Greenhouse Gas Emissions Inventory

Prepared For:

July 2010

Prepared By:

SourceOne, Inc.
132 Canal Street
Boston, MA 02114
Phone: (617) 399-6100
Fax: (617) 399-6186
www.s1inc.com

The following emissions inventory was calculated and prepared in accordance with the General and Technical Guidelines of the U.S. Department of Energy (D.O.E.) 1605(b) voluntary reporting program. Emissions were attributed to Endicott College under the principle of financial control.

This inventory was prepared using data provided by Endicott College personnel. All information, emissions factors, and protocols are subject to inherent uncertainties and variability. This is especially true for electricity emissions factors. Besides being unrealistically uniform over multi-state regions, the factors are also blind to time-of-day fluctuations in emissions resulting from different kinds of power plants coming on- and off-line over the course of any given day.

Endicott College, for the intents and purposes of this inventory, is the made up of the buildings located on the campus on either side of Route 127 (Hale Street) in Beverly, Massachusetts. The school was founded in 1939 by Dr. Eleanor Tupper and Dr. George O. Bierkoe. In the fall of 2008, the college had 4,218 total students. There are approximately 353 full-time employees, along with 211 part-time employees.

Table of Contents

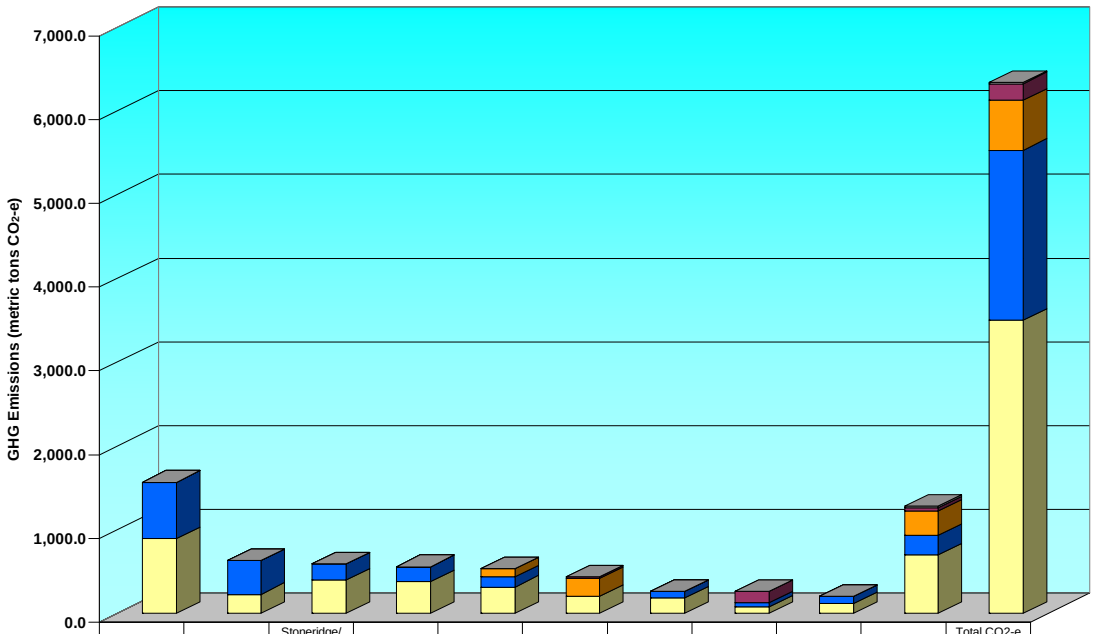
Executive Summary 4
Accounting Scope 6
Emissions Calculations 7
Main Campus 8
East Buildings 9
Stoneridge & Bayview 10
Post Center 11
Art Center 12
College Hall, Trexler Hall, & Alhambra Hall 13
Wylie Inn, Tupper Manor, & Meeting Place 14
Physical Plant & Campus Safety 15
Van Loan 16
Miscellaneous Accounts 17
De Minimis Emissions 18
Summary 19
Appendix A – Endicott College Utility Account Date Ranges 20
Appendix B – Endicott College Utility Account Groupings 21

Executive Summary

SourceOne constructed this Greenhouse Gas (GHG) emissions inventory for Endicott College following the guidelines of the Department of Energy 1605(b) voluntary reporting program. The college's largest source of emissions was electricity usage. The second largest source of emissions was the combustion of natural gas used for heating and domestic hot water. The consumption of fuel oil was the third largest source of emissions. Propane consumption accounted for a very small percentage of the emissions. The remaining emissions were from the use of gasoline and diesel fuel in vehicles.

Due to the limited availability of utility consumption data, this emissions inventory was calculated using data from different periods of time. The great majority of electric data was from July 2008 through June 2009. Natural gas data was mainly comprised of consumption between June 2008 and May 2009. Fuel oil, propane, and vehicle fuel consumption were from several 12-month periods. Unfortunately there are gaps in the data and some accounts have less than 12-months of data. The periods of time for each data source are listed in the table in **Appendix A**. All of this consumption data was combined to create a "typical year" of emissions. While this is not ideal, it was necessary based on the information available. Utility invoices and consumption summaries were provided by Endicott College personnel.

Emissions were grouped by area of the campus or building. Small emission sources or accounts which could not be correctly attributed to an area or building were combined into a Miscellaneous Accounts group. The groupings by account are shown in **Appendix B**. The group emissions are show below along with the emissions total in Figure 1.



	Main Campus	East Buildings	Stoneridge/ Bayview	Post Center	Art Center	College Hall	Wylie Inn	Physical Plant	Van Loan	Misc. Accounts	Total CO2-e (metric tons)
Propane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.3	16.3
Automotive	0.0	0.0	0.0	0.0	0.0	21.1	0.0	134.5	0.0	42.4	198.0
Fuel Oil	0.0	0.0	0.0	0.0	96.4	211.6	0.0	0.0	0.0	288.6	596.6
Natural Gas	675.3	405.8	198.0	182.2	118.6	0.0	82.4	43.4	88.2	234.0	2,027.9
Electricity	892.2	228.6	396.1	376.1	317.7	208.0	184.2	82.2	118.3	698.6	3,501.9

Figure 1 – "Typical Year" GHG Emissions for Endicott College

The emissions for a "typical year" were calculated to be **6,340.8 metric tons of CO_2-e**. The primary driver was electricity usage, which made up 55% of the emissions or 3,501.9 metric tons. The largest user of electricity, with 25% of the total, was the main campus. Natural gas consumption made up 32% of the emissions with the main campus also being the largest user (33% of the total).

Fuel oil consumption made up 9% of the emissions with the largest single user being College Hall, but most consumption was spread across the smaller miscellaneous accounts. Automotive fuel emissions made up just 3% of the total, with the Physical Plant (which includes Campus Safety) emitting 68% of these emissions and the remainder from the Athletic Team Bus, which is under miscellaneous accounts. Less than a 0.5% of the emissions were from propane consumption at the Misselwood Tent and the Football Locker Room (both grouped under Miscellaneous Accounts).

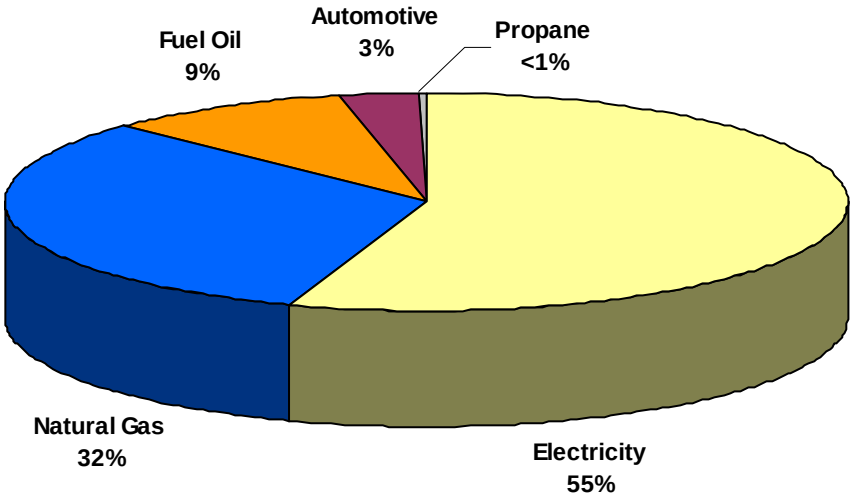


Figure 2 – GHG emissions by source across Endicott College

Accounting Scope

This emissions inventory includes Greenhouse Gas (GHG) emissions attributable to Endicott College according to the principle of financial control. If the college has financial control over a facility, vehicle, machine, or process that has GHG emissions, then those emissions are included in the emissions inventory. Owned and controlled buildings located in Endicott, Massachusetts are included in the report.

Emissions fall into three different categories: Scope I, II, and III. Scope I GHG emissions are from direct sources such as the combustion of fuels on site or in college vehicles. For Endicott College, natural gas, fuel oil, propane, and vehicle fuel consumption make up the Scope I emissions. Scope II emissions are indirect emissions from the purchase of energy. Endicott College's Scope II emissions are entirely from electricity usage/purchase.

Scope III emissions were not taken into account when preparing this report. Scope III emissions cover a very broad range of indirect sources. They can include production and disposal of almost everything that is utilized within the college, employee air & rail travel, employee and student commuting, and any other indirect emissions that could be attributed to the college. Reporting emissions from these sources is optional and they have been excluded from this report.

De Minimis Exclusion: The D.O.E. 1605(b) program allows for up to 3% of entity-wide emissions to be excluded from the emissions report. Sources can be excluded on any grounds as long as it can be justified that the omitted emissions are less than 3% of the emissions total. The reasons for exclusion of an emissions source that are most often cited are insignificance, inability to monitor emissions, inaccuracy of data, lack of data, and excessive reporting burden.

Some critics say that because an estimate of emissions is required for inclusion in the *De Minimis* category, those emissions might as well be included in the overall report instead of having a built-in underestimate in the overall total, however small. But given the inherent uncertainties in emissions factors, especially electricity emissions factors, a very small portion of the total emissions with an even higher inherent uncertainty does not contribute to the quality of an emissions report enough to justify the additional effort.

Emissions Calculations

GHG emissions for fuel combustion and electricity usage were calculated using usage data (e.g. kWh) multiplied by emissions factors for carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) (e.g. lbs CO_2/kWh). These are the three most common Greenhouse Gases. The other three main GHGs (SF_6, HFCs, and PFCs) are not emitted by traditional combustion of fossil fuels or electricity usage. They are typically emitted by specific types of processes or equipment, such as refrigeration equipment for HFCs or electricity distribution equipment for SF_6.

Emission Source	CO_2	CH_4	N_2O	Unit	Information Source
MA Electricity	466.0	0.0265	0.0062	kg/MWh	U.S. Energy Information Administration, Oct 2007
Natural Gas HHV of 1025-1050	52.79	-	-	kg/MMbtu	U.S. Dept of Energy, Technical Guidelines Voluntary Reporting of Greenhouse Gases (1605(b)) Program, Chapter 1 (Part C &D), January 2007
Propane	62.44	-	-	kg/MMbtu	
Fuel Oil	72.32	-	-	kg/MMbtu	
Vehicle Gasoline	19.36	-	-	lbs/gallon	
Vehicle Diesel	22.15	-	-	lbs/gallon	

Table 1 - Emissions Factors Used in U.S. Greenhouse Gas Emissions Inventory

Electricity emissions factors are assigned on a regional basis to reflect the generation mix that serves the load in each region. The electricity emissions factors, though published in 2007, are based on 1999-2002 emissions as calculated by the Energy Information Administration (EIA), the research arm of the D.O.E. When electricity grid emissions are next evaluated for a more recent period, the emissions factors will most likely be lower to reflect the increasing presence of renewables in the national and regional generation mixes.

Natural gas emissions factors can vary depending on the energy content of the gas. The Gas delivered to Endicott College was assigned the United States Pipeline Average emissions factor for the calculations. The pipeline average assumes a Higher Heating Value (HHV) between 1025 to 1050 Btu per scf. The CH4 and N2O emissions from the combustion of natural gas, fuel oil, and vehicle fuel are considered *De Minimis* due to the relatively small amounts emitted.

CO_2 is the weakest of the main GHGs in terms of atmospheric effect per unit of gas, but it is responsible for the large majority of the enhanced greenhouse effect caused by manmade emissions because it is emitted in the largest quantities. For simplicity, emissions of all GHGs are converted to lbs CO_2-equivalent based on their global warming potential (GWP). The GWP of a gas is equal to how many pounds of CO_2 it would take to create the same atmospheric effect as one pound of that gas. For example, CH_4 is 25 times more potent than CO_2 as a GHG, thus one pound of CH_4 can be counted as 25 lbs CO_2-equivalent (CO_2e). (Table 2)

Gas	GWP	
Co_2	1	These values are from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change
CH_4	25	
N_2O	298	

Table 2 - Global Warming Potential (GWP) of the Greenhouse Gases inventoried in this report

Main Campus

The Main Campus, for purposes of this inventory, is comprised of the accounts for Kennedy Hall, Callahan Center, Academic Center, Halle Library, Williston Townhouses, Wax Academic Center, West Center, and the Chapel. The Main Campus made up the largest percentage of carbon emissions across all of the groupings with 1,567.6 metric tons of CO_2-e emissions. This was 25% of the total emissions across all of Endicott College.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	892.2	1,904,410 kWh	6,498
Natural Gas	675.3	127,931 therms	12,793
Fuel Oil	N/A	N/A	N/A
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**1,567.6**		19,292

Table 3 – GHG emissions by source at Endicott College's Main Campus

On the main campus, the largest percentage of emissions, 57% or 892.2 metric tons, was created through the usage of electricity. This electricity was supplied by National Grid (July 2008 through June 2009) and totaled 1,904 MWh. The remaining emissions, 43% or 675.3 metric tons of CO_2-e, were produced through the consumption of 127,931 therms of natural gas, which serves as the heating fuel for the facilities. The natural gas was also purchased from National Grid. The consumption of fuel oil, automotive fuel, or propane was not attribution to the Main Campus and thus these facilities had no emissions from these sources.

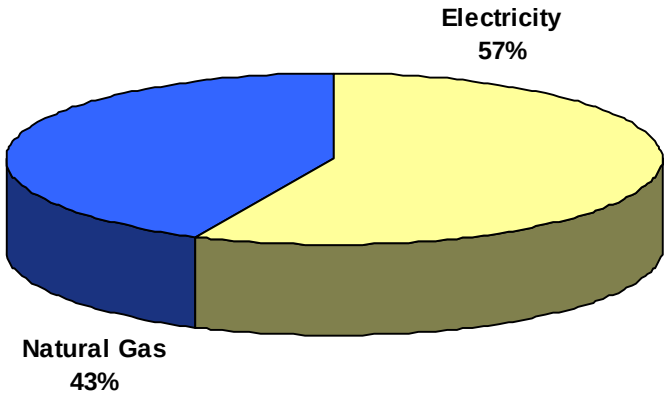


Figure 3 – Emission percentages at Endicott College's Main Campus

East Buildings

For this inventory, the East Buildings are made up of four residence halls, known as: Brindle Hall, Hale Hall, Endicott Hall, and Reynolds Hall. Brindle Hall was built in 1967 as a residence hall and still serves in this capacity today. Hale Hall was previously utilized for classroom and office space, but was renovated as a residence hall in 1998. Endicott Hall is another residence hall, which can house 120 students. Reynolds hall was purchased by Endicott College in 1939, making it the school's first building acquisition. This group of buildings made up the 10% of the total carbon emissions for Endicott College at 634.4 metric tons of CO_2-equivalent.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	228.6	487,920 kWh	1,665
Natural Gas	405.8	76,864 therms	7,686
Fuel Oil	N/A	N/A	N/A
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**634.4**		9,351

Table 4 – GHG emission by source at Endicott College's East Buildings

Carbon emissions from the usage of 487,920 kWh of electricity produced 228.6 metric tons of CO_2-equivalent. This electricity was delivered by National Grid (August 2008 to July 2009). This accounted for 36% of the total emissions produced at the East Buildings. The largest source of emissions was the consumption of natural gas (June 2008 through May 2009). The consumption of 76,864 therms produced 405.8 metric tons of CO_2-e, which was 64% of the total emissions at the East Buildings. The consumption of fuel oil, automotive fuel, and propane was not attributable to the East Buildings.

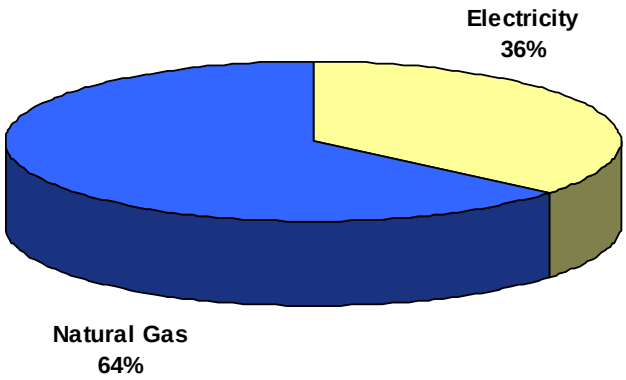


Figure 4 – GHG emission percentages at Endicott College's East Buildings

Stoneridge & Bayview

Stoneridge Hall and Bayview Hall are located on Village Road towards the west end of the campus. Stoneridge Hall is a traditional residence hall, which was built in 2002. Bayview Hall was constructed in 2005 and serves as not only a traditional residence hall, but also has six apartments for students living with a child. These two buildings were responsible for 9% of the total emissions at Endicott College. The combined emissions of the two buildings totaled 594.1 metric tons of CO_2-equivalent.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	396.1	845,400 kWh	2,885
Natural Gas	198.0	37,511 therms	3,751
Fuel Oil	N/A	N/A	N/A
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**594.1**		6,636

Table 5 – GHG emissions by source at Endicott College's Stoneridge & Bayview Buildings

The largest portion of emissions, 396.1 metric tons of CO_2-e, was the result of electricity usage. The usage of 845,400 kWh (July 2008 to June 2009) accounted for 67% of the emissions at the two buildings. The other 33% of emissions were from the consumption of natural gas (June 2008 to May 2009). The consumption of 37,511 therms resulted in the emission of 198.0 metric tons of CO_2-e. Stoneridge and Bayview were not responsible for any of the fuel oil, automotive, or propane emissions at Endicott College.

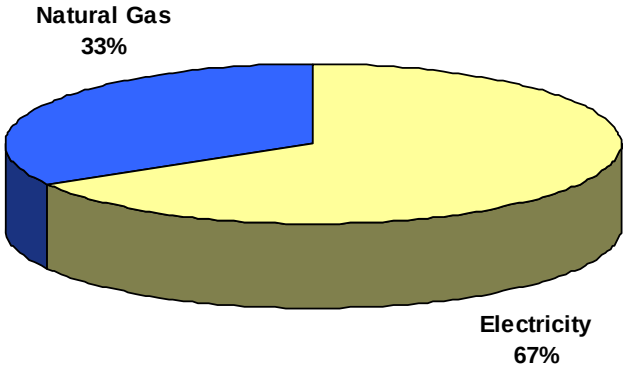


Figure 5 – GHG emission percentages at Endicott College's Stoneridge & Bayview Buildings

Post Center

The Post Center is an 84,000 square foot building that was built in 1999. It serves as the main offices for the Athletics Department and the School of Sport Science. This facility contains classrooms and offices, as well as a 1,200-seat gymnasium and a field house. The post center accounted for a little under 9% of the carbon emissions across all of Endicott College with 558.3 metric tons of CO_2-e emissions.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	376.1	802,800 kWh	2,739
Natural Gas	182.2	34,508 therms	3,451
Fuel Oil	N/A	N/A	N/A
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**558.3**		6,190

Table 6 – GHG emissions by source at Endicott College's Post Center

Electricity usage accounted for 376.1 metric tons of CO2-equivalent emissions. This was 67% of the total emissions at the Post Center. These emissions were the result of purchasing 802,800 kWh of electricity from National Grid (November 2008 to October 2009). At the Post Center, 34,508 therms of Natural Gas were consumed (July 2008 to May 2009). This consumption was the source of 182.2 metric tons of CO_2-e, which made up the other 33% of the emissions at the Post Center. There were no emissions from fuel oil, propane, or automotive fuel attributed to the Post Center.

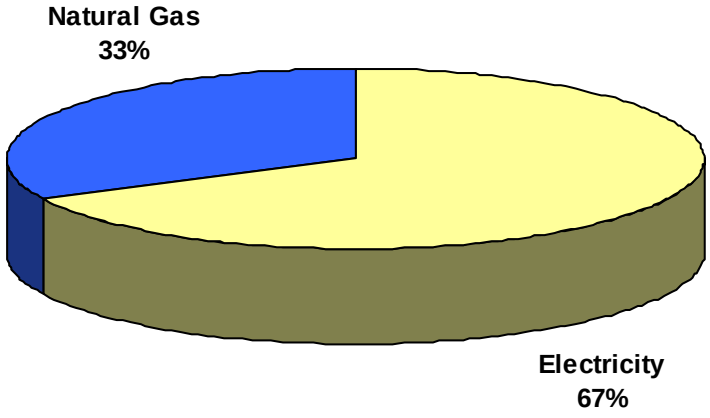


Figure 6 – GHG emission percentages at Endicott College's Post Center

Art Center

The Art Center was opened in January 2009 and is home of the School of Visual and Performing Arts. The building contains classroom space as well as multiple venues for different types of exhibitions. The Art Center is responsible for 8% of the total emissions at Endicott College. The emissions of the buildings totaled 532.7 metric tons of CO_2-equivalent.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	317.7	678,100 kWh	2,314
Natural Gas	118.6	22,472 therms	2,247
Fuel Oil	96.4	9,613 gallons	1,333
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**532.7**		5,894

Table 7 – GHG emissions by source at Endicott College's Art Center

Electricity usage accounted for 317.7 metric tons of CO2-equivalent emissions. This was 60% of the total emissions at the Art Center. These emissions were the result of purchasing 438,100 kWh of electricity from National Grid (September 2008 to April 2009) and extrapolating May 2009 through August 2009, based on standard load profile, to get a total of 678,100 kWh. At the Art Center, 22,472 therms of Natural Gas were consumed (July 2008 to September 2009). This consumption was the source of 118.6 metric tons of CO_2-e, which made up 22% of the emissions at the Art Center. Fuel oil emissions totaled to 96.4 metric tons, accounting for the remaining 18%. This was the result of consuming 9,613 gallons (October 2008 to September 2009).

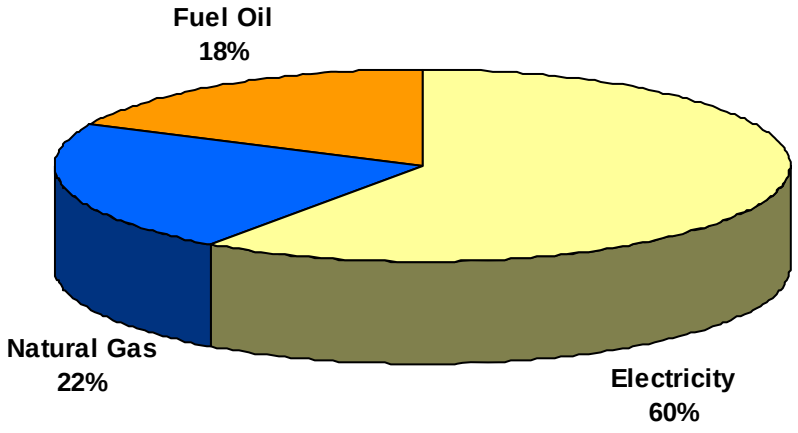


Figure 7 – GHG emission percentages at Endicott College's Art Center

College Hall, Trexler Hall, & Alhambra Hall

College Hall serves has Endicott College's main administration building, housing such departments as Admissions, Financial Aid, and the Registrar. Trexler Hall was previously a library and in 1965 was converted into a student residence. Alhambra Hall was originally built in 1750 and moved to its current location in the 1920's; it now used as a student residence. These buildings accounted for slightly under 7% of the campus wide emissions. The emissions at the three buildings totaled to 440.6 metric tons of CO_2-e.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	208.0	443,970 kWh	1,515
Natural Gas	N/A	N/A	N/A
Fuel Oil	211.6	30,703 gallons	4,259
Automotive	21.1	2,400 gallons (Gas)	276
Propane	N/A	N/A	N/A
Total	**440.6**		6,049

Table 8 – GHG emissions by source at Endicott College's College Hall, & Trexler Hall

Fuel oil consumption was the source of 48% of the emissions at these three buildings with 211.6 metric tons of CO_2-e. The fuel oil was delivered by Townsend Oil between July 2008 and June 2009 and totaled 21,091 gallons. The second largest emissions source at these three buildings was the usage of electricity (July 2008 to June 2009). This group of buildings was billed for 443,970 kWh of electricity, which was the source of 208.0 metric tons of CO_2-e (47% of the total). College Hall is the home of the Admissions Department, which utilizes (5) cars that each drive approximately 12,000 miles annually. These cars have an estimated gas mileage of 25 miles per gallon resulting in a total of 2,400 gallons of automotive gasoline a year. The combustion of gasoline in these cars resulted in the emission of 21.1 metric tons of CO_2-e, 5% of the emissions from College Hall, Trexler Hall, and Alhambra Hall sources.

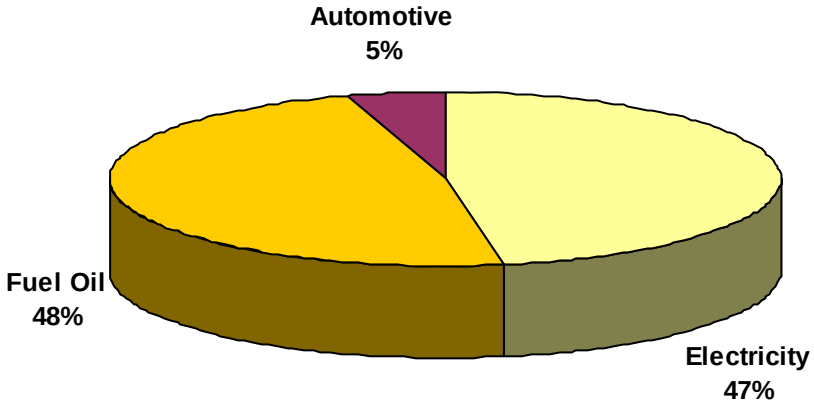


Figure 8 – GHG emission percentages at Endicott College's College Hall, Trexler Hall, & Alhambra Hall

Wylie Inn, Tupper Manor, & Meeting Place

This group of buildings consists of the Wylie Inn & Conference Center, Tupper Manor, and Meeting Place. The Wylie Inn was originally built in 1958 and renovated in 2007. Tupper Manor was purchased by Endicott College in 1943 and serves as the manor house for the Wylie Inn. Meeting Place was built in 1955 and served as the campus gymnasium until 1999. It is now utilized as a conference center. This group of buildings was responsible for the production of approximately 4% of the CO_2-e emissions at Endicott College (266.6 metric tons of CO_2-e).

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	184.2	393,240 kWh	1,342
Natural Gas	82.4	15,601 therms	1,560
Fuel Oil	N/A	N/A	N/A
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**266.6**		2,902

Table 9 – GHG emissions by source at Endicott College's Wylie Inn, Tupper Manor, and Meeting Place

The majority of combined emissions across this group of buildings were created through the purchase and usage of National Grid electricity. The electricity usage from the buildings totaled 393,240 kWh (July 2008 to June 2009). This resulted in the emission of 184.2 metric tons of CO_2-equivalent, which was 69% of the total emissions at Wylie Inn, Tupper Manor, and Meeting Place. The remaining 31% of emissions (82.4 metric tons of CO_2-e) were produced through the combustion of 15,601 therms of natural gas (June 2008 to May 2009). No emissions from fuel oil, automotive fuel, or propane were attributed to these buildings.

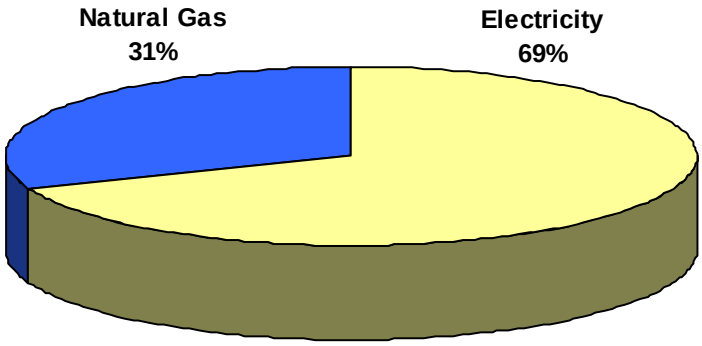


Figure 9 – GHG emission percentages at Endicott College's Wylie Inn, Tupper Manor, and Meeting Place

Physical Plant & Campus Safety

For this report, Campus Safety and the Physical Plant (Facilities Department) were grouped together due to shared vehicle gasoline logs. The Campus Safety building was constructed in 2008 and is operated 24 hours a day. The Physical Plant is a two-story building built in 2001. These two buildings accounted for 260.1 metric tons of CO_2-equivalent (4% of Endicott College's total emissions).

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	82.2	175,364 kWh	598
Natural Gas	43.4	8,224 therms	822
Fuel Oil	N/A	N/A	N/A
Automotive	134.5	14,756.7 gallons (Gas) 492.7 gallons (Diesel)	1,761
Propane	N/A	N/A	N/A
Total	**260.1**		3,182

Table 10 –GHG Emissions by Source at Endicott College's Campus Safety & Physical Plant

These two buildings were the largest user of vehicle fuel at Endicott College with 134.5 metric tons of CO_2-e emitted during the combustion of vehicle fuel. The Campus Safety and Physical Plant gasoline fueled vehicles consumed 14,756.7 gallons (December 2007 and January 2008). The Physical Plant also has a diesel-powered truck, which consumed 492.7 gallons of diesel fuel (January 2008 through December 2008). The emissions from these vehicles accounted for 51% of the CO_2-e attributable to these two buildings. The consumption of 8,224 therms resulted in the emission of 43.4 metric tons of CO_2-e (17% of the total). The Physical Plant consumed this natural gas from June 2008 to May 2009. Campus Safety natural gas data is only from October 2008 – May 2009. Electricity accounted for the remaining 32% of emissions, 82.2 metric tons of CO_2-e. This was produced through the use of 175,364 kWh. The Physical Plant (Facilities) electric usage occurred from July 2008 to June 2009 and Campus Safety usage records were from August 2008 to Jun 2009. Propane and fuel oil were not consumed by these two buildings.

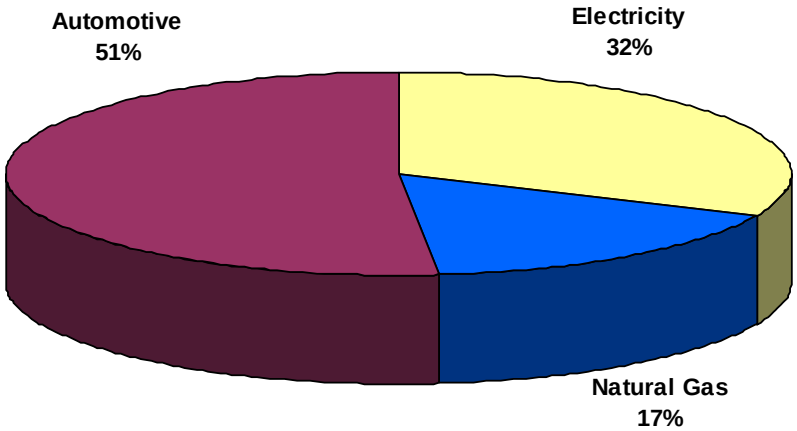


Figure 10 – GHG emission percentages at Endicott College's Campus Safety & Physical Plant

Van Loan

This building was originally known as Bullock Hall and was acquired by Endicott College in 1943. After being renovated in 2003, it became the Van Loan School of Graduate and Professional Studies. It is comprised of classrooms, labs, and offices. The Van Loan building was the source of 206.5 metric tons of CO_2-equivalent, which is 3% of the total emissions at Endicott College.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	118.3	252,500 kWh	862
Natural Gas	88.2	16,702 therms	1,670
Fuel Oil	N/A	N/A	N/A
Automotive	N/A	N/A	N/A
Propane	N/A	N/A	N/A
Total	**206.5**		2,532

Table 11 – GHG emissions by source at Endicott College's Van Loan

Electricity usage accounted for 118.3 metric tons of CO_2-e emissions, which was 57% of the total at the Van Loan School. This electricity was utilized from October 2007 to September 2008 and totaled 252,500 kWh. Natural Gas consumption was the source of the other 43% percent of emissions. The Van Loan School consumed 16,702 therms (June 2008 to May 2009) to produce 88.2 metric tons of CO_2-equivalent.

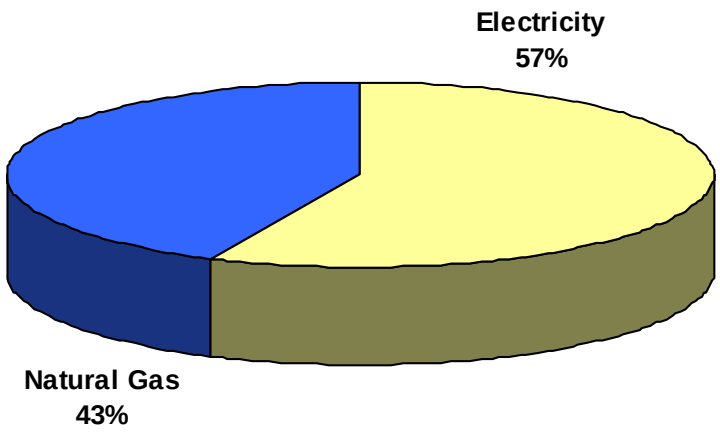


Figure 11 – GHG emission percentages at Endicott College's Van Loan School

Miscellaneous Accounts

Endicott College had 56 miscellaneous accounts that were grouped together for the purpose of a more concise organization. This included 23 electric accounts, 19 natural gas accounts, 12 fuel oil accounts, and two propane accounts. This group consists mostly of residences including Beacon Hall, Birchmont, the Farm House, Hamilton Hall, Hawthorne Hall, the Ledge, Rockport Hall, Rogers Hall, Tower Hall, the Village, Winthrop Hall, and the Woodside Townhouses. Recreational and sports areas such as Grove Hall, The Lodge, and the Stadium are part of the miscellaneous accounts. Finally, there are various areas such as Misselwood Estate, the Research Center, the Art Center, and parking lots. The miscellaneous accounts emitted a total of 1,279.9 metric tons of CO_2-e. These emissions were 20% of the total at Endicott College.

Source	CO_2-e (metric tons)	Annual Usage	Annual MMBTU
Electricity	698.6	1,491,098 kWh	5,088
Natural Gas	234.0	44,335 therms	4,434
Fuel Oil	288.6	28,773 gallons	3,991
Automotive	42.4	4,217 gallons (Diesel)	485
Propane	16.3	2,864 gallons	261.60
Total	**1,279.9**		14,259

Table 12 – GHG emissions by source across Endicott College's Miscellaneous Accounts

Amongst the Miscellaneous Accounts, electricity was the source of the majority of CO_2-e emissions with 55%. The usage of 1,491,098 kWh resulted in the emission of 698.6 metric tons of CO_2-equivalent. The next largest source was fuel oil consumption, which was 23% of the total. Across the Miscellaneous Accounts, 28,773 gallons of fuel oil were consumed, producing 288.6 metric tons of CO_2-e. The consumption of 44,335 therms of natural gas resulted in 18% of the emissions or 234.0 metric tons of CO_2-e.

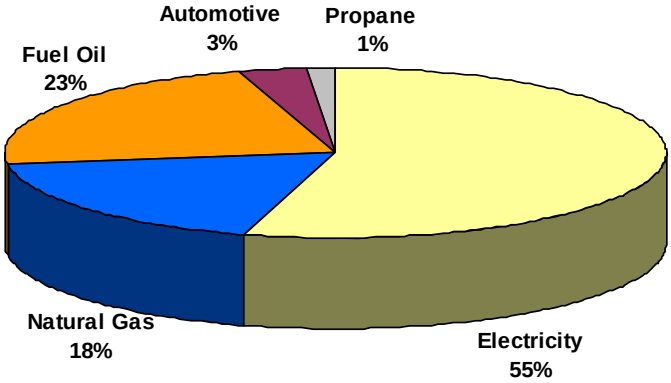


Figure 12 – GHG emission percentages across Endicott College's Miscellaneous Accounts

Endicott College's athletics team bus-travel was incorporated into the Miscellaneous Accounts. There were 25,304 miles of recorded bus travel in 2008. Assuming a fuel efficiency of 6 miles per gallon, this would result in 4,217 gallons of diesel being consumed. This was the source of 42.4 metric tons of CO_2-e emissions (3% of the total). There are two small propane accounts at Endicott College: the Misselwood Tent and the Football Locker Room. 2,864 gallons of propane were consumed at these two sources resulting in 16.3 metric tons of CO_2-e emissions.

De Minimis Emissions

A small percentage of emissions at Endicott College were not calculated in this report. These emissions are considered De Minimis and do not need to be included as they account for less than 3% of the college-wide emissions. Reasons for exclusion of an emissions source that are most often cited are insignificance, inability to monitor emissions, inaccuracy of data, lack of data, and excessive reporting burden.

For Endicott College, one type of excluded emission is the methane (CH_4) and nitrous oxide (N_2O) emitted through the combustion of gasoline and diesel fuel in campus vehicles. While these gases are considered potent, in terms of atmospheric effect per unit of gas, they are emitted in small quantities during this type of combustion. The same is true for CH_4 and N_2O emissions when accounting for Endicott College's natural gas combustion.

Another De Minimis emission source not accounted for in this report are the fugitive HFCs from air conditioning equipment used on campus. These emissions are not explicitly tracked because they are typically very small when compared to more common emissions sources

Summary

Endicott College produced 6,340.8 metric tons of CO_2-equivalanet during a "typical year" utilizing data ranging from 2007 to 2009. The two largest contributors to the total were the Main Campus buildings (25%) and the Miscellaneous Accounts (20%). The next largest contributors were the East Buildings with 10% of the total emissions.

Source	Main Campus	East Buildings	Stoneridge/ Bayview	Post Center	Art Center	College Hall	Wylie Inn	Physical Plant	Van Loan	Misc. Accounts	Total CO_2-e (metric tons)
Electricity	892.2	228.6	396.1	376.1	317.7	208.0	184.2	82.2	118.3	698.6	3,501.9
Natural Gas	675.3	405.8	198.0	182.2	118.6	N/A	82.4	43.4	88.2	234.0	2,027.9
Fuel Oil	N/A	N/A	N/A	N/A	96.4	211.6	N/A	N/A	N/A	288.6	596.6
Automotive	N/A	N/A	N/A	N/A	N/A	21.1	N/A	134.5	N/A	42.4	198.0
Propane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.3	16.3
Total	**1,567.6**	**634.4**	**594.1**	**558.3**	**532.7**	**440.6**	**266.6**	**260.1**	**206.5**	**1,279.9**	**6,340.8**

Table 13 – GHG Emissions by building groups at Endicott College in metric tons of CO_2-equivalent

The greenhouse gas emissions across the Endicott College campus were mostly created through the use of electricity (55%) and natural gas consumption (32%). A smaller portion of the emissions were created through fuel oil consumption (9%), automotive fuel consumption (3%), and propane consumption (<1%). The Main Campus and Miscellaneous Accounts were logically the largest users of electricity. Breaking from the emission percentage breakdown, the Main Campus and the East Buildings were the largest consumers of natural gas. The Miscellaneous Accounts and the three buildings grouped as College Hall were the largest consumers of fuel oil. The vehicles from the Physical Plant and Campus Safety consumed the most automotive fuel. The two propane accounts were part of the Miscellaneous Accounts.

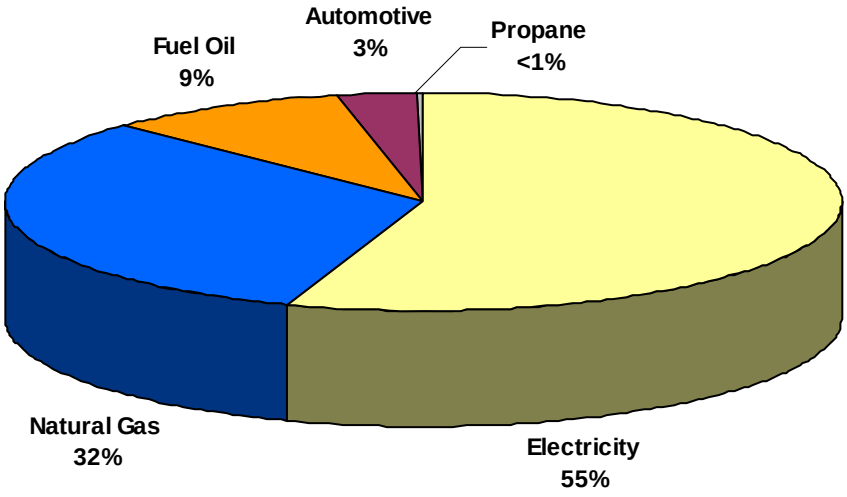


Figure 13 – GHG emissions by source across Endicott College

Appendix A – Endicott College Utility Account Date Ranges

Electric Accounts (except for below)	**Jul 2008**	**Jun 2009**
Hawthorne	Sep 2008	Jul 2009
East Buildings	Aug 2008	Jul 2009
Campus Safety	Aug 2008	Jun 2009
Post	Nov 2008	Oct 2009
Van Loan	Oct 2007	Sep 2008
Art Center	Sep 2008	Apr 2009
Fuel Oil Accounts	**See Below**	
332 Hale Street Mahlstedt House	Feb 2008	Jan 2009
31 Beckfod Street Apt#2	Nov 2008	Oct 2009
322 Hale Street Keeper's/Rockport House	Sep 2008	Aug 2009
376 Hale Street	Feb 2008	Feb 2008
378 Hale Street (Research Center)	Aug 2008	Jun 2009
407 Hale St (Main House)	Jan 2008	Apr 2008
413 Hale Street	Oct 2008	Sep 2009
8 Pickett Court 1st Floor	Nov 2008	Nov 2009
8 Pickett Court 2nd Floor	Sep 2008	Nov 2009
Art Center	Aug 2008	Jun 2009
Birchmont	Sep 2008	Aug 2009
Maintenance Shed	Sep 2008	Sep 2009
Rogers Hall	Jan 2008	May 2008
Winthrop Hall	Jul 2008	Jun 2009
Alhambra Hall	May 2008	Apr 2009
College Hall	Jul 2008	Jun 2009
Trexler Hall	May 2008	Apr 2009
Natural Gas Accounts (except for below)	**Jun 2008**	**May 2009**
Performing Arts	Oct 2008	Sep 2009
Rogers	Aug 2008	Sep 2009
Post	Jul 2008	May 2009
Campus Safety	Sep 2008	May 2009
Propane Accounts	**See Below**	
Misselwood	Jun 2008	May 2009
Football	May 2008	Apr 2009

Appendix B – Endicott College Utility Account Groupings

Grouping	Electric Accounts		Natural Gas Accounts			Fuel Oil Accounts	Propane Accounts
Misc	64097-31019	31 Beckford St.,#2 (rental)				31 Beckfod Street Apt#2	
Misc	64256-24037	8 Pickett Ct., #1				8 Pickett Court 1st Floor	
Misc	76718-54039	8 Pickett Ct.,#2 (rental)				8 Pickett Court 2nd Floor	
Misc	76719-51024	310 Hale St.(Farmhouse)					
Misc	64257-21022	320 Hale St.(Ledge)					
Misc	39321-31017	322 Hale St.(Rockport)				322 Hale Street Keeper's/Rockport House	
Misc	39321-28029	332 Hale St.(StaffHouse)				332 Hale Street Mahlstedt House	
Misc	02065-91022	361 Hale St.(Beacon)	00042-61823-290	376 HALE ST	Beacon		
Misc	26858-06028	361 Hale St.(Winthrop)				Winthrop Hall	
Misc	39321-27022	365 Hale St.(Birchmont)				Birchmont	
Misc	14455-54022	372 Hale St.(Rogers)	00042-61821-470	376 Hale Street	Rogers	Rogers Hall	
Misc	31738-31003	374 Hale St. (Hawthorne)	00042-61821-630	374 Hale Street	Hawthorne	376 Hale Street	
Misc	62989-14026	376 Hale St.(Lot G lights)					
Misc	75460-62021	376 Hale St.(Stadium)					Football Lock Room
Misc	02021-48025	376 Hale St.(Stoneridge lot)					
Misc	64257-17028	400 Hale St.(Research Ctr.)				378 Hale Street (Research Center)	
Misc	50518-03014	407 Hale St.(Misselwood)	00042-61823-340	395 Hale St-Misselwd	Misselwood-House	407 Hale St (Main House)	Misselwood Tent
Misc	26858-05012	413 Hale St. (Hamilton-carriage house)	00042-61823-370	395 Hale St-Carriage	Misselwood-Carriage		
Misc	39321-26016	413 Hale St. (Hamilton-house)				413 Hale Street	
Misc	00654-49023	376 Hale St.(Grove & Lodge)	00042-61821-410	287 Hale Street	Grove		
			00042-61823-610	302 Hale Street	Lodge		
Misc	62991-85029	376 Hale St.(Village)	00042-61823-510	302 Hale Street	T1		
			00042-61823-520	302 Hale Street	T2		
			00042-61823-540	302 Hale Street	T3		
			00042-61823-570	302 Hale Street	T5		
			00042-61823-580	302 Hale Street	T6		
			00042-61823-600	302 Hale Street	T7		
			00042-61823-550	302 Hale Street			
Misc	00653-11024	376 Hale St.(Tower)	00042-61822-720	287 Hale St	Tower		
			00042-61821-450	376 Hale St-Gloucester	Gloucester		
			00042-61821-440	376 Hale St-Manchester	Manchester		
Misc	38047-25007	376 Hale St. (Woodside T.H.'s)	00042-61823-330	400 Hale St-Townhse1	Woodside #1		
			00042-61823-360	400 Hale St	Woodside #2		
Main Campus	25558-14029	370 Hale (Main Campus/Williston)	00042-61822-420	376 HALE ST	Kennedy		
			00042-61821-460	376 HALE ST	Callahan		
			00042-61822-450	376 HALE ST	Academic Center		
			00042-61821-490	376 HALE ST	Library		
			00042-61821-700	376 HALE ST	T.H.-Williston		
			00042-61821-640	370 HALE ST	Dining Hall		
East Buildings	38034-48029	376 Hale St.(East Bldgs.)	00042-61821-790	376 HALE ST	Brindle		
			00042-61822-780	376 Hale St	Hale		
			00042-61822-960	376 HALE ST	Endicott		
			00042-61823-320	376 HALE ST	Reynolds		
College Hall	62993-74017	376 Hale St.(College Hall)				College Hall	
						Trexler Hall	
						Alhambra Hall	
Art Center	27339-35014	Art Center	00042-61821-420	376 Hale Street	Performing Arts	Art Center	
Stoneridge/ Bayview	00655-26025	302 Hale St.(Stoneridge/Bayview)	00042-61823-630	376 Hale Street	Bayview		
			00042-61823-500	287 Hale St	Stoneridge		
Wylie Inn	50518-29009	295 Hale St.(Inn)					
	50517-17022	295 Hale St. (Tupper & Mtg. Place)	00042-61823-490	376 HALE ST	Meeting Place		
Post Center	87934-83028	376 Hale St.(Post Ctr.)	00042-61822-900	376 HALE ST	Post		
VanLoan	62992-82023	289 Hale St.(VanLoan)	00042-61821-590	287 Hale St	Van Loan		
PhysPlant/ Campus Saftey	74935-78007	376 Hale St.(Campus Safety)	00042-61812-450	346 Hale Street	Campus Saftey		
			00042-61823-260	376 HALE ST	Physical Plant	Maintenance Shed	
	00654-61029	386 Haie St.(Facilities)					