- Baked fish
- Rice
- Carrots

Additional items (not available to NJSP) were as follows:

- Bread and butter
- Peanut butter and jelly sandwiches
- Pre-packaged salads and hard-boiled eggs
- Fresh fruit (apples, bananas, and oranges)

Dinner meal service was conducted from 17:00 until 19:15. The military staff meal period was between 17:00 and 17:30. The NJSP were between 17:30 and 18:00 for their meal period. At 18:30, the YC cadets began their meal period which lasted until 19:00. Beverages are also available at the DFAC and are coffee, tea, juices, water, and soft beverages. NJSP and DOC cadets were only permitted to have water bottles which they brought with them in to the DFAC. Menu meal items were as follows:

- Barbecue chicken
- Macaroni and cheese
- Green beans or mixed vegetables

Additional items (not available to NJSP) were as follows:

- Bread and butter
- Peanut butter and jelly sandwiches
- Pre-packaged salads and hard-boiled eggs
- Fresh fruit (apples, bananas, and oranges)

4.3.2 New Jersey State Police

The NJSP had a meal period of 30 minutes for breakfast, lunch, and dinner. Mealtime activities for the NJSP cadets are very regimented and are considered to part of their training. The NJSP lined up outside the DFAC and entered at the beginning of their meal period. They would wait in line for food service and be served the meal on pre-portioned styrofoam plates. Photograph 13 and 14 shows the NJSP cadets getting their plates. Except for individuals with dietary restrictions, every individual was given a standardized portion of each menu item. They were not given the option to decline menu items or ask for additional menu items. Once they got their meals, they would walk to the tables. They were not able to choose their drinks or select additional items from the salad bar. After receiving their pre-portioned plates, they would walk to a table and remain standing. When four cadets were present at a single table, they were instructed to sit and eat. They would consume their food quickly and were instructed to get up and leave after approximately one minute. Surveyors timed 43 tables and documented the average time of 1 minute and 1 second. The cadets would then walk single file toward the exit and discard their meal waste, including plates, utensils, napkins, and non-consumed food, into designated trash cans before lining up outside. Two or three cadets cleaned and disinfected each table to prepare it for the next four cadets.

Most of the food waste from this group seemed to be vegetables. Specifically, carrots during lunch and green beans during dinner. Observers estimated that the vegetable menu items accounted for

approximately 90% of the total food waste. The protein and carbohydrate menu items accounted for approximately 10% of the total food waste. Along with food waste, there were also plastic wrappers containing three plastic utensils per person and the styrofoam plates.

4.3.3 Military and Staff

The military and staff had a meal period of 45 minutes for breakfast, lunch, and dinner. Military personnel and staff were able to come into the DFAC at any point in their assigned meal period. They were able to pick and choose what they wanted from the food service line and could get bread if they wanted. They were able to choose food from the salad bar and choose their own drinks. They were able to pick their own seat in the DFAC and be social. Photograph 15 shows a few military personnel eating during their meal service period. Military personnel and staff did not clean their tables after they were done eating, but they did throw out their waste. Photograph 9 shows the waste produced by the NJNG personnel during the lunch observation on August 16, 2021. Most of the food waste from this group seemed to be vegetables. Along with food waste, there were also plastic wrappers containing three plastic utensils per person, styrofoam plates, styrofoam cups (most individuals took two styrofoam cups), and packaging from the salad bar.

4.3.4 New Jersey Youth Challenge Academy

The YC had a meal period of 30 minutes for breakfast, lunch, and dinner. Youth Challenge cadets were split into two groups by gender. The first group that ate were female cadets. They lined up in the food service line and got to choose which menu items they were given. Photograph 10 shows one of the YC cadets in the meal service line. They were able to select additional items from the salad bar, but they were not able to get drinks. All cadets would remain standing at their table until instructed to sit and eat by the officers. They would eventually be signaled to throw out their trash and one person would stay behind to clean the tables. Most of the food waste from this group seemed to be vegetables. Along with food waste, there were also plastic wrappers containing three plastic utensils per person, styrofoam plates, and packaging from the salad bar. After the female cadets were done, the male cadets were able to begin their meal service routine that mirrored the female cadets' procedure.

4.3.5 Provided Tableware and Utensils

For each meal, a styrofoam plate and a package of utensils are given to each person. This utensil package consists of one plastic spoon, fork, and knife which are made of white polypropylene plastic. It also contains salt and pepper packets and a napkin. These contents are wrapped in plastic packaging. Due to the COVID-19 pandemic, salads are individually packaged in plastic containers and to-go containers are styrofoam containers. Military staff are also able to use multiple styrofoam cups each meal. Based on our observations, the number of single-use non-compostable plastic and foam items disposed of for 1 day (3 meal) period included:

- 3,741 utensils (spoons, knives, and forks)
- 1,247 styrofoam plates
- 145 styrofoam cups
- 15 styrofoam containers
- 40 plastic containers

Styrofoam plates are currently being used in meal operations because of the COVID-19 pandemic. As of the time of this observation, the DFAC does not have a dish washer on staff. A fully functional dishwashing

system and dish-washer safe plates and utensils are pre-set and available at the facility. Since there is no dishwasher staff member, it does not appear that the DFAC will discontinue the use of single use plates, utensils, or cups any time. Bill Solicitation #20DPP00554 Section 3.4.5.1 states that Vendors are encouraged to use biodegradable and environmentally friendly products whenever possible, and foam products which are produced using chlorofluorocarbons (CFCs) are forbidden.

The styrofoam plates that were in use at the time of the waste collection were determined to likely contain CFCs since the box did not indicate otherwise (Photograph 53). The styrofoam hinged boxes did not contain CFCs as was indicated on its box (Photograph 54). Styrofoam cups were not able to be located at the time of waste collection, and from the invoice of products ordered in 2019 and 2020, the cups may contain CFCs.

These styrofoam products are not biodegradable, but most do not contain chlorofluorocarbons, so they are allowed to be used at the DFAC. The item that has been identified to likely contain CFCs are in the process of being phased out of use by the DFAC employees and biodegradable plates are being phased in. It is suggested that the DFAC change their foam products for compostable foam plates and cups or use reusable products. Making a change to compostable foam products would mean less plastic waste generated each year, and it could be used in a composting operation. Reusable products are also preferred since the current plates, cups, and utensils are single use. A dishwasher was installed in 2020 and has not been used to sanitize reusable products.

4.3.6 Meal Observation Conclusion

The hypothesis prior to observation was that the NJSP would generate the largest volume of food waste each meal period because they were given limited time to eat. Based on meal observations, this hypothesis was incorrect. Instead, the YC cadets and military personnel seemed to generate a larger volume of waste.

The primary waste was styrofoam plates and plastic utensils which are not considered food waste. Since the JJC and DOC were not in session when this meal observation was conducted, observers received information from the DFAC staff about the meal procedures for these groups. From the estimates in Section 4.3.5, meal counts from June 2020 through May 2021, and information received about JJC and DOC meal procedures, estimations were made for these three groups for yearly approximations of tableware and utensil usage and disposal.

97,281 meals were served to the NJSP from August 2020 and May 2021. The following are the estimated amounts of tableware and utensils used and disposed of within this period:

- 97,281 styrofoam plates
- 291,843 plastic utensils
- 97,281 napkins and cutlery kit plastic wrappers
- 2,918 styrofoam containers

43,776 meals were served to the New Jersey National Guard personnel from August 2020 and May 2021. The following are the estimated amounts of tableware and utensils used and disposed of within this period:

- 43,776 styrofoam plates
- 131,328 plastic utensils

- 43,776 napkins and cutlery kit plastic wrappers
- 65,664 styrofoam cups
- 875 styrofoam containers
- 8,480 plastic containers

48,084 meals were served to the DOC from June 2020 and May 2021. The following are the estimated amounts of tableware and utensils used and disposed of within this period:

- 48,084 styrofoam plates
- 144,252 plastic utensils
- 48,084 napkins and cutlery kit plastic wrappers

2,792 meals were served to the JJC from August 2020 and May 2021. The following are the estimated amounts of tableware and utensils used and disposed of within this period:

- 2,792 styrofoam plates
- 8,376 plastic utensils
- 2,792 napkins and cutlery kit plastic wrappers
- 2,792 styrofoam cups
- 40 styrofoam containers
- 558 plastic containers

In total, the following single-use non-compostable products are disposed of annually:

- 191,993 styrofoam plates
- 575,799 plastic utensils
- 191,993 napkins and cutlery kit plastic wrappers
- 185,456 styrofoam cups
- 6,603 styrofoam containers
- 18,058 plastic containers

4.4 Food Waste Collection Experiment

Based on the information gathered during the meal observations, SUEIP designed and conducted a food waste collection experiment to categorize and quantify the waste generated during meals. This required coordination with the DPG, the site superintendent, and the NJSP officers. Breakfast and lunch waste collections were conducted on September 28, 2021. Dinner waste collection was conducted on October 19, 2021. The procedures and findings for this experiment are described in Sections 4.4.1 – 4.4.4. below. Data was collected on the "Food Waste Collection Datasheet". Blank datasheets can be found in Appendix D. Materials needed for this process included:

- Disposable gloves
- 10 5-gallon buckets
- One trash can
- Blank datasheets
- Spring scale
- Laminated signs
- Maps
- Writing utensils
- Garbage bags
- Sanitary spray
- Paper towels

4.4.1 Waste Collection and Separation

Surveyors reserved three tables near the DFAC exit for food waste collection. Signage stating "Please Place All Waste On Table" were displayed on each collection table. The regularly positioned trash receptacles near the exit were removed. The DFAC floorplan (Figure 9) was used to design a layout for this study. The approximate location of waste collection area can be seen in Figure 10. Diners were asked as they exited to place their plates on designated tables as opposed to discarding waste into trash receptacles. Every effort was made to not interfere with meal service operations or NJSP training.

As the plates were deposited on the tables, SUEIP members sorted the waste into 10 different buckets and one trash can located behind the tables. All waste buckets and bags were weighed ahead of time (Table 16 and 17). Each bucket was given a unique identification number corresponding to its known mass. The average mass of the plastic garbage bags was calculated by weighing 10 empty bags and averaging their masses. A total of 10 buckets were needed to separate waste into the following categories: proteins, carbohydrates, vegetables, fruits and fruit scraps, cereal and salad bar items, soiled paper products, liquids, assorted miscellaneous plastic products, and utensils. Foam products were collected using a large trash can provided by the DFAC staff. There was also a bin designated for miscellaneous food waste for the menu items that do not clearly fall into one category of food waste. Meal separation was repeated for all groups for all meals of the day.

Cereal is served exclusively during breakfast and salad is served during lunch and dinner. Cereal and other salad bar items are optional and not available for the DOC and the NJSP. These items were grouped together to represent additional/optional items that were only available to certain groups. For example, non-consumed salad from the salad bar was collected in the "Cereal and Salad Bar Items" bucket as opposed to the "Vegetables" bucket because salads were an optional menu item.

Surveyors made every effort to separate and categorize all waste items from each plate to the best of their abilities. However, in some instances, different categories of waste were mixed on a plate, making it difficult to separate the items entirely. Certain menu items included multiple categories of waste. For example, a chicken sandwich consisted of chicken, breading, cheese, condiments, and a bun. In this case, the chicken was separated from the bun. The chicken, although breaded, was discarded in the protein bucket, and the bun was discarded in the carbohydrate bucket. The melted cheese on the chicken patty was not separated and therefore categorized and weighed with the protein bucket. Potatoes au gratin, as another example, contained both potatoes and dairy in one cohesive serving. In these instances, the menu item was categorized based on the primary ingredient. Although this was common, surveyors consider the amount of incidentally comingled waste to be negligible. Photographs 18 through 33 show the buckets prior to collection and after collection after the NJSP breakfast service on September 28, 2021. Photograph 38 shows the setup for the NJSP lunch service, and Photographs 39 through 46 show the waste generated by the NJSP during lunch on September 28, 2021. Photograph 47 shows the waste separation process for the NJNG during their dinner service on October 19, 2021.

The DFAC cooking staff make every effort to minimize food waste, such as bones, scraps, unused or soiled fruits and vegetables, or spoiled salad items. Certain items, such as ripe bananas are repurposed to make desserts. Chicken bones or scraps are used to make soup stocks. Many menu items are pre-portioned and pre-packaged and require minimal preparation. Although these methods do not generate a lot of food waste, they do generate a lot of packaging waste. Typically, food preparation waste and packaging are disposed of in one trash can which is disposed of following dinner service. The preparation waste for

dinner service on October 19, 2021, was weighed. The contents of the waste were primarily plastic packaging with small amounts of food waste. The contents of this waste weighed about 1,600 grams which equates to 0.00176 tons. This weight can be used to approximate the daily and yearly preparation waste which would be 0.00491 tons daily and 1.792 tons annually. This waste was largely comprised of packaging and was not considered food waste for the purposes of this study.

4.4.2 Waste Quantification

Once the waste was separated, all categories were weighted in their pre-weighed buckets or in their bags between groups. For each group and each meal, the weight of the empty buckets or average mass of the plastic garbage bags was subtracted from the total weight of each bucket to get the weight of the waste alone. Photographs 34 through 37 show the process of waste quantification following the breakfast meal service for the NJSP, and Photographs 48 through 50 show the waste quantification for the NJNG during their dinner service. Waste quantification information was collected for each group and each meal and was totaled after the completion of the waste collection period and was recorded on a datasheet (Appendix D). Scanned datasheets can be seen in Appendix E. All waste collection data was entered into Table 7: Food Waste and Non-food Waste Collection Totals. The observed number of plates served for breakfast, lunch, and dinner can be seen in Table 9. After the waste was weighed and data was recorded, the waste was properly disposed of in the solid waste dumpsters behind the DFAC. The meal quantity approximation for all groups can be seen in Figure 11. The weight of each food waste category was determined and input into Figure 12.

4.4.3 Sanitary Procedures

Surveyors were required to adhere to all COVID-19 protocols in lieu of the ongoing pandemic. Between each group, all collection tables were sanitized using disinfectant spray and towels. SUEIP also wore disposable gloves and face masks. The gloves were exchanged for fresh gloves when necessary.

4.4.4 Food Waste Collection Results

The results for each collected meal can be seen in Table 8a-f. Based on our meal collection data and meal counts from May 2019 – June 2020, it has been determined that 282.85 grams (0.00029 tons) of food waste were generated per person in one day. This number was used to calculate the quantity of tons per person generated in one meal, day, week, month, and year. This information can be seen in Table 12. Table 15 shows the number of people that would need to be served each day, how many meals need to be served each day, and the total meals served in one year to reach the 52 ton per year limit. From these data, it was concluded that 492 people per day would need to be served annually to exceed the 52 ton per year limit. The number of meals per year needed to be served to meet the 52 tons per year limit would be 539,137 meals.

Section 6 provides potential best management practices if the food waste tonnage meets or exceeds the 52 tons per year limit. Based on our calculated mass of food waste per person per year, it has been determined that the maximum possible food waste is 36.11 tons per year. These values are shown in Table 13. However, this maximum possible value is based on the unlikely assumption that 342 people (the number of people served during food collection experiment) are served three meals/day, seven days/week, 365 days/year. This value is conservative. A more realistic approximation is 29.52 tons of food waste per year. This value assumes that 306,074.4 individual meals will be served in a single year. This assumption considers the anticipated number of meals served per group based on their anticipated annual schedule. These values, calculations, and schedules are shown in Tables 10 - 15.

Surveyors used the food waste collection data to approximate the waste percentage for each menu item. These results are shown in Table 18. Vegetables accounted for 30.91% of the total food waste. Other observations include:

- Approximately 10.48% of protein and 11.33% of carbohydrates were wasted during breakfast on September 28
- Protein had the highest consumption percentage for most meals. At minimum the percent food consumed was 88.67% and at maximum this percentage was 99.76%.
- Between 31.38% and 51.67% of carbohydrates (au gratin potatoes), and between 32.66% and 41.93% of vegetables (green beans) were wasted during lunch on September 28
- Between 0.20% and 12.94% of carbohydrates (waffle fries), and between 7.94% and 34.48% of vegetables (cauliflower, broccoli, and carrots) were wasted during dinner on October 19

5.0 Compliance Requirement Determination

According to the results summarized in Section 4.4.4, current meal service operations at the SG NGTC DFAC do not meet or exceed the 52 tons per year food waste threshold. Additionally, as stated in Section 4.1, the SG NGTC DFAC is not currently within 25 road miles of a Class C recycling facility that accepts food waste. Therefore, this facility is not subject to the food waste disposal requirements in the A2371. However, if the number of meals per year meets or exceeds 4,163 meals, and if a new Class C recycling facility with food waste composting capabilities opens within 25 road miles, or the existing Class C recycling facilities currently within 25 road miles start accepting food waste, meal service operations at the SG NGTC DFAC will need to implement food waste disposal initiative in compliance with A2371. It is recommended that proactive actions be taken to reduce and/or utilize food waste to accommodate potential future meal total increases and in anticipation of additional Class C recycling facilities opening in response to this new bill. Best Management Practices (BMPs) are included in Section 6.

6.0 Potential Best Management Practices

6.1 Reducing Food Waste

The reduction of food waste from preparing food and non-consumed food items is crucial in minimizing the food waste generated at the SG NGTC. Current meal operations excel at reducing food preparation waste.

6.2 Utilizing Generated Waste

6.2.1 Removal of Food Waste

Even though the SG NGTC does not fall within 25 road miles of an authorized recycling facility that accepts food waste, it is possible to contract a recycling facility for regularly scheduled food waste pickup. There are three authorized recycling facilities that could compensate for the lack of nearby Class C facilities. These facilities are in Warren County, Middlesex County, and Mercer County. The location in Warren County is 93.1 road miles away from the SG NGTC. The location in Middlesex County is 49.7 road miles away from the Sea Girt NGTC. The location in Mercer County is 50.3 road miles away from the SG NGTC. Since Monmouth and Middlesex counties are similar distances away, either can be used to source food waste. This option may be less effort to maintain compared to selective composting. This option would

require multiple scheduled pickups each week to prevent odors and pests, and the dishwasher or diners to collect the waste.

6.2.2 Discontinue Use of Single Use Plastic

It is recommended that the DFAC staff utilize the existing dishwashing machine to reduce dependence on single-use plastics and styrofoam products. As stated in Section 3.3 of the bid solicitation, single-use dinnerware can be used in the event of a power or mechanical failure or for boxed meals. Section 3.4.4.1 of the bid solicitation also states that cutlery kits should be included in box meals. The indefinite use of single-use dinnerware for normal DFAC meal service operations is not specifically addressed in the solicitation. Given that dinnerware dishwashing operations are part of standard meal service operations (Section 3.5.3.) and that newly installed dish washing equipment is available and functional, we recommend the contractor resume dinnerware dishwashing and discontinue the use of all single-use dinnerware during normal meal services. By making this change to the meal service operations, it would reduce the amount of non-biodegradable materials being transported to landfills. The dishwashing system at the DFAC was replaced in 2020 during DFAC renovations. There are some challenges associated with using the dishwashing system such as an increase in labor costs, water costs, and electricity costs.

The existing dishwashing machine is a Hobart CLPS86EN 480v/60hz/3ph. Assuming that the dishwasher would be used 6 hours per day (2 hours per meal), the kilowatt (kWh) hours per year would be 92,505.6. According to the most recent Sea Girt Comprehensive Energy Report, the average electricity cost at this site is $0.10 per kWh. Based on these values, the total energy cost for washing dishes would be $9,250.56 annually. The water usage of the dishwasher is 132 gallons per hour. If the dishwashing machine is used 6 hours a day, the annual water usage would be 289,080 gallons, costing approximately $2,081.38 per year. To approximate labor costs, we assumed that DPG would need to employ an additional staff member to operate the dishwashing machine. However, it is possible that dishwashing operations could be conducted by the existing personnel on staff. Our labor cost calculations assume that the new employee would work 8 hours a day. At the NJ State minimum wage, the cost of labor would be $37,960 annually. These combined costs total to $49,292. Calculations for the yearly cost of dishwasher utilization can be found in Table 20. Dishwashing only accounts for the use of the dishwasher and not for handwashing of any other dishes or equipment.

Annual price approximations for single-use foam and plastic products are as follows:

- 6,603 foam containers are used at $0.16 each, totaling $1,089.16
- 191,993 foam plates are used at $0.15 each, totaling $28,407.28
- 191,993 biodegradable plates are used at $0.18 each, totaling $34,153.63
- 68,456 foam cups are used at $0.22 each, totaling $15,293.07
- 191,993 cutlery kits are used at $0.15 each, totaling $28,407.28
- 18,058 plastic containers are used at $0.20 each, totaling $3,682.63

These prices were sourced from either past DFAC purchase invoices or online searches for comparable items from wholesale food industry product suppliers. In total, the use of single-use plastic, biodegradable plates, and foam products is expected to cost approximately $82,675.78 annually. Using only single-use foam and plastics would cost approximately $76,879.43 annually. This is approximately

$33,383.78 more than the estimated cost of dish washing. These calculations are shown in Tables 19 and 20.

6.2.3 Selective Composting

Selective composting is one possible action to help reduce food waste. The select food wastes that would be collected in this situation would be the waste from fruits such as bananas, apples, and oranges. It is also a possibility to compost only food preparation waste in addition to fruit waste. An outdoor composting machine would need to be purchased for composting operations. The fruit scraps would need to be collected in a bin separate from the garbage and recycling bins. Signage will be needed to inform individuals of this bin. Compost is considered ready for use when it is dark brown in color, smells like soil, and crumbles when removed from the pile. If compost is ready, it can be extracted from the machine and stored or used.

6.2.4 Compost Uses

Generated compost could be used for landscaping and gardening purposes and could provide opportunities for environmental justice initiatives. Raised beds are inexpensive, easy to construct, and do not take up much space. Gardens could be used as a form of environmental outreach and environmental education tools to learn agricultural or bioremediation techniques, and could be used and managed by YC, site personnel, or community volunteers. For example, Stockton interns could work with YC cadets to develop composting procedures, use the compost to amend soil, germinate seeds, grow and harvest herbs and vegetables, construct raised beds, and manage the gardens. If initial efforts are successful, this may provide future opportunities to expand the program to include more gardens, install small greenhouses around building 66, or create pollinator habitat on-site.

6.3 Alternative Best Management Practices

6.3.1 Animal feed

Another possibility is sending food scraps to local farming operations for animal feed. In the State of NJ, there are specific regulations for sending food waste to be used as animal feed. This method has the potential to save expenses such as transportation cost of the food waste, but has many challenges, including finding a local farm or zoo to donate food scraps to, refrigerating food waste prior to donation, and state and local regulations regarding the utilization of food waste to feed animals. Information about what types of food, how often, and the amount of food scraps that can be provided to a specific farm or zoo operation can be obtained from local solid waste, county agricultural extension office, or public health agency. Referencing the legal guide published by the Harvard Food Law and Policy Clinic, the Food Recovery Project, and the University of Arkansas School of Law (Appendix G) may be useful in considering the legal regulations of donating food scraps for animal feed. The state of NJ establishes two main groups of providing food waste which are commercial feed and donated feed. Commercial animal feed is sold while donated animal feed is not. Commercial feed has many more regulations than donated feed.

The state of NJ prohibits feeding swine and other farm animals untreated garbage or unpasteurized dairy products, apart from individuals feeding household garbage to swine. There are several federal

regulations that involve feeding animals food scraps. The Swine Health Protection Act (SHPA) requires that food scraps containing animal meat or by-products must be heat-treated. These scraps must be heated throughout at boiling temperatures (212°F or 100°C at sea-level) for at least 30 minutes by a person that holds a valid license or permit to treat food scraps fed to animals. It also includes requirements for safely storing treated and untreated food scraps. The FDA's Bovine Spongiform Encephalopathy (BSE)/ Ruminant Feed Ban Rule prohibits the use of mammalian protein in animal feed for all ruminant animals. It also creates compliance requirements for the processing, inspection, labeling, and record-tracking of products that may contain mammalian protein. The Food Safety Modernization Act (FSMA) Preventative Controls for Animal Food requires animal food processing facilities to implement necessary food safety controls such as Current Good Manufacturing Practices (CGMPs), Hazard Analysis and Risk-based Preventive Controls (HARPC), and the Supply Chain Program to prevent foodborne illness during food production and distribution. Facilities that comply with the FSMA Preventive Control Rule for Human Food and who hold and distribute human food by-products for use as animal feed do not have to follow the above requirements if the facility is following all human food safety rules under the Food, Drug, & Cosmetic Act, complies with all CGMPs, and does not further manufacture or process the by-products intended for use as animal food.

The names and locations of the different farms and zoos were retrieved during a Google search. These results were collected and compiled into Figure 8.

6.3.2 Anaerobic Digestion

The process of anaerobic digestion (AD) involves bacteria breaking down organic matter and produces biogas. These reactors contain complex microbial communities that break down the waste and produce resultant biogas and digestate which is discarded from the digester. Diagram 2 shows this process and illustrates the possible uses for biogas and digestate. The use of biogas may be difficult for current SG NGTC operations and finding a location for anaerobic digestion.

6.4 Final Recommendations

As stated in Sections 6.1 - 6.3 above, strategic meal preparation and waste reduction strategies should be the primary focus for reducing unnecessary food waste. However, waste pickup, selective composting, anaerobic digestion, and donation as animal feed are all potential options for utilizing or disposing of the generated food waste. When considering which method to use, it is important to consider the overall goals of this project, and acknowledge the limitations and challenges associated with these methods. Maintenance effort and responsibilities, energy costs, space availability, and output byproduct are all important variables to address when considering a long-term food waste management strategy. Product descriptions for these waste treatment options can be found in Appendix F.

If selective composting is the preferred method to reduce waste, we recommend Aerobin based on the information gathered about this composter. The Aerobin is an outdoor composting machine that can be used year-round. It is odor, rodent, and pest free, and it does not require any turning or electricity. This option would require regular emptying and is only a viable option if site personnel or site groups are willing to maintain the unit and commit to removing and utilizing the compost regularly. Product descriptions for these waste treatment options can be found in Appendix F. If the preferred output is graywater, as opposed to compost, we recommend the Power knot LFC-(25/500) as an alternative to composting. The LFC-(25/500) takes food waste and turns it into graywater that can be safely discharged into sewage systems. This system is odor free, runs constantly, and needs little maintenance. This unit is

a good option if site personnel or site groups are not able to commit to removing and utilizing compost year-round. One downside to this option is that it would use a lot of energy since it is constantly running. Product descriptions for these waste treatment options can be found in Appendix F.

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