

TASK ORDER 3-21 SWR
ENGINEERING SERVICES FOR THE CITY OF KEY WEST
COMPOST PILOT STUDY

This TASK ORDER 3-21 SWR is issued under the terms and conditions of the AGREEMENT TO FURNISH GENERAL ENGINEERING SERVICES TO THE CITY OF KEY WEST ("AGREEMENT") between the City of Key West ("CITY") and CH2M HILL, Engineers, Inc. ("CONSULTANT") dated November 3, 2017 which is incorporated herein by this reference.

A. SCOPE OF SERVICES

Specific services which the CONSULTANT agrees to furnish are summarized on the attached statement entitled TASK ORDER 3-21 SWR "SCOPE OF SERVICES." The "Scope of Services" defines the work effort anticipated for the Task Order.

This Task Order, when executed, shall be incorporated in and shall become an integral part of the November 3, 2017, Master Agreement.

B. TIME OF COMPLETION

Work under this Task Order will begin immediately following acceptance and completed expeditiously subject to coordination with the City of Key West staff.

C. COMPENSATION

Compensation for the labor portions of TASK ORDER 3-21 SWR, Tasks A will be on a lump sum fee basis as stipulated in Article 5, Paragraph 5.1.1 of the AGREEMENT. Compensation for equipment procurement and all expenses will be on a Cost Reimbursable-Per Diem basis as stipulated in Article 5, Paragraph 5.1.2 of the AGREEMENT. The estimated compensation is shown on the attached statement entitled TASK ORDER 3-21 SWR COMPENSATION.

D. ACCEPTANCE

By signature, the parties each accept the provisions of this TASK ORDER 3-21 SWR and authorize the CONSULTANT to proceed at the direction of the CITY's representative in accordance with the "SCOPE OF SERVICES." Start date for this project will be no later than two (2) days after execution of this authorization.

For CH2M HILL ENGINEERS, INC.

For CITY OF KEY WEST

By:  5/17/21

By: _____

Sirpa H. Hall, P.E.
Senior Business Vice President

Patti McLaughlin
Interim City Manager

 5/17/2021

Dated the _____ day of _____, 2021

Elaine Tolon, P.E.
Key West Project Manager

ATTEST: _____

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SCOPE OF SERVICES

Project Background

The Key West Water Reclamation Facility currently produces about 6,000 wet tons per year of dewatered wastewater solids using belt filter presses. The two Ashbrook Winkle presses dewater to about 16% total solids on average. Typical operation is for dewatering to run 8 hours per day, 5-6 days per week depending on solids inventory. The dewatered cake is loaded directly into trailers and hauled by a third-party contractor to landfill disposal approximately 200 miles away at a current unit cost of \$75.22/ton. In addition, the City generates significant quantity of yard waste/horticultural debris which is also hauled by a third-party contractor to a compost facility over 200 miles away at a cost of approximately \$69/ton.

The City has expressed interest in evaluating the potential of composting the wastewater solids as a management method to eliminate the long-distance hauling and disposal costs. An additional benefit would be the potential use of the horticultural waste as bulking agent for composting the wastewater solids thereby beneficially reusing these two materials locally to produce a marketable compost product for local landscape use.

Project Description

Jacobs Engineering, Inc. (JACOBS) is pleased to submit this proposal for a pilot study for composting biosolids generated by the City of Key West that are currently landfilled. A pilot aerated static pile composting operation is recommended for further evaluation of blending dewatered cake with available chipped yard/brush wastes and producing a product for testing. Pilot testing of the process using City of Key West sludge and bulking agent materials will allow for further refinement of the mass balance and process flow requirements developed in the conceptual design before a final design is developed. The pilot can be easily constructed and operated on the Key West WWTP site by our wastewater personnel to familiarize them and the City with the process. Simple equipment can be used such as a front-end loader, a small blower, perforated piping, simple controls, and screening equipment to gather field data for better design of a full-scale system and to provide information to the Florida DEP and the community.

The benefits to the City of the pilot test would be:

- Ability to evaluate characteristics, cleanliness and quantity of various potential bulking agents available.
- Allow City personnel to see how the operation would function first-hand on Key West specific waste materials.
- Allow City to evaluate the operational requirements of the system.

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- Allow for quantifying and testing of the compost and to explore potential uses/markets for the compost.

Scope of Services

Task A – Composting Pilot Study

Execution of the Composting Pilot Study is proposed to occur under a single Task and will follow the below 10 steps.

1. Kickoff Meeting
 - a. Scope: JACOBS will meet with WWTP and City staff to discuss the objectives of the pilot study, determine materials and quantities to be tested in the pilot study, and identify the location of the pilot study on the WWTP site. Any materials or equipment that the City has on-hand that could be used for the pilot study such as a front-end loader, piping, etc. will be investigated during this kickoff meeting. JACOBS will work with the City to determine site logistics such as power source, bulking agent storage, dirty water handling, and sizing of the planned pilot compost pile.
 - b. Deliverable: Meeting minutes
 - c. Assumptions: City staff who will be responsible for developing and operating the pilot compost operation will be available for this meeting with JACOBS staff. The meeting(s) will occur over the course of two days to allow for information gathering and dialogue.
2. Pilot Design
 - a. Scope: Based on the information summarized in the Jacobs August, 2019 Compost Facility Concept TM and the pilot study kickoff meeting, JACOBS will develop a compost pilot study equipment using an aerated static pile compost operation. A preliminary list of equipment will be developed for operation of the pilot including front loader/skid loader, aeration blower, piping, temperature probes, screening needs, etc. It is assumed that no site improvements such as asphalt pad or a lined site will be required but that the pilot can be arranged on an existing gravel or asphalt pad on the north side of the WWTP site. ASP composting using positive aeration will be used to process approximately 30 cubic yards of normally dewatered sludge cake. Limited odor control will be provided using a filtration layer of wood chips placed on top of the composting pile to minimize odors from the process. JACOBS will develop sketches for the pilot design, and an operation plan for carrying out the pilot study. It is anticipated that the pilot study would be conducted over a 3-4 month period with active composting for 3-4 weeks and curing for 3-4 weeks. It is assumed screening will be performed by a third party offsite, or by using small a hand-made screen to generate sufficient quantities of compost product to test and show potential users various product types (coarse vs. fine).
 - b. Deliverable: JACOBS will prepare a pilot study design layout including drawings, materials balance, equipment list and pilot study protocol.

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- c. Assumptions: City to secure sufficient bulking agent/wood chips (approximately 160 cubic yards) and discussions/negotiations with a potential local landscaper to screen the compost pile to 3/8" after processing. Trucking equipment/costs to move compost pile (approximately 130 CY) to the third-party site for screening and to return compost (approximately 40 CY) back to the WWTP for curing is assumed to be City responsibility.
- 3. Permitting with Florida DEP
 - a. Scope: JACOBS will meet with Florida DEP South District via virtual means to review the pilot study design and planned sampling and testing protocols to ensure the pilot design meets Florida DEP requirements and addresses Florida DEP concerns. JACOBS will prepare written document for submission to Florida DEP for their review and approval.
 - b. Deliverable: Meeting with Florida DEP and meeting minutes to all parties.
 - c. Assumptions: City staff to participate in Florida DEP meeting by phone. A letter submission to DEP documenting the pilot facility planned operation is all that is required.
 - 4. Equipment Procurement
 - a. Scope: JACOBS will develop an equipment list and gather specific equipment cut sheets for procurement of such equipment. Items will include a blower, piping, temperature probes, pressure gauges, timer, electrical connections, blower housing, and miscellaneous equipment. It is assumed the City will have access to a small front-end loader for preliminary pile construction and tear down activities.
 - b. Deliverable: Equipment list and specification/cut sheet information for City use.
 - c. Assumptions: JACOBS will identify equipment for procurement and will procure equipment.
 - 5. Pilot Setup
 - a. Scope: JACOBS will assist the City with development of the pilot site location and layout details including determining where materials will be received, mixed, and placed into the ASP. Pad area required, electrical connections, drainage and runoff details will be determined for development of the pilot facility.
 - b. Deliverable: Pilot facility layout concept sketches.
 - c. Assumptions: JACOBS operations team to set up pilot equipment. City to procure/secure wood chip delivery to WWTP site.
 - 6. Pilot Start Up
 - a. Scope: JACOBS will be on site for up to 4 consecutive days to assist the City in properly mixing of components and placing material into a compost pile and starting the compost process. JACOBS will ensure WWTP staff are properly trained to operate and monitor the compost operation including data collection and process adjustments.

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- b. Deliverable: On-site training and assistance and initial trip memo outlining activities performed and monitoring activities.
 - c. Assumptions: WWTP staff will conduct mixing and pile building activities using existing front-end loader.
7. Pilot Monitoring and Management
- a. Scope: JACOBS will be available for over-the-phone consultation as needed for the duration of the pilot study. Initially daily phone calls will be conducted followed by daily emailing or faxing of operating data for JACOBS review and feedback.
 - b. Deliverable: Operational monitoring assistance and one site visit by JACOBS staff to assist in transitioning from composting to curing activities.
 - c. Assumptions: JACOBS WWTP plant staff to perform process monitoring and communicate to JACOBS technology staff daily throughout the composting pilot study.
8. Final Compost Sampling & Testing
- a. Scope: JACOBS staff will collect representative finished compost samples for analysis of all regulatory required parameters to demonstrate compliance with Florida DEP requirements. Samples will be collected and shipped to a certified compost testing laboratory for analysis of fecal coliform and salmonella, metals, nutrients and other compost parameters. The exact number of samples and frequency of testing will be determined through meetings with Florida DEP earlier in the planning stages. In addition, sludge and final compost samples will be collected and analyzed for Per- and Poly-Fluoro Alkyl Substances. Costs of all sampling and testing performed is included. Depending on Florida DEP requirements, the final compost product may or may not be able to be used in demonstration activities. If not, DEP may require landfilling of the finished compost after sampling and testing is completed. The cost of landfilling these materials if needed will be included in normal sludge hauling and disposal activities with those costs being passed on to the City.
 - b. Deliverable: Site visit at the completion of the composting and curing stages to oversee screening and sampling of finished compost product. Results of sampling and analysis will be summarized in a memo for incorporation into the final pilot study report.
 - c. Assumptions: Jacobs to pay for costs of shipping and analyzing compost samples.
9. Pilot Study Report and Meeting
- a. Scope: JACOBS will summarize the results of the pilot study in a written report which will supplement the preliminary previously submitted Concept TM. Findings from the pilot study will be used to adjust the preliminary materials balance and process flow as necessary for use in the final design. Information regarding process performance, materials used and final product characteristics and compliance with Florida DEP regulatory requirements will be summarized in this report. Next steps in the development of a full-scale composting facility will be outlined for City use. After submission of a draft

report, a meeting will be held to discuss the overall findings and to outline future implementation steps and schedule.

- b. Deliverable: Draft and final report and final project meeting with the City.
- c. Assumptions: Final meeting to be virtual and in person

10. Pilot Study PM and Administration

- a. Scope: Project manager to conduct monthly progress phone calls with the City as to completed and planned project activities, project schedule updates, budget and billing.
- b. Deliverable: Monthly phone calls and project progress invoices.
- c. Assumptions: Project to be completed within 5 months of notice to proceed.

Assumptions

In addition to those listed above, the following assumptions were used in the development of this Task Order:

- All electronic deliverables will utilize Adobe format (pdf), or another common software format as noted in scope.
- Meetings may be held utilizing on-line resources (Microsoft Teams, or similar) for all or some of the attendees. Typically, CONSULTANTS local Project Manager will attend in person, with other Technologists attending via online conference resources.
- CONSULTANT will reasonably rely upon the accuracy, and completeness of any information/data provided by the CITY or other third parties.

Obligations of the CITY

To assist meeting schedule and budget estimates contained in this proposal, the CITY will provide the following:

- City of Key West will provide front-end loader, and all bulking agent materials required for composting.
- City of Key West WWTP staff will assist in pilot set-up and tear-down, as well as conduct daily monitoring of the compost pile as outlined in Scope of Services.
- City of Key West will transport compost material to and from third party screening facility as discussed in Scope of Services.
- Prompt review and comment on all deliverables.
- Facilitate access to any required facilities.
- Attendance of key personnel at meeting as requested.

Additional Services

The CONSULTANT will, as directed, provide additional services that are related to the project but not included within this Scope of Services. These and other services can be provided, if desired by the CITY, as an amendment to the Task Order. Work will begin for the Additional

Services after receipt of a written notice to proceed from the CITY. Additional services may include, but are not limited to, the following:

- Additional design services if requested by the CITY
- Bid or construction phase services
- Permitting Services

Compensation

The estimated compensation for TASK ORDER NO. 3-21 SWR **\$99,711.00**.
Compensation listed by task and per diem rate is included as Attachment A.

Schedule

Once Notice To Proceed is issued by the CITY, this project is estimated to be completed within 5 months.

Attachment A
COMPENSATION

Key West Composting Facility Pilot Study Compensation									
Role	PM	Senior Consultant	Process	Admin	Total Hours	Labor	Expenses	Travel	Total
Rate Category	Engr. 5	Engr. 8	Engr. 3	Clerical			Includes markup		
2021 Rate	\$147.21	\$256.40	\$147.21	\$78.52			10%	10%	
	Hours	Hours	Hours	Hours			10%	10%	
Task A - Compost Facility Pilot Study									
1.0	Kickoff Meeting	4	8	8		20	\$3,818		\$3,818
2.0	Pilot Design	4	16	8		28	\$5,869		\$5,869
3.0	Permitting with FL DEP		8	16		24	\$4,407		\$4,407
4.0	Equipment Procurement	8	4	16		28	\$4,559	\$8,000	\$12,559
5.0	Pilot Set Up		8	8		16	\$3,229		\$3,229
6.0	Pilot Start Up	12	40	24		76	\$15,556	\$4,000	\$19,556
7.0	Pilot Monitoring and Management	12	16	24		52	\$9,402	\$1,500	\$10,902
8.0	Final Sampling & Testing	12	16	32		60	\$10,580	\$3,000	\$15,080
9.0	Pilot Study Report and Meeting	11	32	32	16	91	\$15,727		\$17,227
10.0	Pilot Study PM and Administration	48				48	\$7,066	\$0	\$7,066
	Subtotal	111	148	168	16	443	\$80,211	\$11,000	\$99,711
	Task Order 3-21 Total								\$99,711