

Technical Specifications for Biosolids Management Services

JEA Buckman Residuals Management Facility

1. Background

JEA is seeking biosolids management services from experienced biosolids management contractor(s) and service providers (the “Contractor” or “Company”) that possess technical expertise in managing and beneficially reusing Class A, thermally dried biosolids pellets and Class B and unclassified dewatered cake biosolids for a large, municipal wastewater utility. JEA intends to award one continuing service contract for this work but reserves the right to issue more than one contract. Separate contracts may be utilized for management of biosolids from different JEA facilities.

1.1 Existing Facilities

Dewatered cake biosolids from JEA’s Buckman Residuals Management Facility (RMF), Blacks Ford Water Reclamation Facility (WRF), Monterey WRF, and future Greenland WRF will be included in the contract(s) for biosolids management services. The Blacks Ford WRF and Monterey WRF produce primarily Class B, aerobically digested and dewatered biosolids. The Greenland WRF will be a similar facility to the Blacks Ford WRF and is predicted to begin operation about 2025.

The Buckman Water Reclamation Facility (WRF) and the Buckman Residuals Management Facility (RMF) are located at 2221 Buckman Street, Jacksonville, Florida, (see Figure 1-1) and are centrally located within JEA’s service area. The Buckman WRF is JEA’s largest wastewater treatment facility, with a permitted annual average daily flow (AADF) treatment capacity of 52.5 million gallons per day (mgd) and an AADF ranging from approximately 29 mgd in 2018 to 34 mgd projected in 2038. Residuals from the Buckman WRF and several other WRFs are transferred to the Buckman RMF for treatment.

Influent wastewater to the Buckman WRF passes through mechanical bar screens before entering an onsite influent pump station. This pump station sends the screened influent to an influent chamber where it combines with influent from offsite lift stations. This combined flow then enters two grit settling basins with three channels per basin. The dewatered flow then passes through two mechanical fine screens and onto one of eight primary clarifiers. The primary effluent proceeds to secondary treatment, which is composed of four aeration tanks with fine bubble diffusers operated in series. The combined basin includes anoxic and oxic zones along with recycle pumping for nitrogen removal. The flow then proceeds to one of six secondary clarifiers and then to an ultraviolet (UV) disinfection system. Effluent is discharged to the St. Johns River with a permitted discharge capacity of 52.5 mgd AADF. Sludge from the primary and secondary clarifiers is transferred to the raw holding tank at the Buckman RMF.

The biosolids management process at the Buckman RMF begins with primary sludge, waste activated sludge (WAS), and the pumped or trucked residual solids from the JEA WRFs being combined in the raw sludge storage tank, then pumped to the gravity belt thickeners. Output from the gravity belt thickeners is then pumped into three anaerobic digesters. Biogas is harnessed from the digesters and used as fuel for energy production. The approximately 3 percent total solids (TS) digested sludge is moved from the digesters to the centrifuges for dewatering where additional polymer is added. The dewatered biosolids, now at approximately 20 percent TS, are conveyed from the centrifuges to a thermal dryer where they reach 95 percent TS. The dried biosolids are stored in silos before being land applied or further processed by the vendor into other fertilizer products.

The Buckman RMF has an approximate design capacity of about 35 dry tons per day of solids loading based on the existing condition of equipment.

The existing biosolids dewatering and drying building has reached the end of its useful life and is not considered a viable candidate for rehabilitation because of the extremely high costs involved in rehabilitating the building and bringing up to current design and building code standards.

1.2 New Biosolids Process Facility

A new facility will be constructed for solids thickening, dewatering, and truck loading. The current concept for a new biosolids process facility at Buckman WRF is a three-story structure with thickening and polymer feed processes and two truck loading bays on the first floor. Conveyors would be located on the second level for safe and convenient access for maintenance. The third floor will house operations and dewatering. Existing thickening and dewatering equipment will be relocated to the new biosolids process facility. New biosolids cake storage bins and truck loadout facilities will be used to transfer dewatered cake from the Buckman RMF to the Contractor's trucks for hauling to the Contractor's biosolids processing, reuse, or disposal sites. In the case where the Contractor will be using a JEA-provided site for a Merchant Organics Recycling Facility (MORF), JEA will be responsible for hauling the dewatered biosolids cake from the Buckman RMF to the MORF.

Viable thickening, dewatering, and conveyance equipment will be relocated from the existing solids process building to the newly constructed facility as needed. Once the new facility is operating, the existing facility will be demolished to alleviate safety concerns and provide available space for future plant upgrades as needed.

A DigestivorePAD™ (post-aerobic digestion process) is also planned to be added to the Buckman RMF between anaerobic digestion and dewatering. One of the anticipated benefits of this process is the reduction in total solids (TS) produced by approximately 10 percent (on a dry-mass basis) through further volatile solids reduction. This additional digestion process is expected to be operational by 2022.

1.3 Other Facilities

Solids from the existing Blacks Ford WRF and Monterey WRF and future Greenland WRF will also be included in the contract for biosolids management services. See Figure 1-1 for the general locations of these WRFs. The Blacks Ford WRF expansion is under construction and when complete will consist of screening, biological treatment in an oxidation ditch in a 5-stage Bardenpho process configuration for biological nitrogen and phosphorus removal, secondary clarifiers, filtration, and UV disinfection. Alum may be added to polish residual phosphorus from the biological process when necessary. Waste activated sludge will be sent to aerobic digestion followed by centrifuge dewatering producing Class B dewatered biosolids.

The Greenland WRF is expected to be a similar facility to the Blacks Ford WRF, and is predicted to begin operation about 2023 as noted in Table 2-2.

As with the Buckman RMF, if the Contractor proposes to use a site provided by JEA for a MORF, JEA will also be responsible for transporting the dewatered cake biosolids from the other WRFs that produce dewatered biosolids to the MORF site.

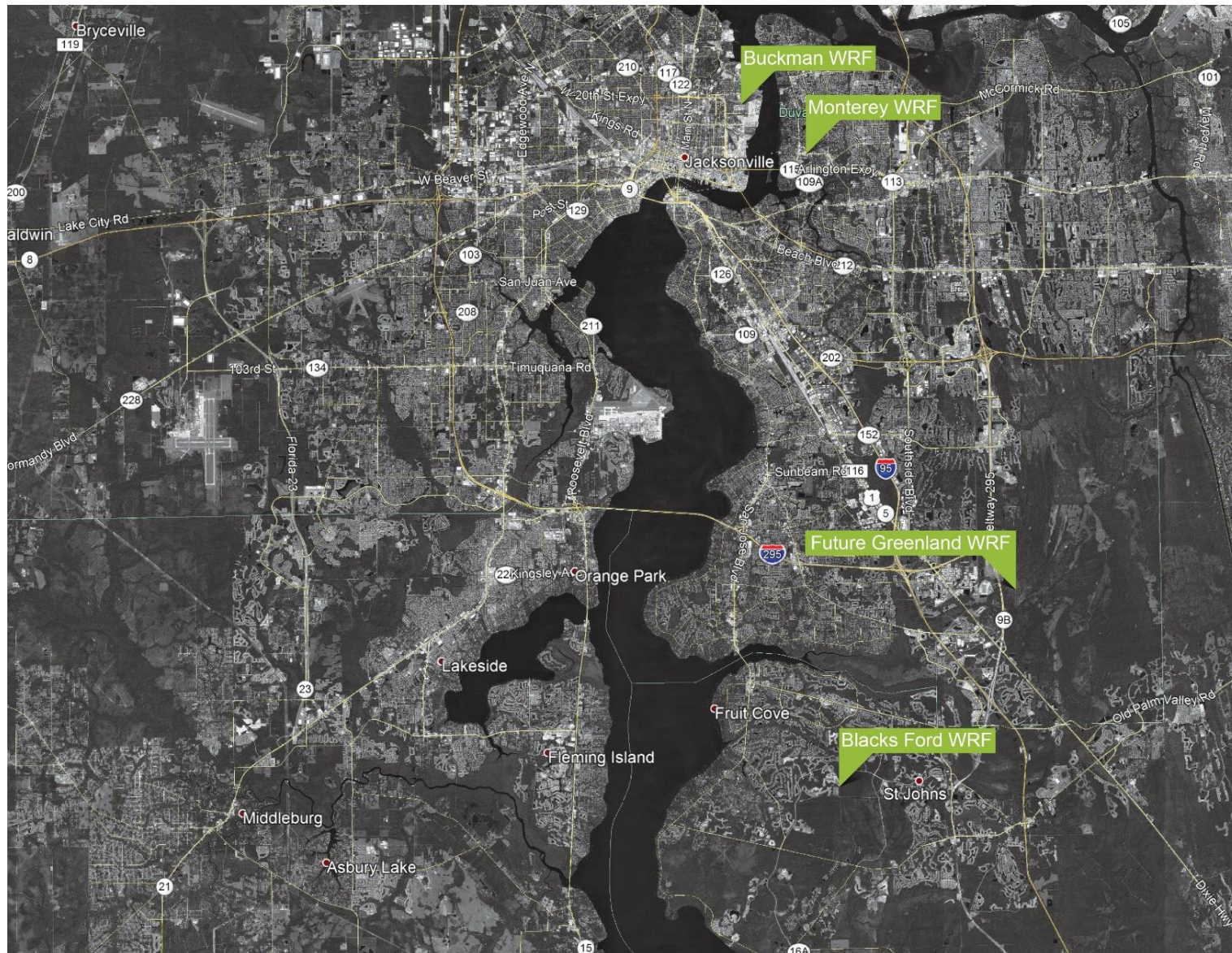


Figure 1-1. General Locations of JEA Water Reclamation Facilities Generating Biosolids to be Managed Under Invitation to Negotiate

2. Scope of Work

The work will consist of receiving Class AA thermally dried biosolids, Class B dewatered biosolids, or at times, unclassified solids from the designated truck loading stations at JEA's existing Buckman Solids Process Building while it remains operational until approximately 2022 and then switching the biosolids receiving location to the new Buckman Solids Process Building, where the material received will consist primarily of Class B dewatered biosolids (Project). The work will also consist of receiving primarily Class B dewatered biosolids from JEA's Blacks Ford and Monterey WRFs and future Greenland WRF.

As noted above, the biosolids will be transported to the permitted biosolids processing sites, to land application sites, or to biosolids disposal locations such as landfills. Work areas and scope may include, but not be limited to, the following:

1. Design, construct, operate, and maintain merchant organics recycling facility (MORF), or biosolids land application, or biosolids disposal facilities at offsite locations either owned or operated by the Contractor or, in the case of a MORF, on one of the JEA- or COJ-owned sites discussed in Item 4 below, with sufficient capacity to process JEA's biosolids, which have projections of mass quantities as shown in Tables 2-1 and 2-2, and general characteristics as described in Table 2-3, for a **20-year** contract operating period. For purposes of this Invitation to Negotiate (ITN), the contract operating period is assumed to be 2019-2038. **The total quantity of dewatered cake (average annual daily basis) to be managed under this ITN in 2038 is approximately 47 dry tons per day or 235 wet tons per day, assuming an average dewatered cake solids content of 20 percent.**
2. Receive dewatered cake biosolids or dried biosolids at one of the designated JEA- or COJ-owned sites discussed in Item 4 if the Contractor decides to locate a MORF at one of those sites. Otherwise, Contractor shall unload dewatered cake biosolids or dried biosolids at one of the designated interface connection points and transport them to the Contractor's MORF not located on the designated JEA- or COJ-owned sites, land application, or disposal sites throughout the **20-year** contract operating period. The location of interface connection points at the Buckman RMF are shown approximately in Figures 2-1 and 2-2 (Process Schematics), Figure 2-3 (Existing Site Plan) and Figure 2-4 (Future Site Plan), and will be determined more precisely on Step 2 of the ITN.
3. Incorporate available yard waste if the Contractor's MORF involved composting that can make use of yard waste as a bulking agent and carbon amendment. Available yard waste can be made available from through JEA's Vegetation Management contractor, and other sources in the Jacksonville and Duval County area. It is estimated that approximately 50,000 tons of yard waste are generated by JEA's Vegetation Management contractor annually, which is part of an estimated 300,000 tons of yard waste generated annually in Duval County. Of that annual total, approximately 100,000 tons are collected by COJ and the remaining approximately 200,000 tons are collected and processed by private entities. COJ does not have any yard waste composition or quality data for the material received at Trail Ridge Landfill. There are several private companies that contract with COJ to collect and process (chip) the yard waste. If the Contractor implements a composting process for the MORF, the Contractor will be responsible for coordinating with COJ or its private contractors for transport and pre-processing (grinding, chipping, etc.) of COJ yard waste. **Attachment 1 - List of Yard Waste Collection and Processing Contractors Employed by City of Jacksonville**, provides a contact list of current entities that COJ contracts with for collecting and processing yard waste. JEA's Vegetation Management contractor is Trees, Inc., (contact: Anthony Principi, President, phone: 443-838-7174, email: aprincipi@trees-llc.com).
4. Design facilities for handling any recycle waste streams produced at the Contractor's BPF(s).
5. For cases where the Contractor proposes to develop, operate, and maintain a MORF for managing JEA's biosolids covered under this ITN, the Contractor may elect to use one of the four (4) sites that

JEA and COJ intend to commit for the Contractor's use. JEA or COJ intend to commit a minimum, useable parcel size of 30 acres at each site for all MORF facilities. The site would be leased to the Contractor for a nominal lease cost (i.e., One dollar per year) to be negotiated with the successful proposer. If the Contractor decides to use one of the MORF sites identified herein, JEA will be responsible for loading and transport costs to deliver dewatered cake biosolids to the site from all JEA WRF facilities covered under this ITN. The general site locations, which are shown on Figure 2-5 are as follows:

- Site 1: Northside Generating Station (NGS) A- NGS A is located adjacent to William Ostner Road on the western edge of JEA's NGS site. New Berlin Road forms the western edge of the parcel.
 - Site 2: NGS B-JEA can also provide an alternate site at NGS which is located approximately one mile east of the intersection of New Berlin Road and William Ostner Road. The west side NGS B abuts the St. Johns River Power Park which is being decommissioned.
 - Site 3: Trail Ridge Landfill- COJ will provide a dedicated site at the Trail Ridge Landfill. All the residential yard waste collected in Duval County is delivered to the Trail Ridge Landfill which is located approximately 6 miles south of Baldwin, Florida off State Highway 301.
 - Site 4: Deep Creek- This large JEA-owned property is located approximately 2 miles west of State Highway 301 and abuts Interstate 10 on the north side. Primary access to this tract is from U.S. Highway 301, approximately 0.6 miles south of the Interstate 10-U.S Highway 301 intersection. JEA will identify a 30-acre parcel within the 2000-acre Deep Creek parcel for the MORF site.
 - Site 5: Peterson Tract- This large JEA-owned property is located approximately 2 miles east of State Highway 301 and extends from Wells Road on the south to Interstate 10 to the north, abuts Interstate 10 on the north side. Primary access points to the site are from Yellow Knife Road and Wells Road. JEA will identify a 30-acre parcel within the 3000-acre Peterson Tract for the MORF site
6. Design, construct, operate, and maintain all required utilities (water, sewer, electricity, natural gas, biogas) for the MORF(s). For MORF sites located at NGS (NGS A and B), there may be potential sources of waste heat or other heat sources that could be used to support MORF operations (i.e., drying). Refer to **Attachment 2 – Technical Specification for Northside Generation Station Waste Heat**, for a description of these sources associated with the operation of Generating Units 1 and 2 and the availability of natural gas from an existing pipeline located on the plant site. It is the Contractor's responsibility to determine the economic viability of recovering available waste heat or using available natural gas for any proposed MORF to be located at the NGS.
7. Operate and maintain, or produce, biosolids end product(s) that can be marketed or disposed.
8. Identify, obtain, and maintain all construction and operating permits required by local, state, and national jurisdictions. Permits will include those for site development, utilities, water and air pollution prevention, zoning, and environmental. JEA will cooperate with the Contractor on providing information necessary for permitting related to site development, zoning, and utility coordination. All permits and licenses required for design and construction will be obtained and paid for by the Contractor.
9. Market the biosolids end product(s) to potential users, or properly handle and dispose of any other biosolids products.
10. Develop an appropriate monitoring, record keeping, and reporting program to accomplish the following:
- Measure the quantity of materials processed

- Identify and track where material is used
 - Maintain a record demonstrating the quality of the material produced, if the material is distributed or marketed to the public or private enterprise
 - Record and maintain all regulatory reports
 - Maintain accounting records, recording costs and revenues that would be required by regulations or tax law
 - Perform all sampling and analyses required for the program; sampling and analyses must be performed in accordance with local, state, and federal regulatory requirements.
 - Develop and implement an appropriate asset management and maintenance management program, perform required preventive and corrective maintenance for the new facilities, and perform asset replacement consistent with the asset management program.
11. Perform all work in accordance with the more stringent code or regulation should there be a conflict in applicable regulations.
12. **Biosolids Specifications:** JEA currently produces Class AA dried biosolids with typically greater than five percent (5%) nitrogen. When the thermal dryer is not operating and after its operation has been terminated, JEA produces dewatered biosolids meeting FDEP Class B requirements and suitable for land application on permitted sites. Refer to **Attachment 3 – Buckman WRF Class B Vector Attraction Reduction (VAR) Compliance Data** for results of three recent laboratory tests confirming compliance with Class B VAR standards for the Buckman WRF anaerobically-digested dewatered biosolids. Upon request, JEA will provide additional pathogen reduction and VAR Class B compliance data for biosolids produced by the Buckman WRF and other WRFs included in this ITN.
13. **Odor Control Requirements:** All sites where biosolids are to be further processed (such as the MORF) or land applied will need to meet local and state requirements for acceptable odor levels at the nearest affected receptor. “Receptor” is generally defined as any location where any member of the public may reside, work, or travel through on a regular basis. “Acceptable odor level” is generally defined as an odor level that cannot be considered a nuisance level by a reasonably odor-sensitive individual, and is not detected by a reasonably odor-sensitive individual above background odor levels. The specific means of achieving acceptable odor levels at all locations that would potentially be impacted by the transport, processing, land application, or landfilling of biosolids must be provided by the Contractor as part of its response to this solicitation. The means of odor control and measurement to ensure acceptable odor levels will be discussed in more detail as the ITN process proceeds.
14. **Service Level Requirements:** During the Performance of the contract, the Contractor shall maintain the following minimum service levels and maintain operational procedures to address issues such as power outages, outage recovery planning with time-frames, and disaster-recovery planning, as detailed further in the items that follow:
- 14.1 **Emergency Support:** Contractor shall provide a contact phone number to support emergency responses at any time day or night.
 - 14.2 **Storm Events:** The Company shall provide a return to service in the event of a disaster (storm, hurricane), as mutually agreed to and negotiated with JEA (this should be considered during the ITN process). JEA may request additional load (or additional trailers for staging) out on an emergency basis (i.e., a Sunday, with 24-hour prior notice).

- 14.3 **Recovery Plan:** Contractor shall provide a recovery plan within 24 hours of power outages and other significant interruptions to operations, including timeframes for returning to normal operations. Following power outages, Contractor shall provide in writing the outage cause and plans to prevent or minimize downtime in the future.
- 14.4 **Biosolids Loading Conditions and Times:** Under conditions when Contractor is responsible for loadout and transport of biosolids from JEA facilities, Contractor shall accept biosolids at regular intervals and frequencies such that the JEA's biosolids storage facilities will remain at or below 75% of full capacity. Contractor shall coordinate with JEA and receive JEA approval for biosolids loadout and staging activities at each facility. The period of time and number of trailers to be stored shall be subject to JEA approval. Regular pickup and loading times shall be between the hours of 7 a.m. to 3 p.m., Monday through Saturday. Pickup and loadout activities outside regular hours shall be requested and approved at least 24 hours in advance. Contractor shall not leave trucks onsite, and truck drivers shall not park onsite for resting periods. Contractor's vehicles shall hold a minimum of twelve (12) tons per individual truckload.
- 14.5 **Biosolids Storage Capacities and Control Levels at JEA facilities:** JEA's existing, dried biosolids storage facility has two (2) holding tanks with a combined capacity of 400 tons. JEA is required to keep both tanks below their Upper Control Limit. The Upper Control Level for each tank is seventy-five percent (75%) of the tank's capacity (150 tons/tank). Contractor shall coordinate with JEA to ensure that JEA's Upper Control Limit is not exceeded. If the Upper Control Limit of a tank exceeds seventy-five percent (75%), Contractor shall pick up a minimum of four (4) truck loads (2 per silo) to bring levels back to within tolerance. If Contractor does not pick up within twenty-four (24) hours, JEA shall have the excess volume landfilled at Contractor's expense. JEA shall charge Contractor the current landfill rate. If Contractor fails to perform in accordance with the requirements stated herein, JEA may terminate the contract for default. The Upper Control Level and Upper Control Limit concepts shall apply to JEA's future dewatered-cake storage and loadout facility at the Buckman RMF, as well as biosolids cake loadout facilities at JEA's existing Blacks Ford and Monterey WRFs and JEA's future Greenland WRF. This control limit applies to all circumstances when it is Contractor's responsibility to retrieve and transport biosolids from JEA facilities.
- 14.6 **Load-Out Station Chute Clearance:** Clearances for tractors and trailers will be a minimum of twelve foot (12'), six inches (6"). Rubber skirts around loading chutes may be lower than twelve feet (12'), six inches (6"); however, skirts lower than twelve feet (12'), six inches (6") in height will not interfere with driving equipment through the station.
- 14.7 **Planned and Unplanned Shutdowns:** In the event that JEA needs to shut down dewatered biosolids cake or dried biosolids storage facilities for maintenance, Contractor shall respond with enough trucks to completely empty the storage within a reasonable time, not to exceed 48 hours. Contractor shall pay the agreed upon price per ton. In the event of an unscheduled shutdown or other unscheduled stoppage and resumption of biosolids production, JEA shall manage offloading biosolids to a suitable landfill.
- 14.8 **Weighing of Biosolids:** Contractor shall be required to have the vehicle used in transporting the Biosolids weighed before and after loading. Contractor shall provide sequentially numbered bills of lading which shall have the weight recorded prior to departure. This weighing shall be performed at the Buckman station scales, and weight

tickets shall be furnished to JEA for each load. Contractor shall contact the JEA Representative at the pickup site prior to the weighing of the vehicle. A JEA Representative may be present to observe all weighing and accumulate weight tickets. Per the FDEP permit, JEA cannot allow biosolids to be loaded when weigh scales are not operable. In this event, Contractor shall not be responsible for paying any cost for landfilling the material. JEA shall notify Contractor when the scales are not operable and when they return to service.

Table 2-1. Solids Production Forecast for the Buckman RMF*

Year	TS to Buckman RMF (dry tons/day) ADF	Peak 3 Month TS to Buckman RMF (dry tons/day) 1.11 x ADF	TS after Digestion* (dry tons/day) 62% x TS to Buckman RMF + 5% x TS after 2021	Peak 3 Month* After Digestion (dry tons/day) 1.11 x TS after Digestion
2018	52.0	57.7	35.35	39.24
2019	51.6	57.2	35.06	38.92
2020	51.9	57.6	35.27	39.15
2021	52.3	58.0	35.54	39.45
2022	52.7	58.5	34.02	37.76
2023	52.9	58.7	34.15	37.9
2024	53.3	59.1	34.41	38.19
2025	53.7	59.6	34.66	38.47
2026	54.2	60.2	35.02	38.87
2027	54.8	60.8	35.38	39.27
2028	55.3	61.4	35.75	39.69
2029	55.9	62.1	36.12	40.09
2030	56.5	62.7	36.48	40.49
2031	57.0	63.2	36.79	40.84
2032	57.5	63.8	37.12	41.21
2033	58.0	64.3	37.44	41.56
2034	58.4	64.9	37.76	41.91
2035	58.9	65.4	38.07	42.26
2036	59.5	66.0	38.43	42.65
2037	60.0	66.6	38.78	43.04
2038	60.6	67.2	39.12	43.42

*Updated based upon new JEA 2018 wastewater flow projections. Values include anticipated 5% mass reduction in biosolids after post-aerobic digestion (PAD) is implemented at Buckman RMF in 2022.

Table 2-2. Solids Production Forecast for the Blacks Ford, Greenland, and Monterey WRFs

Year	Blacks Ford WRF TS (dry tons/day)	Greenland WRF TS (dry tons/day)	Monterey WRF TS (dry tons/day)
	ADF	ADF	ADF
2018	1.61	0	1.13
2019	2.68	0	1.13
2020	2.81	0	1.14
2021	2.92	0	1.15
2022	3.04	0	1.15
2023	2.08	2.63	1.16
2024	2.18	2.68	1.17
2025	2.27	2.73	1.17
2026	2.33	2.80	1.17
2027	2.38	2.87	1.18
2028	2.44	2.94	1.19
2029	2.50	3.00	1.19
2030	2.55	3.07	1.20
2031	2.61	3.15	1.21
2032	2.67	3.23	1.21
2033	2.73	3.30	1.21
2034	2.78	3.38	1.21
2035	2.84	3.46	1.21
2036	2.90	3.53	1.21
2037	2.95	3.60	1.22
2038	3.00	3.66	1.22

Table 2-3. Characteristics of Biosolids Produced at the Buckman RMF

Type of Biosolids	Total Solids Concentration, %	Ratio of volatile solids to total solids (%)	Regulatory Standard Met
Class AA Dried Pellets	88-95% TS	65-75% TS	EPA Class A pathogen reduction Vector attraction reduction Pollutant concentrations under EPA Table 3 limits
Class B Dewatered Cake	18-22% TS	60-80% TS	EPA Class B pathogen reduction Vector attraction reduction Pollutant concentrations under EPA Table 3 limits
Unclassified, dewatered cake	17-22% TS	n/a	Does not meet Class B pathogen reduction, vector attraction reduction, or pollutant concentration limits, so it must be landfilled or processed further at Contractor's BPF provided it meets pertinent requirements

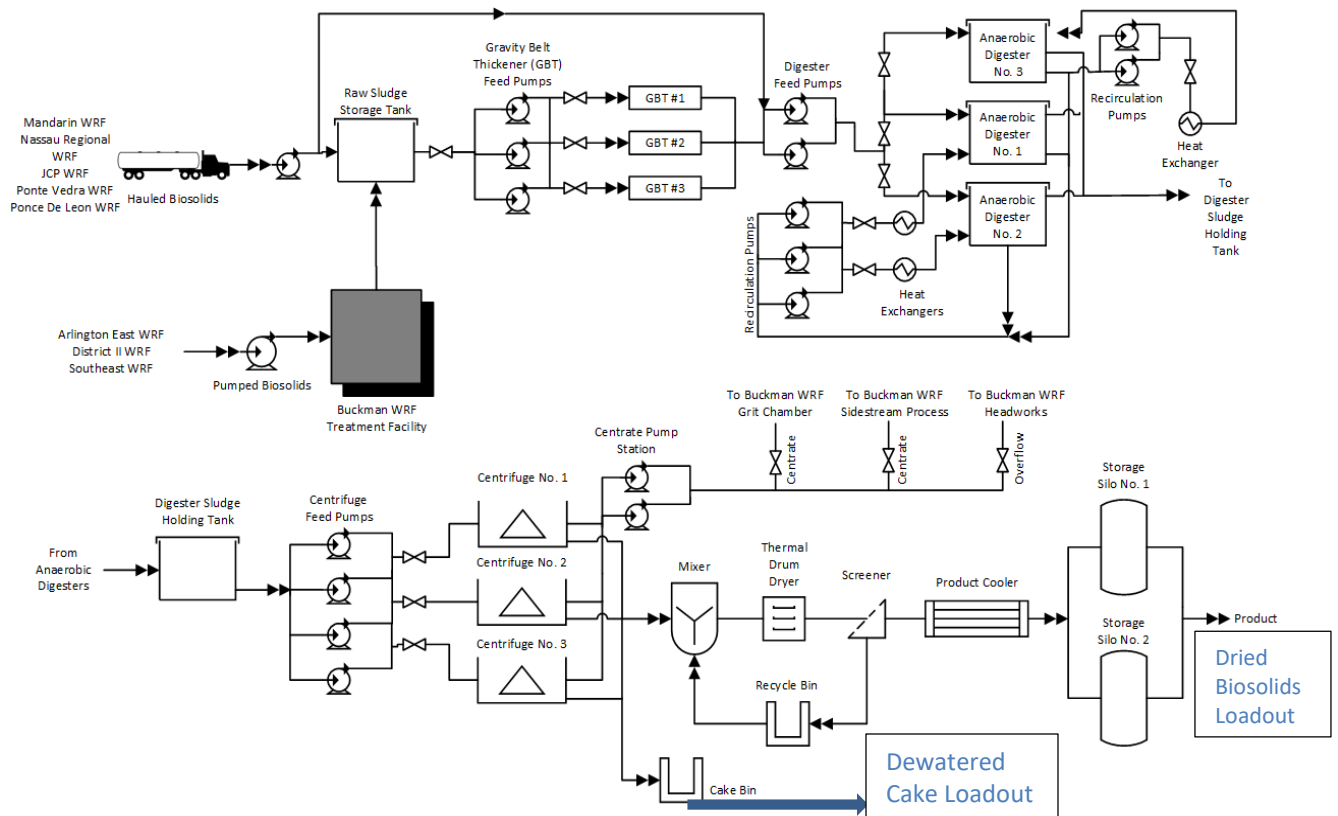


Figure 2-1. Existing Buckman RMF Process Flow Diagram

APPENDIX A - TECHNICAL SPECIFICATIONS FOR BIOSOLIDS MANAGEMENT SERVICES
JEA BUCKMAN RESIDUALS MANAGEMENT FACILITY

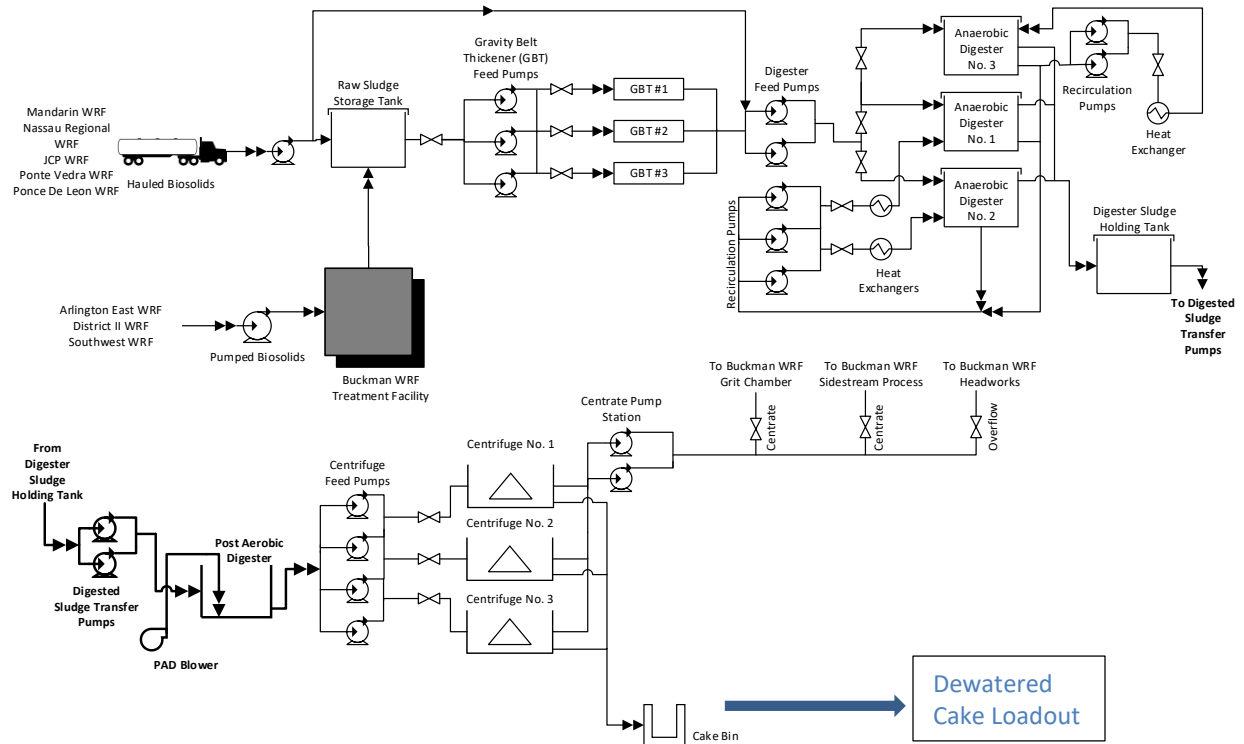


Figure 2-2. Future Buckman RMF Process Flow Diagram (after 2022)

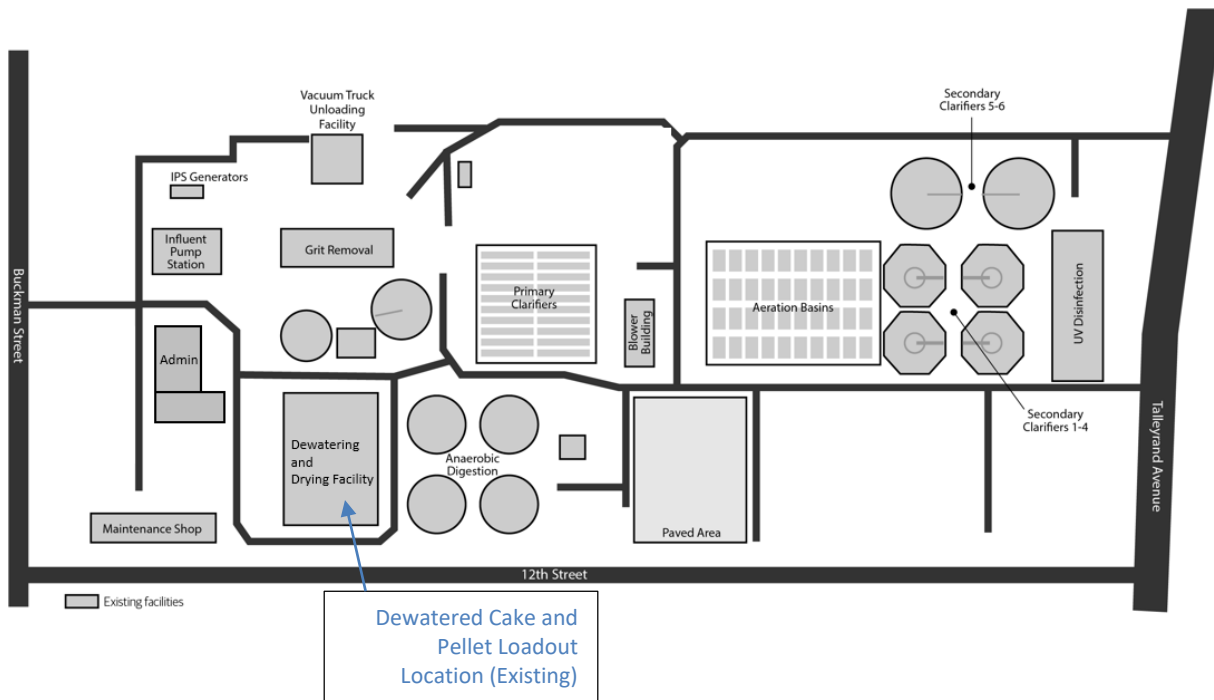


Figure 2-3. Buckman RMF Existing Site Plan Concept

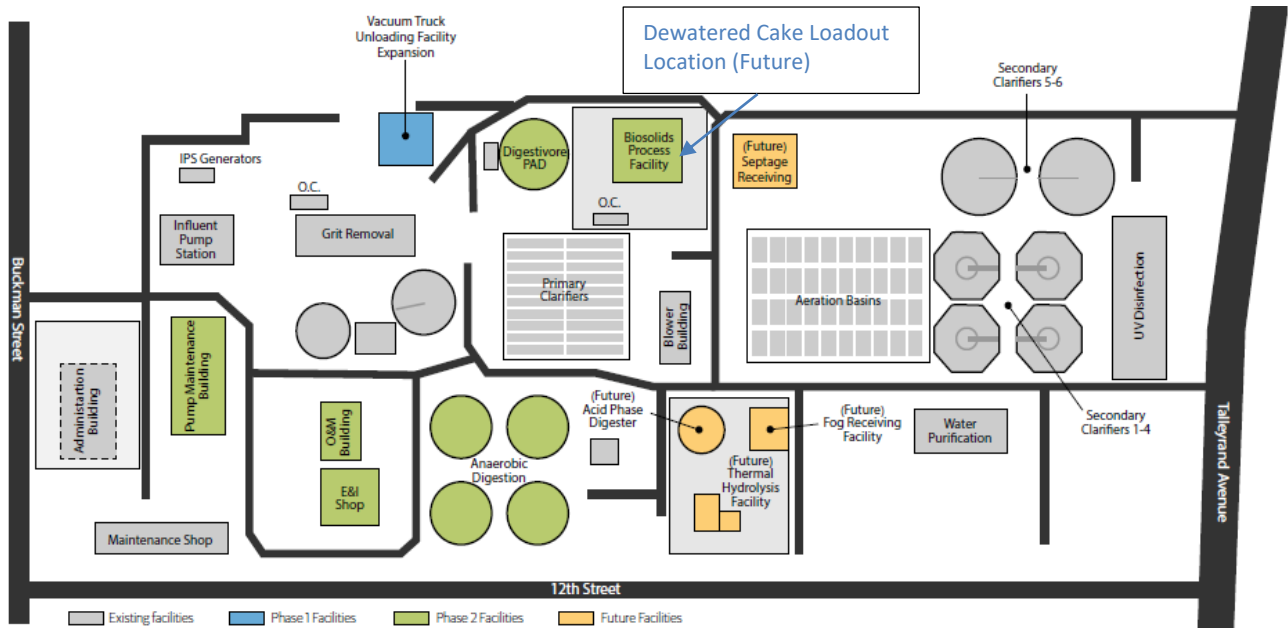


Figure 2-4. Buckman RMF Future Site Plan Concept

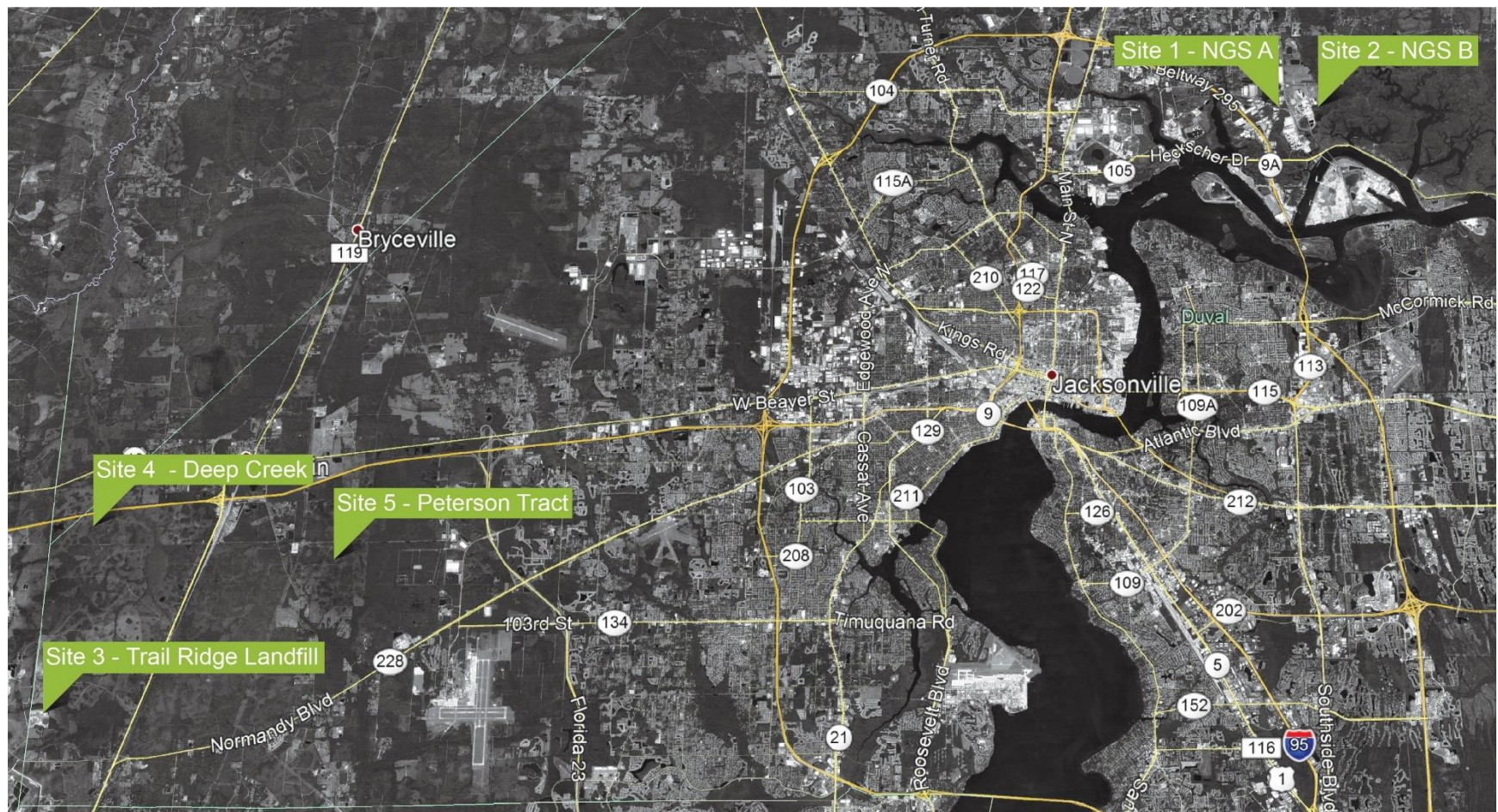


Figure 2-5. General Locations of JEA- or COJ-Owned Properties for Siting MORF

3. Technical Qualifications and Capability

The Procurement Evaluation Committee will evaluate each Respondent's technical qualifications and capability in accordance with the criteria as stated in the SOLICITATION FOR PARTICIPATION IN MULTI-STEP INVITATION TO NEGOTIATE FOR BIOSOLIDS MANAGEMENT SERVICES, and primarily in Section 1 of the Solicitation.

4. Other Considerations

4.1 Ineligible Firms

The following firms are not eligible to respond to this solicitation, to assist in preparing a Statement of Qualifications, or to participate on any Respondent's team:

- Jacobs

ATTACHMENT 1

List of Yard Waste Collection and Processing Contractors Employed by City of Jacksonville

Company	FACILITY TYPE	Commodity	Use (specifically yard waste, compost and concrete) ie. Landfill cover, fill, mulch, etc.	Council District	RE #	Facility Address	City	Zip	Phone Number	Contact Name	EMAIL	FDEP CERT Y/N	FDEP REG Y/N	FDEP FAC ID #	CON #	CON DATE	CON EXP DATE	Status/Comments	Action Item	Due Date
Aetna Recycling	YT	Yard Trash	Mulch & Process Fuel	8	003011 0000	8050 Old Kings Road	Jacksonville	32219	904-707-8415	Gary Lindros	glcrpa@bellsouth.net	N	Y		2013-458-E	9/13/2013	9/13/2018	Active CON. Facility not active at this time.	Monthly inspections. Awaiting Renewal Application.	3/13/2018
Borfield Investments	YT	Yard Trash	Mulch & Process Fuel	11	152581 0020	7405 Philips Highway	Jacksonville	32256	904-260-3000	Marshall Adkison	me@adkisonbwing.com	N	Y	90983	2012-293-E	7/24/2012	7/24/2017	Active CON Renewal Application Received 3/16/2017	Monthly inspections. Review Renewal Application Awaiting 3rd RAI Response	5/18/2018
Coastal Recycling Services	C&D / YT	C&D & Yard Trash	Various	2	109084 0302	11011 Blasius Rd. P.O. Box 1611	Jacksonville Ponte Vedra Beach	32226 32004	904-400-6491	Ed Scaro	escaro@creamcitywrecking.com	Y	Y	98399	2015-406-E	7/28/2015	7/28/2020	Active CON.	Monthly inspections.	1/28/2020
JB Cowell/Whitehouse Recycling	C&D	C&D & Yard Trash	Various	12	006675 0000 003328 0100 003377 0500	10419 General Avenue	Jacksonville	32220	904-786-1120	Raymond Pace	raymondp@jbcowell.com	Y	Y	99283	2010-897-E-Rt	5/3/2018	5/3/2023	Active CON	Monthly inspections.	11/3/2022
Jones Road Landfill	C&D / YT	C&D & Yard Trash	Landfill	8	003302 0000	3400 Jones Road	Jacksonville	32220	904-768-5363	Paul Caprood	paul.caprood@advanceddisposal.com	Y	Y	33568	2011-457-E-Rt	11/16/2017	11/16/2022	Active CON	Monthly inspections	5/16/2022
Old Kings Road	C&D / YT	C&D & Yard Trash	Landfill	8	003302 0000	8540 Old Kings Road North	Jacksonville	32219	904-768-5363	Paul Caprood	paul.caprood@advanceddisposal.com	Y	Y	90661	2016-602-E	10/25/2016	10/25/2021	Active CON	Monthly inspections.	4/25/2021
Otis Road Landfill, LLC	Class III / YT	Class III & Yard Trash	Landfill	12	001382 0010	1700 Otis Road	Jacksonville	32220	904-786-1120	JB Cowell	jbc@jbcowell.com	Y	N	100230	2015-571-E	9/23/2015	9/23/2020	Active CON	Monthly inspections.	3/23/2020
Shaw Tree Service	YT	Yard Trash	Mulch & Process Fuel	9	057363 0000	2762 West Beaver Street	Jacksonville	32254	904-387-1804	Roy Shaw or Peggy Forbes	office@shawtree.com	N	Y	95279	2010-608-E-Rt	5/29/2018	5/29/2023	Active CON	Monthly inspections.	11/29/2022
Greenland Biomass	YT	Yard Trash	Mulch & Process Fuel	11	168068 1100 000993 5000	11771 Philips Highway	Jacksonville	32256	904-502-1582	Tom Clark or Billy Powell	greenlandbiomass2012@gmail.com wpowell@cwcpowellins.com	N	Y	86441	2012-187-E	5/8/2012	5/8/2017	Active CON Renewal Application Received 5/10/2017	Monthly inspections. Review Renewal Application Awaiting Director Approval	8/15/2018
Trail Ridge Landfill (CQ)	Class I / YT	Class I Waste & Yard Trash	Landfill	12	001159 0100	5110 U.S. Hwy. 301	Baldwin	32234	904-289-9100	Greg Mathes	gmathes@wm.com	Y	Y	33268	1991-895	10/8/1991	10/8/1996	Renewal Application Complete, waiting on zoning issues to be resolved	Prepare package for MBRC after zoning	
Tidewater Resources	YT	Yard Trash	Mulch & Process Fuel	10	059251 0000	5631 W. Beaver Street	Jacksonville	32254	334-714-7209	Loia Buchin	lola@tidewater-resources.com	N	Y	97978	2013-528-E	9/24/2013	9/24/2018	Active CON Transferred from Woodchucks to Tidewater Resources Renewal Application Received 3/29/2018	Monthly inspections. Review Renewal Application Awaiting 1st RAI Response	6/8/2018

Technical Specification

Northside Generation Station Waste Heat

If Northside Generation Station “NGS” waste heat is to be used, the best option would be to supply it from Unit #1 and Unit #2 so heat is available during an unit outage. The units are approximately 38% efficient which means that 38% of the heat supplied by the fuel is used for making electricity. The other 62% of the heat is considered waste heat.

Approximately 50% of the total heat input is used to heat the circulating water. The discharge temperature of this water going to the river is 125° F. Although there are plenty of BTU’s available, 2,716 mmBTU/hr, the temperature available may not be high enough for process drying when converted to air unless drying occurs across the outside of water piping. Water piping would have to be run from the plant to the facility location.

Approximately 12% of the total heat input is used to heat the flue gas which is discharged to the stack (boiler being 88% efficient). The BTU’s available would be 651 mmBTU/hr. The stack exit temperature is 200° F. Some of the flue gas exit temperature is by design to ensure there is no visible plume leaving the stack. To recover the waste heat a large “air heater” would have to be placed in the flue gas stream before the stack that either converts water to steam or the heat from the flue gas to heat air. Either the steam or the hot air would then have to be run from the plant to the facility location. The capture of this waste heat normally is not cost effective based on other project cost analysis. The cost of building such a large air heater is not economical. At SJRPP for a similar heat capture project it proved to be ten times as expensive as using extraction steam and incurring the heat rate loss to the unit.

When the main steam of the boiler, 2,400 psi 1000° F, is put through the turbine it loses energy, however energy is still available for recovery in the lower pressure stages of the turbine. The multiple turbine stage extractions are typically used by feed water or condensate heaters that capture as much of the BTU’s as practical to pre-heat the water into the boiler. Although the extraction steam is less costly than the main steam, it still provides heat into the boiler heat rate. We could use extraction to provide 270° F steam. This steam would then be piped to the facility location and the water returned to the plant. Returning the demineralized water would minimize the cost of replacement water. The effect of using this steam for drying purposes would cause an increase in heat rate to the generating units. This would be equivalent to an increase in cost for NGS generation.

Other Heat Sources

The SJRPP 8” natural gas line could be used for a gas dryer. The most efficient gas dryer would be to directly use the heat for drying. A 70 mmBTU/hr dryer with today’s natural gas prices of \$3.50 mmBTU would be \$245/hr.

Another option would be to use a small gas turbine to generate electricity and recover the exhaust heat for drying the process. A 70 mmBTU gas turbine would produce approximately 7 MW of electricity at a cost of \$38/MW/hr. The recovered heat would offset the generation expense.

ATTACHMENT 3

Buckman WRF Class B Vector Attraction Reduction (VAR) Compliance Data



BIOLOGICAL CONSULTING SERVICES
OF NORTH FLORIDA, INC.

September 27, 2018

Peter J. Blackley
JEA- Buckman RMF
2400 Talleyrand Avenue
Jacksonville, Florida 32206
BlacPJ@jea.com
904-665-8377

Client ID: Digested Sludge; BCS ID: 1808129.

Dear Mr. Blackley,

We have conducted the requested study to demonstrate that the supplied anaerobically digested biosolids meet the Vector Attraction Reduction Requirement as per US EPA 625/R-92/013. The study was conducted according to the methodology outlined in option 2 of Appendix D. The submitted sample was aliquoted into 12 subsamples. Volatile and total solids of 6 of the subsamples was measured initially by submission to TestAmerica (Tampa). The remaining 6 subsamples were subjected to simulated digestion under laboratory conditions. This was performed by continuous stirring in a nitrogen rich atmosphere at 30°C for 40 days. Following, the digested samples were submitted to TestAmerica for volatile and total solids analysis. Based on the results obtained, the volatile solids values following digestion did not differ significantly from the ones prior to digestion. Since the reduction in volatile solids is negligible, the submitted biosolids sample should meet the requirement for Vector Attraction Reduction (VAR) as per the published standard.

In the following pages, you will find a summary of the analytical results obtained. Should you have any questions or concerns, please do not hesitate to contact me. Sincerely,

George Lukasik, Ph.D.
Laboratory Director

BCS LABORATORIES, INC. — GAINESVILLE
4609 NW 6TH STREET, STE. A, GAINESVILLE, FLORIDA 32609
TEL. (352) 377-9272, FAX. (352) 377-5630

WWW.MICROBIOSERVICES.COM

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FILE:

FL DOH #E82924, ISO/IEC 17025:2005 L2422 (L-A-B), EPA# FLO1147



**LABORATORY
ACCREDITATION
BUREAU** a division of ASQ
ACCREDITED ISO/IEC 17025



Client: JEA- Buckman RMF
Project: Simulated digestion for 40 days at 30°C
Analysis Parameter: Volatile and Total Solids in Biosolids; SM 2540G
Sampling Date/Time: August 13, 2018 @ 11:30
Receipt Date/Time: August 13, 2018 @ 14:08; 6.8°C
Study Start Date/Time: August 13, 2018 @ 14:31
VS/TS Analysis by: TestAmerica-Tampa; TestAmerica Job ID: 680-156576
Analysis Minimum Detection Limit: 0.1%
Practical Quantification Limit: 0.1%

Sample ID BCS Sample #	Pre-digestion Analysis Date/Time	Total Solids	Volatile Solids	Post Digestion Analysis Date/Time	Total Solids	Volatile Solids	VS% reduction*
680-156576 BCS1808129 sample 1	08/17/2018 07:38	3.4%	70%	09/25/2018 09:54	3.2%	67.4%	11.4%
680-156576 BCS1808129 sample 2		3.5%	69%		3.6%	67.2%	8.0%
680-156576 BCS1808129 sample 3		3.5%	70%		3.2%	67.3%	11.8%
680-156576 BCS1808129 sample 4		3.4%	69%		3.2%	67.3%	7.5%
680-156576 BCS1808129 sample 5		3.4%	69%		3.2%	67.2%	8.0%
680-156576 BCS1808129 sample 6		3.4%	69%		3.2%	67.3%	7.5%

*VS% reduction calculated using Van Kleeck equation

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FILE:

FL DOH #E82924, ISO/IEC 17025:2005 L2422 (L-A-B), EPA# FLO1147



**LABORATORY
ACCREDITATION
BUREAU**
a division of ASQ
ACCREDITED ISO/IEC 17025



I certify that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. The above results relate only the collected and referenced sample(s) and to their condition at the time of process. The analysis results are not indicative or representative of a process. Sampling and field data information was submitted by the client. The analysis and presented results in this report meet the requirements of The NELAC Institute (TNI) and /or state of Florida Department of Public Health's Laboratory Certification programs, as applicable unless otherwise noted.

PAGE 3 OF 3



Laboratory Services
1002 Main Street North
Jacksonville, FL 32206
Phone (904) 665-4517
Fax (904) 665-8343

Laboratory Time Stamp

CHAIN OF CUSTODY RECORD

part 1 of 1

180813-041

For Lab Use Only

Project Number:

Entered by: GP

Scanned by: GP

Temp. of Contents: 80°F deg. C received under ice

(Y) N

1. Client

Address:

JEA WW

2221 BUCKMAN STREET JACKSONVILLE, FL 32206

phone: 904-665-8377

2. Site Name

10. Analysis Requested

11. Turnaround Time (circle)

Buckman Biosolids

8. Preservative

C

9. Container Type

P

STANDARD

Matrix Codes
(for item 6)

Preservative Codes
(for item 8)

Container Codes
(for item 9)

DW = Drinking Water
GW = Ground Water
SW = Surface Water
WW = Waste Water
SG = Sludge
SL = Soil
AR = Air

C = Cool Only
H = HCL
N = HNO3
OH = NaOH
S = H2SO4
SF = Solid Fuel
OT = Other
D = Dark

V = VOA vial
G = Glass
AG = Amber Glass
P = Plastic
M = Micro bag/cup
C = Cubitainer
OT = Other

C
O
N
T
A
I
N
E
R
40 day bench digestion

12. Laboratory Section

Springfield

BCS LABORATORIES
GAINESVILLE, FL

7. Container Num/Letter/Lot

No	Sample Desc or Field ID	Date	Time	Comp	Grab	Matrix	Let	A	B	C	D	E	F	G	H	I	J	K	13. Lims ID
1	Digested Sludge	8/13/18	1130		X	SG		X											
2																			
3																			
4																			
5																			
6																			
7																			

14. Sampled By (Signature)	15. Samp No	Date	Time	Sampled By (Signature)	Samp No	Date	Time
[Signature]	1	8/13/18	1130				
Sampled By (Signature)	Samp No	Date	Time	Sampled By (Signature)	Samp No	Date	Time
16. Relinquished By:	Date	Time	17. Received By:	Date	Time	18. Shipping Method:	19. Send Report To:
[Signature]	8/13/18	1407	[Signature]	8/13/18	14:06	Hand delivered	Name: Buckman Biosolids
						Bus	Location/ Address: PETER BLACKLEY
						Courier	blacpj@jea.com
						Other	

20. Remarks: Instructions on back

River Flow:

Treated Flow:

Sample sent to BCS laboratories in Gainesville FL for 40 day bench digestion test for Biosolids cake classification.



BIOLOGICAL CONSULTING SERVICES
OF NORTH FLORIDA, INC.

October 10, 2018

Peter J. Blackley
JEA- Buckman RMF
2400 Talleyrand Avenue
Jacksonville, Florida 32206
BlacPJ@jea.com
904-665-8377

Client ID: Digested Sludge; BCS ID: 1808305.

Dear Mr. Blackley,

We have conducted the requested study to demonstrate that the supplied anaerobically digested biosolids meet the Vector Attraction Reduction Requirement as per US EPA 625/R-92/013. The study was conducted according to the methodology outlined in option 2 of Appendix D. The submitted sample was aliquoted into 12 subsamples. Volatile and total solids of 6 of the subsamples was measured initially by submission to TestAmerica (Tampa). The remaining 6 subsamples were subjected to simulated digestion under laboratory conditions. This was performed by continuous stirring in a nitrogen rich atmosphere at 30°C for 40 days. Following, the digested samples were submitted to TestAmerica for volatile and total solids analysis. The average percent reduction of the submitted sample is $11.4\% \pm 2.1\%$. Based on the results obtained, the volatile solids values following digestion did not differ significantly from the ones prior to digestion. Since the reduction in volatile solids is negligible, the submitted biosolids sample should meet the requirement for Vector Attraction Reduction (VAR) as per the published standard.

In the following pages, you will find a summary of the analytical results obtained. Should you have any questions or concerns, please do not hesitate to contact me. Sincerely,

George Lukasik, Ph.D.
Laboratory Director

BCS LABORATORIES, INC. — GAINESVILLE
4609 NW 6TH STREET, STE. A, GAINESVILLE, FLORIDA 32609
TEL. (352) 377-9272, FAX. (352) 377-5630
WWW.MICROBIOSERVICES.COM

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FILE:

FL DOH #E82924, ISO/IEC 17025:2005 L2422 (L-A-B), EPA# FLO1147



**LABORATORY
ACCREDITATION
BUREAU** a division of A-S-B
ACCREDITED ISO/IEC 17025



Client: JEA- Buckman RMF
Project: Simulated digestion for 40 days at 30°C
Analysis Parameter: Volatile and Total Solids in Biosolids; SM 2540G
Sampling Date/Time: August 27, 2018 @ 08:00
Receipt Date/Time: August 27, 2018 @ 11:35; 7.1°C
Study Start Date/Time: August 27, 2018 @ 11:55
VS/TS Analysis by: TestAmerica-Tampa; TestAmerica Job ID: 680-157202
Analysis Minimum Detection Limit: 0.1%
Practical Quantification Limit: 0.1%

Sample ID BCS Sample #	Pre-digestion Analysis Date/Time	Total Solids	Volatile Solids	Post Digestion Analysis Date/Time	Total Solids	Volatile Solids	VS% reduction*
680-156576 BCS1808129 sample 1	08/29/2018 07:55	3.2%	70%	10/09/2018 12:48	2.9%	68.0%	8.9%
680-156576 BCS1808129 sample 2		3.1%	71%		2.9%	68.6%	10.8%
680-156576 BCS1808129 sample 3		3.2%	71%		2.9%	68.2%	12.4%
680-156576 BCS1808129 sample 4		3.1%	71%		3.2%	67.9%	13.6%
680-156576 BCS1808129 sample 5		3.1%	71%		3.2%	67.9%	13.6%
680-156576 BCS1808129 sample 6		3.2%	70%		3.2%	67.9%	9.3%

*VS% reduction calculated using Van Kleeck equation

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FILE:

FL DOH #E82924, ISO/IEC 17025:2005 L2422 (L-A-B), EPA# FLO1147



Client: JEA- Buckman RMF
Project: Simulated digestion for 40 days at 30°C
Analysis Parameter: Volatile and Total Solids in Biosolids; SM 2540G
Sampling Date/Time: August 27, 2018 @ 08:00
Receipt Date/Time: August 27, 2018 @ 11:35; 7.1°C
Study Start Date/Time: August 27, 2018 @ 11:55
VS/TS Analysis by: TestAmerica-Tampa; TestAmerica Job ID: 680-157202
Analysis Minimum Detection Limit: 0.1%
Practical Quantification Limit: 0.1%

I certify that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. The above results relate only the collected and referenced sample(s) and to their condition at the time of process. The analysis results are not indicative or representative of a process. Sampling and field data information was submitted by the client. The analysis and presented results in this report meet the requirements of The NELAC Institute (TNI) and /or state of Florida Department of Public Health's Laboratory Certification programs, as applicable unless otherwise noted.



Signature of Laboratory Director/Authorized Rep. _____ Date: 10/10/2018

BCS LABORATORIES, INC. — GAINESVILLE
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ACCREDITED ISO/IEC 17025





BIOLOGICAL CONSULTING SERVICES
OF NORTH FLORIDA, INC.

October 24, 2018

Peter J. Blackley
JEA- Buckman RMF
2400 Talleyrand Avenue
Jacksonville, Florida 32206
BlacPJ@jea.com
904-665-8377

Client ID: Digested Sludge; BCS ID: 1809054.

Dear Mr. Blackley,

We have conducted the requested study to demonstrate that the supplied anaerobically digested biosolids meet the Vector Attraction Reduction Requirement as per US EPA 625/R-92/013. The study was conducted according to the methodology outlined in option 2 of Appendix D. The submitted sample was aliquoted into 12 subsamples. Volatile and total solids of 6 of the subsamples was measured initially by submission to TestAmerica (Tampa). The remaining 6 subsamples were subjected to simulated digestion under laboratory conditions. This was performed by continuous stirring in a nitrogen rich atmosphere at 36°C for 40 days. Following, the digested samples were submitted to TestAmerica for volatile and total solids analysis. The average percent reduction of the submitted sample is $9.4\% \pm 1.9\%$. Based on the results obtained, the volatile solids values following digestion did not differ significantly from the ones prior to digestion. Since the reduction in volatile solids is negligible, the submitted biosolids sample should meet the requirement for Vector Attraction Reduction (VAR) as per the published standard.

In the following pages, you will find a summary of the analytical results obtained. Should you have any questions or concerns, please do not hesitate to contact me. Sincerely,

George Lukasik, Ph.D.
Laboratory Director

BCS LABORATORIES, INC. — GAINESVILLE
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FILE: JEA VS 09 10 2018 1809054

FL DOH #E82924, ISO/IEC 17025:2005 L2422 (L-A-B), EPA# FLO1147



**LABORATORY
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a division of A-S
ACCREDITED ISO/IEC 17025



Client: JEA- Buckman RMF
Project: Simulated digestion for 40 days at 36°C
Analysis Parameter: Volatile and Total Solids in Biosolids; SM 2540G
Sampling Date/Time: September 10, 2018 @ 09:30
Receipt Date/Time: September 10, 2018 @ 12:06; 6.8°C
Study Start Date/Time: September 10, 2018 @ 12:48
VS/TS Analysis by: TestAmerica-Tampa; TestAmerica Job ID: 680-157808
Analysis Minimum Detection Limit: 0.1%
Practical Quantification Limit: 0.1%

Sample ID BCS Sample #	Pre-digestion Analysis Date/Time	Total Solids	Volatile Solids	Post Digestion Analysis Date/Time	Total Solids	Volatile Solids	VS% reduction*
680-157808 BCS1809054 sample 1	09/13/2018 13:22	2.9%	73%	10/23/2018 15:07	3.0%	70.9%	9.9%
680-157808 BCS1809054 sample 2		3.2%	73%		3.0%	71.2%	8.6%
680-157808 BCS1809054 sample 3		3.0%	73%		3.0%	71.0%	9.5%
680-157808 BCS1809054 sample 4		2.9%	73%		3.1%	70.2%	12.9%
680-157808 BCS1809054 sample 5		3.2%	72%		3.1%	70.3%	8.0%
680-157808 BCS1809054 sample 6		3.2%	73%		3.0%	71.4%	7.7%

*VS% reduction calculated using Van Kleeck equation

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ACCREDITED ISO/IEC 17025



Client: JEA- Buckman RMF
Project: Simulated digestion for 40 days at 36°C
Analysis Parameter: Volatile and Total Solids in Biosolids; SM 2540G
Sampling Date/Time: September 10, 2018 @ 09:30
Receipt Date/Time: September 10, 2018 @ 12:06; 6.8°C
Study Start Date/Time: September 10, 2018 @ 12:48
VS/TS Analysis by: TestAmerica-Tampa; TestAmerica Job ID: 680-157808
Analysis Minimum Detection Limit: 0.1%
Practical Quantification Limit: 0.1%

I certify that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. The above results relate only the collected and referenced sample(s) and to their condition at the time of process. The analysis results are not indicative or representative of a process. Sampling and field data information was submitted by the client. The analysis and presented results in this report meet the requirements of The NELAC Institute (TNI) and /or state of Florida Department of Public Health's Laboratory Certification programs, as applicable unless otherwise noted.



Signature of Laboratory Director/Authorized Rep. _____ Date: 10/24/2018

BCS LABORATORIES, INC. — GAINESVILLE
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FILE: JEA VS 09 10 2018 1809054

FL DOH #E82924, ISO/IEC 17025:2005 L2422 (L-A-B), EPA# FLO1 147



**LABORATORY
ACCREDITATION
BUREAU** a division of ASA
ACCREDITED ISO/IEC 17025





Laboratory Services
1002 Main Street North
Jacksonville, FL 32206
Phone (904) 665-4517
Fax (904) 665-8343

Laboratory Time Stamp

CHAIN OF CUSTODY RECORD part 1 of 1

180827-004

For Lab Use Only Project Number:
Entered by: Scanned by:
Temp. of Contents: deg. C received under ice Y N

1. Client Address:
JEA WW 2221 BUCKMAN STREET JACKSONVILLE, FL 32206
phone: 904-665-8377

2. Site Name			10. Analysis Requested										11. Turnaround Time (circle)			
Buckman Biosolids			8. Preservative		C										STANDARD	
Matrix Codes (for item 8)			9. Container Type		P										12. Laboratory Section	
DW = Drinking Water GW = Ground Water SW = Surface Water WW = Waste Water SG = Sludge SL = Soil AR = Air			Preservative Codes (for item 8) C = Cool Only H = HCL N = HNO3 OH = NaOH S = H2SO4 SF = Solid Fuel OT = Other		Container Codes (for item 9) V = VOA vial G = Glass AG = Amber Glass P = Plastic M = Micro bag/cup C = Cubitainer OT = Other										Springfield BCS LABORATORIES GAINESVILLE, FL	
3			4		5										7. Container Num/Letter/Lot	
No Sample Desc or Field ID			Date Time		Comp Grab Matrix Lot										13. Lims ID	
1 Digested Sludge			9/10/18 0930		X SG X											
2																
3																
4																
5																
6																
7																
14. Sampled By (Signature)			15. Samp No		Date Time		Sampled By (Signature)				Samp No		Date Time			
[Signature]			1		9/10/18 0930		[Signature]									
Sampled By (Signature)			Samp No		Date Time		Sampled By (Signature)				Samp No		Date Time			
16. Relinquished By:			Date Time		17. Received By:		Date Time		18. Shipping Method:		19. Send Report To:					
1 [Signature]			9/10/18 1205						Hand delivered		Name: Buckman Biosolids					
2 [Signature]									Bus		Location/ Address: PETER BLACKLEY					
3									Courier		blackj@jea.com					
4									Other							

20. Remarks: Instructions on back
Sample sent to BCS laboratories in Gainesville FL for 40 day digestion test for Biosolids cake classification.

River Flow: Treated Flow:
K Sayler
Received 9.10.18
1200 5.0°C + 1.8°C CF = 16.8°
NSP, on wet ice