APPENDIX A

Describe how the services or products provided with this project will assist in promoting the goals of the Solid Waste Management Hierarchy, which are identified on page 4 of the instructions.

As identified, on page 2 of the Solid Waste Management Program Application, there are four project components described. The following provides support for each of these projects.

**Cell 16 Final Cover** - The Cell 16 Final Cover project component follows “Item 4 – Disposal in landfills or combustion for volume reduction”, of the Solid Waste Management Hierarchy as defined by South Dakota Codified Law 34A-6-1.2.

More importantly, the project will specifically address the following:

1. Cost savings in that alternative cover arrangements will be analyzed to provide the most efficient cover system at an economical price.
2. Public health will be better protected by the completion of an effective final cover system that limits stormwater infiltration into the MSW (waste), captures landfill gasses emitted by the decomposing waste, and prevents other harmful elements of the waste from exiting the closed cell.
3. The environment will be better protected against exfiltration of harmful elements of MSW decomposition. The final cover system will include a vegetative cover that restores areas to their natural ecosystems, allowing plant and animal life to safely inhabit the area.

**Cell 16 Landfill Gas Collection System** - The Cell 16 Gas Collection project component follows “Item 3 – Use for energy production”, of the Solid Waste Management Hierarchy as defined by South Dakota Codified Law 34A-6-1.2. A portion of the landfill gas collected from Cell 16 will be utilized to heat multiple shops and operations buildings as the landfill. The project will better protect public health and the environment as it will effectively capture the landfill gas emitted by the decomposition of MSW, preventing harmful gases from polluting the air.

**Cell 18 Litter Control Netting** - The Cell 18 Litter Control Netting project component will protect public health and the environment as it will capture windblown litter and debris. The netting project will allow for a majority of the litter and debris to be confined to the cell during the placement MSW.

**Cell 15 Improvement** - The Cell 15 Improvement project component will follow “Item 4 – Disposal in landfills or combustion for volume reduction”, of the Solid Waste Management Hierarchy as defined by South Dakota Codified Law 34A-6-1.2.

More importantly, the project will specifically address the following:

1. Cost savings in that multiple improvement options will be analyzed to provide the most cost efficient system, long term, for the use of Cell 15.
2. Public health will be better protected by the completion of an effective system that limits stormwater from collecting in the bottom of Cell 15.
3. The environment will also be better protected by minimizing potential stormwater contact or interaction with MSW in Cell 16.
Narrative: Cell 16 Closure/GCCS System, final cover and Gas Collection system, Litter Control Netting along Perimeter of Cell #18, and Cell #15 Project Analysis. 
City of Rapid City, Solid Waste Division

Executive Summary

The Rapid City Regional Landfill is an active Municipal Solid Waste Landfill (MSWLF), operating since 1960. The existing landfill site is located on the southwestern corner of the intersection of Highway 79 and Catron Boulevard south of Rapid City, SD. The Rapid City Regional Landfill serves the City of Rapid City and surrounding metropolitan area, including Ellsworth Air Force Base, cities and towns of Nemo, Johnson Siding, Summerset, Piedmont, New Underwood, Box Elder, Keystone, Hill City, Custer, and Hermosa and surrounding urbanized areas. The total population served is estimated at approximately 127,427.

There are four project components and they are described in further detail as follows:

**Cell 16 Final Cover**

The City of Rapid City plans to construct a final cover system over the in-place municipal solid waste (MSW) in Cell 16. Existing Cells 1-14, and 17 are closed with a final cover in place. Cell 18 is currently active and Cell 15 is partially constructed but not yet receiving waste.

Cell 16 has reached near final design grades and currently has an interim cover in place. The City of Rapid City is under contract with an engineering consultant for design of the final cover system. Bidding is planned for early 2020, with construction in the spring/summer of 2020. Design of the final cover project will include grading and drainage design of the final cover system, a geotechnical evaluation of the site to determine final cover material properties, and final stabilization design of the cover system. A comprehensive Construction Quality Assurance (CQA) program will be implemented during construction to ensure state and federal requirements are met.

Cell 16 is an approximately 10.1 acres in size and contains an estimated 509,000 tons of Municipal Solid Waste (MSW). Construction of the final cover system may require a composite barrier system where geosynthetics are utilized in combination with soil cover layers.

The Cell 16 Final Cover Project would follow “Item 4 – Disposal in landfills or combustion for volume reduction”, of the Solid Waste Management Hierarchy as defined by South Dakota Codified Law 34A-6-1.2.

More importantly, the project will specifically address the following:

1. Cost savings in that multiple cover arrangements are being analyzed to provide the most efficient cover system.
2. Public health will be better protected by the completion of an effective final cover system that limits stormwater infiltration into the waste, captures landfill gasses emitted by the decomposing waste and prevents other harmful elements of the waste from exiting the cell.
3. The environment will also be better protected against exfiltration of harmful elements of MSW decomposition. The final cover system will include a vegetative cover that restores areas to their natural ecosystems, allowing plant and animal life to safely inhabit the area.

**Cell 16 Landfill Gas Collection System**

In addition to a final cover system, the closure of Cell 16 will require a landfill gas collection system. The design of the gas collection system has been contracted in combination with the final cover system; however, the construction may be separated into two separate contracts. The gas collection system construction will require vertical gas extraction wells to be installed through the in-place MSW, the wells will then be connected to a collection system that collects and transports the landfill gas to its terminal point at either the flare or boiler used to heat operations buildings.

The overall landfill gas collection system for the entire site is currently being evaluated for potential maintenance requirements. The gas system will require a separate project to repair the overall system. This project will be contracted separately from the Cell 16 gas collection system, but will likely need to be completed prior to installation of the Cell 16 system to ensure efficient operation.

The landfill gas is currently utilized for the beneficial use of providing heat for multiple landfill shops and operations buildings. The City of Rapid City continues to evaluate additional beneficial uses for the recapture/reuse of the landfill gas generated.

The Cell 16 Gas Collection Project would follow “Item 3 – Use for energy production”, of the Solid Waste Management Hierarchy as defined by South Dakota Codified Law 34A-6-1.2. A portion of the landfill gas collected from Cell 16 will be utilized to heat multiple shops and operations buildings as the landfill.

The project will also better protect public health and the environment as it will effectively capture the landfill gas emitted by the decomposition of MSW, preventing harmful gases from polluting the air.

**Cell 18 Litter Control Netting**

The City of Rapid City has determined the need for construction of litter control netting along the perimeter of recently constructed Cell 18, with emphasis on the western and northern perimeters of the cell. The litter control netting will serve to contain windblown litter and debris. The litter control netting will allow for a majority of the litter and debris to be confined to the cell during the waste placement and minimize litter and debris from exiting the area of Cell 18 and traveling onto the adjacent DOT right-of-way or private property. The litter control netting will likely be 20 to 30 feet in height and extend along the northwestern portions of the cell perimeter.

The City of Rapid City is currently under contract with an engineering consultant for design of the litter control netting. The litter control netting project is expected to be bid in early spring of 2020 with construction spring/summer of 2020.

The Cell 18 Litter Control Netting project will protect public health and the environment as it will capture windblown litter and debris and keep it from exiting the cell during waste placement operations and the filling of Cell 18.
Cell 15 Improvement Project

The City of Rapid City has determined the need for improvement to the area of what is commonly referred to as Cell 15. Cell 15 has been rough graded but is not yet lined and is not approved for MSW disposal. It is currently being utilized as a stormwater detention pond. The City has evaluated the landfill phasing and operations plan and determined the need to complete an engineering analysis to determine a path forward for the long term use of Cell 15. One possible improvement option will be to complete grading of the cell, construct a liner system, and utilize the cell for MSW placement.

The Cell 15 project is an engineering evaluation/analysis to determine the most efficient solution for the long term use of Cell 15. Engineering evaluation of the Cell 15 project is expected to begin sometime in the fall of 2019. Depending on costs and availability of funding a construction project could occur in late 2020 or early 2021.

The Cell 15 Improvements Project will follow “Item 4 – Disposal in landfills or combustion for volume reduction”, of the Solid Waste Management Hierarchy as defined by South Dakota Codified Law 34A-6-1.2.

More importantly, the project will specifically address the following:

1. Cost savings in that multiple improvement options will be analyzed to provide the most cost efficient system, long term, for the use of Cell 15.
2. Public health will be better protected by the completion of an effective system that limits stormwater from collecting in the bottom of Cell 15.
3. The environment will also be better protected by minimizing potential stormwater contact or interaction with MSW in Cell 16.