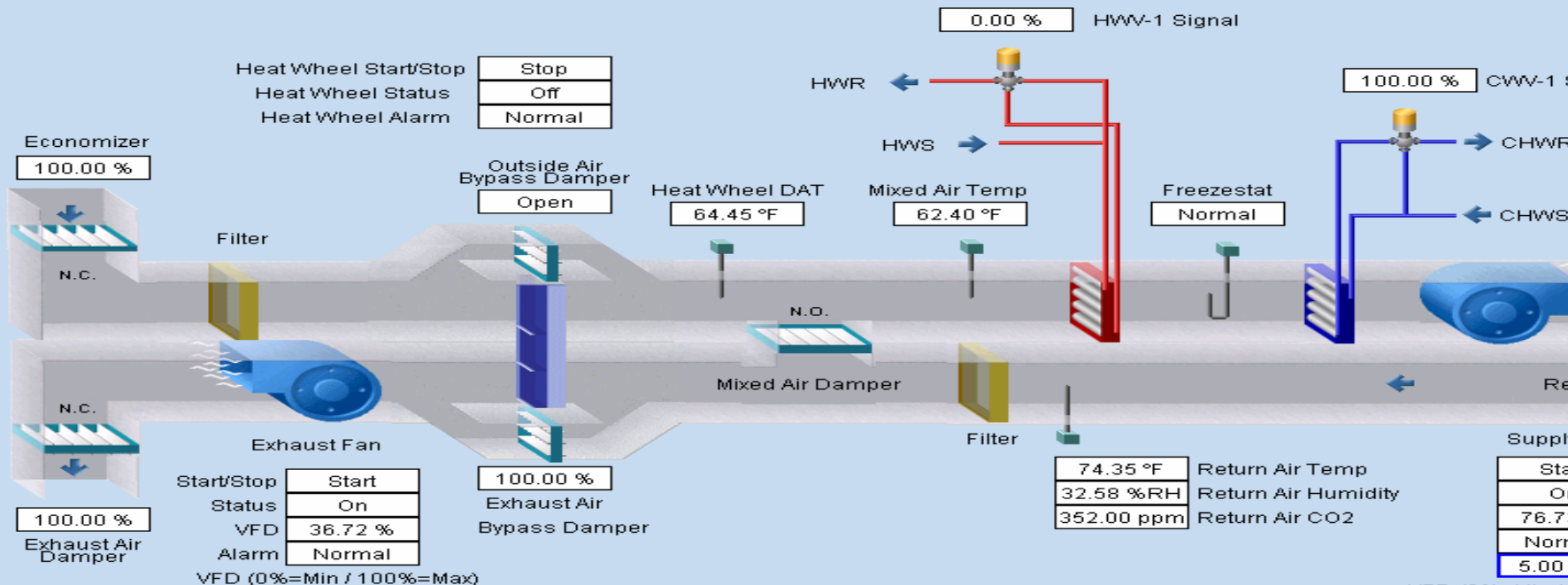
Home

## Fossil High School

First Floor Area A	AHU-1	●	CRAC-1
Second Floor Area A	AHU-2	●	CRAC-2
First Floor Area B	AHU-3	●	CRAC-3
Second Floor Area B	AHU-4	●	CRAC-4
First Floor Area C	AHU-5	●	MAU-1
Second Floor Area C	AHU-6	●	MAU-2
First Floor Area D	AHU-7	●	MAU-3
First Floor Area E	AHU-8	●	Hot Water System
First Floor Area F	AHU-9	●	Chilled Water System
First Floor Area G	AHU-10	●	Exhaust Fans
First Floor Area H	AHU-11	●	Vending Machines

# Air Handling Unit 8

Main Menu





Daily Totals

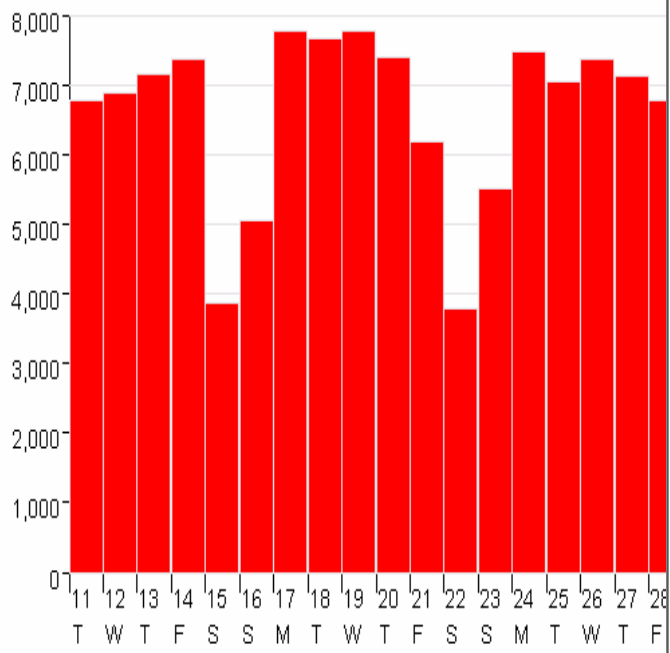
**Customer Information**

**Name:** Fossil Ridge H.S.  
**Address:** 5400 Ziegler Rd  
 Ft. Collins, Co  
  
**Acct. No:**  
**Meter No:** 33136

**Tue Oct 11 2005 to Thu Nov 10 2005**

**Total Usage:** 197,438.76 KWH  
**Max Demand:** 562.56 KW  
**Occurred On:** Oct 14 2005 10:30

KWH ( channel: 1 set: 1 )



Thu Oct 27 2005 00:15 = 7,114.08

Daily

24 Hour Profile

**Customer Information**

**Name:** Fossil Ridge H.S.  
**Address:** 5400 Ziegler Rd  
 Ft. Collins, Co  
  
**Acct. No:**  
**Meter No:** 33136

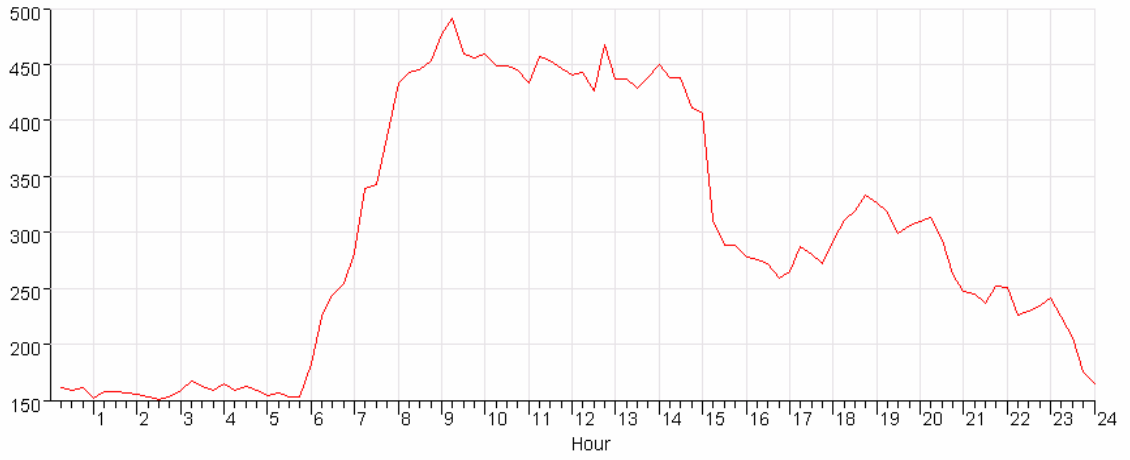
**Data for Tue Nov 8 2005**

**Total Usage:** 7,123.08 KWH  
**Max Demand:** 491.52 KW  
**Occurred On:** Nov 8 2005 09:15  
**Load Factor:** 60.383%  
**Date Range:** Nov 8 To Nov 8

KW ( channel: 1 set: 1 )

24 Hour Profile

01903710



Tue Nov 8 2005 20:00 = 309.84

# FRHS vs. FCHS

Sept. 2004 – June 2007

(\$90,273 Savings)

KW ( channel: 1 set: 1 )

Comparison Graph

01901000

FCHS

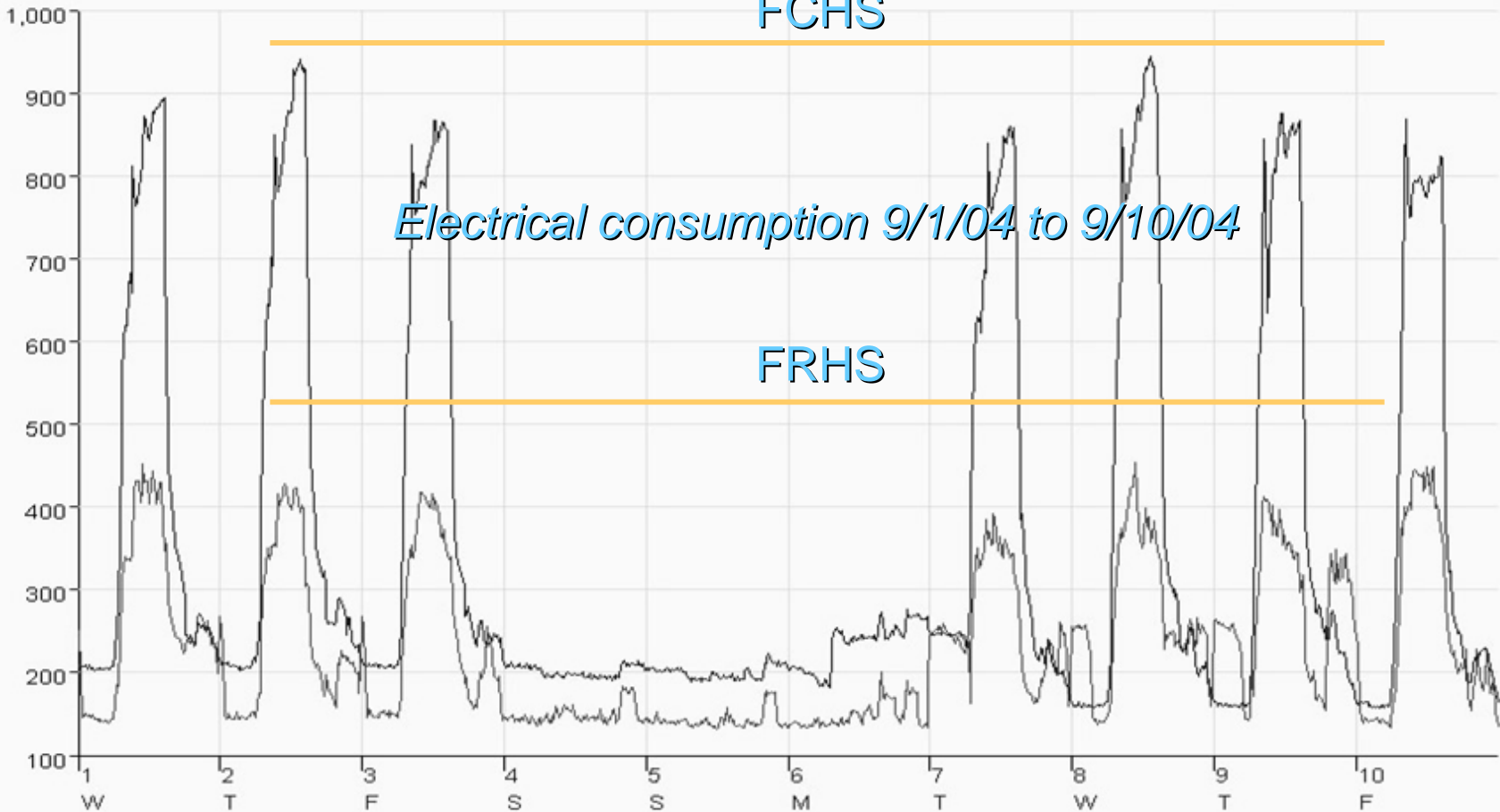
Add Line

01903710

01901000

*Electrical consumption 9/1/04 to 9/10/04*

FRHS





[About](#) | [Projects](#) | [Irrigation Management](#) | [Data](#) | [Information](#) | [Finance](#) | [Water Quality](#)

HOME

Weather

Maps

Web Chat

FAQs

WATER ACCOUNTING

C-BT RENTAL WATER

KEYWORD SEARCH

Go!

LATEST NEWS

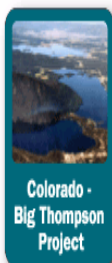
- Keeping your lawn beautiful
- May 2006 issue of Waternews
- 2006 C-BT Project Quota
- Windy Gap Firming Project EIS Update
- NCWCD Water Conservation & Management Plan



NCWCD, a public agency created in 1937, provides water for agricultural, municipal, domestic and industrial uses in northeastern Colorado. The District was established as the local agency to contract with the United States to build the [Colorado-Big Thompson Project](#).

[READ MORE](#)

**NCWCD Feature Projects:**



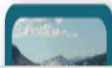
Colorado - Big Thompson Project

The Colorado-Big Thompson Project is the largest transmountain water diversion project in Colorado. [more](#)



Windy Gap Project

The Windy Gap Project is located just west of the town of Granby on Colorado's West Slope. [more](#)



The Windy Gap



Northern Integrated

The Northern

Weather

Maps

Web Chat

FAQs

WATER ACCOUNTING

C-BT RENTAL WATER

KEYWORD SEARCH

Go!

LATEST NEWS

- Keeping your lawn beautiful
- May 2006 issue of Waternews
- 2006 C-BT Project Quota
- Windy Gap Firming Project EIS Update
- NCWCD Water Conservation & Management Plan

ONLINE VIDEOS



### Northern Colorado Water Conservancy District WEATHER STATIONS Data/Reports

Locations west of Greeley, Colorado

Locations east of Greeley, Colorado

Click on location for latest data

District boundary index map

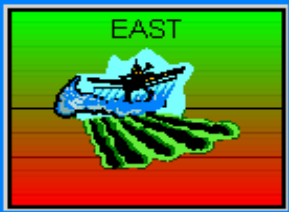
Colorado Colorado Index Map



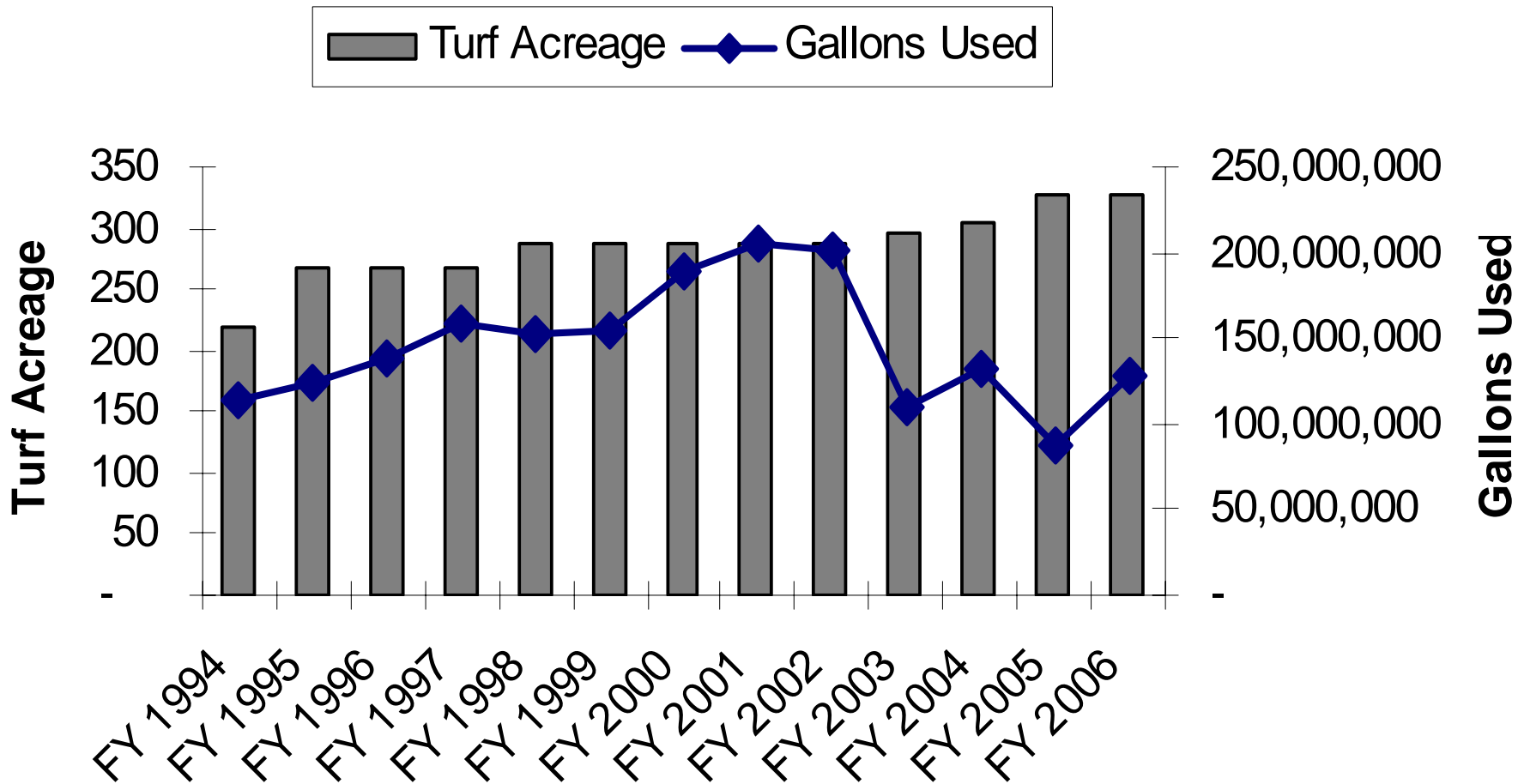
Poudre School District

Fixed User

- System
  - NORTH
  - SOUTH
  - EAST
  - WEST
  - FIU



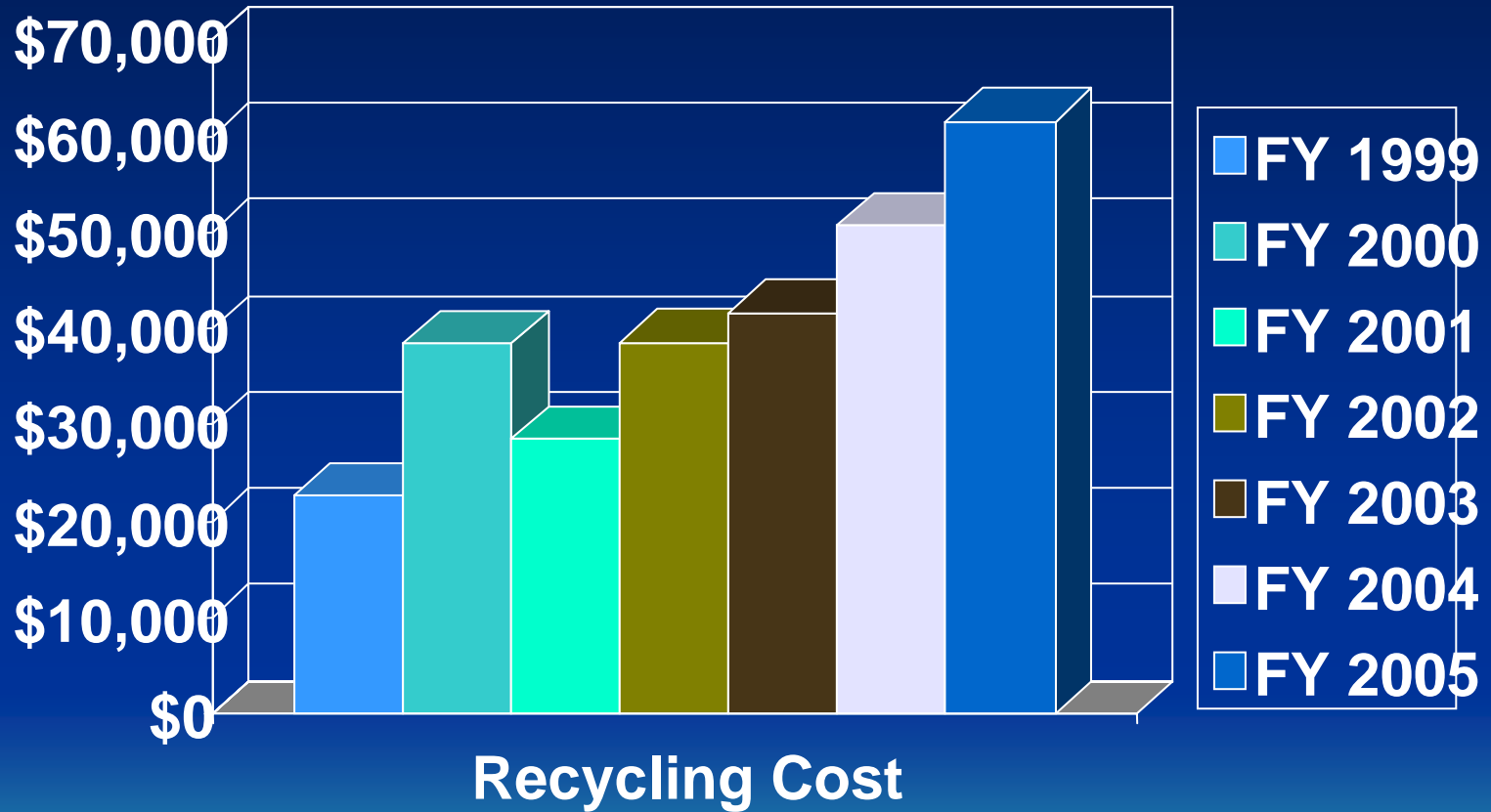
# Water Use



# Trash Costs



# Recycling Costs



# Yearly Energy Efficiency Projects

SITE	ACTION	TYPE	DESCRIPTION	DEPARTMENT	FUND	PROJECT MGR
Bacon Elem.	Upgrade	Energy	Install Green Transformer	Energy	EET	Jim Norgard
Lesher JH	Install new	Energy	Energy Management System (boiler room)	Energy	EET	Tom Weatherly
ITC	Install new	Energy	Energy Management System	Energy	EET	Tom Weatherly
Shepardson Elem.	Install new	Energy	Energy Management System (start/stop control)	Energy	EET	Tom Weatherly
Bennett Elem.	Upgrade	Energy	Lighting Retrofit	Energy	EET	Jim Norgard
Wellington JH	Upgrade	Energy	Lighting Retrofit	Energy	EET	Jim Norgard
Dunn Elem.	Upgrade	Energy	Lighting Retrofit	Energy	Bond	Jim Knauer
Moore Elem.	Upgrade	Energy	Lighting Retrofit	Energy	Bond	Jim Knauer
Timnath Elem.	Install new	Energy	Automated Irrigation Control	Energy	EET	Jerry Garretson
Bacon Elem.	Install new	Energy	Resize Main Electrical Transformer	Energy	EET	Jim Norgard
Webber	Upgrade	Energy	Gas Booster Heaters	Energy	EET	Jim Tishmack
Lesher	Upgrade	Energy	Gas Booster Heaters	Energy	EET	Jim Tishmack
Bennett	Upgrade	Energy	Foodservice Hot Water Heaters	Energy	EET	Jim Tishmack
Traut	Upgrade	Energy	Foodservice Hot Water Heaters	Energy	EET	Jim Tishmack
					EET	<b>FY 2007 SUB TOTAL</b>
					EET	<b>FY 2008 SUB TOTAL</b>
					Bond	<b>FY 2008 SUB TOTAL</b>
						<b>TOTAL</b>



# Performance Goals For New Schools

- Beat ASHRAE 90.1 by 60%
- Energy Star score of 85
- 35 kBTU/sq.ft./yr or better
- Improved building envelope
- Reduce cooling load to 1 ton/1,000 sq.ft.
- 70 degree heating and 75 degree cooling set points
- Confirm climate zone design parameters



# Performance Goals Cont.

- Natural daylighting
- Design to lighting to 35 foot candles in class rooms
- Design lighting to .8 watts/sq.ft.
- Design plug loads to .4 watts/sq.ft.
- Reduce electric service transformer
- Reduce water tap size
- Water efficient Irrigation system design



# Performance Goals Cont.



- *Less tooth decay?*





2006 EDITION



POUDRE  
SCHOOL  
DISTRICT

# Sustainability Management System



# What is an SMS?

Combines a management system with  
a sustainability framework



Sustainability Framework:  
Where do you want to go...



Management System:  
The vehicle for getting there...

# Sustainability Management System Process

## *Policy*

Develop Sustainability Policy

## *Management Actions*

- Visibly Support the Program
- Conduct a Formal Review Annually
- Make Changes to Maintain Effectiveness

## *Planning (ABCD Analysis)*

- Map and Prioritize Impacts
- Develop Strategies
- Set Objectives and Targets
- Link and Develop Programs

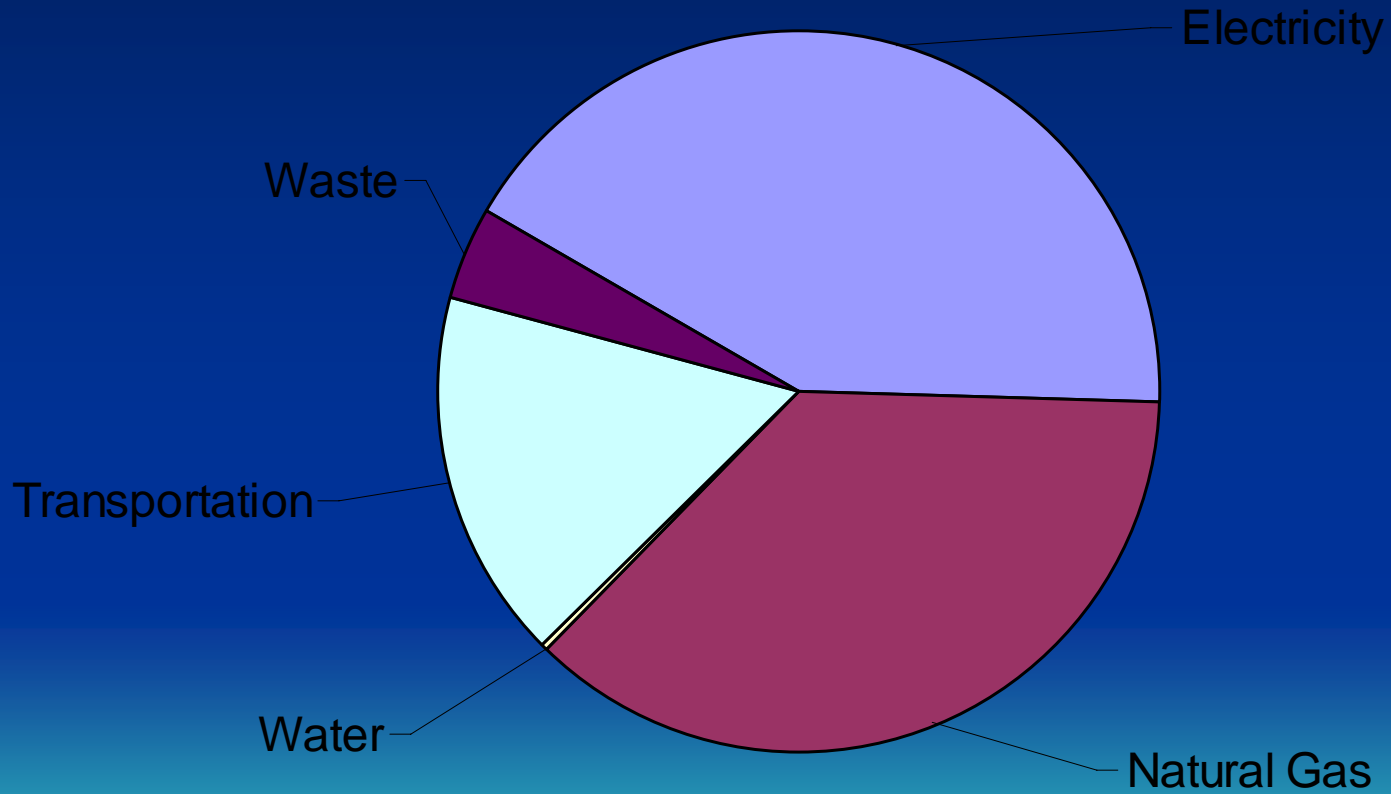
## *Implementation Actions*

- Assign Responsibilities
- Train all Employees
- Communicate Internally and Externally
- Documentation System (what and who)
- Departments and teams make improvements

## *Confirmation Actions*

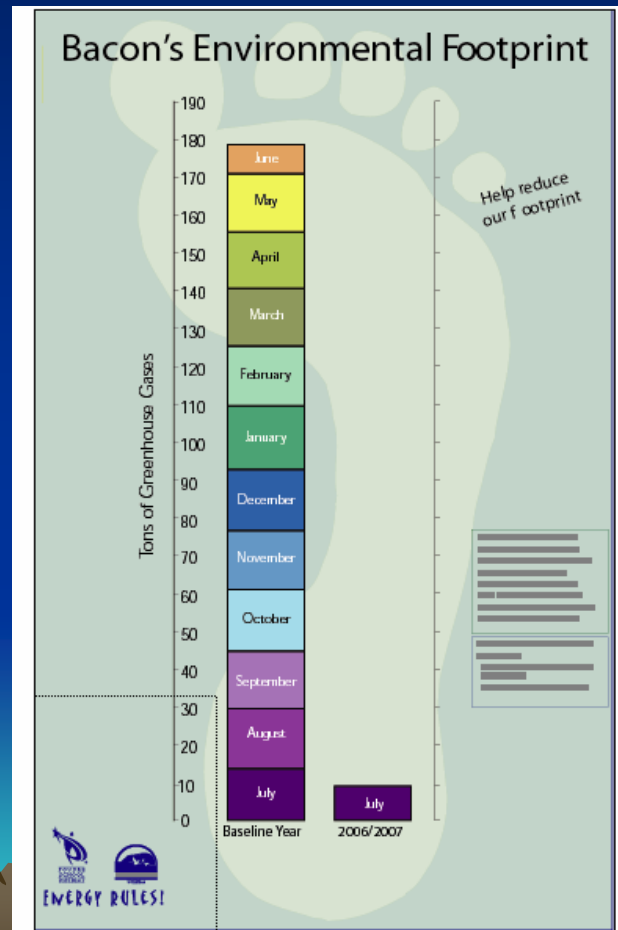
- Monitor and Measure Progress
- Conduct Checks to Confirm Success

# PSD's GHG Baseline



# School's Environmental Footprint

- Making the school connection...





# Recognition...

- *Colorado Renewable Energy Society*
- *US Environmental Protection Agency*
- *US Department Of Energy*
- *Energy Smart Schools*
- *Rebuild Colorado, Rebuild America*
- *American Institute of Architects*
- *American Society of Interior Designers*
- *American Association of School Administrators*
- *Council of Educational Facility Planners, Int.*
- *National Renewable Energy Laboratory*
- *Governor's Energy Office, State of Colorado*
- *City of Fort Collins, CO*
- *Larimer County, CO*
- *North Front Range Solid Waste Action Group*

# Resources

- EPA Energy Star: <https://www.energystar.gov>
- DOE: <http://www.eere.energy.gov/>
- Colorado Association of School District Energy Managers: <http://www.casdem.org>
- PSD Sustainable Design Guidelines:  
<http://www.psdschools.org/services/operations/planningdesign/resources.aspx>
- PSD Sustainability Management System:  
<http://www.psdSMS.brendlegroup.com/docs/2006PSDSMS.pdf>

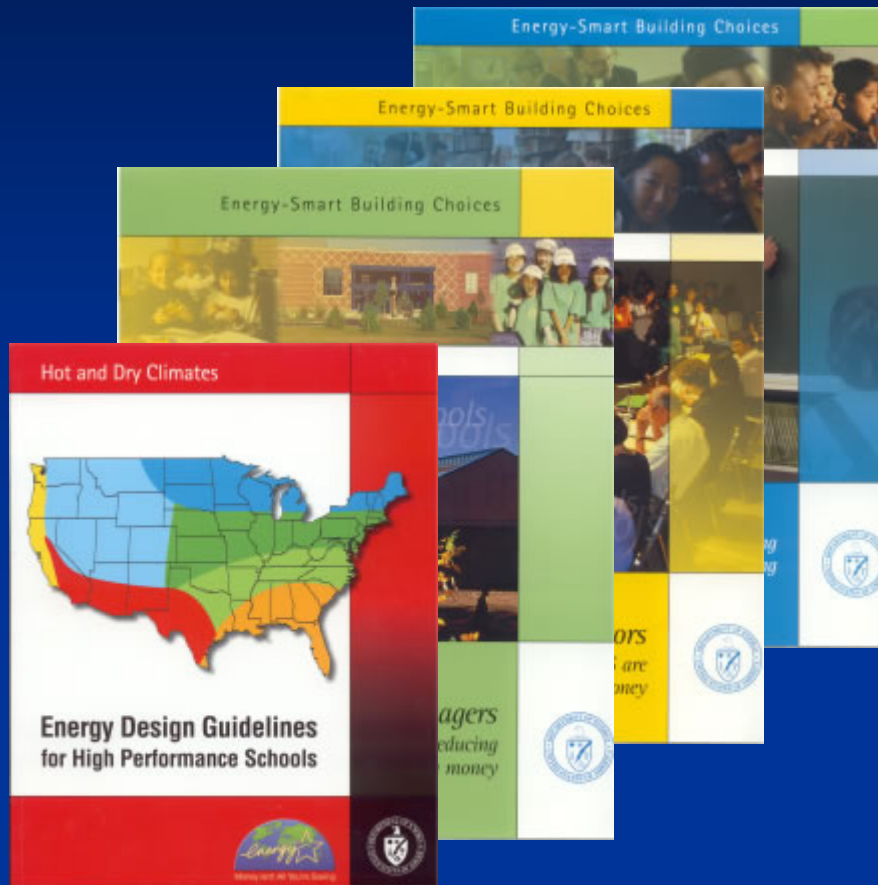


# More Resources

- The Association of Energy Engineers  
<http://www.aeecenter.org/>
- Governor's Energy Office  
<http://www.state.co.us/oemc/>
- Heschong Mahone Group, Inc.  
<http://www.H-M-G.com>
- Collaborative for High Performance Schools  
<http://www.chps.net/>
- National Association of State Energy Officials:  
<http://www.daylighting.org/naseo.htm>



# Rebuild America/Energy-Smart Schools



## Energy design guidelines:

Site design, daylighting & windows

Building shell

Lighting and electrical systems

HVAC

Renewable energy systems

Water conservation

Recycling & waste management

Transportation

Resource – efficient building materials

**Poudre School District**  
Curriculum Learning Tools Intranet Programs Services Jobs Schools PSD Info Students Contact PSD

Site Search: [ ] Quick Links: [ ]

PSD Home: Services Operations

**Operations**  
Bill Franzen  
Executive Director of Operations  
(970) 490-3527  
bfranzen@psdschools.org

Jana Ley and Bill Franzen with EPA Administrator Christine Whitman at the National Energy Star Awards in Washington, DC

**Poudre School District was recognized this week as a National Energy Star Award Winner!**

Jana Ley, Vice-President of the PSD Board of Education, and Bill Franzen, Executive Director of Operations traveled to Washington, DC earlier this week to accept a national Energy Star Award for outstanding energy management.

[Read the EPA Press Release](#)  
[Read the PSD Press Release](#)

**Welcome to Poudre Schools - Microsoft Internet Explorer**

**Poudre School District**  
Curriculum Learning Tools Intranet Programs Services Jobs Schools PSD Info Students Contact PSD

Site Search: [ ] Quick Links: [ ]

**PHS Team Places 2nd in the Nation**  
Representing a land-locked state in the national Ocean Science Bowl competition didn't hamper Poudre High School. The team's 2nd place finish in the national competition is the highest ever for a Colorado school! Click here for more info.

**Welcome to Poudre School District!** Browse our website to learn more about our district, including the latest information from our 45 schools and 24,000 students.

High Performance Schools Conference  
Volunteers & Partners  
Major Initiatives  
Boundary & Enrollment News  
Board of Education

**News & Events**  
Graduation for PSD Class of 2006!  
1800 seniors participate in commencement  
**Boundary Changes Adopted by Board**  
PSD announces location for new SE Elem  
**2006 Summer School Schedules**  
Registration currently underway  
**Public Input Sought on Curriculum**  
7th-grade human sexuality curriculum  
**Intl Problem Solving Conf. June 1-4**  
Beattie's program hosts event at CSU

More news >>

School Registration [click here](#)

PSD Accountability Report [click here](#)

**ROCKY MOUNTAIN**  
HIGH PERFORMANCE SCHOOLS CONFERENCE

HOME • WHO SHOULD ATTEND • SCHEDULE • SPEAKERS • SPONSORS • REGISTRATION • TRAVEL • RECREATION

**Conference Dates:**  
July 27-28, 2006

**Registration Fee: \$150**  
REGISTER BY JUNE 15 AND PAY ONLY \$125!!!

**Contact Information**  
Poudre School District  
Operations  
2407 LaPorte Avenue  
Fort Collins, Colorado 80521

(P) 970.490.3537  
(F) 970.490.3479  
[conference@psdschools.org](mailto:conference@psdschools.org)

**Green design, sustainability, high performance schools...you've heard the buzz, now find out what it's all about.**

U.S. Senator Ken Salazar tentatively scheduled to speak on Friday, July 28! A short video on the Senator's recent visit to Fossil Ridge High School can be found [here](#) in Windows Media Player format.

Come spend two days this summer in the Colorado Rockies to see **real examples of award winning** green, high performance schools.

Take home proven strategies that you can use to construct schools that support high achievement, save money, and cost no more to build than traditional schools.

With more than twenty years of experience in green school design and recognized as a national leader in planning high performance schools, Poudre School District is hosting a two-day conference this summer in Fort Collins, Colorado for school administrators and professionals responsible for school design.

**Research shows** that buildings using these strategies can and do have positive impacts on student learning.

Speak directly to the designers of these high performance schools- buildings that save money, conserve energy, increase student achievement and do not cost any more to build than traditional schools.

High Performance Schools Conference

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