City of Jacksonville, Florida

Lenny Curry, Mayor

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ONE CITY. ONE JACKSONVILLE.

May 11, 2017

TO: **Greg Pease, Chief, Procurement Division**

THRU: **John Pappas, P.E., Director, Department of Public Works**

From: **Jeffrey S. Foster, P.G, Public Works Environmental Coordinator**
Will Williams, Chief, Solid Waste Division

SUBJECT: **CDM Smith, Inc. Amendment #11**
Trail Ridge Landfill Expansion Permitting and Design
Contract No. 6354-13, P-07-10

The Solid Waste Division is requesting approval of Amendment #11 for the Scope of Work contained in Exhibit U to the contract in the amount of $157,718.00 as detailed in the Contract Fee Summary Exhibit V. Amendment #11 is needed to evaluate leachate pre-treatment and/or disposal alternatives for the Trail Ridge Landfill leachate to determine the feasibility of moving forward with one or more alternatives since JEA has informed the Department of Public Works that the leachate effluent is causing compliance problems at their Buckman Street Wastewater Treatment Plant.

Additionally, Amendment #11 will determine the capital and operational cost of each alternative method since JEA has also informed DPW that the current cost the Solid Waste Division pays JEA for disposal is very low and not consistent with their current tariff fees they charge all other industrial and commercial customers. This will cause an unsustainable financial hardship to the Solid Waste Enterprise Fund in upcoming and future budget years. Funding is available in PWSW44K 069505.

The current contract amount for the base contract and Amendments 1 through 10 is $8,107,930.00. Approval of Amendment #11 in the amount of $157,718.00 will bring the maximum indebtedness to the City's not to exceed amount of $8,265,648.00. Nothing contained herein shall be amended, modified or otherwise revised without prior PSEC and Mayor approval. If there are any questions, please do not hesitate to contact me at this office (904) 255-8702. Please advise when this item will be placed on the agenda so a representative of DPW can attend.

JSF/jsf

Attachments

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EXHIBIT U

AMENDMENT 11 TO TASK AUTHORIZATION 6354-13

FOR

TRAIL RIDGE LANDFILL CLASS I CELL EXPANSION PROJECT

LEACHATE TREATABILITY EVALUATION

This Authorization, when executed, shall be incorporated in and become part of the Agreement for Professional Services between the City of Jacksonville (OWNER), and CDM Smith Inc. (CONSULTANT), dated February 9, 2011 hereafter referred to as the Agreement.

PROJECT BACKGROUND

CONSULTANT will assist the OWNER with the design, permitting, and construction of a new Class 1 landfill facility (Phases 6-14) at the Trail Ridge Landfill (TRLF) site. The existing landfill has been developed via 5 stages of cell construction (Phases 1-5) over 20 years and is within 2-3 years of reaching capacity. CONSULTANT has completed the following work related to the TRLF Class I Cell Expansion Project.

Initial Authorization – Developed a Master Plan for the build out of the TRLF site. The Master Plan recommended three phases, Phases 6 through 8 (now numbered 6 through 14), for full site buildout and evaluated various options for the next cell construction, Phase 6 expansion. The initial authorization also initiated field data collection for design of the TRLF Expansion Project.

Amendment 1 – Developed permit application and supporting documentation for the TRLF Expansion Environmental Resource Permit (ERP).

Amendment 2 – Continued data collection and developed permitting plans and specifications for Phase 6A through 6E TRLF Expansion Florida Department of Environmental Protection (FDEP) Solid Waste Permit. Amendment 2 included conceptual stormwater modeling, development of methane gas management plan, geotechnical stability analysis, and ongoing hydro-geological modeling.

Amendment 3 – Authorized investigation of expansion of the on-site borrow pit for use in future landfill activities. This amendment was a partial authorization of the Amendment 3 activities at TRLF. The remaining activities were authorized under Amendment 4.

Amendment 4 – Authorized funding for the remaining work described and approved in Amendment 3, including continued design and permitting activities for Phases 6 through 14 with development of solid waste construction permit application and Phase 6 construction documents. This amendment also included bidding services.

Amendment 5 – this amendment is a continuation of the work begun under the previous four amendments to obtain the ERP and FDEP Solid Waste Construction Permits needed to construct Phases 6-14 of the Trail Ridge Landfill Expansion. This amendment included activities to apply for a major modification of the site's existing Prevention of Significant Deterioration (PSD) permit, renew the site's

solid waste operating permit, and design a new access road for operational traffic. CONSULTANT submitted and received the FDEP solid waste construction permit, operations permit, and 2014 financial assurances for the planned expansion area under this amendment.

Amendment 6 – this amendment authorized Engineering Services During Construction to support the TRLF Phase 6 Expansion Project. The amendment included conforming contract documents, holding a pre-construction meeting, conducting shop drawing review, issuing designer clarifications, addressing requests for additional information and providing resident project representation (RPR) for the project. These services were authorized through December 2015.

Amendment 7 – this amendment authorized design and permitting of a limerock construction access road from County Road 228 to Gilridge road. This road will provide access to the landfill and borrow areas for construction vehicles. This amendment also included intersection improvements to the perimeter road encircling Phases 1-5 of the existing landfill to facilitate re-routing of operations traffic to the new western access road. Re-routing of operations traffic is a key component of the construction sequence for the new Phase 6 cell.

Amendment 8 – this amendment authorized engineering services during construction for January 2016 through December 2016. Additionally, this scope includes activities to perform financial assurances reporting to the Florida Department of Environmental Protection (FDEP) associated with the site Solid Waste Permit, and perform various monitoring and maintenance tasks associated with onsite mitigation areas to maintain compliance with the site Environmental Resource Permit (ERP).

Amendment 9 - this amendment authorized engineering services during construction for January 2017 through June 2017. Additionally, this scope includes activities to perform various monitoring and maintenance tasks associated with onsite mitigation areas to maintain compliance with the site Environmental Resource Permit (ERP).

Amendment 10 – this amendment authorized a seepage analysis study of the borrow pit south of Landfill Phases 1-5 to improve dewatering activities and address erosion concerns.

SCOPE OF WORK

This scope of work for Amendment 11 is a continuation of the work begun under the previous amendments to design and construct the Phase 6 Trail Ridge Landfill Expansion. Currently the City and Landfill Operator, Waste Management Inc. (WMI) collect and transport leachate from the on-site tank farm to the Buckman WWTP. The UV disinfection process at the WWTP is experiencing low transmittance due in part to the highly-colored leachate from TRLF. The City wishes to evaluate various leachate pre-treatment options taking into consideration the leachate quality and quantity. This scope includes activities to perform investigation and recommendation for pretreatment of the landfill leachate prior to disposal at the Buckman WWTP.

Fresh landfill leachate has a COD of 4,000 to 10,000 mg/L, 600 to 1,200 mg/L ammonia and a dark brown color. The color, from compounds with conjugated unsaturated ring structures like humic acid, absorbs light in the UV range. When raw leachate is processed through a municipal wastewater treatment plant, the percentage of the COD removed is may be low because the retention time is short. The color

impairs UV transmittance and hence disinfection efficacy (or requires a more lamps). Dilution requirements for untreated leachate can be greater than 1,000:1 to achieve adequate transmittance.

CDM Smith's treatment experiments have found that the chemical oxidant dose required to adequately reduce the COD concentration and color of raw landfill leachate was too high to be cost effective. Literature studies, including those sponsored by Waste Management, Inc., have shown similar chemical oxidant demand and results.

CDM Smith's experiments with activated sludge treatment of landfill leachate showed that 60% of the COD can be removed, and that 95% of the nitrogen can be removed by ammonia oxidation and subsequent denitrification. These experiments supported the design of a successful 0.5 MGD full scale treatment system at a similar facility in the northeast. While the refractory COD in the effluent retained color, the intensity is much reduced from the raw leachate. Further chemical oxidation of the activated sludge effluent for color removal would be more effective on this treated leachate, than with raw leachate.

The proposed tests will treat a sample of leachate in a dedicated activated sludge reactor, and measure the change in UV transmittance of the effluent relative to raw leachate, and determine what dilution is required to achieve satisfactory transmittance. If transmittance is insufficient at dilutions characteristic of the Buckman treatment plant, CDM Smith would experiment with oxidation for further color removal, dosing activated sludge treated samples with hydrogen peroxide or peracetic acid.

UV transmittance would be compared at the typical peak disinfection wavelength of 254 nm.

The following is a description of the services to be provided under this Amendment No. 11 to the Task Authorization. The non-sequential order of some tasks and subtasks listed below is a result of tasks either being authorized under previous amendments or the work is to be authorized as part of future amendments.

TASK 1 - KICKOFF MEETING

There is no change to Task 1. All work has been completed for this task.

TASK 2 - DATA COLLECTION AND REVIEW

There is no change to Task 2. All work has been completed for this task.

TASK 3 - TRLF EXPANSION LANDFILL CELL ALTERNATIVES DEVELOPMENT

There is no change to Task 3. All work has been completed for this task.

TASK 4 - ANALYSIS OF PHASE 6 CELL ALTERNATIVE LOCATIONS

There is no change to Task 4. All work has been completed for this task.

TASK 5 - INITIATE FIELD SITE INVESTIGATION

There is no change to Task 5. All work has been completed for this task.

TASK 6 - STORMWATER MODELING

There is no change to Task 6. All work has been completed for this task.

TASK 7 - PROJECT MANAGEMENT

There is no change to Task 7.

TASK 8 - WETLAND LONG TERM HYDRATION EVALUATION

There is no change to Task 8. All work has been completed for this task.

TASK 9 - FLOOD ELEVATION DETERMINATION

There is no change to Task 9.

TASK 10 - ENVIRONMENTAL RESOURCE PERMITTING

There is no change to Task 10. All work has been completed for this task.

TASK 11 - DESIGN AND PERMITTING

There is no change to Task 11.

TASK 12 - SOLID WASTE LANDFILL CONSTRUCTION PERMITTING

There is no change to Task 12. All work has been completed for this task.

TASK 13 - QUALITY ASSURANCE AND QUALITY CONTROL

There is no change to Task 13. All work has been completed for this task.

TASK 14 - ECONOMIC EVALUATION

There is no change to Task 14. All work has been completed for this task.

TASK 15 - PUBLIC INFORMATION PROGRAM ASSISTANCE

There is no change to Task 15. All work has been completed for this task.

TASK 16 - BIDDING SERVICES

There is no change to Task 16. All work has been completed for this task.

TASK 17 - GENERAL ENGINEERING SERVICES DURING CONSTRUCTION

There is no change to Task 17.

TASK 18 - SPECIAL SERVICES

There is no change to Task 18.1

Subtask 18.2- Leachate Treatability Study

Subtask 18.2.1 Data Collection

CONSULTANT will contact the OWNER and WMI to request pertinent available data to assist in the leachate evaluation. This includes but is not limited to leachate analytical data, landfill permit information and compliance data reports.

Subtask 18.2.2 Evaluation of Alternatives for Leachate Pre-treatment for WWTP

CONSULTANT will perform a feasibility evaluation of the alternatives listed below. The evaluation will include bench scale testing of the leachate at an analytical lab to determine treatment efficiencies and achievable levels for constituents of concern. The evaluation will include the ability of the treatment method to meet JEA industrial pre-treatment requirements as outlined in the JEA Industrial Pretreatment Regulations dated April 2, 2012.

- Activated Sludge Treatment
- Dilution
- Hydrogen Peroxide
- Peracetic Acid

The general bench scale protocol will involve acclimating an activated sludge culture to leachate. Treatment progress will be monitored for soluble COD, ammonia-N and nitrate removal, with concentrations corrected for the percentage of leachate in the mixture. After the COD has stabilized and nitrification is complete, UV transmittance will be measured on filtered supernate as is, and after dilution with clear water to 10%, 1%, 0.1% and 0.01% leachate concentration.

If UV transmittance is insufficient, considering the available dilution at the Buckman plant, dose activated sludge treated samples with 50 mg/L of hydrogen peroxide and separately with 50 mg/L of peracetic acid (all on a 100% basis for the active chemical). After one hour, retest the UV transmittance of these samples.

Subtask 18.2.3 Evaluation of Onsite WWTP Treatment and Disposal

Based on the results of the bench scale testing under Subtask 18.2.2, CONSULTANT will evaluate the potential to treat the leachate at an onsite wastewater treatment plant (WWTP) owned and operated by the City of Jacksonville. This evaluation will include a determination of the additional treatment steps required for the effluent to meet discharge requirements for a new National Pollutant Discharge Elimination System (NPDES) outfall to a Class III surface water. To evaluate the potential to permit a new NPDES outfall, the effluent from the bench scale testing will be tested for Class III Surface Water Constituent to identify constituents of concern that exceed surface water quality discharge limits. CONSULTANT will identify the permitting steps necessary to address constituents of concern including data needs related to the receiving waterbody, mixing characteristics, and biological survey.

Subtask 18.2.4 Evaluation of Deep Well Injection Disposal Alternative

Parallel to this leachate feasibility treatment study, Waste Management Inc. is investigating alternatives for deep-well injection of leachate from the Trail Ridge Landfill and Chesser Island Landfill at a location

south of the existing Phase 1-5 at TRLF. The results of the Waste Management Study will be reviewed and evaluated as a disposal alternative.

Subtask 18.2.5 Evaluation of Leachate Evaporation Alternative

CONSULTANT will evaluate commercially available package systems designed to reduce leachate volume through evaporation for suitability at Trail Ridge Landfill. CONSULTANT will evaluate two scenarios: A stand-alone package system owned and operated by the City of Jacksonville and a vendor supplied and operated package system. Both scenarios will be based on electrical power to drive the evaporation process rather than landfill gas.

CONSULTANT will primarily use vendor supplied data related to cost, equipment sizing, and treatment efficiency. CONSULTANT will contact third parties who have installed and are using the package system to attempt to validate vendor claims with regard to treatment efficiency, operations cost, and operation and maintenance procedures.

Subtask 18.2.6 Evaluation of Third Party Disposal Alternative

CONSULTANT will contact up to two third party private WWTP operators to obtain an estimate of treatment capacity and treatment cost for the Trail Ridge Landfill leachate stream. If requested, CONSULTANT will coordinate samples of the leachate for examination and testing by the third party WWTPs as necessary.

Subtask 18.2.7 Evaluation of Alternative Costs

CONSULTANT will determine the capital costs associated with each of the alternatives described above for a total of eight alternatives. For Treatment at either Buckman WWTP and onsite WWTP, up to two pre-treatment alternatives that are determined to achieve the required industrial pre-treatment levels for COD and TSS will be selected for cost analysis. Costs will be based on commercially available cost databases and will include contingencies appropriate for planning level cost estimates. Costs will be calculated on an annual basis including estimated operations and maintenance costs. Cost information will be presented as $/kgallon.

Subtask 18.2.8 Alternative Evaluation Report

CONSULTANT will summarize the results of the alternative evaluations and cost estimates in a report for the City. One review meeting will be held with the City to review the report findings and provide comments. The draft report will be revised to incorporate City comments and finalized within two weeks of the review meeting.

Subtask 18.2.9 Full-Scale Treatment Recommendations

Based on the results of the alternative evaluation and historic average and peak leachate flow rate data CONSULTANT will develop a treatment process design concept, major equipment list and concept-level capital and operating costs. Process design development may include screening-level Biowin® modeling of the treatment process if biological treatment is selected.

TASK 19 - RESIDENT PROJECT REPRESENTATIVE SERVICES DURING CONSTRUCTION

There is no change to Task 19.

TASK 20 - NEW CELL GEOSYNTHETIC INSTALLATION QA/QC CONSTRUCTION SERVICES

There is no change to Task 20.

TASK 21 - BORROW PIT EVALUATION AND EXPANSION

There is no change to these subtasks.

TASK 22 - MEETINGS, PROJECT MANAGEMENT AND QUALITY CONTROL

Activities performed under this task consist of those general functions required to maintain the project on schedule, within budget, and that the quality of the work products defined within this scope is consistent with CONSULTANT's standards and OWNER's expectations. Specific activities included are identified below:

Subtask 22.1- Project Kick-Off and Progress Meetings

CONSULTANT will prepare for and conduct the project meetings as previously outlined in the tasks above.

Subtask 22.2- Project Quality Control (QC) Technical Review

No change to this task.

Subtask 22.3- Project Status Reports

CONSULTANT's project manager will prepare and submit monthly written status reports for an anticipated project life of seven months to accompany monthly invoices.

ASSUMPTIONS

The following assumptions are included in this Amendment No. 9:

1. OWNER shall be responsible for all permit or review fees associated with project.
2. OWNER shall bear all costs incident to compliance with the requirements of the OWNER's Responsibilities.

DELIVERABLES

The following deliverables will be provided:

Task	Description of Deliverable	Quantity/Format
Leachate Feasibility Study Report	Draft Memorandum	- Electronic format, PDF
	Final Memorandum	- Electronic format, PDF

TIME OF COMPLETION/SCHEDULE

CONSULTANT will begin work within five calendar days of receiving Notice to Proceed (NTP) from the OWNER. A separate NTP will be issued for each task (18.2.1 through 18.2.9). The Draft Memorandum will be provided within 60 work days. Final memorandum will be provided within 15 work days after receiving client comments.

COMPENSATION AND PAYMENT

CONSULTANT will complete the services in the Tasks listed above in this Amendment No. 11 for a lump sum fee per task as outlined in Table 1 for a maximum amount of $157,718 as shown in Exhibit V. CONSULTANT will invoice monthly as a percentage of each task listed below based on the percentage of work completed during the billing period. Lump sum compensation shall be for all labor, sub-consultants, and other direct costs associated with the performance of the work. The new total amended value for this Task Authorization is $8,265,648.

Table 1

Task	Total
Task 7.0--Project Management for Amendment 11	$8,918
Task 18.2.1 Data Collection	$9,339
Task 18.2.2 Evaluation of Alternatives for Leachate Pre-Treatment at WWTP	$37,378
Task 18.2.3 Evaluation of Onsite WWTP Treatment and Disposal	$20,960
Task 18.2.4 Evaluation of Deep Well Injection Disposal Alternative	$12,577
Task 18.2.5 Evaluation of Leachate Evaporation Alternatives	$10,442
Task 18.2.6 Evaluation of Third Party Disposal Alternatives	$4,019
Task 18.2.7 Evaluation of Alternative Costs	$15,946
Task 18.2.8 Comparison of Leachate Treatment Alternatives	$22,070
Task 18.2.9 Full Scale Treatment	$16,070

EXHIBIT V				
CONTRACT FEE SUMMARY FORMAT FOR ENGINEERING DIVISION				
CITY OF JACKSONVILLE, FLORIDA				
CLASS I LANDFILL PERMITTING AND DESIGN - AMENDMENT 11				
5/10/2017				
PART I - GENERAL				
1. Project			**Proposal Number**	
CLASS I LANDFILL PERMITTING AND DESIGN AMENDMENT #11 Leachate Treatability Study			RFP #P-07-10	
3. Name of Consultant			**Date of Proposal**	
CDM Smith Inc.			5/10/2017	
PART II - LABOR RELATED COSTS				
5. Direct Labor	Hourly Rate	Estimated Hours		TOTAL
Officer/Technical Expert	74.32	172	$ 12,783.04	
Principal / Associate / Project Manager	63.06	188	$ 11,855.28	
Senior Profesional	50.11	252	$ 12,627.72	
Project Engineer II / GIS Speicalist III	41.10	124	$ 5,096.40	
Project Engineer I / GIS Specialist II	34.34	224	$ 7,692.16	
Sr. GIS Specialist/Designer	40.54	-	$ -	
GIS Specialist I /Drafter/Technician	29.28	20	$ 585.60	
Clerical	20.83	104	$ 2,166.32	
Field Staff Support Services	28.15	-	$ -	
TOTAL DIRECT LABOR	48.71	1,084		$ 52,807
6. Overhead (Combined Fringe Benefit & Administrative)				
Overhead Rate	150.0%	x Total Direct Labor		$ 79,210
7. SUBTOTAL: Labor + Overhead (Items 5 & 6)				$ 132,016
8. PROFIT: Labor Related Costs (Item 7)		x	10%	$ 13,202
PART III - OTHER COSTS				
9. Miscellaneous Direct Costs				
Laboratory Equipment - Bench Scale Testing				
MISCELLANEOUS DIRECT COSTS SUB-TOTAL				$ 4,500
10. SUBCONTRACTS (Lump Sum)				
Analytical Laboratory - WQ Testing				
SUB-CONTRACT SUB-TOTAL				$ 8,000
TOTAL LUMP SUM AMOUNT (Items 5, 6, 8, 9 and 10)				$ 157,718
11. REIMBURSABLE COSTS (Limiting Amount)				
SUB-TOTAL REIMBURSABLES				$ -
PART IV - SUMMARY				
TOTAL AMOUNT OF AM 6 CONTRACT (Lump Sum Plus Reimbursables)				$ **157,718**
12. PRIOR CONTRACT AMOUNT (Through Amendment 10)				$ 8,107,930
AMENDED AMOUNT OF CONTRACT				$ 8,265,648