



**Sea Girt Food Waste Audit
Sea Girt National Guard Training Center**

2021



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Abbreviations

AD – Anaerobic digestion

AGR – Active Guard Reserve

AR – Army Regulation

ARCS – Army Ration Credit System

ARNG – Army National Guard

BAS – Basic allowance for subsistence

C. - Chapter

CGMPs – Current Good Manufacturing Practices

DA – Department of the Army

DFAC – Dining Facility

DPG – Dining Partnership Group

DOC - Department of Corrections

DOD – Department of Defense

DODM – Department of Defense Manual

EMB – Environmental Management Bureau

FDA – Food and Drug Administration

FOS – Food operations sergeant

FPM – Food program manager

FSMA – Food Safety Modernization Act

HARPC – Hazard Analysis and Risk-based Preventative Controls

JJC – Juvenile Justice Correction

KWh - Kilowatt hour

LLC – Limited Liability Company

NG – National Guard

NGTC – National Guard Training Center

NJ – New Jersey

NJDEP – New Jersey Department of Environmental Protection

NJDMAVA – New Jersey Department of Military and Veteran Affairs

NJNG – New Jersey National Guard

NJSP – New Jersey State Police

P.L. - Public Law

PLS – Department of Public Law and Safety

POS – Point of Sales System

RA – Regular Army

SG – Sea Girt

SHPA – Swine Health Protection Act

SIK – Subsistence in kind

SUEIP – Stockton University Environmental Internship Program

USDA – United States Department of Agriculture

YC – Youth Challenge

Definitions

Anaerobic digester – A system in which anaerobic digestion can occur to produce biogas and other useful coproducts.

Authorized food waste recycling facility – A Class C recycling center within the State authorized to accept, store, process, or transfer food waste or compostable material.

Biogas – A gas that is composed of methane at a relatively high percentage, carbon dioxide, hydrogen sulfide, water vapor, and trace amounts of other gases.

Class C recycling materials – A source separated compostable material which is subject to Department approval prior to the receipt, storage, processing, or transfer at a recycling center.

Commercial feed – All materials intended for sale as animal feed except unmixed seed, whole or processed, when not adulterated which are distributed for use as feed or for mixing in feed, provided 2002 New Jersey Commercial Feed Law, commodities such as hay, straw, stover, silage, cobs, husks, hills, and individual compounds, or substances when such commodities, compounds, or substances are not intermixed or mixed with other materials are not adulterated.

Digestate – The residual material left after the digestion process that is composed of liquid and solid portions that are handled separately.

Food waste – Any food processing vegetative waste, food processing residue generated from processing and packaging operations, overripe produce, trimmings from food, food product over-runs from food processing, soiled and unrecyclable paper generated from food processing, and used cooking fats, oils, and grease, but shall not include food donated by the generator for human consumption or any waste generated by a consumer after the generator issues or sells food to the consumer. This excludes soiled plastic products and liquids such as unused coffee or soft drinks.

Garbage - Putrescible animal and vegetable wastes resulting from the handling, preparation, cooking and consumption of foods including animal carcasses or parts thereof; but the term “garbage” shall not apply to waste materials from slaughterhouses which go directly to rendering plants for processing.

Greywater - the recycling of wastewater that is generated in homes and commercial buildings using water for laundry, dishes, or for bathing.

Large food waste generator – An entity that produces more than 52 tons of food waste in one year.

1.0 Introduction and Project Scope

The Sea Girt (SG) National Guard Training Center (NGTC) provides facilities for the stationing, training, and support of National Guard (NG) Units, Soldiers, Airmen, and Sailors, as well as federal, state, and local law enforcement agencies. This site also supports the functions and needs of the local Youth Challenge (YC) cadets and staff. Meal service operations for site personnel are conducted at the on-site dining facility (DFAC) in Building 11. Approximately 207,000 meals are served at the DFAC annually. This approximation was based on the meal count totals between April 2020 and April 2021. Meal service operations at the DFAC were conducted by Acorn from March 2012 through October 2019, and as of January 2020, Dining Partnership Group (DPG) is the state contracted meal service company. The DPG began their meal operations on June 8, 2021. This contract is valid for three years and may be extended two years under mutual agreement between the vendor and the Director of the DFAC. DPG is contractually obligated to provide meal services to site personnel in accordance with the Army Food Program AR 30-22.

In accordance with AR 30-22, each individual is entitled to at least three healthy meals daily. At the SG facility, meal preparation and food operations are contracted out to Dining Partnership Group LLC. During meal periods, individuals are expected to get their food and beverage items, consume them, and then properly dispose of any left-over items. These left-over food items, any food waste generated from preparation of meals, and food that spoils prior to preparation are considered food waste.

As of April 14, 2021, the Senate and General Assembly of the State of New Jersey enacted an act concerning food waste recycling and food waste-to-energy production, while supplementing Titles 13 and 52 of the Revised Statutes and amending P.L. 1987, c.102 and P.L. 1999, c.23. In brief, these actions called for large waste generators within 25 road miles of an authorized food waste recycling facility to:

- Source and separate its food waste from other solid waste; and
- Send the source separated food waste to an authorized food waste recycling facility that will accept it.

The NJDMAVA EMB has tasked SUEIP with developing and implementing a study to monitor food waste generation and management at the Sea Girt NGTC. The primary objectives of this study are to:

1. Determine if the DFAC food service operations are subject to compliance actions pursuant to the new food waste recycling bill (A2371).
2. Conduct a food waste audit to approximate the mass of food waste generated by the DFAC facility annually.
3. Recommend food waste reduction strategies and alternatives for food waste disposal.

2.0 Regulations Overview

2.1 Food Waste Recycling Bill (A2371)

The food waste recycling bill (A2371) deals primarily with setting food waste and recycling requirements. This bill is included in Appendix A. The bill begins with defining some key terms such as “food waste” and “large food waste generator.” These definitions are included in the definitions section of this report. Clarification for the definition of “food waste” was provided by Fredrik Khayati from the NJDEP on August 3, 2021. The bill also outlines the authorized alternative food waste recycling methods. The bill sets the requirement that:

If a large waste generator:

- Is within 25 road miles of an authorized food waste recycling facility, and
- Generates 52 tons or more of food waste annually

Then,

- They must have the food waste sourced to an authorized food waste recycling facility that has the capacity to accept specific waste.

Diagram 1 summarizes the process for making compliance action determination based on the criteria for exempt or non-exempt facilities described in the bill. If a facility generates more than 52 tons of food waste annually but does not reside within 25 road miles of an authorized recycling facility, the generating facility may send the food waste for final disposal at a solid waste facility. New Jersey Department of Environmental Protection (NJDEP) provides an exemption for large food waste generators if the cost of transportation of the food waste is more than 10% more than the cost of transporting that same waste to a solid waste disposal site. If any person is found to have violated any of the established guidelines of this bill, they are subject to a civil penalty of \$250 for the first offense, \$500 for the second offense, and \$1,000 for the third and each subsequent offense, to be collected in a civil action by a summary proceeding under the "Penalty Enforcement Law of 1999." The bill also states that any municipality within which an authorized food waste recycling facility is located is entitled to an economic benefit of at least \$0.50 per ton, to be paid and adjusted quarterly, of all food waste accepted for processing at the authorized food waste recycling facility. The bill also requires that, when possible, every state department that has landscaping and construction activities should use compost, mulch, or other soil amendments produced from municipal solid waste, food waste, sludge, yard waste, clean wood waste, or other organic materials.

2.2 AR 30-22

The Army Food Program (AR 30-22) prescribes policies, responsibilities, objectives, and standards for the implementation and management of Army subsistence and food service programs in garrison, field, and contingency operations. The meal service section of the Army Regulation (AR) 30-22 states that the serving period for each meal will be a minimum of 90 minutes. AR 30-22 also discusses menu planning and standards. This section states that menus must be entered into an approved automated system five days prior to the required delivery date. Daily menu standards will need to include choices from each food group as described in the United States Department of Agriculture (USDA) My Plate Campaign and must comply with or exceed the standards established by the DoD Nutrition and Food Subcommittee and AR 40-25. With the guidelines provided by these three resources, meals will also incorporate Go For Green standards which involve a caloric and sodium value for each meal item. Dining facilities are required to display the Go For Green dietary information using a coloring system to promote healthy food choices. AR 30-22 also lists criteria for inventory management. The food operations sergeant (FOS), contract manager, or a designated representative operating a full-time army ration credit system (ARCS) account will conduct both weekly, monthly, semiannual, and an end-of-the-year inventory. An automated headcount system or "Point of Sales System (POS)" is to be used in all DFAC and extended delivery option operations. All transactions affecting the DFAC account must be recorded using the Department of the Army (DA) Form 7454 (Monthly Earnings and Expenditures Record) or automated system. A financial summary worksheet,

DA Form 7455 (Financial Summary), or a comparable automated process must be used to determine account status for both the current accounting period and year-to-date.

There is also a section in AR 30-22 that discusses subsisting personnel. In accordance with Department of Defense Manual (DODM) 1338.10, Army establishment of appropriated fund dining facilities and extended delivery operations are established for the purpose of feeding enlisted Soldiers authorized Subsistence in kind (SIK). Soldiers not authorized to receive basic allowance for subsistence (BAS) are entitled to subsist without charge. In addition to regular Army (RA) SIK Soldiers, the following personnel are authorized to subsist in Army appropriated fund DFACs:

- Members of other military Services
- Members of Army senior and junior Reserve Officers' Training Corps
- Scouts BSA and Girl Scouts, Civil Air Support, and any other nonprofit youth organizations
- Cadets of the US military academies

In accordance with DODM 1338.10, each Service is authorized to prescribe the conditions that enlisted, officer, and civilian personnel retaining BAS may purchase meals at appropriated fund DFACs. The following may receive authorization for cash meal purchases:

- Officers
- Foreign military
- Civilian employees
- Family members and dependents
- Other personnel

A ration control sheet, DA Form 5914, must be used to account for all types of operational rations drawn and issued to units or individuals. This sheet will be monitored by all food service supervisory personnel during routine food service visits. Box lunches will be accounted for as operational rations. The facility is not charged for these box lunches, so no headcount credit will be earned when issued to a Soldier. However, box lunches are not authorized for Army field feeding. A list of approved meal kits can be found in Bill Solicitation #20DPP00554 Section 3.4.4.1 and in Appendix C.

In accordance with AR 420-1, commanders at all levels are responsible for initiating energy and water efficiency and waste minimization or recycling programs throughout their commands. Each food program manager (FPM) will ensure that each DFAC and food service-related activity monitors the use of energy and water, the generation of solid waste, and recycling rates.

2.3 AR 40-25

The Nutrition and Menu Standards for Human Performance Optimization Army Regulation establishes nutritional standards for military feeding, operational rations, and restricted rations. Energy and nutrient requirements for individuals are based on their height and weight. The reference measures for weight and height of military members are 187 pounds and 69 inches for men and 152 pounds and 64 inches for women. The meal guidelines of AR 40-25 and guidelines set by the USDA can be found in Table 1.

During long periods of intense physical activity, the daily carbohydrate requirement is 1.8 to 3.6 grams of carbohydrate per pound of body weight. With the reference standard, men should intake 340 to 680 grams daily and women should intake 276 to 552 grams daily. The daily protein intake ranges from 0.4 to 0.7 grams per pound of body weight. With the standard references, the daily protein for men and women

ranges from 68 to 136 grams and 55 to 110 grams respectively. Fats should account for approximately 30% or less of the total calories consumed in one day. Fat intake should include consumption of omega fatty acids, linoleic acid, and alpha-linolenic acid. Saturated fat, trans fatty acids, and dietary cholesterol should be as low as possible. Daily fiber intake should be 34 grams for men and 28 grams for women. Daily iron intake for men should be 8 milligrams and 18 milligrams for women.

To avoid excessive dehydration, cool water (plain or flavored) is the beverage choice for preventing dehydration. It is noted that flavored waters may increase voluntary fluid consumption. During periods of light to moderate work intensity, men should consume 3 to 4.5 quarts daily and women should consume 2 to 3 quarts daily. Hard physical work in a hot environment increases the amount of sodium lost in sweat. When sodium replacement is required, it is preferred that it be obtained through food, beverages, and as added salt to foods rather than concentrated forms of salt. The use of carbohydrate-electrolyte beverages is justified under the following conditions:

- When troops maintain vigorous physical activity for more than three hours.
- When troops have poor nutritional intake or sustain an energy deficit of 1,000 calories or more per day.
- When sweat losses are high and electrolytes are not adequately replaced by diet.

For every eight ounces served, there are ranges that need to be met for sodium, potassium, and carbohydrate. For every 8 ounces, there should be 82 to 163 milligrams of sodium, 18 to 46 milligrams of potassium, and 5 to 10% of daily carbohydrates.

To promote the consumption of food in accordance with Choose My Plate, the following goals were established:

- Strive to make half the plate fruits and vegetables. At a minimum consume two and a half cups of vegetables per day and two cups of fruit per day.
- Consume whole grains at least half of the time.
- Consume a good source of calcium and vitamin D at least three times per day. Good sources include one cup of milk, yogurt, or fortified soy/almond/rice milk.
- Vary the protein food sources daily.

3.0 Meal Service Contract Overview

The current bid solicitation #20DPP00554 awarded a Master Blanket Purchase Order to Dining Partnership Group (DPG). DPG officially became the contracted meal service provider on June 8, 2021. This contract sets requirements that the DPG must meet. The DPG is required to be able and willing to perform complete food services at the SG NGTC for the New Jersey National Guard (NJNG), Department of Law and Public Safety (PLS), Department of Corrections (DOC), Department of Military and Veteran Affairs (DMAVA), etc. and meet the performance standards set forth in the Bid Solicitation. The bid solicitation provides the estimation of weekly meal totals for these groups to be 1,927 breakfast meals, 2,580 lunch meals, 2,099 dinner meals, and 1,815 snack meals.

The DPG is also responsible for providing meals for separate on-site purchases by Training Center visitors, NGTC and tenant employees, Active Guard Reserve soldiers (AGR), and Officers. The DPG is also responsible for providing full meal services for the NJNG drill weekends, NG youth camp, Youth Challenge Program, and New Jersey State Police (NJSP) Trooper Youth Week. The bid solicitation provides the

estimation of meals as 1,927 breakfast meals, 2,580 lunch meals, 2,099 dinner meals, and 1,815 snack meals in total.

The DPG is required to provide meal services seven days a week. The approximate meal service times are the following:

- Breakfast: 06:00 – 08:30
- Lunch: 11:00 – 13:30
- Dinner: 16:00 – 18:30

The bid solicitation also sets requirements for menu items dependent on the type of meal being served. These meal specific menu items can be found in Table 2. Box meals can have a variety of menu items that meet nutritional requirements. These different menu item options can be found in Table 3.

The following protocols were set forth in the bid solicitation regarding meal nutrition:

- Hot entrees shall include a fish or meat product such as pork, chicken, turkey, beef, veal, etc. Pasta shall not be considered a hot entrée. When pork is served, a secondary meat product is to be served.
- Liquid, frozen, or dried egg products may be used as ingredients for cooking and baking. Shelled eggs shall be used for eggs cooked to order and/or hard cooked eggs.

Reports shall be filed by the DPG to the State Contract Manager at monthly Dining Facility Committee meetings. These reports shall include, but are not limited to:

- All meals served, including on-site for purchase food service sales covered by this Bid Solicitation
- Operation dates and times
- Customer count
- Sales in dollars
- Reports shall be broken down by meals (breakfast, lunch, dinner) by agency by day

Section 3.3 of the bid solicitation describes all contractual operations to be performed by the contractor, including cleaning and sanitizing dinnerware. Section 3.5.3 of the bid solicitation says that the contractor can use single-use dinnerware in the event of a power outage or mechanical failure.

4.0 Methodology

The following assessments were conducted to determine if the Sea Girt NGTC DFAC operations are subject to the food waste requirements of A2371:

- Determine if the Sea Girt NGTC DFAC is within 25 road miles of a Class C recycling facility that accepts food waste
- Determine if meal service operations at the Sea Girt NGTC DFAC generate 52 tons or more of food waste per year

- Determine expected meal counts and number of people served for a 1-year period
- Determine the total amount of food that is purchased for use for a 1-year period
- Observe and document the meal distribution and mealtime procedures specific to each different group
- Conduct a food waste collection experiment to quantify food waste for a 1-day period
- Extrapolate experimental results to approximate food waste totals for a 1-year period

4.1 Determination of Class C Recycling Facilities' Proximity to SG NGTC

A Class C recycling facility is a facility that accepts source separated compostable materials. The definition of Class C recycling materials is included in the definitions section of this report. The NJDEP Division of Solid and Hazardous Waste provides a list of authorized Class C recycling facilities throughout the state (Appendix B). This list provided the names of the recycling facilities and their locations and is current as of July 2021. To determine how many road miles are between each location and the SG NGTC, the coordinates of each facility were plotted on a map (Figure 1). Google Maps was used to determine driving distance for each facility. These values are shown in Table 4. This table was used to create Figure 1 which shows the authorized Class C recycling facilities in NJ. Of the 12 potential authorized recycling facilities, only two were within 25 road miles of the Sea Girt NGTC. These two sites are Ocean Township Compost and Brick Township Compost. Although these two sites are within 25 road miles and are authorized recycling facilities, these two entities do not accept food waste. Ocean Township Compost only accepts leaves, while Brick Township Compost only accepts leaves and brush. There are currently no Class C recycling facilities that accept food waste within 25 road miles of the SG NGTC. Facility managers should be aware that new recycling facilities may open nearby in the future, or the two existing Class C recyclers within 25 road miles may begin to accept food waste in the future in response to the A2371 bill. Facility managers should check the authorized Class C recycling facilities list provided by the NJDEP regularly. The nearest Class C recycling facility that accepts food waste is Republic Services NJ LLC d/b/a Midco Waste in Middlesex County and is 49.7 road miles away from the Sea Girt site.

4.2 Estimation of Potential Food Waste

4.2.1 Determination of Meal Counts

In accordance with the Army Food Program (AR 30-22), the number of individuals that utilize DFAC services is recorded. These recordings include counts for how many individuals from each group attend each meal. The main groups that utilize the DFAC are JJC, DOC, NJSP, NJNG. The meal count records include another section for other various groups that may use the DFAC services. The total monthly counts for each meal can be found in Table 5a-f. Related graphs can be found in Figure 2-6. From April 2020 until May 2021, there were a total of 217,267 meals served. Of these meals served, 46,834 were from breakfast, 55,324 from lunch, and 47,197 from dinner. Snack and box lunches were also served to some groups and totaled 11,935 and 55,977 meals served respectively.

4.2.2 Determination of Total Tons of Product Ordered

To estimate the maximum food waste generation potential, invoices were collected to calculate the weights of each product ordered in each purchase. These invoices showed purchases made between December 15, 2020, and June 10, 2021. The invoices provided information such as the total units ordered, how many products were included in each unit, and the weight measurement of each product. Using this information, the weight was calculated for each ordered product and categorized based on if the item was food, beverage, or miscellaneous. The tonnage for each purchase category can be found in Table 6.

The total tons of product wasted from December 12, 2020, to June 10, 2021, was 1.311 tons. The total food waste during this period was 0.694 tons. The other mass of the ordered products was from ordered beverage and plate ware items. These data were calculated using the weight per unit and how many units were ordered. These numbers were then added in their different categories (food, beverage, or plate ware) and documented in Figure 7.

4.3 Meal Service Observations

On August 18, 2021, observers attended breakfast, lunch, and dinner to observe meal operations at the Sea Girt DFAC. The meal service schedule can be seen in Photograph 1. During the meal observation period, the NJSP, YC, and military and staff were served meals. NJSP marched into the DFAC for their meal service which can be seen in Photograph 7. Observers counted and documented the number of meals served to each group. In total, 1,247 meals were served during this 1-day (3 meal) period. These meals were served to 185 NJSP, 83 NJDMAVA personnel and staff, and 86 YC. This meal observation was conducted approximately three weeks after the beginning of the NJSP class and at the beginning of the YC Academy. Meal service procedures of the NJSP and YC may change depending on their progress in their programs. The DOC and JJS were not in session at the time these observations were conducted.

The DFAC layout for the dining area was two sections of tables that were separated by a salad bar. One side of the dining area had 15 tables while the other had 9. Photographs 4-6, Photograph 8, Photographs 11-12, and Photographs 16-17 show the layout of the dining area of the DFAC.

4.3.1 Meal Menu

Breakfast meal service was conducted from 6:30-8:15. The NJSP had between 6:30 and 7:00 for their meal period. The military staff meal period was between 7:00 and 7:45. At 7:45, the YC cadets began their meal period which lasted until 8:15. 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 items were announced in the weekly meal calendar and on a sign at the beginning of the meal service line (Photographs 2, 3, 51, and 52).

Menu meal items were as follows:

- Two pancakes
- Hash browns
- Cheesy scrambled eggs
- Chicken sausage

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

- Bread and butter
- Cereal and milk
- Fresh fruit (apples, bananas, and oranges)

Lunch meal service was conducted from 11:00 until 13:15. The military staff meal period was between 11:00 and 11:45. The NJSP had between 11:45 and 12:15 for their meal period. At 12:45, the YC cadets began their meal period which lasted until 13:15. 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: