survey, a minor amount of friable ACM exists only in Unit 3 of the plant. For the retirement-in-place scenario only the friable ACM will be abated. All abated asbestos will be disposed of at the Courtney Ride Landfill located in Sugar Creek, MO at a cost of $132 per ton including transportation and disposal, for friable and non-friable asbestos.

Table 2-2: ACM Quantity Estimates

Material	Approximate Quantity	Units
Thermal System Insulation	478	linear feet

Electrical wiring and pipe gaskets were not sampled but are presumed asbestos-containing materials (PACM). Non-friable ACM such as electrical wiring, pipe gaskets, and transite siding will not be abated in this scenario. KCP&L plans to implement an asbestos maintenance program to monitor and ensure that the integrity of remaining ACM materials do not pose a threat to human health or the environment.

Thermal cycles of summer and winter can cause idle facilities to deteriorate rapidly. To reduce ongoing maintenance cost accessible non-asbestos insulation associated with Units 1 through 3 will be abated. Quantities of non-asbestos insulation were not provided. Burns & McDonnell used a factor of 96 linear feet of pipe insulation per megawatt and 338 square feet per megawatt to determine the amount of non-asbestos insulation associated with Units 1 through 3 (see Table 2-3). Approximately 2,500 tons of non-asbestos insulation will be disposed of as construction and demolition debris (C&D) material at the Courtney Ridge Landfill located in Sugar Creek, MO at a cost of $82 per ton including transportation and disposal.

Table 2-3: Non-ACM Insulation Quantity Estimates

Material	Approximate Quantity	Units
Thermal System Insulation	49,728	linear feet
Equipment Insulation/Other	315,800	square feet

2.3.2 Universal Waste Removal

This cost covers the removal and disposal of regulated materials, such as chlorofluorocarbons (CFCs), fluorescent light bulbs and ballasts, fire extinguishers, mercury switches, batteries, and E-waste as identified in the Burns & McDonnell RMA. This also covers the collection and disposal of small quantities of laboratory chemicals, solvents, paints, and other small-container hazardous materials.

Table 2-3: Universal Waste Quantity Estimates

Material	Approximate Quantity	Units
Light Fixtures (Mercury)	1,653	each
Other Devices (Mercury)	206	each
Bulbs (Mercury)	120	containers
PCB Ballasts	1,654	each
Nuclear Devices	29	each
Batteries	251	each
Refrigerant	72	units
Fire Extinguishers	177	each

2.3.3 Chemical Removal

This cost is to drain and remove chemicals identified in the Sibley Station Spill Prevention Control and Countermeasure (SPCC) Plan dated April 2015, and the Burns and McDonnell RMA. Systems will be opened and drained of lubricants, gear boxes cleaned of greases, and chemicals removed from storage tanks. A cost for such removal and disposal associated with equipment located in the Sibley Station plant has been estimated.

Table 2-4: Other Regulated Materials

Material	Approximate Quantity	Units
Chemicals	41,306	gallons
Chemicals	459	cylinders
Chemicals	4,005	containers

2.3.4 Oil Filled Transformers Drained

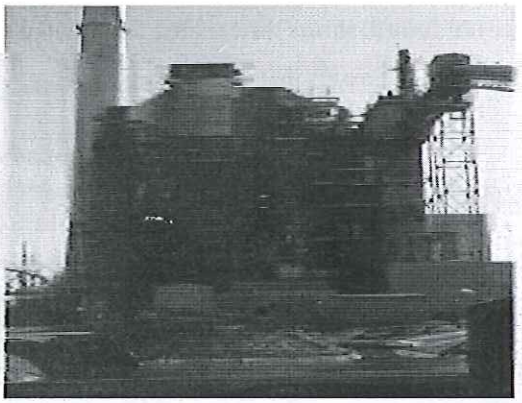
The transformers will be drained with the oil transported offsite for either recycling or disposal in accordance with regulatory requirements. Approximately 40,600 gallons of oil, as identified in the Burns & McDonnell RMA, will be removed upon idling the facility. This estimate assumes that the oil has a polychlorinated biphenyl (PCB) concentration of less than 50 parts per million (ppm). A cost of $1.00 per gallon was assumed for the removal and disposal of this oil.

2.4 Select Demolition

2.4.1 Precipitator Demolition

The Unit 1 and 2 precipitators and duct work are elevated structures that currently are in deteriorated condition. To eliminate long term hazards associated with an idled plant; the Unit 1 and 2 precipitators and duct work will be demolished as shown in Figure 3 (Appendix C). This cost includes demolishing the precipitators in their entirety and the associated horizontal duct work. The duct work will be demolished from elevation 827' to elevation 855'. Due to the proximity of the precipitators and duct work to the Units that will remain, this demolition work will be done with a crane and in a controlled manner.

Figure 2-1: Limits of Unit 1 & 2 Precipitator Demolition



2.4.2 Chimney Demolition

Sibley Station has one 700-foot chimney as shown in Figure 3 (Appendix C). This chimney has an opening at the bottom and with a rail line running through it. Over time condensation and weather elements can severely deteriorate idled concrete chimneys. To prevent hazards associated with the chimney once the Sibley plant is idled down the chimney will be demolished. Due to the limited work footprint, the chimney will be demolished by hand down to elevation 774' and the remaining 50 feet will be demolished mechanically.

2.4.3 Coal Handling Demolition

Coal handling equipment can become a safety concern due to deterioration and an attractive nuisance at an idled power plant. The potential for trespassers to climb on these structures and become injured is very high once this equipment is no longer in operation. To eliminate this hazard, KCP&L is electing to demolish coal handling conveyors and equipment at the Sibley Station as show in Figure 3 (Appendix C). Underground coal handling tunnels will also be demolished and backfilled. Fill material (approximately

8,650 CY) will be needed to backfill the coal unloading hopper and tunnels. This material is assumed to be available from an on-site borrow source.

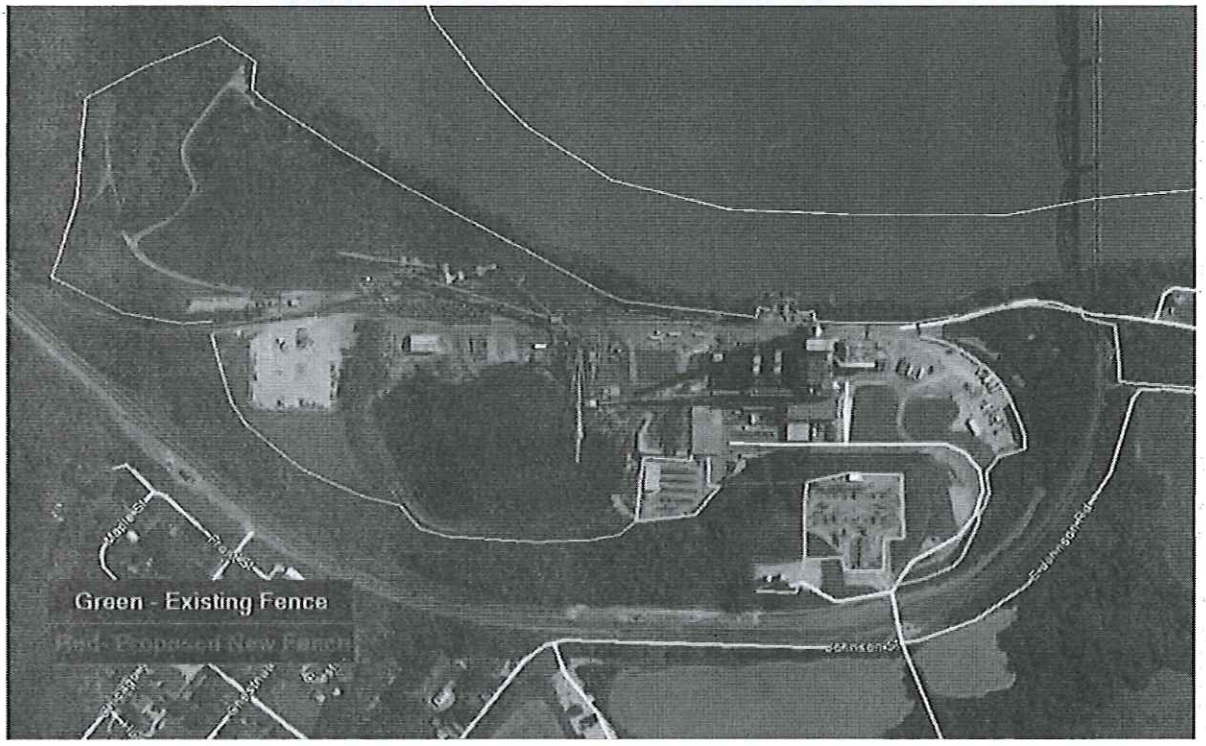
2.5 Fixed Costs

2.5.1 Site Security

It is assumed that the substation will remain in operation and will maintain its own security independent of the power plant and is not included in the scope of this project.

According to information provided to Burns & McDonnell by KCP&L, the existing perimeter fence does not entirely enclose the plant. Therefore, Burns & McDonnell recommends additional fencing and gates be installed to completely enclose the assets that will remain during and after the RIP. **Error! Reference source not found.** shows the existing fence and the proposed new fence locations, which would completely enclose the plant assets that will remain.

Figure 2-2: Proposed and Existing Fence for RIP



Burns & McDonnell estimates the additional fence needed to be approximately 700 linear feet plus an additional two (2) gates installed on the East and West ends of the train track. The cost for materials plus installation is estimated to be approximately $25 per linear foot and approximately $5,000 per gate. In

addition to adding new fencing, an assessment of the existing perimeter fence should be conducted and deficiencies in the existing perimeter fence addressed.

Because the site will be unmanned and is located near a populated neighborhood, Burns & McDonnell also recommends two 24/7 onsite security guards responsible for monitoring access to the facility, reporting any security concerns that arise, and performing regular inspections of site perimeter and remaining assets.

An existing trailer will be reposed to be used as the Security trailer for operation by the onsite security guards. The trailer should be relocated to the entry point to the site and repurposed with communication equipment. If lighting and clear visual of the access gate cannot be obtained from within the shelter than surveillance equipment should also be installed to allow for monitoring of the access road from within the guard shelter.

2.5.2 Property Tax

Long-term property tax costs will be determined by Kansas City Power & Light Company and have not been included in this estimate.

2.5.3 Utility Costs

Long-term utility costs will be determined by Kansas City Power & Light Company and have not been included in this estimate.

2.5.4 Maintenance Cost

Long-term maintenance costs will be determined by Kansas City Power & Light Company and have not been included in this estimate.

3.0 FULL DEMOLITION SCOPE OF WORK

3.1 General Conditions

3.1.1 General Conditions and Project Management

This covers the demolition Contractor's project team costs including, project management, safety personnel, travel expenses, per diem, tools, and consumables. This does not include KCP&L indirect costs for the project team's management of the demolition work.

3.1.2 Mobilization and De-Mobilization

This includes the mobilization of labor, equipment, supplies, and materials needed by the demolition contractor to perform the hazardous material removal, and demolition of the Sibley Station. Labor rates used are based on typical industrial demolition contractor rates. Equipment rates are typical of demolition industry rates and assume that specialized demolition equipment would be used.

The labor and equipment mobilized to the site was estimated to be:

- Superintendent: 1
- Laborers: 8 to 12
- Full-Time Safety Manager: 1
- Operators: 6
- Excavators: 3
- Loaders: 1
- Skidsteer: 2
- Aerial lifts: 3

3.1.3 Erosion Controls

These costs cover the installation, maintenance, and reporting associated with the necessary storm water pollution prevention controls that will need to be implemented. Best management practices will include the installation of a two-row silt fence, hay bales, and storm sewer protection, as needed, to confirm soil erosion control measures are met.

3.1.4 Permitting

This estimate includes costs associated with obtaining a demolition permit, storm water pollution prevention permit, notification with the Missouri Department of Natural Resource Air Pollution Control

Program, and equipment mobilization permits. These costs are based on projects of similar nature. No municipalities or government agencies were contacted to confirm permit costs.

3.1.5 Utility Cutting and Capping

As stated in Sections 2.1.3 and 2.1.4 of the RIP scenario, electrical and mechanical services will be disconnected and isolated prior to the start of demolition. Electrical and potable water services to the station will be cut and capped at the property boundaries.

3.1.6 Electrical Systems Repowering

A landfill leachate system currently in operation will be changed from powered to gravity operation. Repowering work will involve:

- The trailers will be repowered from a distribution line extension. This will include:
  - A distribution line extension from the guard shack to security trailers - seven 40' poles, three 500kVA pole mounted transformers, and 1950' distribution line.
  - Three drops to trailers – three 75kVA transformers with 120V 225A panels, disconnects, and trenching.

A markup of the one-line drawings has been included in Appendix B.

3.1.7 Information Technology and Telecommunications

Sibley Station communications are tied to the rest of the KCP&L network via the microwave tower located near the 345kV Substation approximately 1.5 miles southeast of the plant. Existing single-mode and multi-mode fiber exists between the plant communications/LAN room, the 69kV Substation, the 161kV Substation, and the microwave building. Full demolition of the existing plant buildings that contain the communication equipment will not affect any remaining communication to and from any remaining facilities at the 69kV or 161kV Substations and would leave opportunities to continue to provide connectivity to the KCP&L network should security or site monitoring facilities remain. This estimate covers the cost for KCP&L staff to decommission or remove/provision circuits in OT and IT network environments.

3.1.8 Switchyard Upgrades/Changes

The Sibley switchyard work associated with decommissioning is outlined below:

- Remove 161kV Unit 3 connection.
  - Remove redundant plant controls from breakers R5-10 and R7-10.
  - Add new bus differential relaying and panel to 161kV control building to protect the resulting open bus.

  - Switch 1088 remains as is, locked open.
- Remove 69kV Unit 1, Unit 2, Start-Up 1 & 2, and Start-Up 3 connections.
  - Plant no longer requires start-up connections.
- Primary station service supply is provided from 69kV yard. Reconfigure the AC system to support the new site configuration.
- There are existing independent DC battery systems for both 161kV and 69kV control buildings.
  - Evaluate and possibly reconfiguration the 69kV DC system.
  - Plant DC system overlap to be reconfigured and removed.
- Provide AC service to "guard shack" from distribution line/pole-mount transformer.

3.1.9 Intake and Discharge Removal

Units 1, 2, and 3 receive cooling water from the Missouri River. The intake structure will be demolished down to the river mud line. Intake piping will be permanently sealed by installing steel or concrete bulkheads and be abandoned in place.

The discharge associated with Units 1, 2, and 3 will be permanently sealed by installing steel or concrete bulkheads and filling the pipes with concrete or flowable fill to prevent materials from entering or existing the structure. All underground discharge piping will be abandoned in place.

3.2 Environmental Costs

3.2.1 Asbestos Removal and Disposal

The removal of friable and non-friable asbestos-containing material (ACM) at the Sibley Station has been included in the full demolition estimate. For the full demolition scenario, the abatement cost for non-asbestos insulation has not been included as it is covered in the overall demolition costs. The cost for the removal of friable ACM was developed using the quantities extracted (see Table 2-2) from the Power Engineers asbestos survey dated 12/18/17 found in the Burns and McDonnell RMA. All asbestos will be disposed of at the Courtney Ridge Landfill located in Sugar Creek, MO at a cost of $132 per ton including transportation and disposal, for friable and non-friable asbestos.

Table 3-1: ACM Insulation Quantity Estimates

Material	Approximate Quantity	Units
Thermal System Insulation	478	linear feet
Galbestos Siding	298,216	square feet
Floor Tile	90	square feet

Electrical wiring and pipe gaskets were not sampled but are presumed asbestos-containing materials (PACM) and were included in this cost estimate. The following quantities were assumed based on experience with similar facilities of the similar size and vintage:

Table 3-2: PACM Quantity Estimates

Material	Approximate Quantity	Units
Wiring	30,000	linear feet
Gaskets	455	each

3.2.2 Chemical Removal

This cost is to drain and remove chemicals identified in the Sibley Station Spill Prevention Control and Countermeasure Plan (SPCC) dated April 2015, and the Burns and McDonnell RMA. Systems will be opened and drained of lubricants, gear boxes cleaned of greases, and chemicals removed from storage tanks. Removal and disposal of oils, lubricants, fuels, and chemicals associated with equipment located at Sibley Station has been estimated.

Table 3-3: Other Regulated Materials

Material	Approximate Quantity	Units
Chemicals	41,306	gallons
Chemicals	459	cylinders
Chemicals	4,005	containers

3.2.3 Universal Waste Removal and Disposal

This cost covers the removal and proper disposal of universal wastes, such as chlorofluorocarbons (CFCs), fluorescent light bulbs and ballasts, fire extinguishers, mercury switches, batteries, and E-waste identified in the Burns & McDonnell RMA. This cost also covers the collection and disposal of small quantities of laboratory chemicals, solvents, paints, and other small-container hazardous materials.

Table 3-4: Universal Waste Quantity Estimates

Material	Approximate Quantity	Units
Light Fixtures (Mercury)	1,653	each
Other Devices (Mercury)	206	each
Bulbs (Mercury)	120	containers
PCB Ballasts	1,654	each
Nuclear Devices	29	each
Batteries	251	each
Refrigerant	72	units
Fire Extinguishers	177	each

3.2.4 Fuel Oil, Lubricating, and Hydraulic Systems Drained

As stated in Section 2.2.4 of the RIP scenario, fuel oils, lubricants, and hydraulic oils identified in the Sibley Station Spill Prevention Control and Countermeasure (SPCC) Plan dated April 2015, and the Burns and McDonnell RMA will be drained and disposed.

3.2.5 Transformer Oil Disposal

As stated in Section 2.3.4 of the RIP scenario, the cost for the removal, disposal or recycling of transformer oil will be performed by the demolition contractor or their respected subcontractor. This estimate assumes the oil has a polychlorinated biphenyl (PCB) concentration of less than 50 parts per million (ppm). A cost of $1.00 per gallon was assumed for the removal and disposal of this oil.

3.3 Structure Demolition and Removal

3.3.1 Demolition

This cost includes activities associated with the demolition of the Units 1, 2, and 3, turbine hall, one concrete chimney, coal handling equipment, outbuildings and structures as shown on Figure 4 (Appendix C). These structures will be demolished to grade, and that non-masonry and non-metallic debris generated is clean and can be disposed of at a Class D landfill. All slabs and foundations will remain, and elevated equipment pads, pedestals, or columns will be demolished to the floor slab and the site will be left in a flat, level condition that allows for site drainage. Much of demolition work will be performed using conventional methods except for the boiler structures which will be imploded. No structures will remain after demolition.

3.3.2 Chimney Demolition

There is one 700-foot tall concrete chimney at Sibley Station. This cost covers the demolition and removal of this chimney. The chimney will be imploded in a safe manner and it is assumed that the concrete from the stack is clean and can be recycled.

3.4 Site Restoration and Civil Work

3.4.1 Railroad Track Removal

This cost includes the demolition of two (2) miles of rail and approximately 6,700 wood railroad ties as shown in Figure 4. The rails will be recycled, and railroad ties will be landfilled in a Class D landfill. All ballast material will remain on site.

3.4.2 Concrete Crushing

All brick, block, and concrete generated by demolition activities will be crushed for re-use on site as backfill. It is assumed that masonry debris meets clean fill standards and 35,750 CY of material will be crushed to +/- 2 inches in size.

3.4.3 Backfill and Compaction

Crushed masonry debris from the building demolition and an additional 7,500 CY of borrow fill material will be used to backfill basement areas, pits, and trenches to match the surrounding grade and allow for proper drainage. This material will be compacted to minimize future settling of the site. Masonry debris is assumed to meet clean fill standards and the borrow material is assumed to be readily available from an on-site source.

3.5 Scrap Salvage

3.5.1 Ferrous Metals

Burns & McDonnell has estimated that there is approximately 29,000 tons of ferrous metal at the Sibley Station. The costs for preparation and transportation of the scrap has been deducted from the scrap credit. It was assumed that metallic debris would be recycled and credited back to the project. On December 8, 2017, Burns & McDonnell contacted River Edge Recycling in Kansas City, MO and received the following ferrous scrap metal pricing:

- Plate and structural: $130/gross ton
- #1 heavy melt: $130/gross ton
- Sheet Iron: $115/ gross ton

- Re-Bar: $60/gross ton

See Appendix A (Cost Summary Sheet) for salvage credit value details.

3.5.2 Non-Ferrous Metals

Burns & McDonnell estimated there is approximately 1,740,000 pounds of non-ferrous metal at Sibley Station. The costs for preparation and transport of the scrap has been deducted from the scrap credit. It was assumed that metallic debris would be recycled and credited back to the project. On December 8, 2017, Burns & McDonnell contacted Rivers Edge Recycling in Kansas City, MO and received the following non-ferrous scrap metal pricing:

- Copper: $2.40 per pound
- Copper Wire: $1.30 per pound
- Stainless Steel 304: $0.25 per pound
- Stainless Steel 316: $0.50 per pound
- Yellow Brass: $1.75 per pound

See Appendix A (Cost Summary Sheet) for salvage credit value details.

3.6 Security

It is assumed that the landfill will remain open, the entrance to the landfill will be controlled by the landfill contractor, and the substation near the landfill will remain as the only critical asset at the site. Still undetermined is whether the substation adjacent to the plant would remain in operation. Costs for security modifications are included assuming that the substation is to remain in operation.

- Perimeter and entrance changes
  - The perimeter fence will need to be upgraded to meet KCP&L outer perimeter standards for the criticality of that substation (from the existing interior perimeter type). As of recent conversations, this decision was pending. Assuming fencing is replaced, and substation remains an asset that is not considered critical infrastructure protection (CIP).
  - Fencing costs includes 1,700 LF of chain link with 3-strand topper with manual gate, manual locks, and without IDS at $20/LF installed
- Security technology changes
  - Substation near the landfill is the asset remaining deemed likely to be considered as CIP critical and will require relocation of networking and security system controls (servers/switches) to allow remote monitoring of that and any other remaining assets (e.g. switchyard)
  - Assumes monitoring equipment is already in place and installed at the landfill and critical substation and includes moving only local control and storage devices from the existing

plant location to the control house at the substation, inside the already secure perimeter for that facility.

- Assumes that no trenching will be required, that communications with sufficient bandwidth already extends to the control house, and that sufficient space exists inside the control house for installation of a secure server rack enclosure for such equipment.

- Security staffing changes
  - Assumes that remaining CIP critical asset would have periodic inspections (monthly) of site and perimeter with a 2-hour walkthrough and documentation estimate per month
  - Incident response and investigative time not included
  - Initial cost includes initial law enforcement training for the now unoccupied substation
  - Security staffing during RIP or Demo activities are similar - on site security until facility no longer contains critical assets, estimated at approximately one year. Those costs are not shown as they are already included in staff reduction calculations as appropriate and are constant across the options.

3.7 Alternate Costs

3.7.1 PCB Coated Galbestos Siding

Galbestos is a carbon steel corrugated sheet metal used in the construction of walls and roofs in a wide range of structures from 1948 to 1979. While Galbestos is typically coated with an asbestos felt material, it has recently been discovered that Galbestos was also manufactured with high levels of PCB's. A cost estimate was included in the upper bound should the approximately 242,000 square feet of Galbestos siding at the Sibley plant contain PCB's with a concentration of 50 to 499 ppm. This cost includes labor, disposal, and transportation to properly handle these materials.

3.7.2 PCB Stained Concrete

Various areas of stained concrete were observed at Sibley Station while conducting the RMA. These areas were sampled for PCB's and the following quantities and concentrations of PCB stained concrete will be removed and disposed.

Table 3-5: PCB Concrete Quantities

Location	Approximate Quantity	Concentration (PPM)
Transformer Pads	3 CY	50 - 499
Transformer Pads	1 CY	> 500
Concrete Slabs	50 CY	1 - 49

3.7.1 Slabs and Foundations Demolition

All slabs and foundations within the limits of demolition (Appendix C) will be demolished to 2 feet below grade. This estimate assumes that the clean masonry material resulting from the demolition of the slabs and foundations will be recycled off site at a cost of $6 per ton including transportation and disposal.

3.7.2 Backfill

All voids and depressions created by the removal of any slabs and foundations will be backfilled with an onsite barrow (~4,600 CY). This material will be installed to match the surrounding elevations. It is assumed that a borrow source is readily available on site.

3.7.3 Asphalt Removal

All asphalt pavement (~4,600 CY) as show in Figure 1 (Appendix C), within the limits of demolition will be removed. It is assumed that this asphalt material is clean and will be recycled off site at a cost of $6 per ton including transportation and disposal.

3.7.4 Fine Grading and Seeding

The site will be graded (~105,000 SY) as shown in Figure 2 (Appendix C) to provide for positive sheet flow drainage and avoid ponding. A blended fescue mix of hydroseed will be installed in the affected area.

3.7.5 Boiler Internal ACM Abatement

This cost is to cover the abatement of the Unit 1 and 2 boiler insulation and refractory brick should it be found positive for asbestos. This work will be performed in conjunction with abatement of other asbestos-containing materials while the boilers are under containment. All asbestos will be disposed of at the Johnson County Landfill located in Shawnee, KS at a cost of $172 per ton including transportation and disposal, for friable asbestos.

Table 3-6: Boiler ACM Quantity Estimates

Material	Approximate Quantity	Units
Boiler Insulation	3,440	square feet
Boiler Refractory	2,100	net tons

3.7.6 PCB Building Material Abatement

Polychlorinated Biphenyl (PCB) have been found in building products such as caulk, paints, mastics, and sealants. When PCB's are incorporated into a manufactured product and have a concentration of less than 50 ppm they are classified as bulk PCB waste products and can be disposed of in a Class D landfill.

However, when the PCB concentration is greater than 50 ppm, special handling and disposal of these materials is required. PCB's in building materials were not sampled at the Sibley Station but an allowance is provided for the abatement and disposal of 250 tons of PCB building materials with a PCB concentration between 50 and 499 ppm.

4.0 COAL PILE AND IMPOUNDMENT CLOSURES

The following sections cover civil-related scope for both the retirement-in-place and full demolition options. Construction costs are provided in 2018 dollars and were developed from RS Means and cost data from previous Burns & McDonnell projects. The indicative cost estimates were prepared assuming work will be performed by a construction contractor outside of KCP&L.

4.1 Non-CCR Units

4.1.1 Coal Yard

Sibley operates two separate coal piles which are west of the main plant area. The north coal pile covers approximately 12.4 acres and the south covers approximately 6.5 acres. Both coal piles drain to adjacent runoff ponds (Appendix D). Cost estimates were prepared for closure by removal for both the coal piles and the coal pile runoff ponds.

4.1.1.1 Coal Pile – Closure by Removal

The estimate was prepared assuming coal has been removed by plant operations prior to decommissioning. The top two (2) feet of subgrade will be stripped and disposed of in the on-site landfill. This depth is intended to cover the removal of any remaining coal fines and ash-stabilized base material. The area will then be rough-graded and seeded.

4.1.1.2 Coal Pile – In-Place Closure

In-place closure of the coal pile assumes some coal is to remain in place on-site. Any remaining coal will be graded to drain prior to receiving a cover system. The cover system will consist of 12 inches of clay, 12 inches of vegetative material and seed. Cover material will be obtained from the on-site borrow area near the Sibley landfill.

4.1.1.3 Coal Pile Runoff Pond – Closure by Removal

Closure by removal will consist of dewatering the ponds, removing ponded sediment, and disposal of sediment in the on-site landfill. The ponds will be dewatered using two, 6-inch centrifugal pumps. Assumptions made to develop the cost estimate are as follows:

- The north coal pile runoff pond footprint is approximately 1.7 acres
- The south coal pile runoff pond footprint is approximately 2.9 acres
- Each pond is 10 feet deep with 3H:1V side slopes
- There is two (2) feet of sediment in the ponds at the time of closure

- Six inches of material will be over-excavated from the pond bottom to account for removal of any remaining coal fines

4.1.1.4 Coal Pile Runoff Pond – In-Place Closure

In-place closure of the coal pile runoff ponds will consist of dewatering the ponds, grading ponded sediment, and placement of a cover system. The ponds will be dewatered using two, 6-inch centrifugal pumps. The cover system will consist of 12 inches of clay, 12 inches of vegetative material, and seed. Cover material will be obtained from the on-site borrow area near the Sibley landfill. Assumptions made to develop the cost estimate are as follows:

- The north coal pile runoff pond footprint is approximately 1.7 acres
- The south coal pile runoff pond footprint is approximately 2.9 acres
- Each pond is 10 feet deep with 3H:1V side slopes
- There is two feet of sediment in the ponds at the time of closure

4.1.2 Process Wastewater Pond – Closure by Removal

The process wastewater pond currently receives non-CCR process flows as well as clarifier and filter waste streams. It is assumed the pond will be closed by removal at the time of retirement. The pond will be dewatered using a 6-inch centrifugal pump prior to removing ponded material. All excavated material will be hauled to the on-site landfill for disposal. Assumptions made to develop the cost estimate are as follows:

- The total pond footprint is approximately 0.4 acres
- The pond is 10 feet deep with 3H:1V side slopes
- There is two feet of sediment in the pond at the time of closure

4.1.3 Process Wastewater Pond – Closure by Removal with Backfill

Once the pond is closed by removing sediments per Section **Error! Reference source not found.**, the pond will be filled to grade using material obtained from the on-site borrow source near the Sibley landfill. Prior to filling, Burns and McDonnell assumed an additional six (6) inches of material will be removed to muck out the basin and find a solid subgrade to support fill operations.

4.2 CCR Impoundments

4.2.1 Slag Pond – Closure by Removal

The slag pond currently receives boiler slag from the plant (Appendix D). It is assumed the pond will be closed by removal of coal combustion residuals (CCR) material at the time of retirement. The pond will be dewatered using a 6-inch centrifugal pump prior to removing ponded slag. In addition to the slag, the existing concrete liner and underlying (beneficial use) material will be removed. All excavated CCR material will be hauled to the on-site landfill, and the concrete liner material will be disposed of in an off-site landfill at a cost of $34 per ton. Assumptions made to develop the cost estimate are as follows:

- The total pond footprint is approximately 1.0 acre
- The pond is 10 feet deep with 3H:1V side slopes
- There is two feet of sediment in the pond at the time of closure
- The existing concrete liner is 10 inches thick
- Concrete liner material will be disposed of in an off-site landfill approximately 15 miles from the site
- An additional two feet of underlying material will be excavated from beneath the concrete liner for disposal, to capture sediment potentially containing CCR material

4.2.2 Slag Pond – Closure by Removal with Backfill

Once the pond is closed by removal of CCR per Section **Error! Reference source not found.**, the pond will be filled to grade using material obtained from the on-site borrow source near the Sibley landfill.

4.2.3 Fly Ash Pond – In-Place Closure

The fly ash pond currently receives fly ash and miscellaneous plant flows (Appendix D). The cost estimate was prepared assuming partial in-place closure of the fly ash pond, which will consist of closure by removal of CCR from the east portion of the pond and depositing fly ash in the west portion. The pond will be dewatered using a 6-inch centrifugal pump. Closure of the east portion will include removing fly ash and 24 inches of underlying (liner) material. New berms will be constructed to divide the west pond from the east pond, and to divide the east pond further into north and south. The south area will function as a leachate pond once the landfill leachate piping is re-routed as part of the landfill closure scope. A section of the existing embankment adjacent to the Missouri River will be removed to allow the north area to drain to the river.

Excavated CCR and liner material will be stockpiled for dewatering prior to loading into trucks and transporting to the west portion of the pond. Any excess will be hauled to the Sibley landfill. The west

portion of the pond will be graded prior to receiving a cover system consisting of 18 inches of clay, 6 inches of vegetative material and seed. Cover and berm fill material will be obtained from the on-site borrow area near the Sibley landfill. Assumptions made to develop the cost estimate are as follows:

- The total pond footprint is approximately 16.3 acres
- The pond is 18 feet deep with 2H:1V side slope
- There is nine (9) feet of CCR material in the pond at the time of closure. Actual quantities will need to be surveyed prior to design to allow for optimum berm location and minimization of excess material hauled to the landfill.
- Twenty-four (24) inches of material will be over-excavated from the east portion (west portion will remain in place)
- New berms will have a top width of 20 feet with 4H:1V side slopes
- Material excavated from the existing embankment may be used to grade the north pond area to drain to the Missouri river

4.2.4 Fly Ash Pond – Closure by Removal

The full closure by removal option will consist of dewatering the pond using a 6-inch centrifugal pump and mechanically excavating ponded fly ash. In addition to the fly ash, 24 inches of underlying (liner) material will be removed. Excavated material will be double-handled to promote dewatering prior to disposal in the on-site landfill.

New berms will be constructed to divide the southeast area from the remainder of the pond. This portion will function as a leachate pond once the landfill leachate piping is re-routed as part of the landfill closure scope. A section of the existing embankment adjacent to the Missouri river will be removed to allow the north and west areas to drain to the river. Assumptions made to develop the cost estimate are as follows:

- The total pond footprint is approximately 16.3 acres.
- The pond is 18 feet deep with 2H:1V side slopes.
- There is nine feet of sediment in the pond at the time of closure.
- Twenty-four (24) inches of material will be over-excavated from the pond bottom.
- New berms will have a top width of 20 feet with 4H:1V side slopes
- Material excavated from the existing embankment may be used to grade the north pond area to drain to the Missouri river

After closure, the southeast portion of the pond will remain in place so that it may receive leachate flows from the existing on-site landfill as part of the landfill closure scope.

4.3 CCR Landfill – Final Cover

Final cover will be required at the Sibley landfill, which will include the top and the west slope; other areas have received final cover previously. Costs are included for installing a final cover system consisting of 18 inches of clay, 40-mil LLDPE geomembrane, and 12 inches of vegetative material and seed. Soil cover material will be obtained from the on-site borrow area west of the landfill.

Leachate generated by the landfill is currently pumped to the existing leachate pond. Because power will not be available at the landfill when the plant is retired, the leachate line will be re-routed so that it may gravity drain to the bermed area created within the southeast corner of the existing fly ash pond. Costs for re-routing the leachate line and installing a bottom liner system in the new leachate pond are included in the estimate. The bottom liner system will consist of 24 inches of clay, 60-mil HDPE geomembrane, and 12 inches of protective cover. Costs were also included to remove a portion of the north berm of the existing leachate pond to prevent the pond from impounding water once the leachate line is rerouted. The existing landfill operating permit will need to be modified to account for this change in operation and approved by the Missouri Department of Natural Resources. The existing discharge permit for the fly ash pond will also need to be modified to include leachate contributions.

4.4 CCR Landfill – Expansion

Depending on the retirement disposal quantities, there is potential for vertical and/or horizontal expansion to the west of the current landfill footprint. Based on the possible closure options and assumed quantities, between 55,100-326,600 cubic yards of CCR and/or impacted materials will be disposed of in the landfill at the time of retirement. **Error! Reference source not found.** summarizes assumed disposal quantities for the base and upper-bound scenarios examined as part of this scope. As of July 2017, there was approximately 70,000 cubic yards of existing airspace at Sibley landfill (per documentation provided by KCP&L). With a vertical expansion across the existing landfill footprint to an elevation of 895 feet, the total airspace could be increased to approximately 475,000 cubic yards (per documentation provided by KCP&L). It is currently assumed demolition debris will be removed and disposed of off-site. KCP&L may choose to dispose of demolition debris on-site, which would require approximately 60,000 cubic yards of landfill capacity.

Table 4-1: Potential CCR Disposal Quantities

Source	Disposal Quantity (CY)	
	Base	Upper/Alternate
Coal Pile	61,100	0
Coal Pile Runoff Pond	13,300	0
Slag Pond	4,800	6,300*
Process Wastewater Pond	600	900
Fly Ash Pond	49,700	245,000

*Includes demo'd concrete liner material

Should KCP&L choose to construct a vertical expansion of the existing landfill, a permit modification will be required but capital costs for construction should be minimal. Costs for permitting have not been included; however, costs have been prepared for final cover of the expansion area. Costs are included for installing a final cover system consisting of 18 inches of clay, 40-mil LLDPE geomembrane, and 12 inches of vegetative material and seed. Soil cover material will be obtained from the on-site borrow area west of the landfill.

APPENDIX A - COST ESTIMATE SUMMARY

RETIREMENT-IN PLACE

BURNS McDONNELL

KCP&L Sibley Generating Station
RIP Cost Estimate Summary

Item	Sub Item	Description	Minimum Cost Option		Base Cost Option		Upper Cost Option	
			Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost
1		**System De-Energization**						
1.1		Generator Hydrogen Evacuation		$ 12,000		$ 12,000		$ 12,000
1.2		Intake & Discharge Closure		$ 253,000		$ 714,000		$ 714,000
	1.2.1	Remove/Demo Equipment			$ 204,000		$ 204,000	
	1.2.2	Bulkhead Intake & Discharge	$ 253,000		$ 253,000		$ 253,000	
	1.2.3	Flowable Fill			$ 257,000		$ 257,000	
1.3		Mechanical System Isolation		$ 10,000		$ 10,000		$ 10,000
1.4		Electrical System Isolation/Reconfiguration		$ 275,000		$ 275,000		$ 275,000
	1.4.1	Distribution line extension from guard shack to security trailers	$ 146,000		$ 146,000		$ 146,000	
	1.4.2	Three drops to trailers	$ 129,000		$ 129,000		$ 129,000	
	1.4.3	Remove transformers for switchyard isolation purposes (cost/credit offset)	$ -		$ -		$ -	
1.5		Energy Delivery System Isolation				$ 563,000		$ 563,000
1.6		Security System Reconfiguration		$ 73,000		$ 73,000		$ 73,000
	1.6.1	Assess existing fence line and repair holes, washouts or downed fencing	$ 25,000		$ 25,000		$ 25,000	
	1.6.2	Install chain-link gates at railway access points on the East and the West ends of the plant	$ 10,000		$ 10,000		$ 10,000	
	1.6.3	Install additional fencing along south side of plant to enclose plant and water towers (note if terrain is impassible in this area then fencing may not be required)	$ 18,000		$ 18,000		$ 18,000	
	1.6.4	Refurbish existing trailer for use for security	$ 5,000		$ 5,000		$ 5,000	
	1.6.5	One Time 24/7 Onsite Guard Startup Cost	$ 15,000		$ 15,000		$ 15,000	
1.7		Decommissioning and re-provisioning of IT/OT network circuits and equipment		$ 32,000		$ 32,000		$ 32,000
		Subtotal for System De-Energization		**$ 655,000**		**$ 1,679,000**		**$ 1,679,000**
2		**Decommissioning and Cleaning**						
2.1		Drain Boiler, Condenser, Feedwater Heater, Boiler Feed Pumps		$ 17,000		$ 17,000		$ 17,000
2.2		Boiler, Precipitator & Ash System Cleaning		$ 210,000		$ 210,000		$ 210,000
	2.2.1	Labor & Equipment	$ 122,000		$ 122,000		$ 122,000	
	2.2.2	Disposal	$ 88,000		$ 88,000		$ 88,000	
2.3		Remove and Dispose all Tenant Debris, Trash & Combustibles				$ 96,000		$ 96,000
	2.3.1	Labor & Equipment			$ 45,000		$ 45,000	
	2.3.2	Disposal			$ 51,000		$ 51,000	
2.4		Lubricating & Hydraulic System Draining		$ 107,000		$ 107,000		$ 107,000
	2.4.1	Labor & Equipment	$ 30,000		$ 30,000		$ 30,000	
	2.4.2	Disposal	$ 77,000		$ 77,000		$ 77,000	
		Subtotal for Decommissioning & Cleaning Costs		**$ 334,000**		**$ 430,000**		**$ 430,000**

BURNS McDONNELL

KCP&L Sibley Generating Station
RIP Cost Estimate Summary

Item	Sub Item	Description	Minimum Cost Option		Base Cost Option		Upper Cost Option	
			Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost
3		Environmental						
3.1		Asbestos and Non-ACM Insulation Abatement		$ 560,000		$ 560,000		$ 11,788,000
	3.1.1	Scaffolding, Containment	$ 500,000		$ 500,000		$ 500,000	
	3.1.2	Abate Asbestos Containing Materials	$ 60,000		$ 60,000		$ 60,000	
	3.1.3	Abate Non-Asbestos Insulation					$ 11,228,000	
3.2		Universal Waste Removal				$ 150,000		$ 150,000
	3.2.1	Labor & Equipment			$ 48,000		$ 48,000	
	3.2.2	Disposal			$ 102,000		$ 102,000	
3.3		Regulated Materials & Chemical Removal		$ 697,000		$ 697,000		$ 697,000
	3.3.1	Labor & Equipment	$ 30,000		$ 30,000		$ 30,000	
	3.3.2	Disposal	$ 667,000		$ 667,000		$ 667,000	
3.4		Oil Filled Transformer Draining		$ 47,000		$ 47,000		$ 47,000
	3.4.1	Labor & Equipment	$ 6,000		$ 6,000		$ 6,000	
	3.4.2	Disposal	$ 41,000		$ 41,000		$ 41,000	
		Subtotal for Environmental		$ 1,304,000		$ 1,454,000		$ 12,682,000
4		Select Demolition						
4.1		Unit 1 & 2 Precipitator Demolition				$ 1,050,000		$ 1,050,000
4.2		Chimney Demolition				$ 8,500,000		$ 8,500,000
4.3		Coal Handling Demolition				$ 980,000		$ 980,000
		Subtotal for Select Demolition Costs		$ -		$ 10,530,000		$ 10,530,000
		TOTAL DIRECT COSTS		$ 2,293,000		$ 14,093,000		$ 25,321,000
		Indirect Costs						
		Engineering/Permitting/Construction Management		$ 298,000		$ 1,832,000		$ 3,292,000
		Bonds/Insurance		$ 46,000		$ 282,000		$ 506,000
		Contingency		$ 459,000		$ 2,819,000		$ 5,064,000
		TOTAL DIRECT AND INDIRECT COSTS		$ 3,096,000		$ 19,026,000		$ 34,183,000

BURNS McDONNELL

KCP&L Sibley Generating Station
RIP Cost Estimate Summary

Item	Sub Item	Description	Minimum Cost Option		Base Cost Option		Upper Cost Option	
			Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost
		Scrap Salvage Value						
		Ferrous Metal Value (1,940 tons)				$ (180,000)		$ (180,000)
		Non-Ferrous Value (50,750 lbs)				$ (53,000)		$ (53,000)
		Subtotal for all Scrap Salvage Value		$ -		$ (233,000)		$ (233,000)
		TOTAL NET COST		**$ 3,096,000**		**$ 18,793,000**		**$ 33,950,000**
		Owner Costs		$ 150,000		$ 950,000		$ 1,710,000
		Owner Contingency		$ 150,000		$ 950,000		$ 1,710,000
		TOTAL PROJECT COST (Including Owner Costs)		**$ 3,396,000**		**$ 20,693,000**		**$ 37,370,000**
A		Annual RIP Costs						
A.1		Site Security		$ 303,000		$ 303,000		$ 303,000
	A1.1	2 Onsite 24/7 guards ($11 an hour)	$ 300,000		$ 300,000		$ 300,000	-
	A1.2	Utility costs to maintain the trailer utilities estimated at $250/month including, $100 for electric (if metered), $150 for communications (phone and radio)	$ 3,000		$ 3,000		$ 3,000	
A.2		Property Tax (to be provided by KCP&L)		$ -		$ -		$ -
A.3		Utility Costs (to be provided by KCP&L)		$ -		$ -		$ -
A.4		Facility Inspection/Environmental Permit Costs		$ 50,000		$ 50,000		$ 75,000
A.5		Maintenance Costs (to be provided by KCP&L)		$ -		$ -		$ -
		Total Annual RIP Costs		**$ 353,000**		**$ 353,000**		**$ 378,000**

BURNS McDONNELL.

FULL DEMOLITION

BURNS McDONNELL

KCP&L Sibley Generating Station
Full Demolition Cost Estimate Summary

			Base Cost Option		Upper Cost Option	
Item	Sub Item	Description	Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost
1		**General Conditions**				
1.1		Mobilization and De-Mobilization		$ 185,000		$ 185,000
1.2		Erosion Controls		$ 61,000		$ 61,000
1.3		Mechanical System Isolation		$ 10,000		$ 50,000
1.4		Electrical System Isolation/Reconfiguration		$ 129,000		$ 129,000
	1.4.1	Three drops to trailers	$ 129,000		$ 129,000	
	1.4.2	Remove transformers for switchyard isolation purposes (cost/credit offset)	$ -		$ -	
1.5		IT & Telecommunications Isolation or Re-Routing		$ 60,000		$ 60,000
	1.5.1	Decommissioning and re-provisioning of IT/OT network circuits and equipment	$ 32,000		$ 32,000	
	1.5.2	Fiber re-location, terminations and splicing	$ 28,000		$ 28,000	
1.6		Energy Delivery System Isolation		$ 563,000		$ 563,000
1.7		Full Removal of Intake & Discharge		$ 2,161,000		$ 2,161,000
	1.7.1	Install Coffer Dam	$ 1,275,000		$ 1,275,000	
	1.7.2	Bulkhead Piping	$ 170,000		$ 170,000	
	1.7.3	Demo Structure	$ 680,000		$ 680,000	
	1.7.4	Flowfill	$ 36,000		$ 36,000	
		Subtotal for General Conditions Costs		**$ 3,169,000**		**$ 3,209,000**
2		**Decommissioning and Cleaning**				
2.1		Drain Boiler, Condenser, Feedwater Heater, Boiler Feed Pumps		$ 17,000		$ 17,000
2.2		Boiler, Precipitator & Ash System Cleaning		$ 210,000		$ 210,000
	2.2.1	Labor & Equipment	$ 122,000		$ 122,000	
	2.2.2	Disposal	$ 88,000		$ 88,000	
2.3		Remove and Dispose all Debris, Trash & Combustibles		$ 96,000		$ 96,000
	2.3.1	Labor & Equipment	$ 45,000		$ 45,000	
	2.3.2	Disposal	$ 51,000		$ 51,000	
2.4		Lubricating & Hydraulic System Draining		$ 107,000		$ 107,000
	2.4.1	Labor & Equipment	$ 30,000		$ 30,000	
	2.4.2	Disposal	$ 77,000		$ 77,000	
		Subtotal for Decommissioning & Cleaning Costs		**$ 430,000**		**$ 430,000**

BURNS McDONNELL

KCP&L Sibley Generating Station
Full Demolition Cost Estimate Summary

Item	Sub Item	Description	Base Cost Option		Upper Cost Option	
			Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost
3		**Environmental Costs**				
3.1		Asbestos Removal and Disposal		$ 1,795,000		$ 5,708,000
	3.1.1	Scaffolding, Containment	$ 500,000		$ 500,000	
	3.1.2	Abate Asbestos Containing Materials	$ 1,295,000		$ 1,295,000	
	3.1.3	Galbestos Siding Disposal as PCB-containing (>50 ppm, but < 500 ppm)			$ 1,100,000	
	3.1.4	ACM Boiler Internals Abatement			$ 2,813,000	
3.2		PCB Building Materials Abatement		$ 562,000		$ 562,000
3.3		Universal Waste Removal and Disposal		$ 150,000		$ 150,000
	3.3.1	Labor & Equipment	$ 48,000		$ 48,000	
	3.3.2	Disposal	$ 102,000		$ 102,000	
3.4		Regulated Materials & Chemical Removal		$ 700,000		$ 700,000
	3.4.1	Labor & Equipment	$ 30,000		$ 30,000	
	3.4.2	Disposal	$ 670,000		$ 670,000	
3.5		Transformer Oil Disposal		$ 47,000		$ 47,000
	3.5.1	Labor & Equipment	$ 6,000		$ 6,000	
	3.5.2	Disposal	$ 41,000		$ 41,000	
3.6		PCB Impacted Concrete Removal		$ 29,000		$ 29,000
		Subtotal for all Environmental Costs		**$ 3,283,000**		**$ 7,196,000**
4		**Structure Demolition and Removal**				
4.1		Demolition of Units 1, 2, 3 Turbine Hall, Coal Handling, and Out Buildings		$ 4,830,000		$ 4,830,000
4.2		Chimney Demolition		$ 445,000		$ 8,500,000
4.3		Slab & Foundation Demolition				$ 619,000
4.4		Backfill from Borrow Source				$ 125,000
4.5		Asphalt Removal				$ 83,000
		Subtotal for Demolition and Removal		**$ 5,275,000**		**$ 14,157,000**

BURNS McDONNELL.

KCP&L Sibley Generating Station
Full Demolition Cost Estimate Summary

Item	Sub Item	Description	Base Cost Option		Upper Cost Option	
			Subtask Cost	Task Subtotal Cost	Subtask Cost	Task Subtotal Cost
5		**Site Restoration**				
5.1		Rail Road Track Removal		$ 946,000		$ 946,000
5.2		Concrete Crushing		$ 390,000		$ 390,000
5.3		Backfill & Compaction		$ 410,000		$ 410,000
5.45		Fine Grading & Seeding				$ 360,000
		Subtotal for Site Restoration		**$ 1,746,000**		**$ 2,106,000**
		Subtotal Direct Costs		**$ 13,903,000**		**$ 27,098,000**
		Indirect Costs				
		Engineering/Permitting/Construction Management		$ 1,807,000		$ 3,523,000
		Bonds/Insurance		$ 278,000		$ 542,000
		Contingency		$ 2,781,000		$ 5,420,000
		Total Direct and Indirect Costs		**$ 18,769,000**		**$ 36,583,000**
		Scrap Salvage Quantity and Value				
		Ferrous Metals Quantity (29,000 tons)		$ (1,050,000)		$ (1,050,000)
		Non-Ferrous Quantity (2,265,000 lbs)		$ (1,740,000)		$ (1,740,000)
		Subtotal for all Scrap Salvage Value - SUM OF Item Nos 6.2 and 6.4		$ (2,790,000)		$ (2,790,000)
		Tot Net Cost		**$ 15,979,000**		**$ 33,793,000**
		Owner Costs		$ 938,000		$ 1,829,000
		Owner Contingency		$ 938,000		$ 1,829,000
		TOTAL PROJECT COST (Including Owner Costs)		**$ 17,855,000**		**$ 37,451,000**

BURNS McDONNELL.

CCR CLOSURE

BURNS McDONNELL

KCPL GMO
Case Name: 2019 Sibley Accounting Order Request/Complaint
Case Number: EC-2019-0200

Response to Schallenberg Bob Interrogatories - OPC_20190530
Date of Response: 6/19/2019

Question:1038

Was the $34 to $58 million range of decommissioning costs for the Sibley Generating Station provided at this meeting? If no, what is the current expected range for decommissioning costs for the Sibley Generating Station? Please provide copies of all the management studies that considered these costs in evaluation of the decision to retire the Sibley Generating Station.

Response:

At the November 1, 2018 meeting, a range of $34 to $58 million was provide for the decommissioning (retirement and demolition) cost for the Sibley facility. The Burns & McDonnell report Sibley Station Retirement Scope and Cost Estimate is attached.

Information Provided By:
Richard Pearce, PE, Manager of Engineering –

ATTACHMENT:
Q1038 – Burns and McDonnell report - Sibley Station Retirement Scope and Cost Estimate
Q1038_Verification.pdf