

Oyster River Cooperative School District

Ecological Footprint Report

Period: *July 1, 2010 through June 31, 2011*

April 2012

Oyster River Sustainability Committee

“Cooperating to Sustain the Oyster River Community”



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Environmental Conservation Studies, Sustainable Living

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I. INTRODUCTION

A. The Sustainability Committee

The Oyster River Cooperative School District's (ORCSD) Sustainability Committee was established after the pass of Warrant Article # 7 in March 2011. The Committee, nicknamed "The Green Oyster," consists of 19 members from the ORCSD schools, the school board, the University of New Hampshire, and the three towns. The Committee's mission statement is "...to facilitate a sustainability forum...with the five principles of sustainability (Renewability, Substitution, Interdependence, Adaptability, and Institutional Commitment) in the areas of food, energy, transportation, school curriculum and community outreach."

The ORCSD consists of the following schools and facilities:

| | |
|------------------------------------------|----------------------------------------|
| Mast Way Elementary School (K-4) | Oyster River High School (9-12) |
| Moharimet Elementary School (K-4) | SAU Office |
| Oyster River Middle School (5-8) | Service Building |

The schools reside in three adjacent towns along the New Hampshire seacoast area: Durham (Oyster River Middle and High School), Lee (Mast Way Elementary), and Madbury (Moharimet Elementary).

B. Purpose of this Document

The purpose of this document is for ORCSD Sustainability Committee to create an ecological footprint of the district by benchmarking the following sectors:

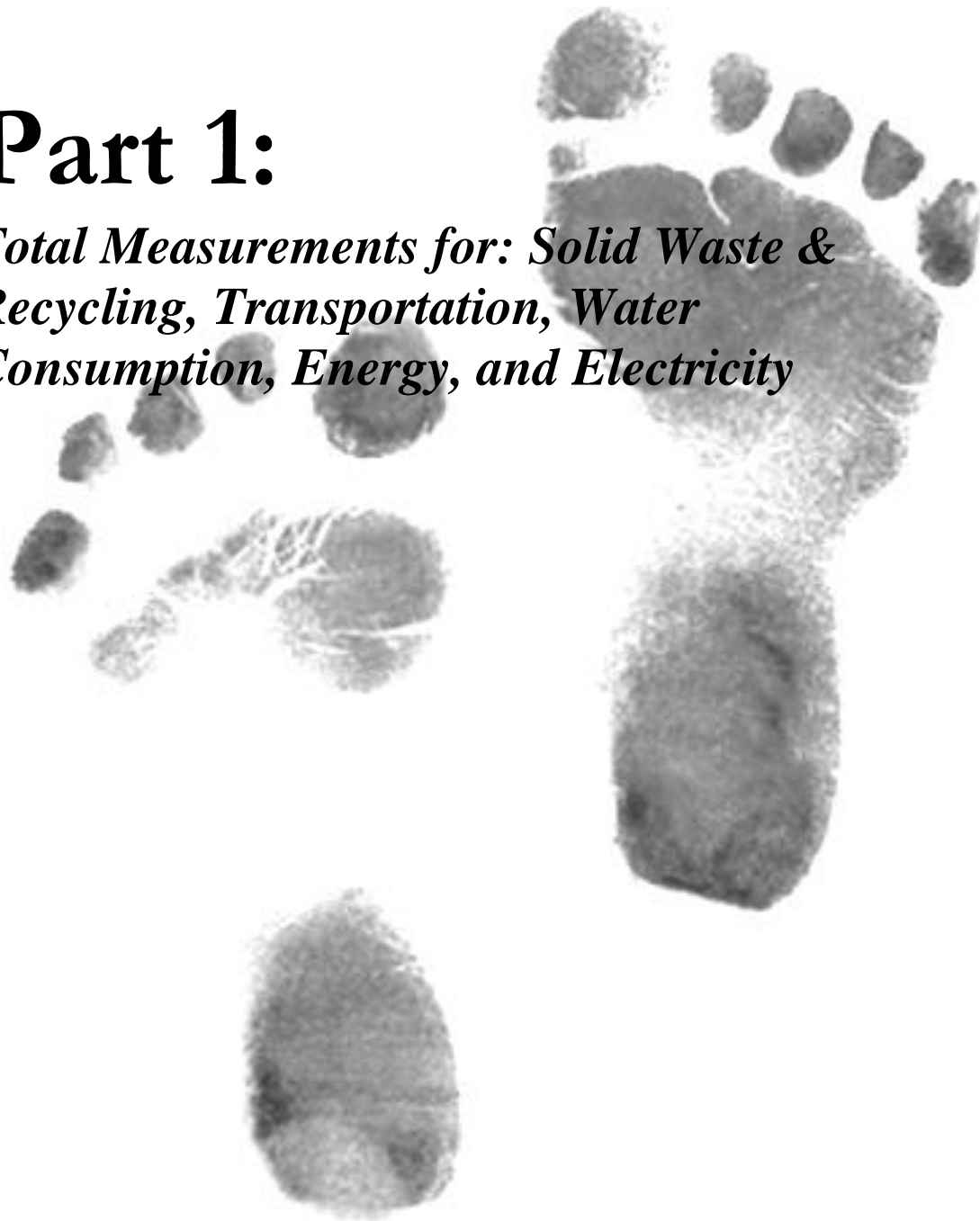
| | |
|------------------------------------|------------------------------------------------|
| Solid Waste & Recycling | Energy (Natural Gas and Transportation) |
| Transportation | Electricity |
| Water Consumption | |

C. Layout of this Document

This document is divided into three sections. Part I represents the total measurements for the five sectors in terms of cost and metric tons of carbon dioxide equivalent emitted (MTCO₂E). Totals were determined for the entire district and, where applicable, totals were compared to previous fiscal schools years. Part II is for an individual school assessment that incorporates each school and facility across the five sectors and, again, compares previous fiscal school years where applicable. Part III concludes with recommendations about decreasing the ORCSD's ecological footprint, suggestions to include in the footprint in the future, and the remaining appendices.

Part 1:

Total Measurements for: Solid Waste & Recycling, Transportation, Water Consumption, Energy, and Electricity



II. TOTALS

A. Total Costs (FY 2010-11)

| | Costs | | | | | | |
|----------------------|-------------------------|-------------------------|--------------|------------|-------------|--------------|--------------|
| | Waste: | | Fleet: | Water: | Energy: | | Electricity: |
| | Solid Waste | Recycling | Upkeep | | Propane | Natural Gas | |
| Mast Way | \$3,761.17 | \$1,884.48 | - | - | \$53,054.76 | - | \$35,072.18 |
| Moharimet | \$9,519.16 | \$2,001.89 | - | - | \$29,430.84 | - | \$48,365.79 |
| Middle School | \$3,759.44 | \$1,758.10 | - | \$1,758.10 | - | \$73,430.37 | \$92,630.84 |
| High School | \$4,546.35 | \$1,710.10 | - | \$1,710.10 | - | \$125,021.73 | \$252,896.61 |
| SAU | <i>(Included in HS)</i> | <i>(Included in HS)</i> | - | \$312.31 | - | - | \$7,725.60 |
| SB | N/A | N/A | - | \$322.23 | - | \$3,606.37 | \$14,745.76 |
| | | | | | | | |
| Totals | \$21,586.12 | \$7,354.57 | \$202,690.08 | \$4,102.74 | \$82,485.60 | \$202,058.47 | \$451,436.78 |

| | |
|----------------------------------|--------------|
| Total Cost (FY 2010-2011) | \$971,714.36 |
|----------------------------------|--------------|

B. MTCO₂E (FY 2010-2011)

| | MTCO ₂ E | | | | | |
|----------------------|---------------------|--------|-------|---------|-------------|--------------|
| | Waste: | Fleet: | Water | Energy: | | Electricity: |
| | | | | Propane | Natural Gas | |
| Mast Way | - | - | - | 147.69 | - | 171 |
| Moharimet | - | - | - | 82.58 | - | 191 |
| Middle School | - | - | - | - | 231 | 404 |
| High School | - | - | - | - | 446 | 1,156 |
| SAU | - | - | - | N/A | N/A | 25.7 |
| SB | - | - | - | - | 12 | 75.8 |
| | | | | | | |
| Totals | - | 1,131 | - | 230.27 | 689 | 2023.5 |

| | |
|--------------------------------------------------------------|----------|
| Total MTCO₂E of all Sectors (FY 2010-2011) | 4,073.77 |
|--------------------------------------------------------------|----------|

III. SOLID WASTE & RECYCLING

Waste Management Companies:

The operating companies involved in the collection of the ORCSD's solid waste are Waste Management and Casella for the district's recycling. In June 2011, Casella merged with the recycling company Pine Tree. As of currently, Pine Tree collects the District's recycling on a flat rate basis: explaining the relative consistent monthly costs for removal.

Additional Offices:

The solid waste and recycling costs and total tons accumulated generated by the SAU office, located on Coe Drive near the High School, are included in the High Schools averages.

Discrepancy with Moharimet Elementary School Averages:

Moharimet Elementary School previously had two (2) 10-yard containers and paper totes that were continuously emptied: resulting in higher costs for waste removal than the other schools in the district. Moharimet currently has one (1) 10-yard container for the 2011-2012 school year.

Oyster River High School Waste Compactor:

The High School currently uses a trash compactor for its solid waste that is emptied when it is full. This may not be done during consecutive months and for months when it is not emptied no cost is averaged into the school's totals (See 'Solid Waste: Monthly Cost' graph).

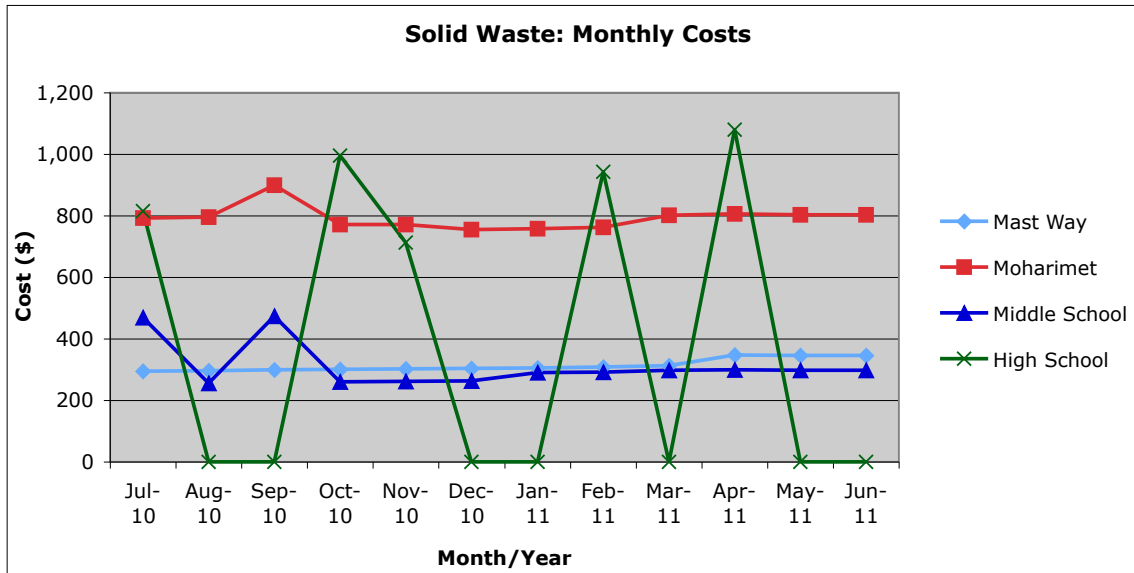
A. Solid Waste and Recycling: Total Costs (FY 2010-11)

Table 1: Total Costs for All Schools (FY 2010-2011)

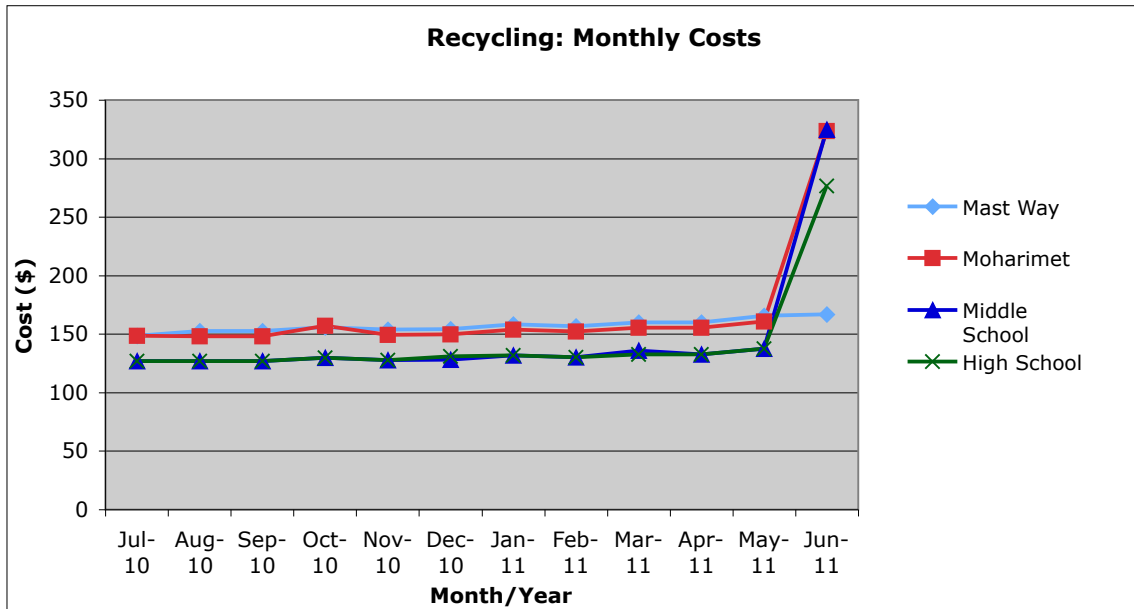
| School | Solid Waste | Recycling |
|-----------------------------|--------------------|------------------|
| Mast Way Elementary | \$3,761.17 | \$1,884.48 |
| Moharimet Elementary | \$9,519.16 | \$2,001.89 |
| Middle School | \$3,759.44 | \$1,758.10 |
| High School | \$4,546.35 | \$1,710.10 |
| Totals (\$) | \$21,586.12 | \$7,354.57 |

| | |
|-----------------------------------------------|-------------|
| Total Cost (Solid Waste and Recycling) | \$28,940.69 |
|-----------------------------------------------|-------------|

B. Solid Waste: Monthly Costs



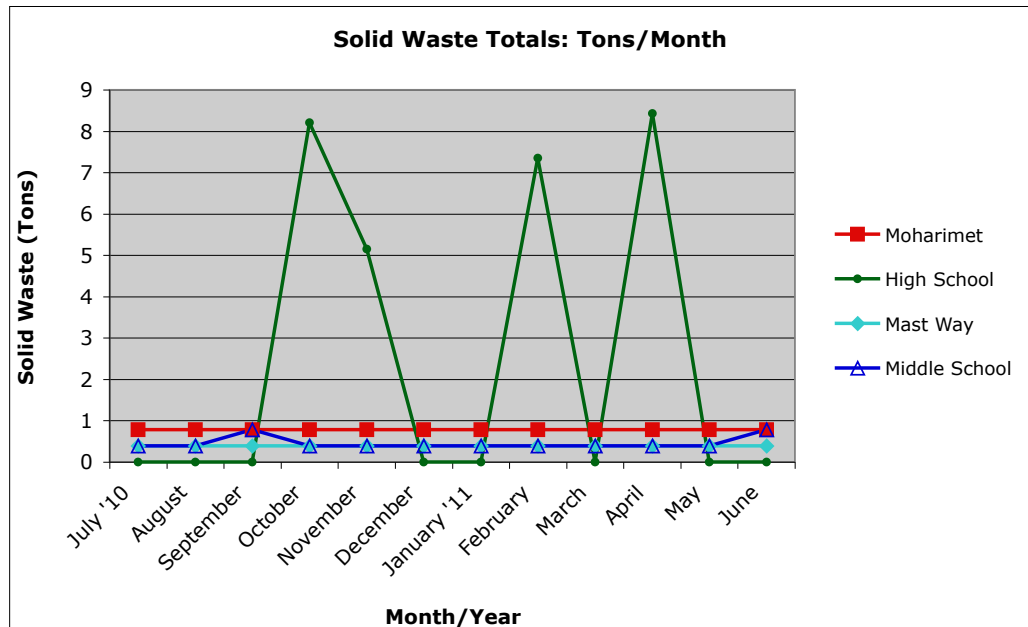
D. Recycling: Monthly Costs

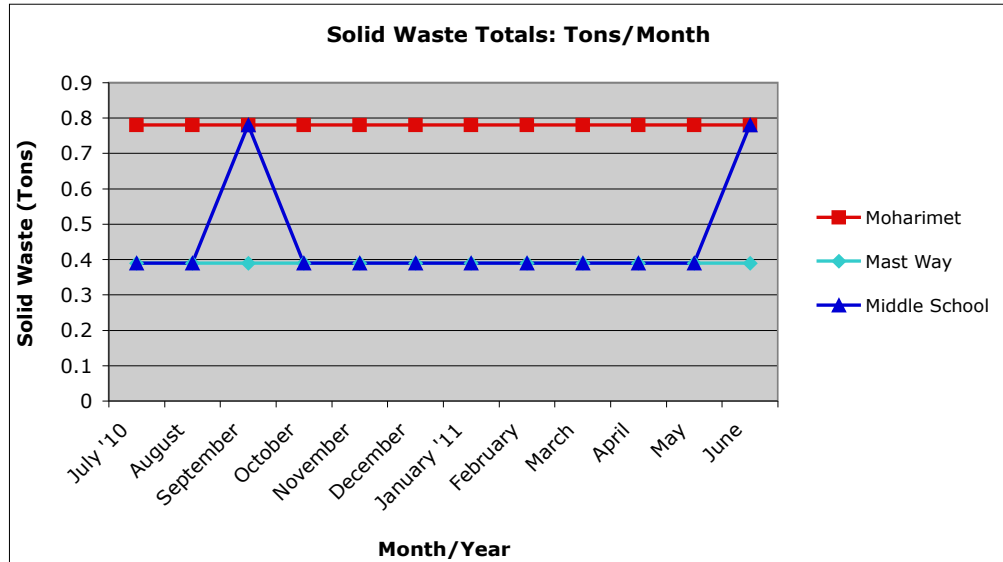


F. Tons of Solid Waste

Table 2: Tons of Solid Waste (FY 2010-11)

| School | Tons of Solid Waste |
|---------------|---------------------|
| Moharimet | 9.36 |
| High School | 29.14 |
| Mastway | 4.68 |
| Middle School | 5.46 |
| Total | 48.64 |





Note: Graph excludes High School data for better representation of remaining schools

IV. TRANSPORTATION FLEET

A. Totals: All Variables for the Transportation Fleet

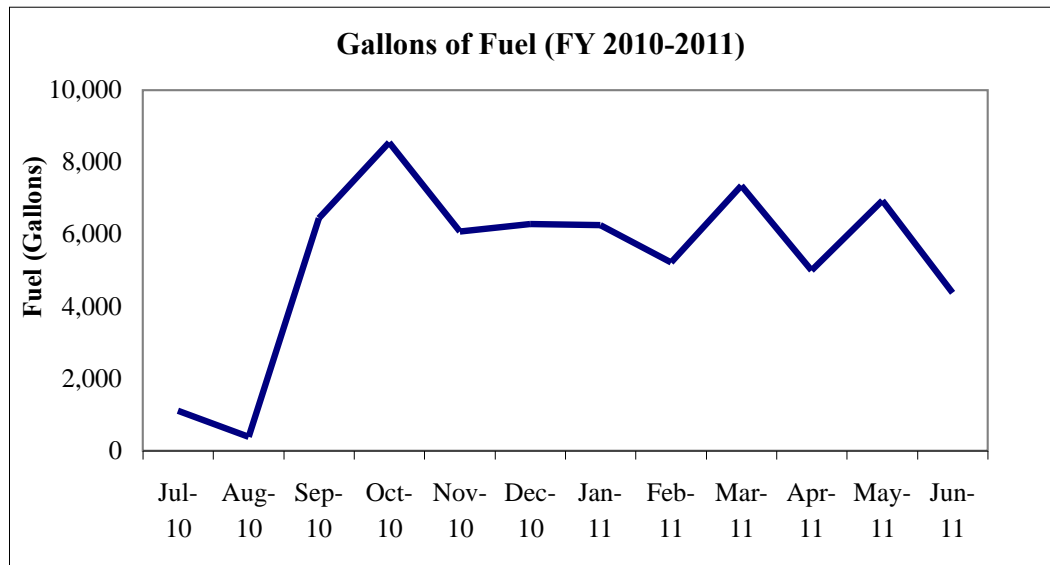
| Table 3: Totals from July 2010- June 2011 | |
|------------------------------------------------------|--------------|
| Miles Driven | 539,068.00 |
| Fuel Consumed (Gallons) | 127,251.70 |
| Maintenance (\$) | \$30,878.72 |
| Repairs (\$) | \$160,423.82 |
| Body Work (\$) | \$11,388.29 |
| Tires (\$) | \$0.00 |

| | |
|-------------------------|--------------|
| Total Costs (\$) | \$202,690.83 |
|-------------------------|--------------|

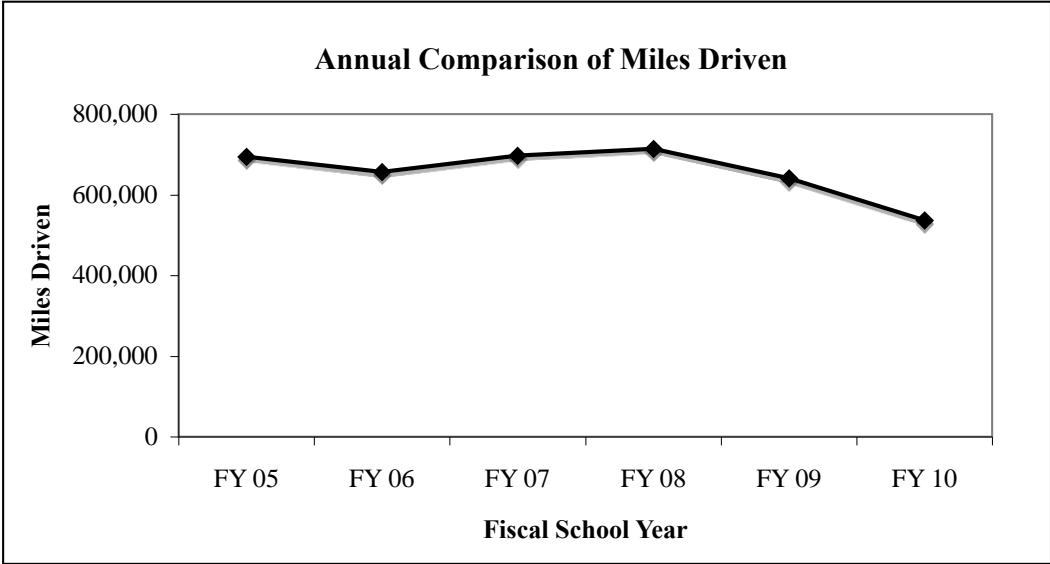
B. Total Carbon Dioxide Emissions

| Fuel Consumed (Gallons) | MTCO₂E |
|------------------------------------|--------------------------|
| 127,251.70 | 1,131 |

C. Monthly Fuel Consumption



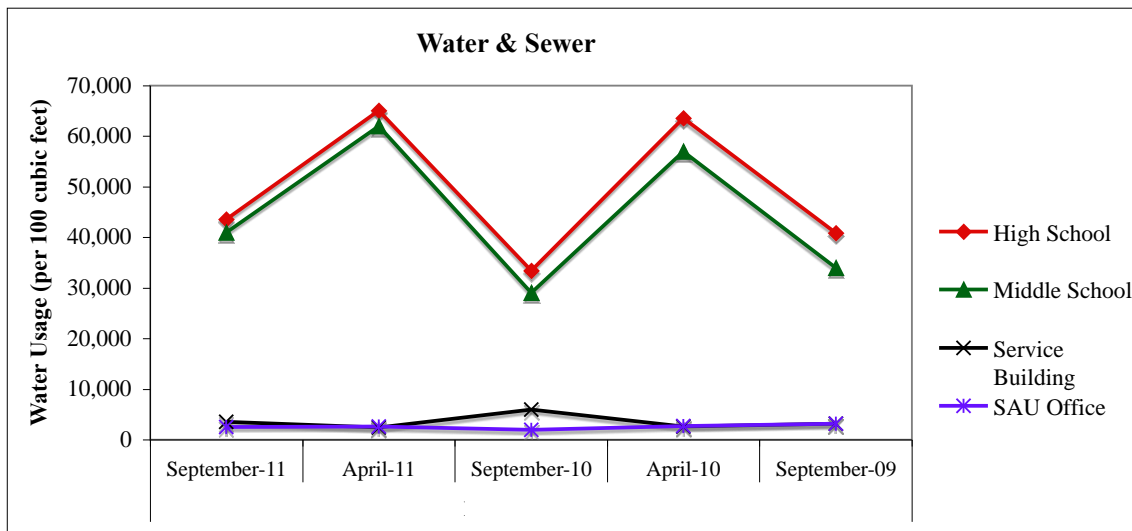
D. Annual Comparison of Miles Driven by the Fleet



V. WATER CONSUMPTION

Omitted Data: Due to Mast Way and Moharimet Elementary Schools' water source being drawn from a well, they were excluded from this report. The amount and cost of water consumed by the High School, Middle School, SAU Office, and the Service Building are the only facilities included in this report.

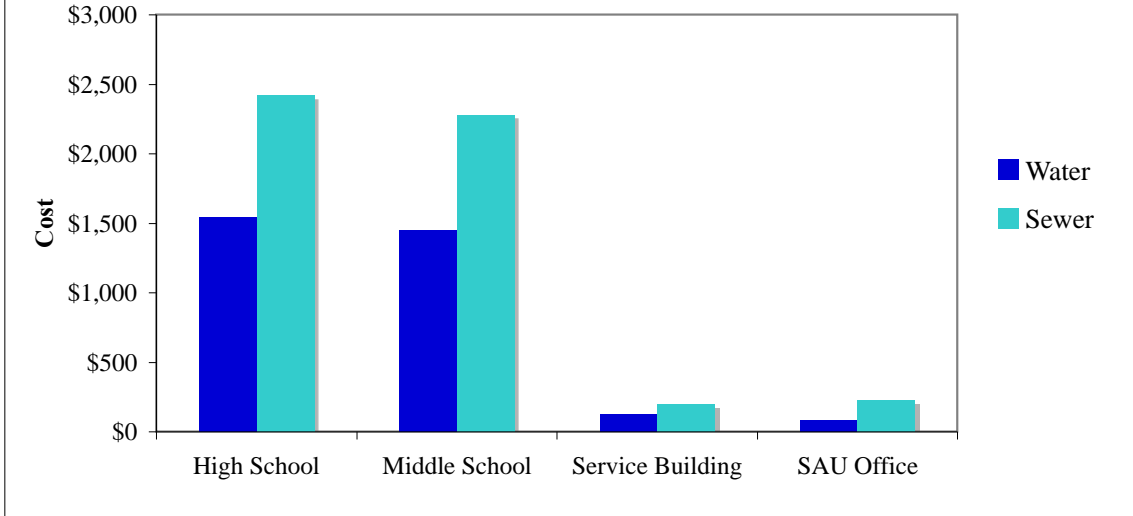
| Read Date & Usage (per 100 cubic feet) | | | | | | |
|----------------------------------------|--------------|----------|----------|--------------|----------|--------------|
| School/Building | September-11 | March-11 | April-11 | September-10 | April-10 | September-09 |
| High School | 43,601 | - | 65,091 | 33,454 | 63,558 | 40,880 |
| Middle School | 41,000 | 62,000 | - | 29,000 | 57,000 | 34,000 |
| Service Building | 3,541 | - | 2,404 | 5,960 | 2,608 | 3,157 |
| SAU Office | 2,470 | - | 2,578 | 1,922 | 2,710 | 3,150 |



| School/Building | Cost of Water & Sewer | | |
|------------------|-----------------------|------------|------------|
| | Water | Sewer | Total |
| High School | \$1,543.47 | \$2,424.11 | \$3,967.58 |
| Middle School | \$1,451.40 | \$2,279.60 | \$3,731.00 |
| Service Building | \$125.35 | \$196.88 | \$322.23 |
| SAU Office | \$87.54 | \$224.77 | \$312.31 |

| Rates (per 100 cubic feet) | |
|----------------------------|--------|
| Water | Sewer |
| \$3.54 | \$5.56 |

Cost of Water & Sewer (FY 2010-2011)

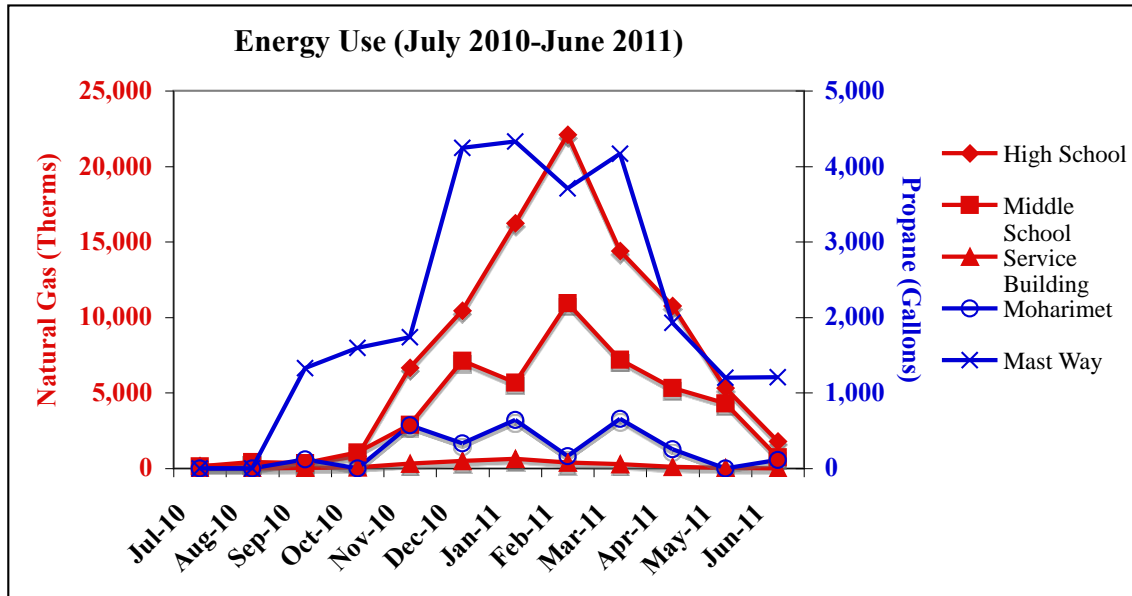


VI. ENERGY

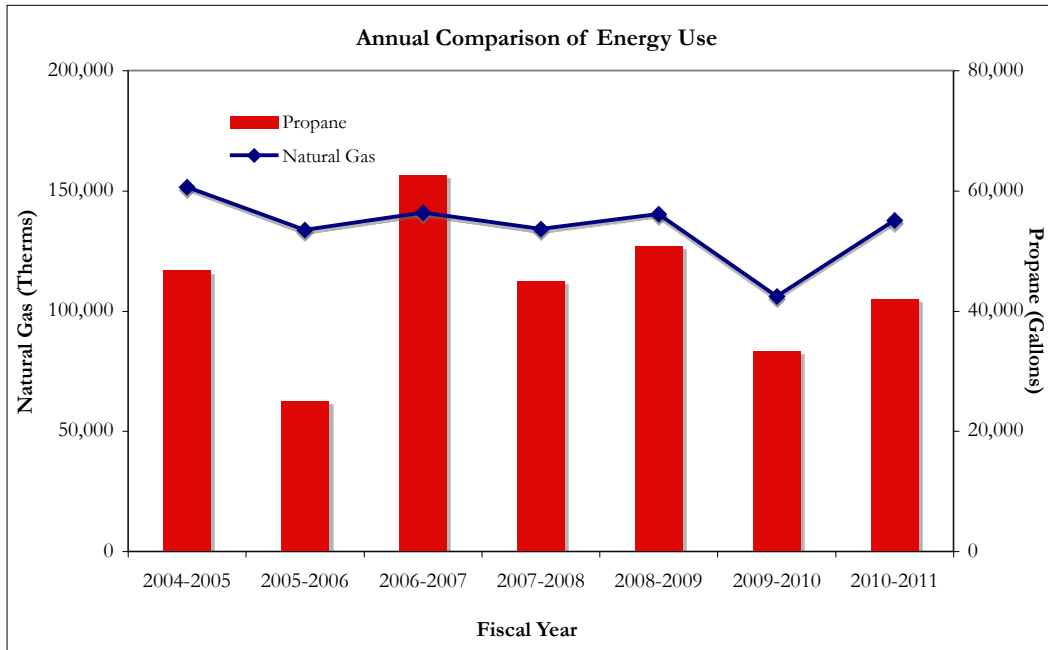
| Total: Energy (FY 2010-2011) | | | | |
|-------------------------------------|----------------------|--------------|--------------|--------------------------|
| School | Energy Type | Total | Cost | MTCO₂E |
| High School | Natural Gas (Therms) | 89,192.96 | \$125,021.73 | 446 |
| Middle School | Natural Gas (Therms) | 45,499.65 | \$73,430.37 | 227 |
| Mast Way | Propane (Gallons) | 25,438.30 | \$53,054.76 | 148 |
| Moharimet | Propane (Gallons) | 14,224.10 | \$29,430.84 | 83 |
| Service Building | Natural Gas (Therms) | 2,398.37 | \$3,606.37 | 12 |

| | |
|--------------------------------|--------------|
| Total MTCO₂E | 916 |
| Total: Cost | \$284,544.07 |

A. Energy Usage (FY 2010-2011)



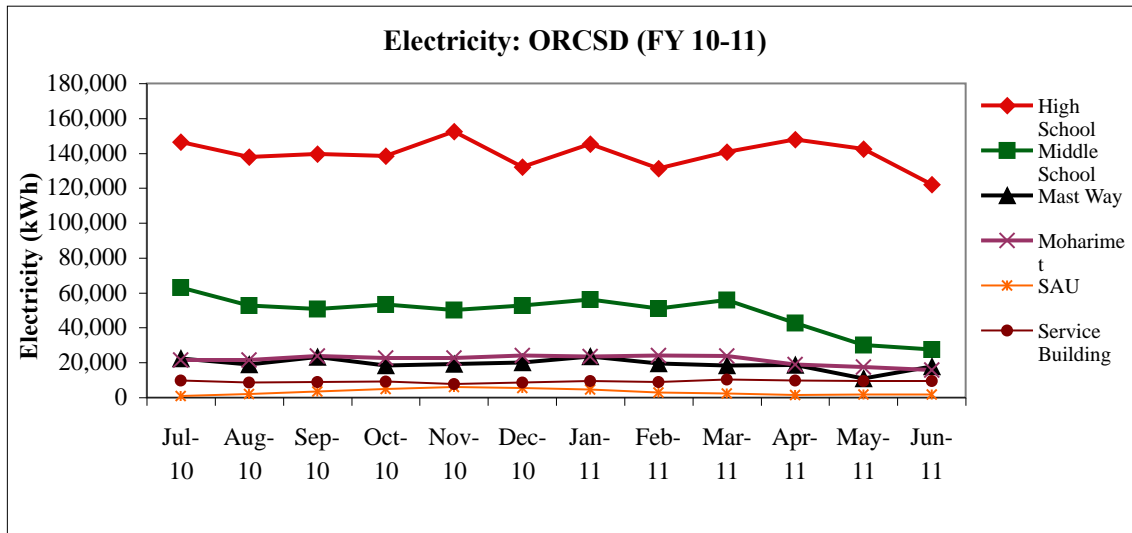
B. Annual Comparison of Energy Usage



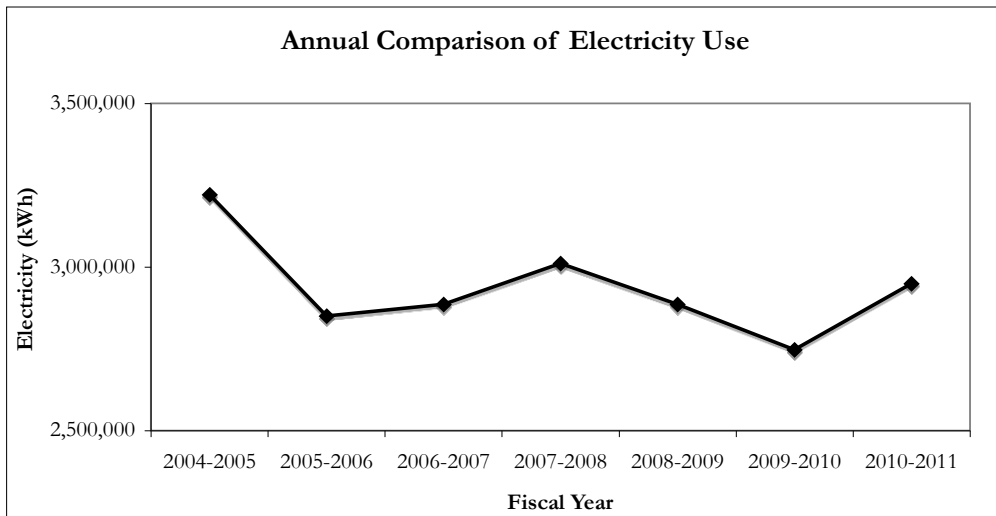
VII. ELECTRICITY

| ELECTRICITY (FY 2010-2011) | | | |
|----------------------------|------------------|---------------------|---------------------|
| School | kWh | MTCO ₂ E | Cost |
| High School | 1,676,400 | 1,156 | \$252,612.66 |
| Middle School | 586,200 | 404 | \$92,630.84 |
| Mast Way | 247,840 | 171 | \$35,072.18 |
| Moharimet | 277,120 | 191 | \$42,330.13 |
| SAU Office | 37,200 | 25.7 | \$7,725.60 |
| Service Building | 109,870 | 75.8 | \$14,745.76 |
| Totals | 2,934,630 | 2,024 | \$445,117.17 |

A. Electricity Use (FY 2010-2011)

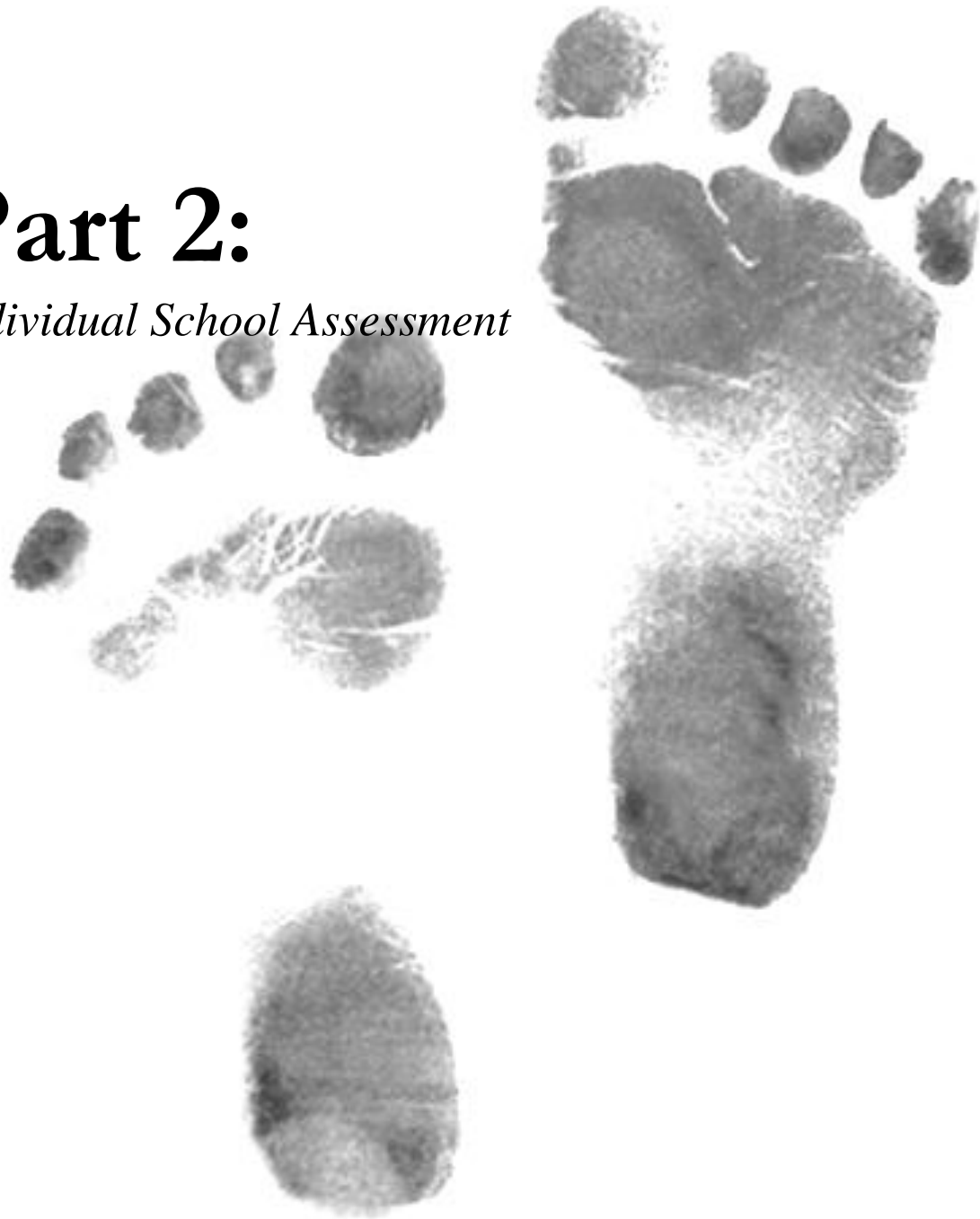


B. Annual Comparison of Electricity Use



Part 2:

Individual School Assessment



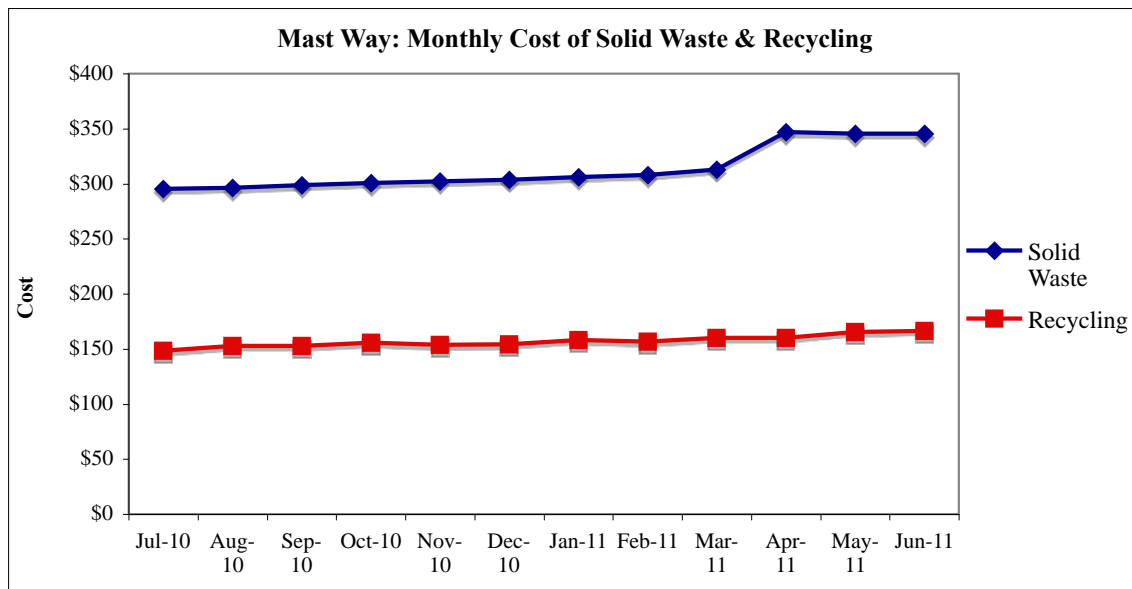
I. MAST WAY ELEMENTARY

A. Solid Waste & Recycling

i. Totals

Mast Way had the lowest costs for both solid waste and recycling disposal as well as the lowest tons of solid waste generated.

| Solid Waste | Tons of Solid Waste | Recycling | Total (FY 2010-2011) |
|-------------|---------------------|------------|----------------------|
| \$3,761.17 | 4.68 | \$1,884.48 | \$5,645.65 |



ii. Seasonal Data

| Season | Solid Waste | Recycling | Tons of Solid Waste | Total |
|--------|-------------|-----------|---------------------|------------|
| Summer | \$890.56 | \$453.91 | 1.17 | \$1,344.47 |
| Fall | \$906.39 | \$463.66 | 1.17 | \$1,370.05 |
| Winter | \$926.61 | \$474.84 | 1.17 | \$1,401.45 |
| Spring | \$1,037.61 | \$492.07 | 1.17 | \$1,529.68 |

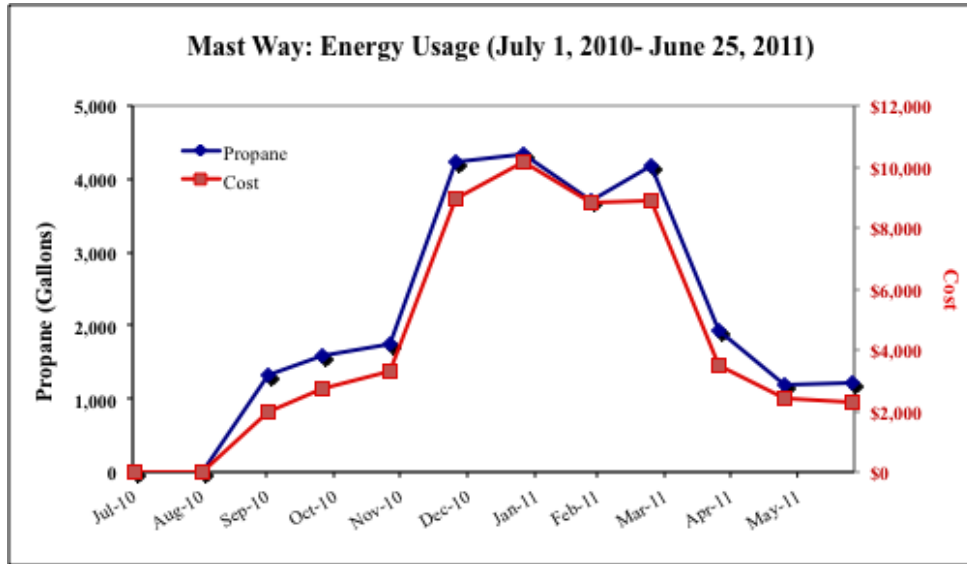
B. Water Consumption

Due to Mast Way Elementary's water being extracted from a well, its averages and patterns of consumption are not included in this report.

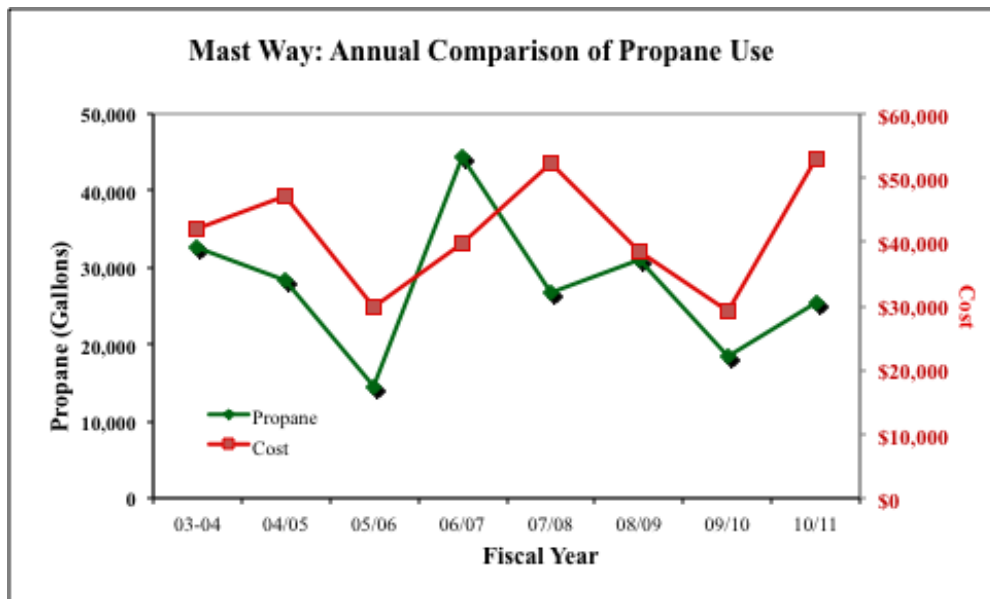
C. Energy

i. Totals & Monthly Use

| Utility Data: Mast Way | |
|------------------------|---------------|
| Start Date | July 1, 2010 |
| End Date | June 25, 2011 |
| Propane (Gallons) | 25,438.30 |
| Cost | \$53,054.76 |



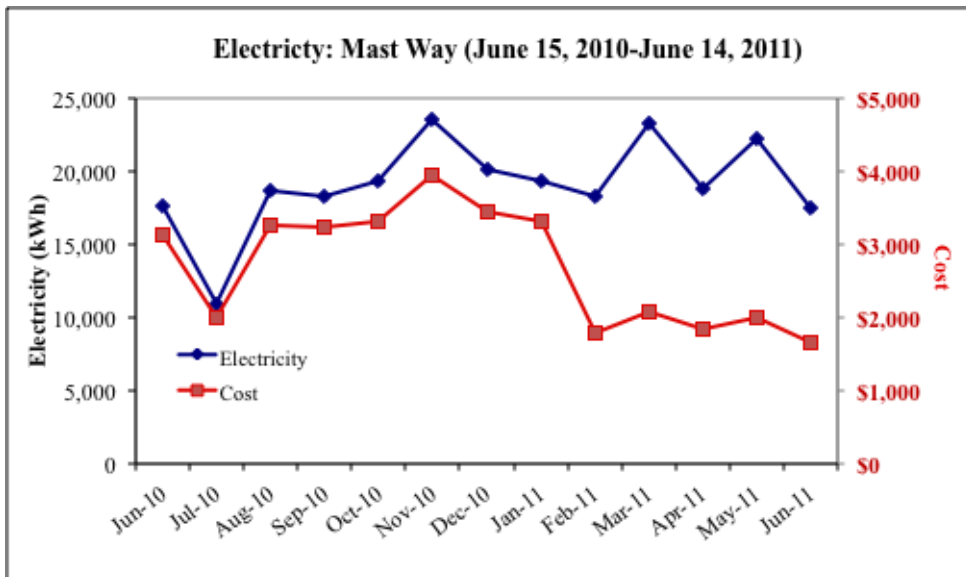
iii. Annual Comparison of Energy Use



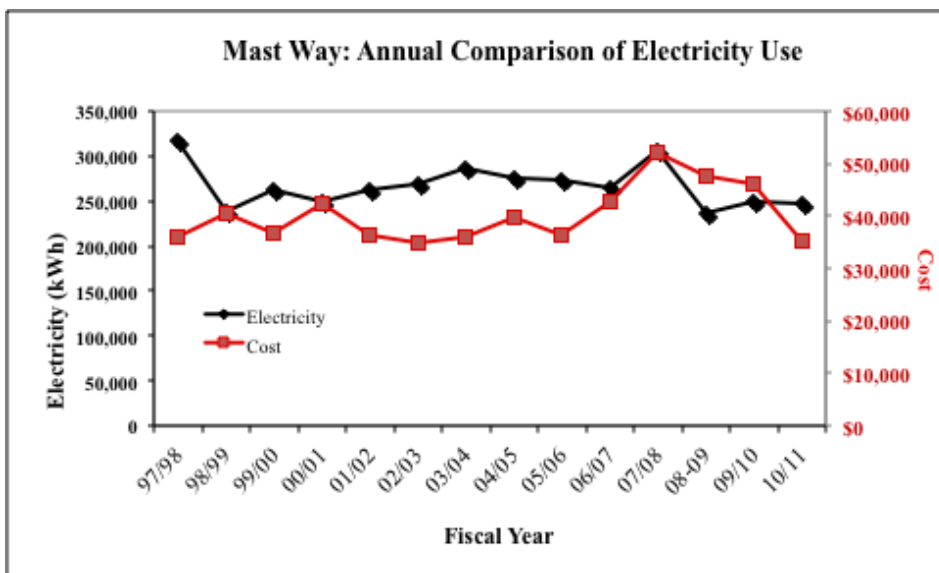
D. Electricity

i. Totals & Monthly Uses

| Electricity: High School | |
|--------------------------|---------------|
| Start Date | June 15, 2010 |
| End Date | June 14, 2011 |
| Usage (kWh) | 247,840.00 |
| Cost | \$35,072.18 |



ii. Annual Comparisons of Electricity Use

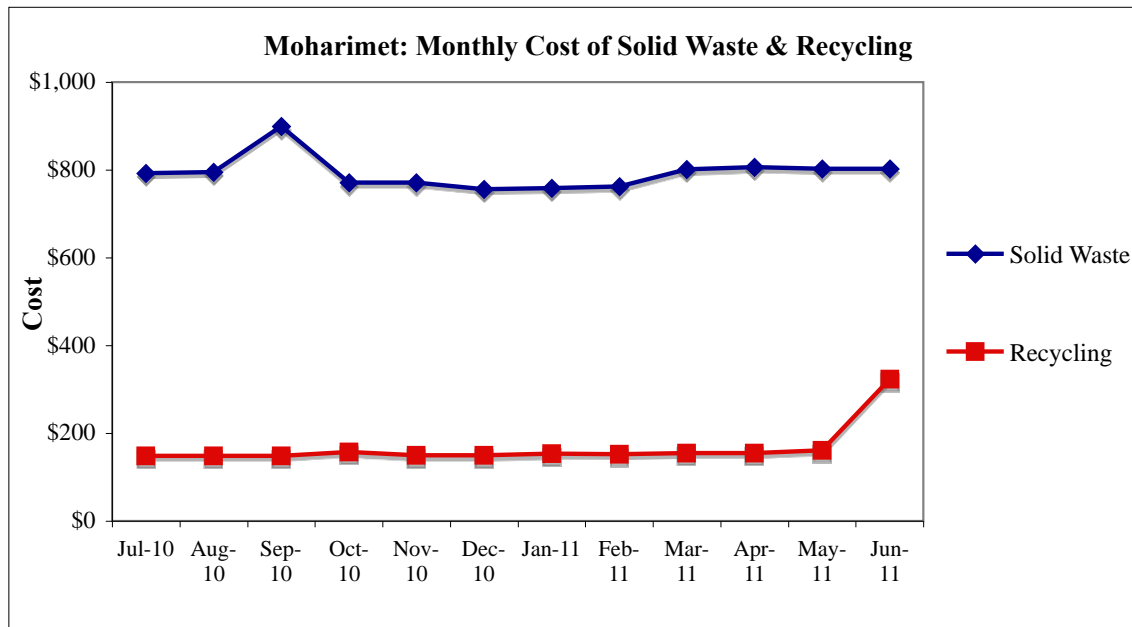


II. MOHARIMET ELEMENTARY SCHOOL

A. Solid Waste & Recycling

i. Totals

| Solid Waste | Tons of Solid Waste | Recycling | Total (FY 2010 -2011) |
|-------------|---------------------|------------|-----------------------|
| \$9,519.16 | 9.36 | \$2,001.89 | \$11,521.05 |



ii. Seasonal Data

| Season | Solid Waste | Recycling | Tons of Solid Waste | Total |
|--------|-------------|-----------|---------------------|------------|
| Summer | \$2,486.70 | \$445.03 | 2.34 | \$2,931.73 |
| Fall | \$2,297.70 | \$456.25 | 2.34 | \$2,753.95 |
| Winter | \$2,322.54 | \$461.10 | 2.34 | \$2,783.64 |
| Spring | \$2,412.22 | \$639.51 | 2.34 | \$3,051.73 |

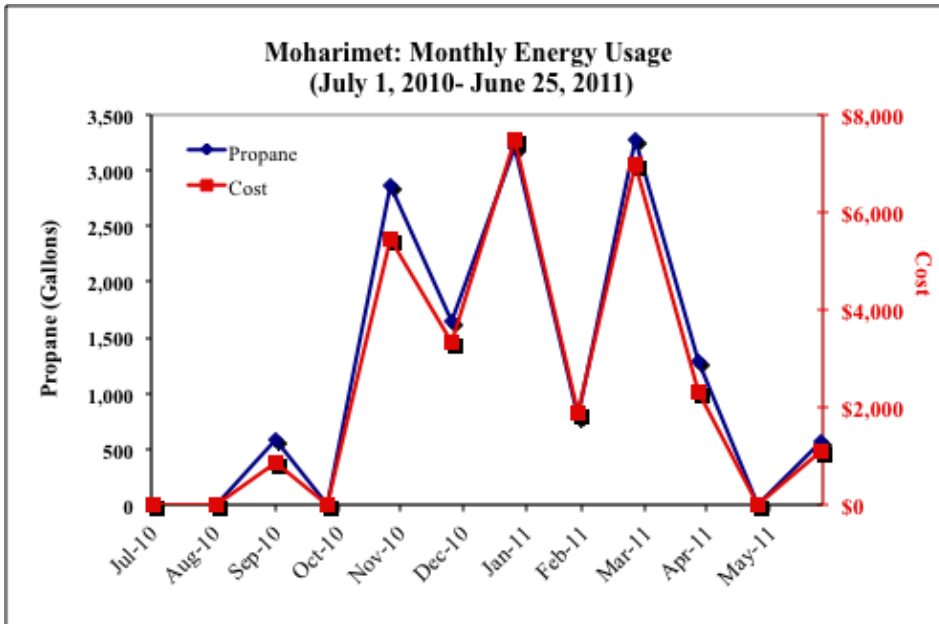
B. Water Consumption

Similar to Mast Way Elementary, Moharimet Elementary's water is extracted from a well and not recorded or included in this report.

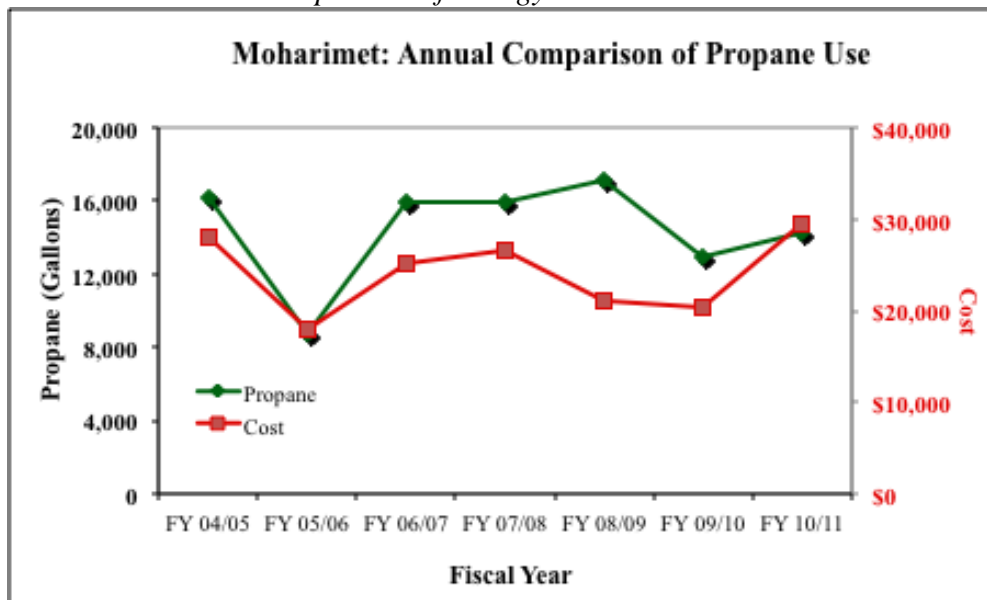
C. Energy

i. Totals & Monthly Use

| Utility Data: Moharimet | |
|-------------------------|---------------|
| Start Date | June 16, 2010 |
| End Date | July 15, 2011 |
| Propane (Gallons) | 14,224.10 |
| Cost | \$29,430.84 |



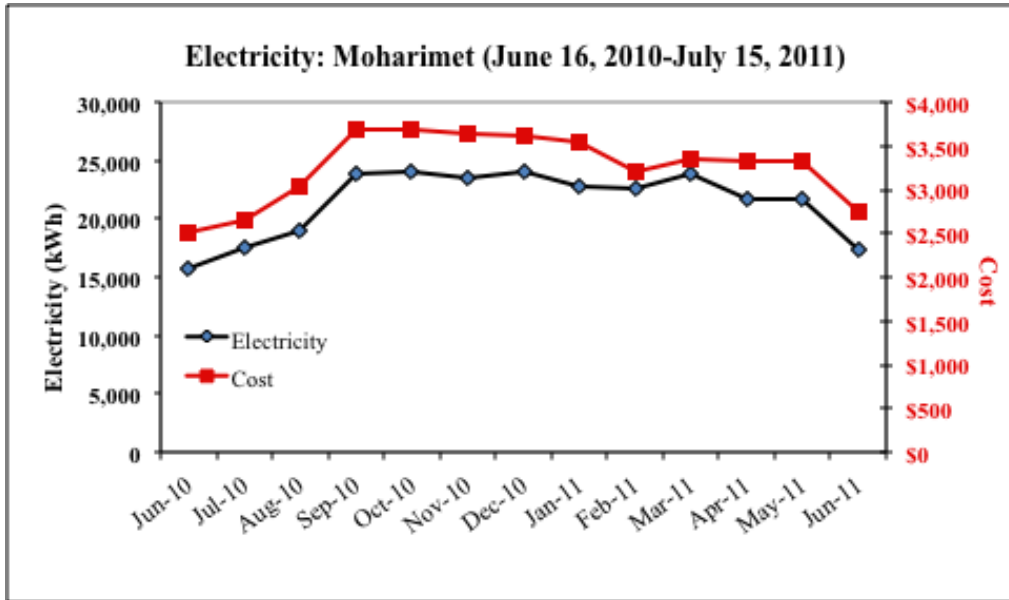
ii. Annual Comparison of Energy Use



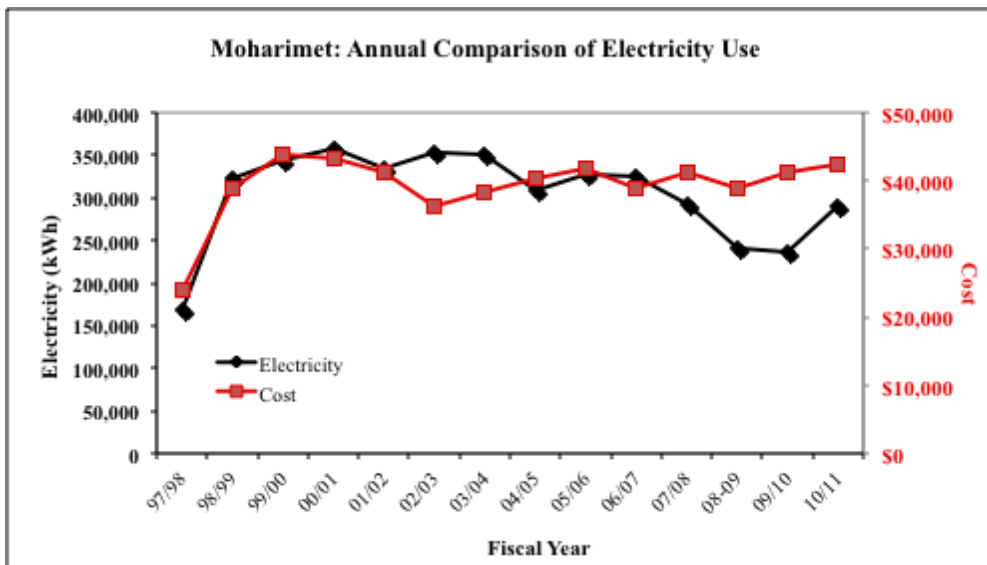
D. Electricity

i. Totals & Monthly Use

| Electricity: Moharimet | |
|------------------------|---------------|
| Start Date | July 1, 2010 |
| End Date | June 25, 2011 |
| Usage (kWh) | 290,967.03 |
| Cost | \$48,365.79 |



ii. Annual Comparison of Electricity Use

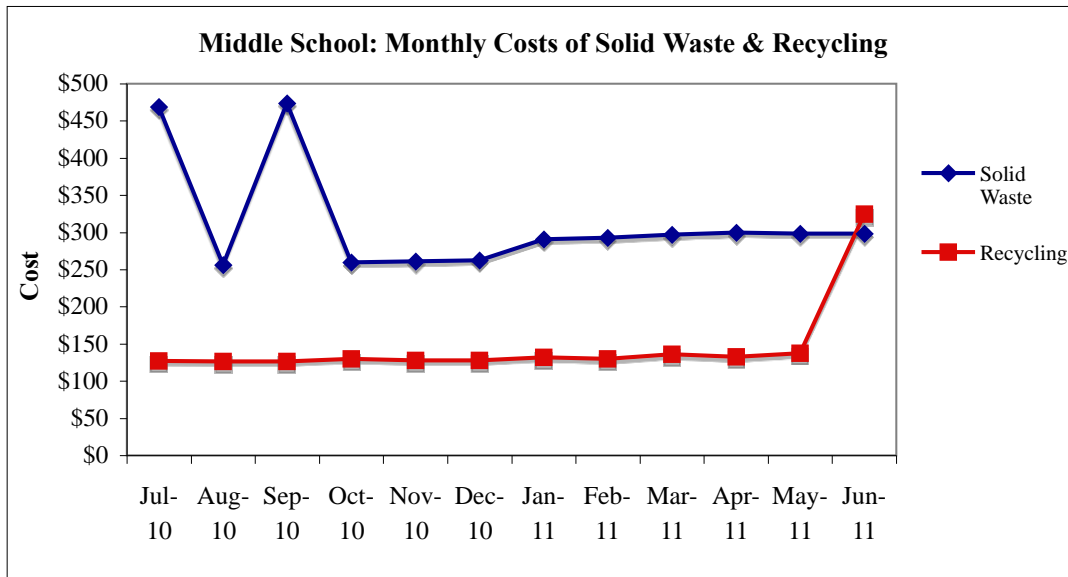


III. OYSTER RIVER MIDDLE SCHOOL

A. Solid Waste & Recycling

i. Totals

| Solid Waste | Tons of Solid Waste | Recycling | Total (FY 2010 -2011) |
|-------------|---------------------|------------|-----------------------|
| \$3,759.44 | 5.46 | \$1,758.10 | \$5,517.54 |



ii. Seasonal Data

| Season | Solid Waste | Recycling | Tons of Solid Waste | Total |
|--------|-------------|-----------|---------------------|------------|
| Summer | \$1,198.82 | \$380.43 | 1.56 | \$1,579.25 |
| Fall | \$783.57 | \$385.33 | 1.17 | \$1,168.90 |
| Winter | \$880.22 | \$397.61 | 1.17 | \$1,277.83 |
| Spring | \$896.83 | \$594.73 | 1.56 | \$1,491.56 |

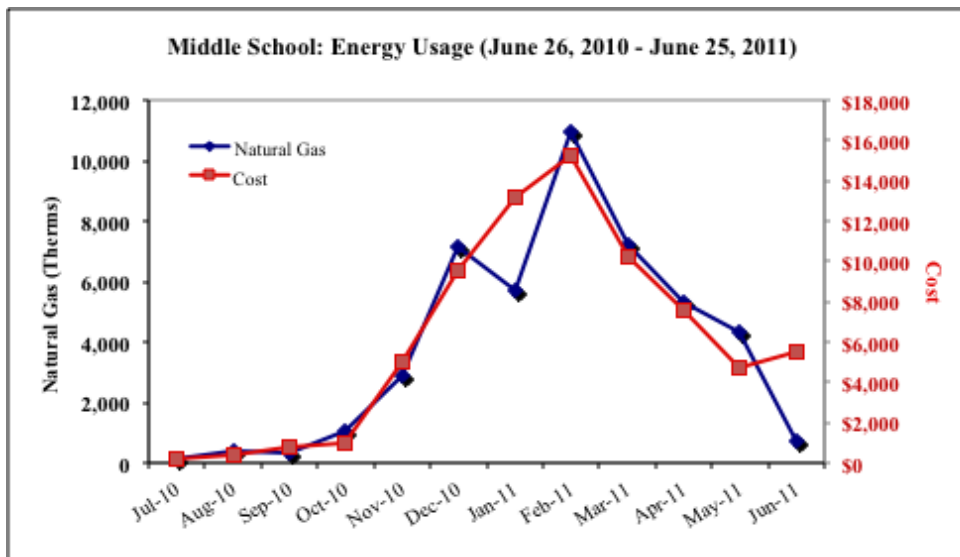
B. Water Consumption

| School/Building | Read Date | Usage (per 100 cubic feet) | Cost of Water & Sewer | | |
|-----------------|--------------|----------------------------|-----------------------|------------|------------|
| | | | Water | Sewer | Total |
| Middle School | September-11 | 41,000 | \$1,451.40 | \$2,279.60 | \$3,731.00 |
| | March-11 | 62,000 | | | |
| | September-10 | 29,000 | | | |
| | April-10 | 57,000 | | | |
| | September-09 | 34,000 | | | |

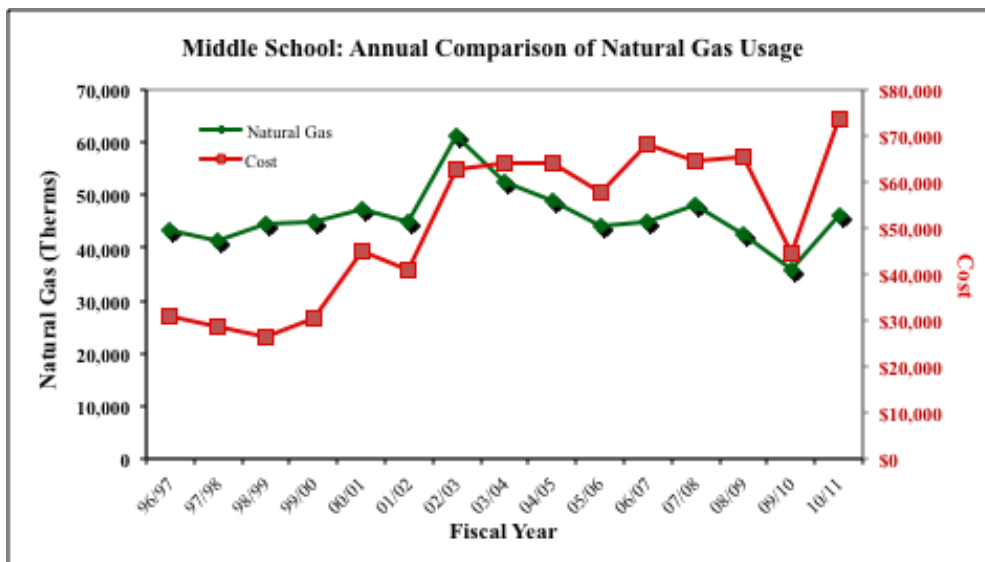
C. Energy

i. Totals & Monthly Uses

| Utility Data: Middle School | |
|-----------------------------|---------------|
| Start Date | June 26, 2010 |
| End Date | June 25, 2011 |
| Natural Gas (Therms) | 46,243.34 |
| Cost | \$73,430.37 |



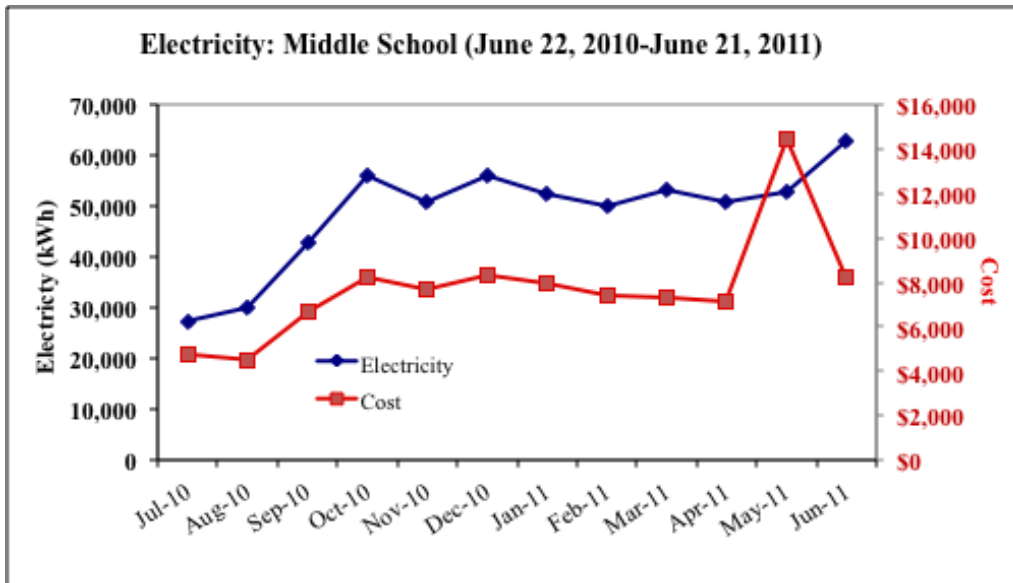
ii. Annual Comparison of Energy Use



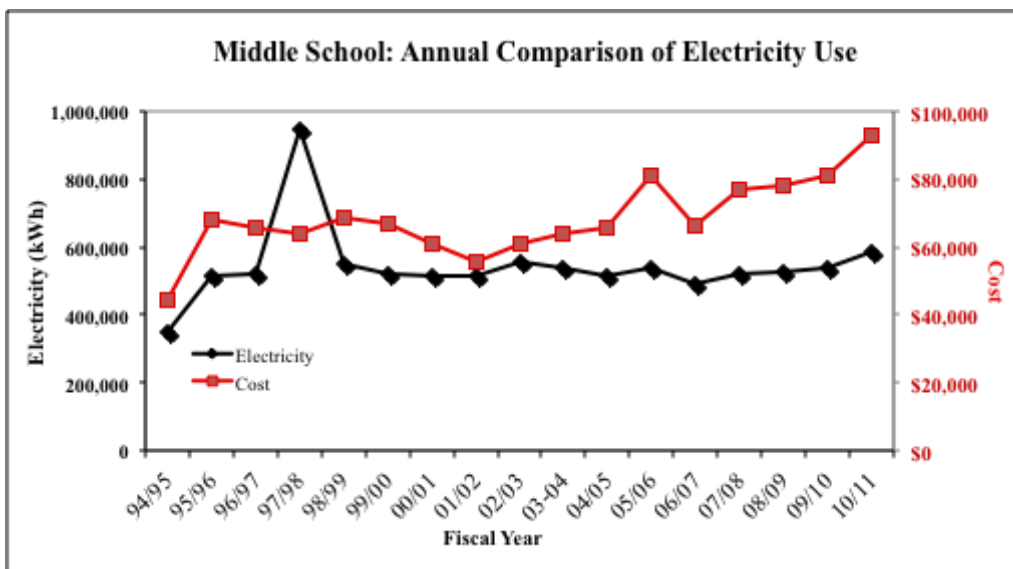
D. Electricity

i. Totals & Monthly Use

| Electricity: Middle School | |
|----------------------------|---------------|
| Start Date | June 22, 2010 |
| End Date | June 21, 2011 |
| Usage (kWh) | 586,200.00 |
| Cost | \$92,630.84 |



ii. Annual Comparison of Electricity Use

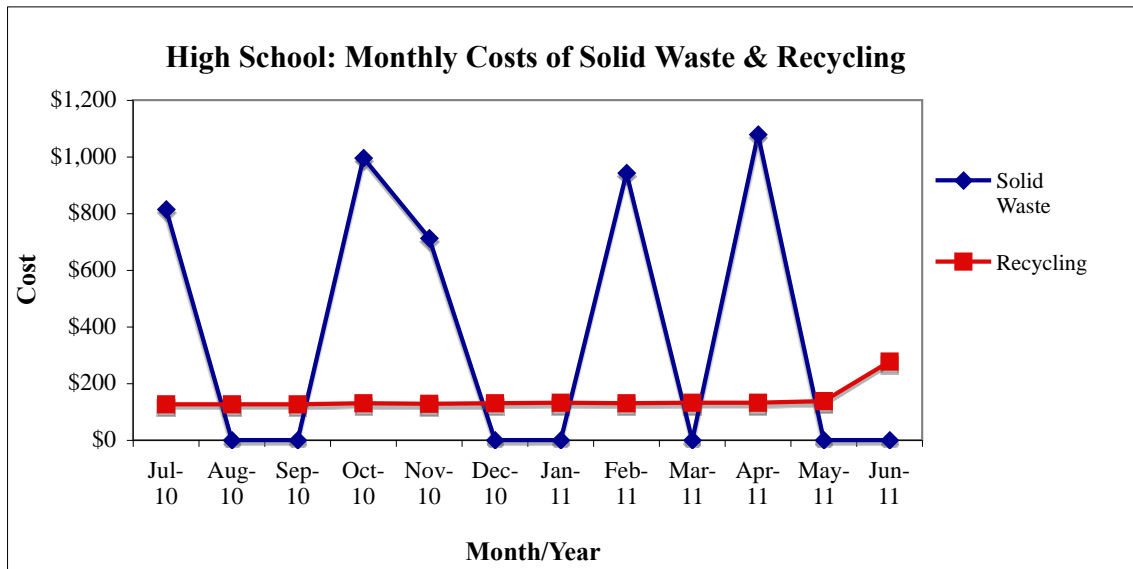


IV. OYSTER RIVER HIGH SCHOOL

A. Solid Waste & Recycling (including SAU Office)

i. Totals

| Solid Waste | Tons of Solid Waste | Recycling | Total (FY 2010 -2011) |
|-------------|---------------------|------------|-----------------------|
| \$4,546.35 | 29.14 | \$1,710.10 | \$6,256.45 |



ii. Seasonal Data

| Season | Solid Waste | Recycling | Tons of Solid Waste | Total |
|--------|-------------|-----------|---------------------|------------|
| Summer | \$815.46 | \$380.43 | 0 | \$1,195.89 |
| Fall | \$713.36 | \$390.51 | 13.36 | \$1,103.87 |
| Winter | \$942.95 | \$394.61 | 7.35 | \$1,337.56 |
| Spring | \$1,079.12 | \$546.73 | 8.43 | \$1,625.85 |

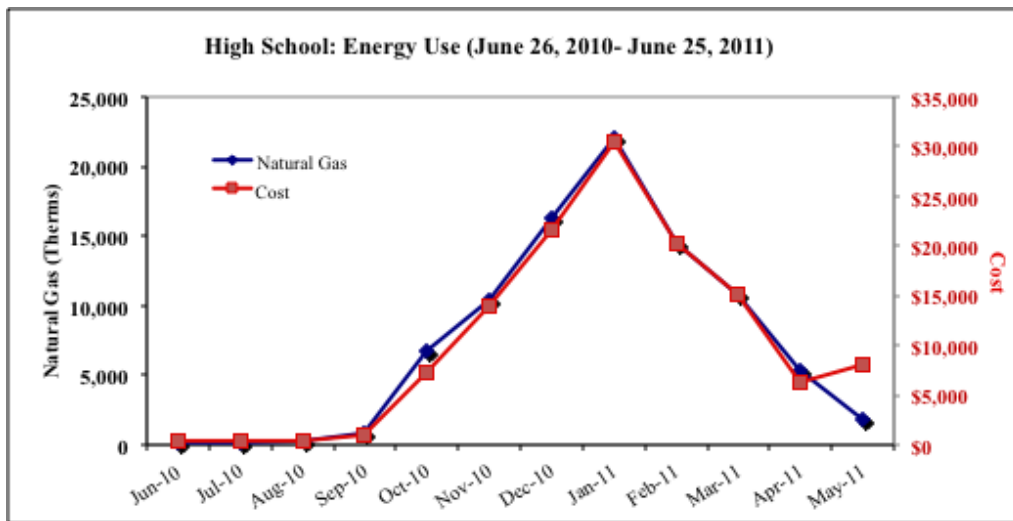
B. Water Consumption

| School/Building | Read Date | Usage (per 100 cubic feet) | Cost of Water & Sewer | | |
|-----------------|--------------|----------------------------|-----------------------|------------|------------|
| | | | Water | Sewer | Total |
| High School | Sep-11 | 43,601 | | | |
| | April-11 | 65,091 | \$1,543.47 | \$2,424.11 | \$3,967.58 |
| | September-10 | 33,454 | | | |
| | April-10 | 63,558 | | | |
| | September-09 | 40,880 | | | |

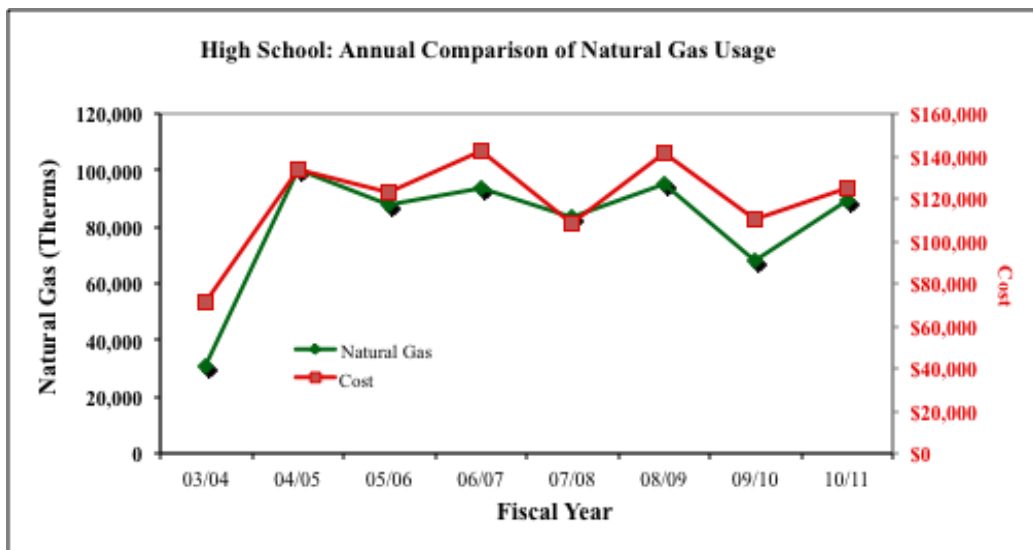
C. Energy

i. Totals & Monthly Use

| Utility Data: High School | |
|----------------------------|---------------|
| Start Date | June 27, 2010 |
| End Date | June 26, 2011 |
| Natural Gas Usage (Therms) | 89,192.96 |
| Cost | \$125,021.73 |



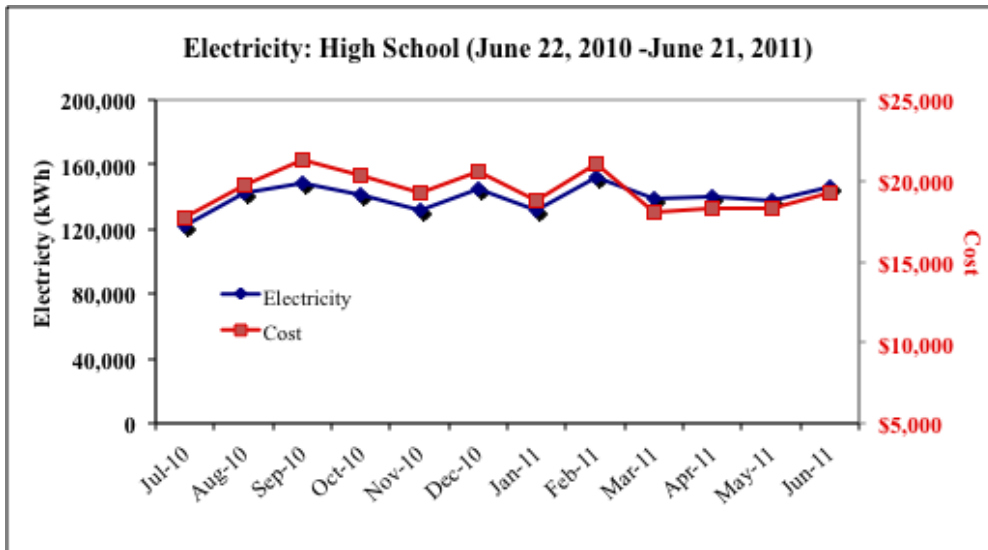
ii. Annual Comparison of Energy Use



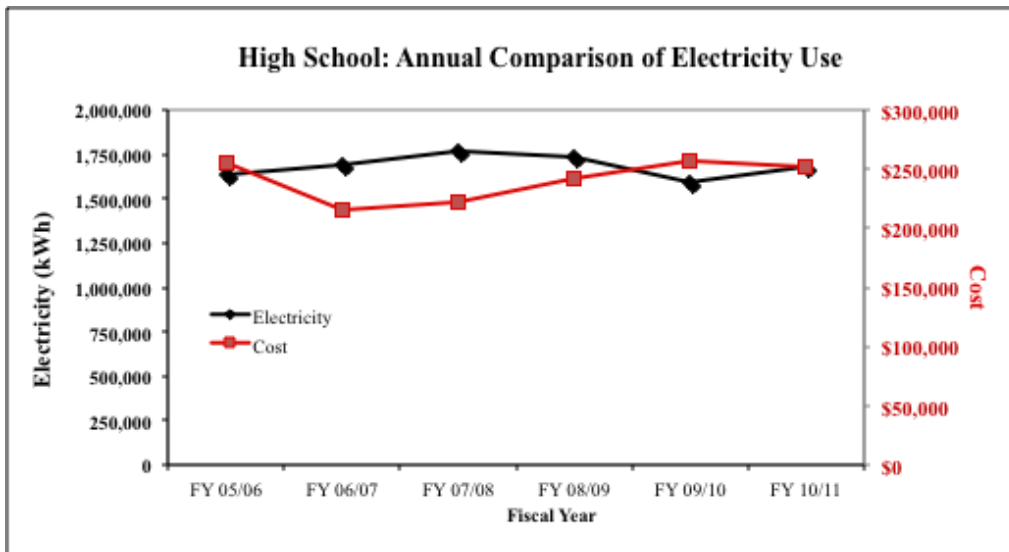
D. Electricity

i. Totals & Monthly Use

| Electricity: High School | |
|--------------------------|---------------|
| Start Date | June 23, 2010 |
| End Date | June 26, 2011 |
| Usage (kWh) | 1,676,967 |
| Cost | \$252,896.61 |



ii. Annual Comparison of Electricity Use



V. SAU OFFICE

A. Solid Waste & Recycling

The SAU Office’s solid waste & recycling is included in the High School totals.

B. Water Consumption

| School/Building | Read Date | Usage (per 100 cubic feet) | Cost of Water & Sewer | | |
|-----------------|--------------|----------------------------|-----------------------|----------|----------|
| | | | Water | Sewer | Total |
| SAU Office | September-11 | 2,470 | | | |
| | April-11 | 2,578 | \$87.54 | \$224.77 | \$312.31 |
| | September-10 | 1,922 | | | |
| | April-10 | 2,710 | | | |
| | September-09 | 3,150 | | | |

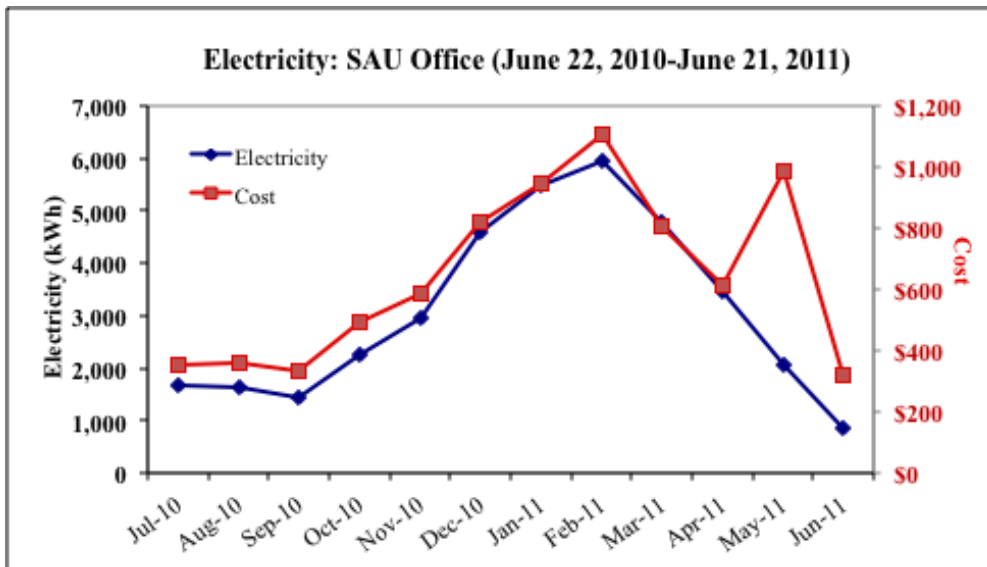
C. Energy

N/A

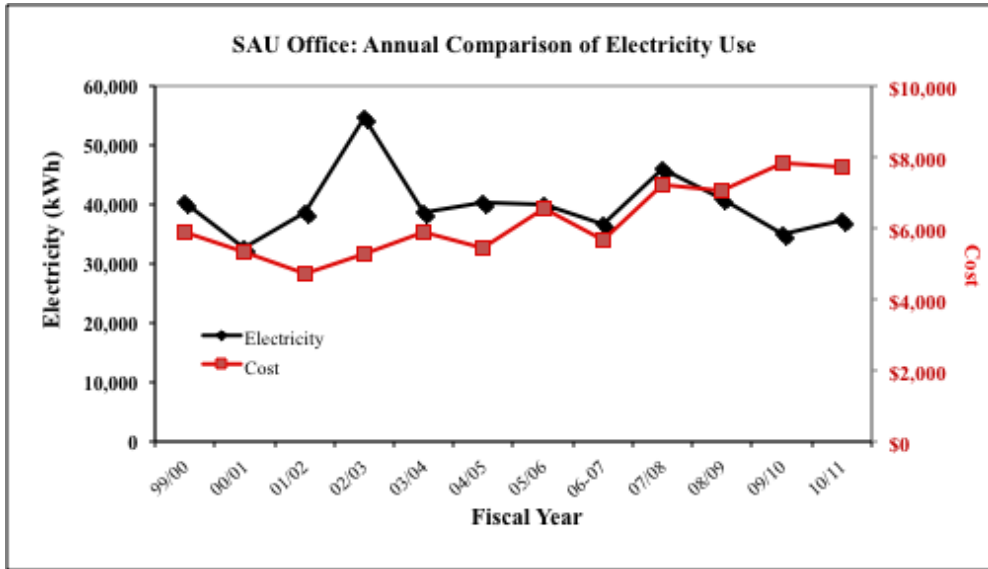
D. Electricity

i. Totals & Monthly Uses

| Electricity: SAU Office | |
|-------------------------|---------------|
| Start Date | June 22, 2010 |
| End Date | June 21, 2011 |
| Usage (kWh) | 37,200 |
| Cost | \$7,725.60 |



ii. Annual Comparison of Electricity Use



VI. SERVICE BUILDING

A. Solid Waste & Recycling

Similar to the SAU Office, the Service Building's solid waste and recycling costs and tonnage is included in the High School's averages.

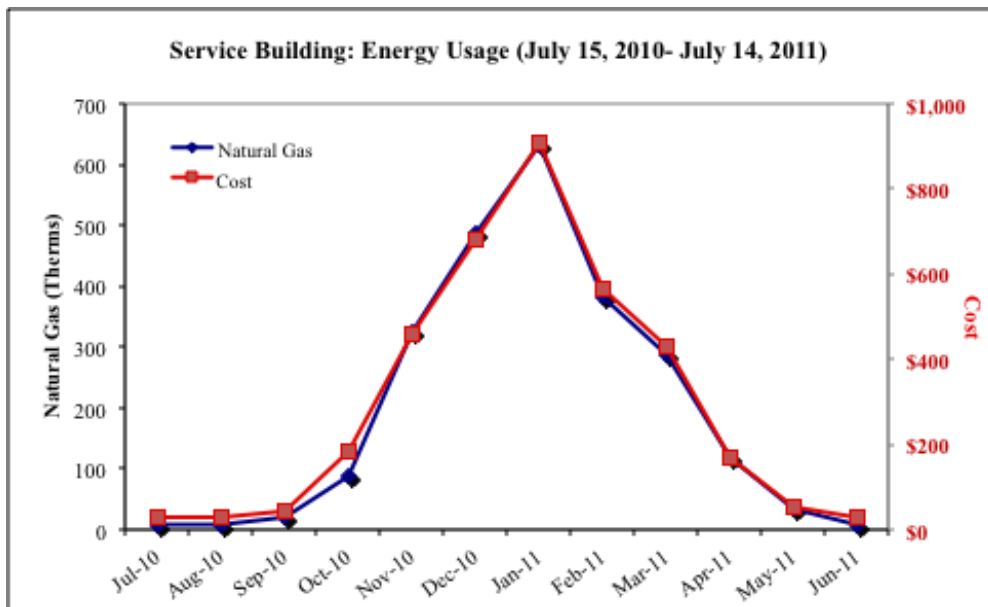
B. Water Consumption

| School/Building | Read Date | Usage (per 100 cubic feet) | Cost of Water & Sewer | | |
|------------------|--------------|----------------------------|-----------------------|----------|----------|
| | | | Water | Sewer | Total |
| Service Building | September-11 | 3,541 | | | |
| | April-11 | 2,404 | \$125.35 | \$196.88 | \$322.23 |
| | September-10 | 5,960 | | | |
| | April-10 | 2,608 | | | |
| | September-09 | 3,157 | | | |

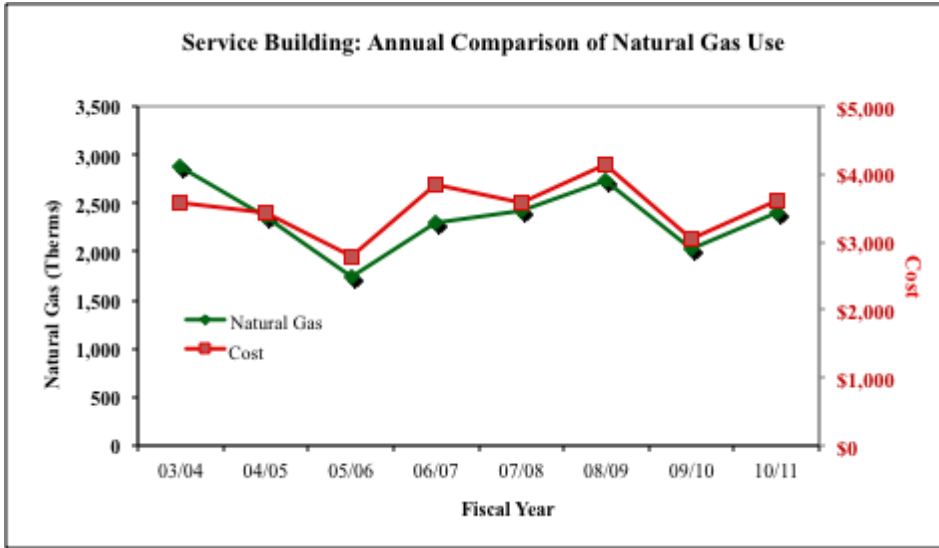
C. Energy

i. Totals & Monthly Use

| Utility Data: Service Building | |
|--------------------------------|---------------|
| Start Date | July 14, 2010 |
| End Date | July 15, 2011 |
| Natural Gas Usage (Therms) | 2,398.37 |
| Cost | \$3,606.37 |



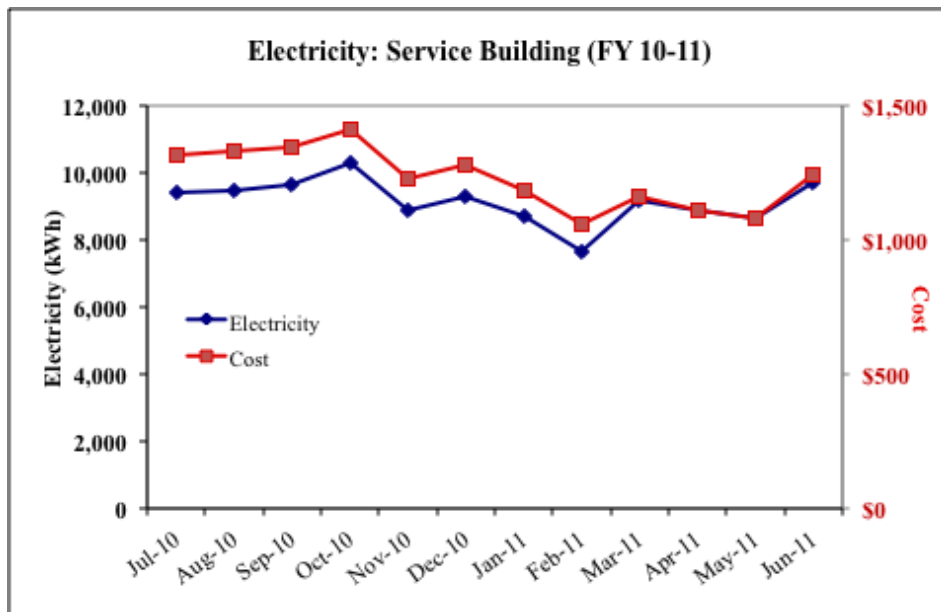
ii. Annual Comparison of Natural Gas Use



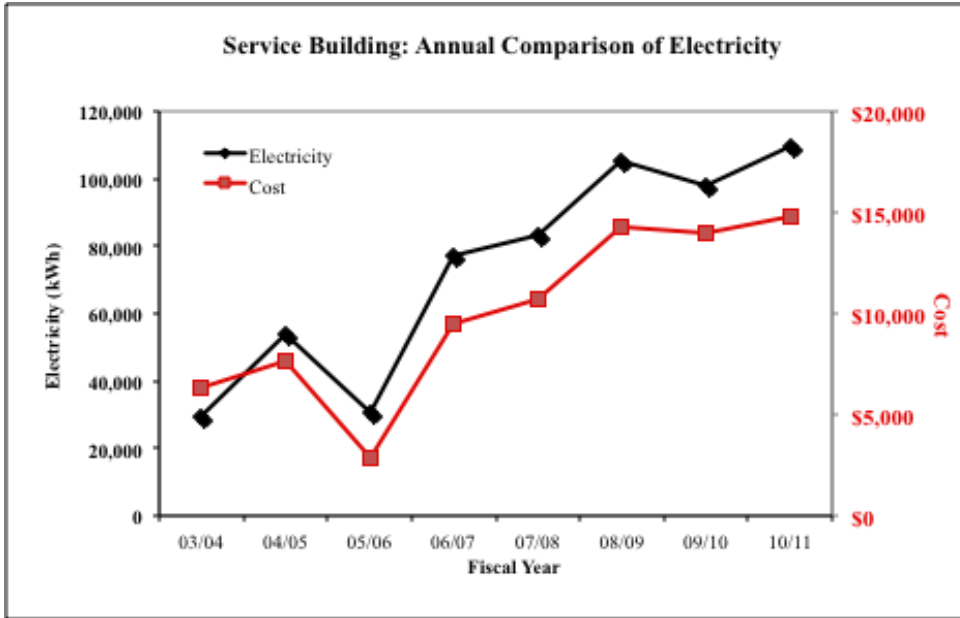
D. Electricity

i. Totals & Monthly Use

| Electricity: Service Building | |
|-------------------------------|---------------|
| Start Date | June 22, 2010 |
| End Date | June 21, 2011 |
| Usage (kWh) | 109,870 |
| Cost | \$14,745.76 |



ii. Annual Comparison of Electricity Use



Part 3:

Recommendations, Appendices



I. RECOMMENDATIONS

- Utilize the Ecological Footprint document as a tool to identify leverage points in each of the five sectors to meet the sustainable goals of the Committee. Suggested points include:
 1. The cost invested in electricity throughout the district: being about 47% of total costs in all the sectors during the FY 2010-2011 and an increase from past fiscal years after a pattern of declined consumption.
 2. The increase in solid waste and recycling costs and tonnage in each school subsequent to the timing of winter and summer school breaks (specifically in December and June).
 3. The High School's energy and electricity consumption: being the highest in the district for both variables.
 4. The increased consumption of water in the High School, Middle School, Service Building and SAU Office, which increased during FY 2010-2011 from previous years.

- Record missing data measurements to be incorporated into future fiscal school year's ecological footprints, specifically for:
 - Total monthly tonnage of recycling for each school
 - Water consumption for Mast Way and Moharimet Elementary Schools
 - Cost of fuel consumption for the transportation fleet
 - Investment costs of Biodiesel 20 (B20) by the transportation fleet
 - Use of hydration centers in the schools

Appendix A: FINAL ECOLOGICAL FOOTPRINT

| Categories | Description | Measurement | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 | 2012-2013 | 2013-2014 | 2014-2015 | |
|------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|-------------------------------------|-----------|-----------|-----------|--|
| | | | <i>(Data not available for annual comparison)</i> | | | | | | | | | | | |
| Waste | Solid Waste | Tons of solid waste | | | | | | | 48.64 | | | | | |
| | Recycling | Cost | | | | | | | \$7,354.57 | | | | | |
| Transportation Fleet | Total buses: 40 | Gallons (gasoline) | - | - | - | - | - | - | 127,252 | | | | | |
| | | MTCOE | - | - | - | - | - | - | 1,131 | | | | | |
| Water Consumption | Recorded twice each year (omitting Masjid Waj and Mohammet Elementary well systems) | per 100 cubic feet | - | - | - | - | - | - | Sep 09: 81,187 April 10: 125,876 | Sep 10: 70,336 April 11: 132,073 | | | | |
| | | | | | | | | | | | | | | |
| Electricity | All schools & facilities | kWh | 3,221,575 | 2,850,532 | 2,885,335 | 3,011,363 | 2,885,376 | 2,747,395 | 2,949,044 | | | | | |
| | | MTCOE | 2,221 | 1,965 | 1,990 | 2,077 | 1,990 | 1,894 | 2,034 | | | | | |
| Energy | Natural Gas | Therms (per consumption) | 151,466 | 133,763 | 140,922 | 134,228 | 140,244 | 106,179 | 137,835 | | | | | |
| | | | MTCOE | 757 | 669 | 705 | 671 | 701 | 531 | 689 | | | | |
| | | | | | | | | | | | | | | |
| Propane | Mas Waj Elementary Mohammet Elementary | Gallons (on demand) | 44,424 | 23,271 | 60,334 | 42,601 | 48,102 | 31,341 | 39,662 | | | | | |
| | | MTCOE | 258 | 135 | 350 | 247 | 279 | 182 | 230 | | | | | |
| Total Metric Tons of CO2 Equivalent (Energy & Electricity) | All schools & facilities | MTCOE | 3,236 | 2,769 | 3,045 | 2,995 | 2,970 | 2,607 | 2,953 | | | | | |
| | | | | | | | | | | | | | | |

Appendix B: Calculations and Sources

The following measurements were used for the calculations in this report as cited by the Environmental Protection Agency's (EPA) Greenhouse Gas Equivalencies Calculator (found at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>):

- Electricity: KiloWatt Hours (kWh):

6.8956×10^{-4} metric tons CO₂ / kWh

- Transportation Fleet: Gallons of Gasoline

$0.125 \text{ mmbtu/gallon} * 71.35 \text{ kg CO}_2/\text{mmbtu} * 1 \text{ metric ton}/1,000 \text{ kg} = 8.92 * 10^{-3}$ metric tons CO₂/gallon of gasoline

- Energy

- Natural Gas (Therms)

$0.1 \text{ mmbtu}/1 \text{ therm} * 14.47 \text{ kg C}/\text{mmbtu} * 44 \text{ g CO}_2/12 \text{ g C} * 1 \text{ metric ton}/1000 \text{ kg} = 0.005$ metric tons CO₂/therm

- Propane (Gallons)

12.8 pounds CO₂/Gallon propane * 2204.62 pounds CO₂/ MTCO₂E