



May 25, 2019

Stacey Titus, P.E.
City of Rapid City
300 Sixth Street
Rapid City, SD 57701

**RE: Rapid City Landfill
Cell 18 Liner and Leachate Collection
Professional Engineering Services for Basic and Expanded Construction Services
Project No. 16-2371
Contract Amendment #2 – Exhibit A Scope of Services**

Dear Stacey:

The contract for the above referenced project has previously been amended in Amendment #1. Amendment #1 included a revised contract price for additional work to update the Stormwater Pollution Prevention Plan for the landfill facility.

The purpose of this letter is to provide commentary and summarize work items performed or proposed in addition to the original contracted scope and Amendment #1. Unforeseen conditions that arose during construction required additional consulting work. Work regarding changed conditions and additional consultation was performed under Tasks 4.5 and 5.11 in the original contract. Further changes required work beyond what was allocated in the original contract. The changes generally include:

- Excess Excavation Waste Area #2 Berm and Re-Grading Design
- Cell 18 Access Road Widening and Re-Design
- Stormwater Channel Concrete Drainage Apron Re-Design
- Stormwater Channel Modifications and Seepage Dewatering Design, Construction Observation and Testing
- Lake Herman/Commercial Scale Slope Drainage Modifications Design, Construction Observations and Testing
- Aerator and Electrical Modifications Design and Construction Observation
- Cell 18 Access Road Approach Improvements Design, Construction Observation and Testing
- Cell 18 Landfill Operations Road Drainage Improvements Design, Construction Observations and Testing
- SDDOT/City of RC Drainage Improvements Design, Construction Observations and Testing
- Clay Liner Protective Cover
- Additional Construction Quality Assurance Observation and Testing Past Original Contract Deadline
- Landfill Facility Wastewater Discharge Permit Renewal
- Cell 18 Fill Progression and Grading Plans



These items are summarized in greater detail in the following sections, with an itemized table of manhours and costs for each additional task attached following this letter.

Additional Task 5 – Expanded Construction Services Work

The following items were completed during construction of Cell 18 and were in addition to the original contracted Task 5 – Expanded Construction Services scope. In general, these items have been identified as Task 5A – Additional Construction Period Services.

5A.1 - Excess Excavation Waste Area #2 Berm

It was decided by the City during construction to add a berm along the southern and eastern extents of Excess Waste Area #2. This required re-design of the grading and drainage in both Excess Excavation Waste Areas #2 and #3, construction contract changes and documentation, and resulted in additional construction staking survey work.

The total cost of this additional work was \$1,399.00.

5A.2 - Cell 18 Access Road Widening

It was decided by the City during construction to widen the Cell 18 Access Road. This required re-design of the grading and drainage along the Cell 18 Access Road. Field Order #2 was drafted to adjust the width and grades of the Cell 18 Access Road. Specifically, the road was widened by 10 feet. This change also resulted in additional construction staking survey work.

The total cost of this additional work was \$1,302.00

5A.3 - Changes to Concrete Apron

It was decided by the City during construction to revise the design of the concrete drainage pan/apron immediately north of the stormwater channel and south of the compost pick-up area. Specifically, Field Order #3 was published to revise the configuration of the drainage apron and add reinforcing steel to the concrete apron. This required re-design of the concrete drainage apron and reinforcing steel, additional coordination with the contractor, and additional construction staking survey work, and construction observation and testing.

The total cost of this additional work was \$894.00.

5A.4 - Stormwater Channel Modifications and Groundwater Seepage Dewatering

During construction, groundwater seepage was discovered in the stormwater channel immediately north of the new leachate pond. This resulted in Request for Price Number 4 (RFP #4) being published to propose modifications to the stormwater channel grading, repair groundwater seeps and dewater the area to allow for construction. These changes required additional design work, coordination and contract administration, construction staking survey work, construction observation and testing.

The total of this additional work was \$3,431.00.



5A.5 - Commercial Scale Drainage Modifications

During construction, it was determined that soil stabilization and drainage runoff would impact slope stabilization and revegetation along the overly steep southern slope of Lake Herman. RFP #5 dated September 19, 2018 was drafted to propose modified grades and added drainage improvements. These changes required additional design work, coordination, contract administration, construction staking survey work, construction observation and testing.

The total of this additional work was \$1,891.00.

5A.6 - Aerator and Electrical Modifications

It was originally intended to reuse the existing Landfill aerators, however upon further investigation it was determined that there could be a substantial risk of damaging the pond liner system if the salvaged aerators were used and therefore floating aerators were determined to be a better choice. RFP #6 dated October 15, 2018 made changes to the proposed leachate pond aerator and planned electrical work. A new aerator was included in the changes, as well as a new control panel, and relocation of the planned truck heater disconnect. These changes required additional design work, coordination and contract administration, and survey work.

The total of this additional work was \$648.00.

5A.7 - Cell 18 Access Road Approach Improvements

During construction, the decision was made to review additional options for the alignment, slope configuration, and pavement section of the southern approach to the Cell 18 Access Road, and ultimately RFP #7 dated November 7, 2018 modified the grading and surfacing of the approach to the Cell 18 Access Road. Specifically, an asphalt pavement section was added as opposed to the asphalt millings as planned, and a new horizontal and vertical alignment was designed. This change required additional design work to provide roadway alignment data, staking information, and cross-sections. The original roadway design was asphalt millings over base course and very little field staking or testing was anticipated. Changing the roadway to an engineered alignment and section with asphalt surfacing required additional coordination and contract administration, construction staking survey work, and construction observation and testing.

The total of this additional work was \$2,775.00.

5A.8 - Landfill Operations Road Drainage Improvements

During construction, it was decided to add roadway and drainage improvements to a Landfill Operations road near the limits of the project. As a result of fill placement and changes in drainage patterns, additional roadway and drainage improvements were necessary. RFP #8 described grading modifications and drainage improvements to the existing landfill operations road. This change requires additional design work, coordination and contract administration, and construction observation. The construction of this work has not yet been completed at the time of this letter and is scheduled to be completed in Spring of 2019.

The total of this additional work is \$3,300.00.



5A.9 - SDDOT/City of RC Drainage Improvements

During construction, it was decided to add drainage improvements and erosion control measures to two (2) sites near the limits of the project. As a result of fill placement and changes in drainage patterns, additional roadway and drainage improvements were necessary. RFP #9 described grading modifications and drainage improvements to two (2) sites on the northern extent of the landfill property. The limits of both sites extend onto SD DOT right-of-way. It has been mutually agreed upon by the City and SD DOT to complete the work as shown in RFP #9. This change requires additional design work, coordination and contract administration, and construction observation. It should be noted that construction of this work has not yet been completed at the time of this letter and is scheduled for Spring of 2019.

The total of this additional work is \$3,480.00.

5A.10 - Clay Liner Protective Cover Concepts and Design

During construction, DENR directed the City to explore options for long-term maintenance or protection of the completed clay liner portion of the Cell 18 liner. Ultimately, it was decided to cover the clay liner with Landfill compost material to maintain moisture, prevent desiccation and erosion. This was a change from the originally reviewed and permitted clay liner section. This change required additional engineering cost estimates, conceptual designs, recommendations, technical memorandums, construction observation work, coordination with DENR, and construction coordination and contract administration.

The total of this additional work was \$3,295.00.

5A.11 – Additional Construction Quality Assurance Observation and Testing Past Original Contract Deadline

The contract deadline for substantial completion as defined in the original contract was September 30, 2018. As discussed in a letter from the City dated October 18, 2018, due to conditions beyond the contractor's control and changes to the contract, the substantial completion deadline was revised to October 17, 2018. The City subsequently granted a second extension of contract time, moving the Contract Deadline for Substantial Completion of the project to November 6, 2018.

As stated in a letter from the City dated November 27, 2018 the project was deemed substantially complete as of November 21, 2018.

In the original scoping and budget estimating for construction period and Construction Quality Assurance (CQA) services, the project was expected to be substantially complete by September 30, 2018.

Even though the Contractor was anticipated to start sooner, the level of effort expended by FMG for Construction Services as a result of the project duration being extended amounts to 38 more working days. In general, based on the original budget, the estimated cost of FMG provided services would be approximately \$775.00 per day.

The total of additional CQA services for this period based on the \$775.00 per day would be 38 x \$775.00 = \$29,450.00.



Additional Tasks

In addition to the extra construction period services required, the City has determined the need for the following professional engineering services.

Task 6 – Landfill Facility Wastewater Discharge Permit Renewal

Following discussions with South Dakota Department of Environment and Natural Resources (DENR), it has been determined that renewal of the Landfill Facility Wastewater Discharge Permit requires update and renewal. This work will be conducted with cooperation from DENR to revise key elements and operational processes described in the permit to reflect current operations and site conditions.

Specifically, this work will require completion and submittal of the DENR Wastewater Discharge Permit Renewal Application form and appropriate attachments. This will also include completion of the United States Environmental Protection Agency (EPA) Application Form 2C – Wastewater Discharge Information and appropriate attachments and drawings. In general, EPA Form 2C requires site maps, operational information, descriptions of wastewater processes and drainages, stormwater drainage analysis, and testing and reporting information. A line drawing is also required showing all operations contributing to wastewater, including process and production areas, sanitary flows, and stormwater runoff. The drawing also includes a water balance showing average flows, significant losses of water to products, atmosphere, and discharge.

In general, the permit renewal will rely heavily on information previously submitted by the City in 2012 for the previous Wastewater Discharge Permit. This task shall update all changed information, but assumes unchanged information previously submitted is accurate and complete. Recreation of engineering design work or calculations of any conditions unchanged since the previous permit renewal is not included in this task and would be extra work.

This task also assumes DENR coordination will be required to complete the permit renewal. This scope assumes all coordination will be conducted via email and teleconferences. No travel or offsite meetings are assumed. This task does include multiple meetings at City or Landfill offices in Rapid City.

The proposed Time and Material fee is a not to exceed amount of \$12,800.00.

Task 7 – Cell 18 Fill Progression and Grading Plans

The conceptual fill progression and phasing plans for Cell 18 include two vertical expansions where additional on-site soil is placed to create cell berms along the northern edge of Cell 18 effectively increasing the overall height of the cell and allowing for additional waste placement. Final construction drawings have not been completed for these two vertical expansion berms, only conceptual sketches. DENR has generally agreed with the concept of the vertical expansions, however, has not officially approved final grading configurations.

This task would produce regulatory review drawings for both vertical expansion berms. This task would also coordinate with DENR and provide the required submittals necessary for DENR acceptance of construction ready drawings. This task assumes multiple meetings with City and DENR



via teleconferences in Rapid City. This task does not assume any trips to DENR offices in Pierre will be required.

This task will include submittal of a design report discussing waste fill progression, berm grading, and any geotechnical calculations including waste settlement analysis and berm slope stability as required for DENR approval.

This task also includes submittal of construction ready drawings to the City and DENR. Electronic copies of both AutoCAD and PDF will also be submitted to the City for future use. Detailed Specifications will not be produced as part of this task.

In summary, this task assumes the following submittals

- Preliminary Conceptual Drawings to City for review (Assumes approximately 3-4 plan sheets per vertical expansion berm)
- Final Construction Ready Drawings and Design Report to DENR for approval
- Final Construction Ready Drawings and Design Report to City for files. Includes AutoCAD Drawings, PDFs, and hard copies. Does not include detailed specifications or CQA Documents.

The proposed Time and Material fee is a not to exceed amount of \$5,500.00.

In summary, FMG Engineering performed the additional Expanded Construction Period Services work as described above under direction of the City. This work was beyond the original scope of services and estimated budget. As described in Tasks 6 and 7 additional services have been requested.

Therefore, FMG Engineering is requesting an amendment to the current contract amount of \$303,894.00 of an additional \$70,165.00, which would bring the amended total to \$374,059.00.

Please feel free to contact me if you have any questions or need additional information.

FMG Engineering

Jason Hinds, P.E.
Project Engineer

Cc: FMG Project File Z:\160515.02 RC Landfill Cell 18 Constr. Services\Contract\Amendment No. 2\SW16-2371 Contract Amendment No. 2_Exhibit A.docx

FMG ENGINEERING
TASK SCHEDULE - AMENDMENT NO. 2
EXHIBIT B - SUMMARY OF WORK

RAPID CITY LANDFILL
CELL 18 LINER AND LEACHATE COLLECTION
Project No. 16-2371

TASK 5A - ADDITIONAL CONSTRUCTION PERIOD SERVICES		FEES
5A.1	Excess Excavation Waste Area #2 Berm and Re-Grading Design , lump sum	\$ 1,399.00
5A.2	Cell 18 Access Road Widening and Re-Design, lump sum	\$ 1,302.00
5A.3	Stormwater Channel Concrete Drainage Apron Re-Design, lump sum	\$ 894.00
5A.4	Stormwater Channel Modifications and Groundwater Seepage Dewatering, lump sum	\$ 3,431.00
5A.5	Lake Herman/Commercial Scale Slope Modifications, lump sum	\$ 1,891.00
5A.6	Aerator and Electrical Modifications Design, lump sum	\$ 648.00
5A.7	Cell 18 Access Road Approach Re-Design, lump sum	\$ 2,775.00
5A.8	Cell 18 Landfill Ops Road Drainage Improvements and Erosion Control, lump sum	\$ 3,300.00
5A.9	SDDOT/City Drainage Improvements Design and Erosion Control, lump sum	\$ 3,480.00
5A.10	Clay Liner Protective Cover Concepts and Design, lump sum	\$ 3,295.00
5A.11	Additional Construction QA Observation and Testing Past Original Contract Deadline, lump sum	\$ 29,450.00
TOTAL 5A - ADDITIONAL CONSTRUCTION PERIOD SERVICES		\$ 51,865.00

TASK 6 - LANDFILL FACILITY WASTEWATER DISCHARGE PERMIT RENEWAL		FEES
Labor		\$ 12,474.00
Reimbursible Expenses and Mileage		\$ 326.00
TOTAL TASK 6		\$ 12,800.00

TASK 7 - CELL 18 FILL PROGRESSION AND GRADING PLANS		FEES
Labor		\$ 5,315.00
Reimbursible Expenses and Mileage		\$ 185.00
TOTAL TASK 7 - CELL 18 FILL PROGRESSION AND GRADING PLANS		\$ 5,500.00

TOTAL ALL TASKS		\$ 70,165.00
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Although dollar values have been provided for each task FMG retains the right to reallocate monies to other tasks subject to the maximum limiting fee shown above.