



Clifton Park Local Government Operations Greenhouse Gas Inventory

A Preliminary Report for Baseline Year 2013

A report developed for the CSC Service
Strategy for the Town of Clifton Park



Key Findings

The Town of Clifton Park, with support from Climate Action Associates and the Capital District Regional Planning Commission, began a 2013 municipal operations greenhouse gas (GHG) inventory as part of Climate Smart Communities Regional Coordinators Pilot Program. This report summarizes data gathered and analyzed thus far. Some of key findings include:

- The Town spent approximately \$571,000 on energy in 2013 and created 1,686 metric tons of GHG emissions.
- Town's vehicle fleet was the largest source of GHG emissions (56%), as well as the most expensive type of energy cost. Clifton Park spent roughly \$290,000 for gasoline and diesel in 2013. These amounts are usually high for a municipality of this size; this could be explained either by the large spatial area of the Town or by the possibility that some of the reported usage is charged back to third parties. Nonetheless, reducing vehicle miles travelled (VMT) and procuring more efficient and/or electric drive vehicles represent two important ways that Clifton Park could cut back on GHG emissions and fuel costs.
- The Highway Main Building, Public Safety Building, Town Hall, and the Senior Center were the highest facility energy users. The Town Hall energy expenditures were greater than \$12,000 per year. The Clifton Commons Little League facility had the highest energy bill, though not the highest energy use and it was not clear why; this should be investigated.
- Outdoor lighting, which includes the general street/area lighting districts, park entrance lights, signs, and traffic signals, amounted to 30 percent of the Town's 2013 energy bill at \$169,825. The unmetered general street/area lighting districts billed by National Grid and NYSEG accounted for 88 percent of the outdoor lighting costs. In lighting owned and operated by the Town such as metered park lights, signs, and traffic signals, the Town could consider LED lighting as a way to reduce costs and GHG emissions. Until utilities provide an LED option for the general lighting district, the town would have to take back responsibility for the lighting district and then install and outsource maintenance of LED lights.

GHG Accounting Overview and Sources Included

Municipal GHG inventories are a crucial starting point for climate action by providing a baseline for setting realistic emissions reduction targets and measuring the impact of future actions. The information in this report will help Clifton Park reduce energy use, save taxpayer dollars, and cut GHG emissions. The inventory is being performed in accordance with the Local Government Operations Protocol (LGOP), a protocol developed by The Climate Registry and ICLEI – Local Governments for Sustainability.

Communities typically chose one or more recent prior years to set a baseline. Clifton Park selected 2013 as the baseline year for this GHG inventory. When the preliminary assessment is finalized, the information in this report will serve as a baseline from which to track progress and measure the impact of future actions taken to reduce GHG emissions.

GHG Sources

This preliminary assessment considers most major GHG sources with a few exceptions noted below. The data reported will likely represent greater than 90-95 percent of GHG emissions from Town operations:

- Electricity consumption. This creates indirect emissions because the actual emissions occur at power plants, but the LGOP requires them to be included in the analysis due to the fact that municipalities can lessen these emissions by reducing their use of electricity. All metered use is considered in this study.
- Stationary fossil fuels. These include natural gas, propane, and fuel oil. Natural gas usage was taken from National Grid bills. The Town reported that only one facility, a greenhouse, which used propane, and this data was unavailable during the preliminary assessment. No fuel oil is known to be used.
- Transportation fossil fuels. These include gasoline, diesel, natural gas, and electricity (for plug in vehicles), used in both on road fleet vehicles and off road equipment. The Town reports only gasoline and diesel usage in its combined fleet and all that consumption was included.
- Solid waste emissions from landfills. The Town does not own or operate a landfill and so it has no direct emissions. The LGOP provides communities the option of estimating a small indirect footprint from waste generated by government facilities but the Town elected not to do it during the preliminary assessment. This sector is usually not included because it is difficult to measure waste volume generated by government operations and this source is usually less than 1-2 percent of a typical inventory.
- Refrigerant usage. Most refrigerants such as those used in building and vehicle cooling systems are GHGs in themselves. For most conventional facility applications they can be excluded in simple GHG assessment since they are difficult to estimate and amount to less than 2% of a typical GHG inventory. Clifton Park elected not to consider them for this preliminary assessment. However, the Town operates an ice rink at Clifton Commons and that source may be significant. Therefore if the Town plans to upgrade cooling equipment at that facility, it should evaluate baseline refrigerant usage before doing so to be able to take credit for reducing GHG emissions as part of the upgrade.
- Employee commute. This is an optional source in the LGOP for indirect emissions associated with employees traveling to work. These were not included in Clifton Park's preliminary inventory. This source is usually only included when a local government wishes to set goals and create commute incentives to try to reduce these types of emissions. For example, giving preferential parking and free charging for employees driving plug in electric vehicles is an incentive to reduce employee commute emissions.

Data Organization

Emissions were analyzed by government sector, by individual facility, and by fuel type. Clifton Park worked with Climate Action Associates LLC to identify sectors and sector subgroups to categorize the information into useful groups (Table 1.). Climate Action Associates then collated the energy data into one consolidated spreadsheet that includes the town categories, original National Grid utility bills, and embedded formulas for calculating energy usage, energy costs, and emissions.

All raw data, calculations, tables, and figures are contained in the workbook entitled "CliftonParkEnergyGHGTool2013.xlsx."

Table 1. Sectors, Sector Subgroups, and Fuel Types Included in this Report

Sectors	Sector Subgroups	Fuel Types Reported*
Outdoor Lighting	Street/Area Lighting	Electricity
	Park Entrance Lights	Electricity
	Traffic Signals	Electricity
	Signs	Electricity
Sewer	N/A	Natural Gas and Electricity
Town Buildings	Admin Buildings	Natural Gas and Electricity
	Bldgs & Grounds Garages	Natural Gas and Electricity
	Clifton Commons	Natural Gas and Electricity
	Highway Dept Garages	Natural Gas and Electricity
	Town Parks	Natural Gas and Electricity
	Town Pools	Electricity
Vehicle Fleet	N/A	Gasoline and Diesel

* Town did not report data on propane or fuel oil usage.

Emissions and Energy Costs by Sector

In 2013, Clifton Park's operations produced 1,686 metric tons of GHG emissions (measured as metric tons of carbon dioxide equivalent, or MTCO₂e). The Town consumed approximately 23,358 MMBtu of energy and spent well over half a million dollars on energy costs (\$571,738). Shaving just 10 percent off this cost through energy conservation and efficient vehicle procurement would save \$60,000 annually.

Clifton Park identified four main groups, or sectors, for use in categorizing the GHG emissions from town operations: Vehicle Fleet, Town Buildings, Outdoor Lighting, and Sewer. The amount of GHG emissions produced by the vehicle fleet and equipment was nearly twice the amount produced by the town buildings (Table 2). Emissions from the vehicle fleet combined with those from the town buildings account for 85 percent of the total emissions produced by Clifton Park's operations.

Table 2. Energy Use, Cost, and Emissions by Sector

Sector	GHG Emissions (MTCO ₂ e)	Energy Use (MMBtu)	Energy Cost (USD)
Vehicle Fleet	946.38	13,039.53	\$290,393.00
Town Buildings	478.79	7,189.24	\$93,476.21
Outdoor Lighting	211.79	2,532.81	\$169,825.03
Sewer	48.87	597.28	\$18,043.28
Total Government	1,685.84	23,358.87	\$571,737.52

Over half of the Town's GHG emissions (56%) came from the Vehicle Fleet sector, which includes the gasoline and diesel used to power its vehicle fleet and maintenance equipment (Figure 1). Town Buildings produced 28 percent and Outdoor Lighting contributed 13 percent of the total emissions. The remaining 3 percent came from the electricity consumed in running the Town's sewer pumps (all the energy consumed in the sewer sector was for pumps). Despite its large contribution to emissions, the Town Buildings sector comprises only 16 percent of energy costs, due largely to the fact that the street lighting energy bills are loaded to include maintenance by the utility (Figure 2).

Figure 1.
GHG Emissions by Sector

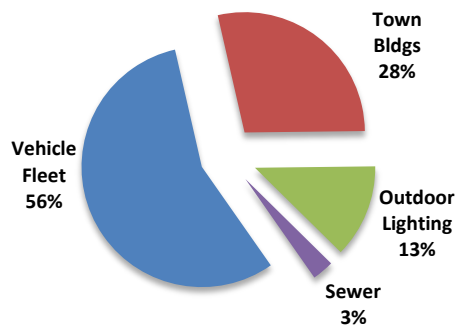
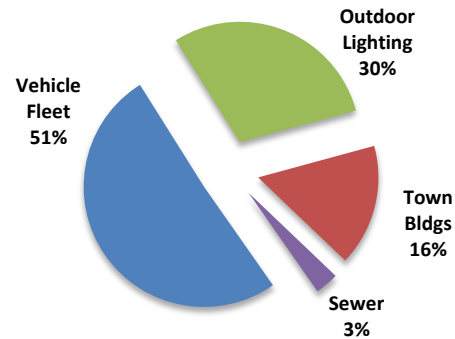


Figure 2.
Energy Cost by Sector



Vehicle Fleet Sector (56% of GHG Emissions, 51% of Energy Costs)

This sector includes all on-road and off-road (equipment) use of gasoline and diesel supplied at the Town's distribution facility. The data on gasoline and diesel usage was reported as a lump sum because the Town wished to focus on facility energy use during the initial GHG assessment. However, simple conversion to GHG emissions shows that gasoline and diesel account for 56 percent of the Town's GHG emissions and for 51 percent of the Town's energy bill. These percentages are on the high side for a municipality of this size, and may be explained by the Town fleet serving a large geospatial area. It may be worth doing a more detailed fleet assessment to look for ways to reduce fuel use as part of the Town's CSC commitment.

Town Buildings Sector (28% of GHG Emissions, 16% of Energy Costs)

Town Buildings made up the second largest share (28%) of GHG emissions at 429 MTCO₂e. This sector was divided into six subgroups (Table 3) showing that 50 percent of the emissions came from administrative buildings. Only nine percent of the emissions came from the Clifton Commons athletic park, though it comprised 31 percent of the energy costs within the Town Buildings sector (Figure 4). This is unusual since energy use and GHG emissions are typically similar in percentage. The discrepancy appears to be caused by a large energy bill associated with the Little League facility.

Table 3. Energy Use, Cost, and Emissions within the Town Buildings Sector

Town Building Subgroups	GHG Emissions (MTCO ₂ e)	Energy Use (MMBtu)	Energy Cost (USD)
Admin Building	238.64	3,487.78	\$37,566.69
Highway Dept. Garages	115.54	1,971.37	\$12,528.34
Town Pools	58.10	796.23	\$8,869.70
Clifton Commons	44.06	580.51	\$28,696.27
Buildings & Grounds Garages	20.13	325.58	\$4,063.11
Town Parks	2.32	27.78	\$1,752.10
Total Town Buildings	478.79	7,189.24	\$93,476.21

Figure 3.
GHG Emissions from Town Buildings

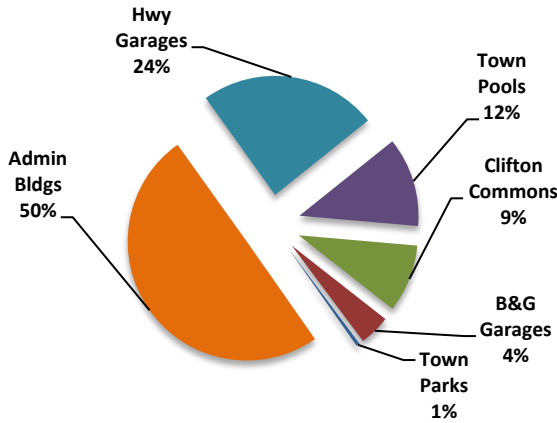
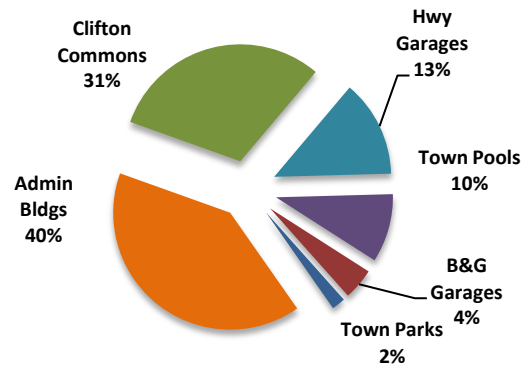
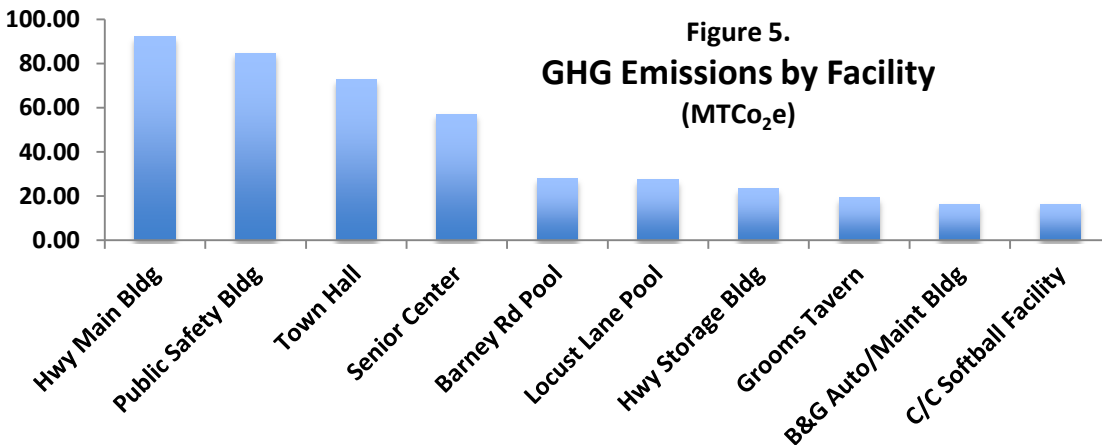


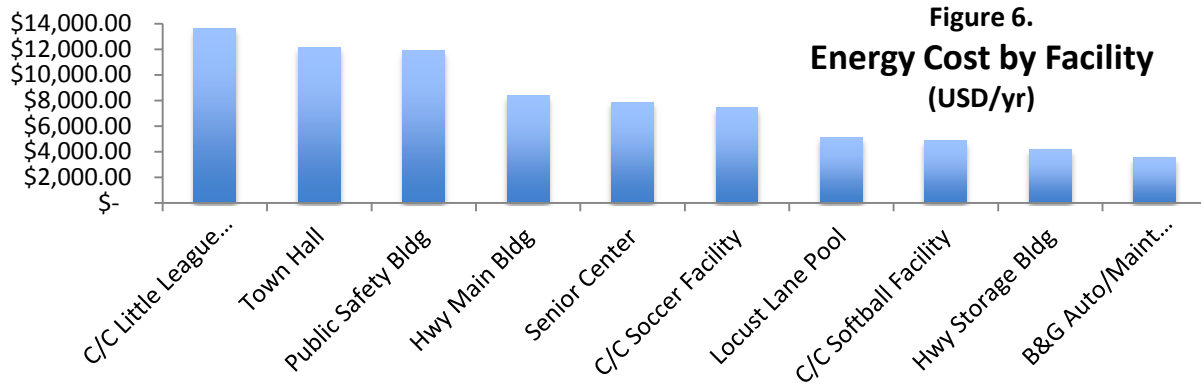
Figure 4.
Energy Costs of Town Buildings



Clifton Park operates a total of 23 facilities that consume natural gas and electricity; figures 5 and 6 show GHG emissions and energy costs for the top 10 facilities. Of those ten, the highest emission sources were the Highway Department Main Building, the Public Safety Building, and the Town Hall (Figure 5).

Figure 5.
GHG Emissions by Facility (MTCO₂e)





The full list of all 23 town facilities, along with the associated emissions, energy use, and energy costs is below as Table 4. There were some unusual energy use and billing patterns in the data that should be investigated and confirmed. For example, the Clifton Commons Little League facility had the highest energy bill but was only 11th in terms of metered energy consumption. The natural gas usage at the Town Hall, Public Safety Building, and Highway Main Building differed widely between the three buildings, but very similar natural gas costs were reported for all three buildings (Table 4).

Table 4. 2013 Energy Use, Cost, and Emissions associated with Individual Town Facilities.

Town Facilities	Electricity (KWH)	Electricity Cost (\$)	Nat. Gas (therms)	Nat. Gas Cost (\$)	GHG (MTCO ₂ e)	Energy Use (MMBtu/yr)	Total Cost (\$/yr)
C/C Little League Facility	39,680	\$13,623.43	0	\$-	11.32	135.39	\$13,623.43
Town Hall	181,155	\$8,422.84	3,858	\$3,706.32	72.66	1,003.90	\$12,129.16
Public Safety Bldg	180,969	\$8,726.16	6,083	\$3,175.40	84.71	1,225.77	\$11,901.56
Hwy Main Bldg	79,640	\$4,879.50	12,763	\$3,506.89	92.13	1,548.03	\$8,386.39
Senior Center	105,680	\$6,148.17	4,963	\$1,720.41	57.14	856.88	\$7,868.58
C/C Soccer Facility	24,935	\$6,618.19	1,532	\$816.81	15.45	238.28	\$7,435.00
Locust Lane Pool	49,926	\$2,736.80	2,412	\$2,352.98	27.36	411.55	\$5,089.78
C/C Softball Facility	34,308	\$4,860.87	0	\$-	9.79	117.06	\$4,860.87
Hwy Storage Bldg	3,908	\$510.00	4,100	\$3,631.95	23.41	423.33	\$4,141.95
B&G Auto/Maint Bldg	24,321	\$1,760.32	1,749	\$1,781.79	16.45	257.88	\$3,542.11
Barney Rd Pool	98,471	\$3,329.23	0	\$-	28.09	335.98	\$3,329.23
Grooms Tavern	6,679	\$561.90	3,225	\$2,461.02	19.44	345.29	\$3,022.92
Transfer Station	16,395	\$2,395.83	0	\$-	4.68	55.94	\$2,395.83
C/C Baseball Facility	10,612	\$896.27	0	\$-	3.03	36.21	\$896.27
C/C Garage	9,759	\$868.21	0	\$-	2.78	33.30	\$868.21
Dog Park	3,213	\$694.71	0	\$-	0.92	10.96	\$694.71
C/C Stage	4,800	\$608.54	0	\$-	1.37	16.38	\$608.54
B&G Workshop	0	\$-	677	\$521.00	3.68	67.70	\$521.00
Burning Bush Pool	0	\$-	487	\$450.69	2.65	48.70	\$450.69
Veterans Park	2,742	\$424.67	0	\$-	0.78	9.36	\$424.67
C/C Restrooms	1,144	\$403.95	0	\$-	0.33	3.90	\$403.95
Collins Park	2,078	\$377.20	0	\$-	0.59	7.09	\$377.20
M. Valley Grange Hall	0	\$248.64	0	\$-	0	0	\$248.64

Outdoor Lighting Sector (13% of GHG emissions, 31% of Energy Costs)

Because emissions from the Outdoor Lighting sector are the third highest group, Table 5 breaks them into four subcategories. The Street/Area Lighting subsector is, for the most part, the Town’s general lighting districts operated by both National Grid and NYSEG. They were, by far, the highest source of emissions and energy costs within the lighting sector. A portion of the Street/Area Lighting costs are not “true” energy costs because the utility tariff is loaded to include the service charges for maintenance of these lights. Comparing straight energy supply costs for lighting not under utility management to those that are suggests that the effective cost paid to utilities for streetlight maintenance is on the order of \$100,000 per year.

Table 5. Energy Use, Cost, and Emissions within the Outdoor Lighting Sector

Outdoor Lighting Subgroups	GHG Emissions (MTCO ₂ e)	Energy Use (MMBtu)	Energy Cost (USD)
Street/Area Lighting	168.95	2,020.43	\$150,478.18
Park Entrance Lights	27.95	334.26	\$9,820.28
Traffic Signals	13.59	162.47	\$7,948.86
Signs	1.31	15.64	\$1,577.71
Total Outdoor Lighting	211.79	2,532.81	\$169,825.03

Figure 7. GHG Emissions from Outdoor Lighting

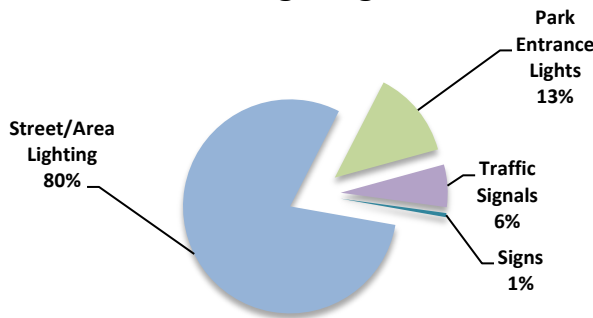
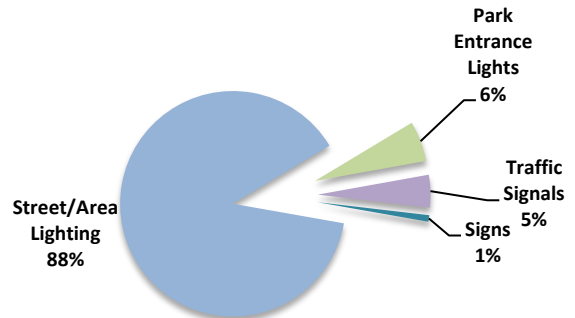


Figure 8. Energy Costs of Outdoor Lighting



Emissions and Energy Costs by Fuel Type

Across facilities and fleet operations, Clifton Park utilizes four main fuel types: electricity, natural gas, gasoline, and diesel. Gasoline consumption produced the most GHG emissions, followed by electricity and diesel (Table 6 and Figure 9). The Town spent the most on electricity (42%), followed by gasoline (31%) (Figure 10).

Table 6. Energy Use, Cost, and Emissions by Fuel Type

Fuel Type	GHG Emissions (MTCO ₂ e)	Energy Use (MMBtu)	Energy Cost (USD)
Gasoline	533.88	7,466.28	\$170,777.00
Electricity	509.89	6,097.83	\$255,609.54
Diesel	412.51	5,573.25	\$119,616.00
Natural Gas	229.57	4,221.50	\$25,734.98
Total Government	1,685.84	23,358.87	\$571,737.52

Figure 9. GHG Emissions by Fuel Type

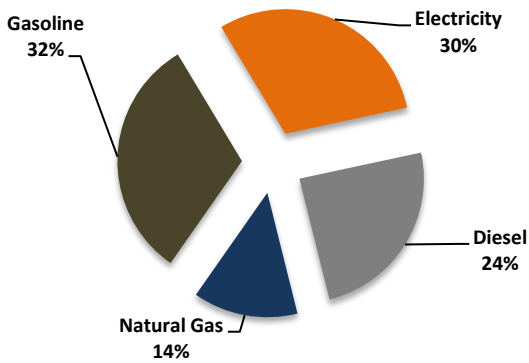
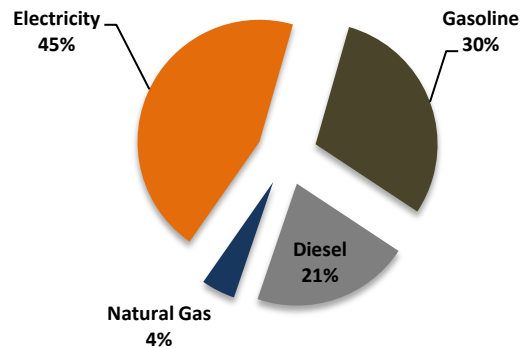


Figure 10. Energy Cost by Fuel Type



A small amount of propane is also used to heat a town-operated greenhouse during the winter; data on this fuel source was unavailable at the time of this report. The cost data for seven of the 12 NYSEG electricity accounts was not available at the time of this report so an estimate of the cost (\$0.17/KWH) was generated from the existing data from the other 80 electric utility accounts.

Next Steps and Recommendations

We recommend the Town review this report and then meet with the CSC team to discuss options for developing a Climate Action Plan consisting of measures to reduce costs and GHG emissions. In terms of finalizing the GHG inventory, suggestions include:

- Obtain refrigerant usage data from the ice rink and include it in the analysis.
- A more detailed assessment of vehicle use is recommended to understand how fuel usage is tracked and/or reveal which vehicles are the highest emitters or the most costly.
- The Town should consider doing an inventory of outdoor lighting it owns and controls in order to evaluate potential savings from LED traffic signals and area lights.
- Obtain data on propane usage and confirm that there is no fuel oil use by the Town.

- Review utility data assignments to facilities as shown in the report's compendium spreadsheet. Confirm the status of the Public Safety Building; currently there are four National Grid and seven NYSEG accounts linked to this facility – is it one building or a complex of buildings?
- Some irregularities were found in the utility bills that were used as source data. In some cases the charges for electricity and natural gas were not proportional to energy bills. There may be good reasons for this, but further investigation could be useful.

