

**2016 ECR Plan Status Update Report  
Quarterly Report – Update #10  
January 30, 2019**

**Executive Summary:**

**General**

This report covers LG&E and KU’s (“Companies”) progress on the 2016 Environmental Cost Recovery (“ECR”) Plan through the fourth quarter of 2018.

The overall 2016 ECR Plan safety performance through the fourth quarter of 2018 remains excellent with a year-to-date OSHA Recordable Incident Rate of 0.36 and an inception-to-date OSHA Recordable Incident Rate of 0.61, compared to the industry average of 3.2.

The total 2016 ECR Plan projected cost remains \$892.1 million (net) compared to the filed total of \$996.4 million as provided in Case Nos. 2016-00026, 2016-00027, and 2017-00483. Total spend to date increased from \$431.8 million (net) last quarter to \$513.1 million (net) through December 31, 2018.

**CCR Compliance (CCR Rule and State CCR Pond Closures)**

Safety performance through the fourth quarter is excellent with a year-to-date OSHA Recordable Incident Rate of 0.36 and an inception-to-date Recordable Incident Rate of 0.63, compared to an industry average Recordable Rate of 3.2.

The total projected costs for the Coal Combustion Residual (“CCR”) Closure Program remains \$862.9 million (net) reported last quarter. Total spend to date through December 31, 2018 has increased from \$419.7 million (net) last quarter to \$495.8 million (net).

The remaining engineering activities primarily consist of corrections for “as-built” field changes during construction on the projects completed or under construction, design engineering associated with the diffusers at E.W. Brown, Ghent and Mill Creek for the Process Water System (“PWS”) discharges, and design engineering associated with the clean closure of Trimble County’s Gypsum Storage Pond. The Mill Creek Main Ash Pond Request for Quotation (“RFQ”) and the E.W. Brown Diffuser installation RFQs were issued to the market during the fourth quarter of 2018. The Mill Creek Main Ash Pond award is anticipated in April of 2019, while the E.W. Brown Diffuser award is planned for January, 2019. Remaining procurement activities are associated with contract maintenance of all awarded contracts through completion of the work and warranty periods, the development of the remaining RFQ documents for the closure scopes for Trimble

County's Bottom Ash and Gypsum Storage ponds, as well as Phase III of Ghent's Ash Treatment Basin ("ATB") #2.

The Company continues to monitor and evaluate changes to the CCR Rule proposed by the U.S. Environmental Protection Agency ("EPA"). A lawsuit was filed by the Sierra Club challenging the new EPA Phase I, Part I Rule. The Companies have not made any design or construction changes to our compliance plan as a result of the EPA's Rule issuance or the challenge by the Sierra Club.

### CCR Impoundment Closures

- Ghent – The Phase I scope construction was impacted by the record rainfalls in 2018, especially the rainfall from September through December of 2018. Construction of the cooling channel has been completed and liner installation is ongoing for the North Cooling Pond. Tetra Tech's Phase II scope (construction of the South Cooling Pond and closure of ATB #1) has been limited to preliminary investigations and management of process inflows. As previously reported, closure of ATB #2 will now be bid separately as a Phase III scope. Overall, Tetra Tech is progressing the Ghent projects well with no compliance issues forecasted.
- E.W. Brown – Thalle Construction Company ("Thalle") has completed development of the onsite soil borrow area that is providing soil for the closure and PWS projects. Hauling of soil continues for the construction of the berms of the new Process Pond. The overall progress of the Process Pond has been delayed due to the fall rainfall events; however, no compliance issues are forecasted. The installation of the Process Pond discharge pipe and diffuser was bid out to the market during the quarter with an anticipated award in January to support a spring 2019 installation prior to Herrington Lake rise to summer pool.
- Green River – The CCR Impoundments Closure Project is progressing to plan by Trans-Ash. Trans-Ash completed the installation of the Process Pond and the Main Ash Pond closure cap. The SO<sub>2</sub> pond CCR material has fully been relocated to ATB #2 as planned and work is ongoing to install the cap system and storm-water perimeter ditches. The Kentucky Division of Waste visited the site in December 2018 with very good reviews.
- Mill Creek – South Ponds (Construction Runoff Pond, Clear-well Pond, and Dead Storage Pond) closure work is also progressing well by MAC Construction ("MAC"). MAC has completed closure and construction on the Construction Runoff and Clearwell Ponds with both ponds being fully closed, lined and placed into operation. Work associated with the Dead Storage Pond will start during the first quarter of 2019.

- Pineville – Thalle completed the installation of the new storm-water pond and associated spillways. Thalle is working on final subgrades and anticipates completing the installation of the capping system in the first quarter 2019.

The CCR Impoundment Closure Program is on schedule to be completed on or before the CCR Rule regulatory deadlines.<sup>1</sup> To ensure the Companies' CCR Compliance projects comply with the regulations and to share best-practices and lessons-learned, the Companies continue to hold program-wide meetings with internal project management teams and affected stations to provide opportunities for all parties to deliver updates and to ensure the contractors are providing similar deliverables across the projects.

### Process Water Systems

- Trimble County – AMEC completed erecting the pipe rack and PWS building steel, and continues installing piping and electrical infrastructure. AMEC continues coating the Wet Flue Gas Desulfurization (“WFGD”) storage tank, equalization tanks, clarifier tanks, and sludge holding tanks. Overall, work by AMEC is progressing well to support the planned initial commissioning activities in the February/March 2019 timeframe.
- Mill Creek – AMEC is focused on completing the erection of all piping and electrical scopes. AMEC is slightly ahead of plan and on pace to begin PWS commissioning in January 2019. MAC has completed the partial lining of the new Knockout Pond, which is a small pond that allows heavy solids to fall out prior to reaching the process water pond.
- Ghent – Burns & McDonnell (“B&McD”) continues to work on underground utilities and installation of piping and electrical systems to support initial commissioning activities late first quarter 2019. Bowen Engineering, a local contractor and a subcontractor to B&McD, is performing most of the construction. Overall quality is very good.
- E.W. Brown – Bowen mobilized their construction team to the site in October with work focused on the ABS Maintenance Tank foundation formwork and rebar construction. The tank foundation pour is planned for January 2019. Underground utilities were relocated

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<sup>1</sup> EPA has committed to revising various portions of the CCR Rule in the period between mid-2018 and the end of 2019. The revised regulatory language is expected to provide clarification to some portions of the Rule which are nebulous while effectively addressing other parts of the Rule which have had legal challenges upheld. An August 21, 2018 decision by the DC Circuit Court has potentially expanded the universe of facilities and units that are subject to the Rule and is expected to force EPA to revise portions of the Rule which it had not anticipated. While these conditions may suggest uncertainty, the Rule's baseline requirements have not changed and the Companies' plans were developed to meet those requirements, even at locations that were not previously subject to the Rule. The Companies are well-positioned to comply with the evolving CCR Rule and, as a result, have not significantly changed any of the efforts already underway to comply with the Rule's basic requirements and deadlines. The Companies will continue to track actions related to the Rule and to ongoing litigation and will provide updates to the Commission as they relate to construction schedules and activities.

and the piling system was installed by year’s end. Civil construction at the Toe Drain and Coal Pile Runoff Treatment System has commenced.

Suez, the water treatment technology supplier for the Ghent, Mill Creek, and Trimble County PWS projects, is primarily focused on working in concert with both AMEC and B&McD on initial commissioning activities. To ensure the Companies’ PWS projects share best practices and lessons learned across all projects, the Companies continue to hold program-wide meetings with the owner’s engineers (“OEs”), internal project management teams, and all affected stations. These meetings provide an opportunity for all parties to deliver updates and ensure the OEs and contractors are providing similar deliverables and lessons learned across the projects.

## Schedules

### CCR Rule and State CCR Impoundment Closures

<u>Project</u>	<u>Project #</u>	<u>EPC Status</u>	<u>Planned Construction Completion</u> <sup>3</sup>
E.W. Brown Aux Pond	KU Project 42	Awarded July 9, 2018	December 2020
E.W. Brown Main Ash Pond (Deleted Phase III of Landfill)	KU Project 36	Awarded July 9, 2018	December 2019
Ghent ATB #1	KU Project 40	Awarded September 7, 2018	December 2021
Ghent ATB #2	KU Project 40	Issue RFQ 3Q 2019	December 2024
Ghent Gypsum Stack	KU Project 40	Amended Sept. 7, 2018	December 2020
Green River Main Pond	KU Project 39	Awarded July 28, 2017	2Q 2019
Green River ATB #2	KU Project 39	Awarded July 28, 2017	2Q 2019
Green River SO2 Pond	KU Project 39	Awarded July 28, 2017	2Q 2019
Mill Creek Ash Pond	LG&E Project 29	Issued RFQ in November 2018	December 2021
Mill Creek Clearwell Pond	LG&E Project 29	Completed	Closure Completed & New Pond in Service
Mill Creek Construction Runoff Pond	LG&E Project 29	Completed	Closure Completed and New Pond in Service
Mill Creek Emergency Pond	LG&E Project 29	Completed	Closure Completed
Mill Creek Dead Storage Pond	LG&E Project 29	Awarded December 27, 2017	2Q 2019
Pineville Ash Pond	KU Project 39	Awarded December 7, 2017	2Q 2019
Trimble County Bottom Ash Pond	KU Project 41, LG&E Project 30	Issue RFQ 2/3Q 2019	December 2024
Trimble County Gypsum Storage Pond	KU Project 41, LG&E Project 30	Issue RFQ 2/3Q 2019	December 2021
Tyrone Ash Pond	KU Project 39	Awarded December 7, 2017	2Q 2019

Process Water Systems

<u>Project</u>	<u>Project #</u>	<u>EPC Status</u> <sup>2</sup>	<u>Planned In-Service Date</u> <sup>3</sup>
E.W. Brown Process Water System	KU Project 42	Awarded June 14, 2018	December 2019
Ghent Process Water System	KU Project 40	Awarded August 1, 2017	August 2019
Mill Creek Process Water System	LG&E Project 29	Awarded July 19, 2017	April 2019
Trimble County Process Water System	KU Project 41, LG&E Project 30	Awarded July 7, 2017	May 2019

**E.W. Brown Landfill Phase II**

Thalle has commenced grading of Phase II of the landfill and has begun installation of soil berms to support liner installation. The overall progress of the landfill Phase II has been delayed due to the record rainfalls in late 2018; however, no compliance or operational issues are forecasted as work will continue to progress towards completion in 2019.

**Quarterly Status Update:**

**State Division of Waste Closure Projects:**

**KU Project 39 – Green River (GR)/Pineville (PV)/Tyrone (TY) Impoundment Closure**

Green River: While the CCR impoundments closure project was impacted by the record rainfalls in 2018, Trans-Ash continues to progress towards completion of the work. Trans-Ash has completed the installation of the process pond as well as the main ash pond cap. Relocation of the SO2 pond material into ATB #2 has been completed and work is ongoing to install the cap system and storm-water perimeter ditches on the ATB #2. The Kentucky Division of Waste visited the site and performed a thorough review, including an agreement that the SO2 Pond has been clean closed and agreeing the berms could be removed and used in the closure plan for ATB #2 as designed. Associated Engineers, Inc. continues to work with KU to perform Construction Quality Assurance (“CQA”) services and AMEC continues to provide OE services on the Green River project.

<sup>2</sup> Engineering, Procurement, and Construction (“EPC”) Status - the red font signifies actuals.

<sup>3</sup> The Planned In-Service Dates reflect the executed EPCs. Ghent ATB #2 and Trimble County BAP was changed to 2024 to reflect a mid-point between the original rule and the proposed rule changes being litigated. Trimble County GSP was accelerated to reflect the clean-closure plan being completed prior to the original plan of cap and closure.



*Green River CCR Impoundments – Site View – October 2018*



*Green River CCR Impoundments – Site View – January 2019*

Pineville: Thalle completed the installation of the new storm-water pond and associated spillways, and is now working on final subgrades. Completion of the capping system remains planned for the first quarter 2019. AMEC is providing CQA and OE services.



*Pineville Ash Pond – October 2018*



*Pineville Ash Pond – January 2019*

Tyrone: Work has been impacted by the rainfall during the quarter; however, Thalle continues to work on construction of the new storm-water runoff pond and has completed the cleanout of the Coal Pile Runoff Pond. All of the CCR material in the stockpile area has been relocated into the Ash Pond. Thalle is working on final subgrades and planning for completion of the capping system in the first half of 2019. AMEC continues to provide CQA and OE services.



*Tyrone Ash Pond – October 2018*



*Tyrone Ash Pond – January 2019*



## **Federal CCR Rule Closure Projects:**

### **KU Project 40 – Ghent (GH) Station CCR Rule Compliance Construction and New Process Water Systems**

KU continues to hold weekly and monthly project update meetings. Phase I scope has been impacted due to the record fall rainfall during the quarter; however, Tetra Tech continues to progress towards completion of the work. Construction of the cooling channel has been completed and liner installation is ongoing for the North Cooling Pond. Construction of Phase II scope (construction of the South Cooling Pond and closure of ATB #1) has been limited to preliminary investigations and management of process inflows. AMEC continues to perform CQA services and AECOM is providing OE services for KU.

B&McD’s engineering activities are focused on picking up field construction changes. B&McD and Bowen Engineering continue to progress construction of the PWS with work focused on completing the mechanical and electrical subsystems. Initial startup and checkout activities commenced in December 2018 and will continue through the first two quarters of 2019. Black & Veatch (“B&V”) continues to provide OE services on the Ghent PWS project.



*Ghent Gypsum Stack – Looking South – October 2018*



*Ghent Gypsum Stack – Looking South – January 2019*



*Ghent ATB #1 Cooling Channel – Looking West – October 2018*



*Ghent ATB #1 Cooling Channel – Looking West – January 2019*



*Ghent PWS Facility – Site View – October 2018*



*Ghent PWS Facility – Site View – January 2019*

## **KU Project 41 and LG&E Project 30<sup>4</sup> – Trimble County (TC) Station CCR Rule Compliance Construction and New Process Water Systems**

The activities associated with the Bottom Ash Pond (“BAP”) dewatering pilot system were completed during the fourth quarter. The pilot system consisted of two FLASH units fueled by propane, which were used to evaporate BAP water and create a brine mixture. The Electric Power Research Institute (“EPRI”) used various grout mix designs to encapsulate the brine and pumped it into deposition cells within the footprint of the BAP to monitor its behavior when coming into contact with BAP water. The Companies have completed additional process water chemistry sampling and testing to support analyses on various dewatering options for the BAP. Reports are being finalized for the BAP dewatering options and for the process water sampling program. These reports will be submitted to the EPA for their review in the first quarter of 2019.

AMEC is progressing well on the PWS scope and is meeting regularly with Suez and the Companies on PWS integration into the existing station facilities. AMEC continues coating the WFGD maintenance storage tank, equalization tanks, clarifier tanks, and sludge holding tanks. AMEC’s subcontractor, MAC Construction, began constructing pump structures, storm-water structures, and underground utilities that discharge into the future Knockout Pond. Structural steel for the PWS building and pipe rack was completed during this quarter. AMEC is focused on final construction activities leading to the initial commissioning activities of the PWS facility in the first quarter of 2019.

MAC completed constructing the new Process Pond outfall pump structure, storm-water structures, and Knock-Out Pond (“KOP”) inlet piping. MAC continues installing fabric form concrete in the KOP, which is the final layer of the liner system, and preparing the subgrade of the Process Pond South Basin for liner installation.

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<sup>4</sup> KU and LG&E’s net costs are split 48%:52% respectively.



*Trimble County PWP – Knockout Pond Overview – October 2018*



*Trimble County PWP – Knockout Pond Overview – January 2019*



*Trimble County PWS Facility – Site View Looking East – October 2018*



*Trimble County PWS Facility – Site View Looking East – December 2018*

**KU Project 42 – E.W. Brown (BR) Station CCR Rule Compliance Construction and New Process Water Systems**

Bowen mobilized their construction team to the site in October with work focused on the ABS Maintenance Tank foundation formwork and rebar construction. The tank foundation pour is planned for January 2019. Underground utilities were relocated and the piling system was installed by year’s end. Civil construction at the Toe Drain and Coal Pile Runoff Treatment System has commenced. AMEC is providing CQA and OE services.



*E.W. Brown Aux Pond – January 2019*





*E.W. Brown Landfill Phase II and Closure – October 2018*



*E.W. Brown Landfill Phase II and Closure – January 2019*

## **LG&E Project 29 – Mill Creek (MC) Station CCR Rule Compliance Construction and New Process Water Systems**

While the fall 2018 rainfall impacted MAC on the South Ponds’ (Construction Runoff Pond, Clearwell Pond, and Dead Storage Pond) closure work, MAC has continued to progress towards completion. MAC completed the closure activities and construction on the Construction Runoff and Clearwell Ponds. Both ponds have been fully cleaned of CCR, construction completed and placed back into service. Work associated with the Dead Storage Pond will start during the first quarter of 2019. MAC completed the initial Knockout Pond liner system. AMEC continues to perform CQA services and AECOM OE services on the Mill Creek closure projects.



*Mill Creek South Ponds – October 2018*



*Mill Creek South Ponds – January 2019*

AMEC is approaching completion of engineering and procurement activities with engineering focused on picking up field corrections on the PWS project. AMEC is meeting regularly with Suez and the Companies on PWS pre-commissioning planning. AMEC's focus is on completing the installation of the mechanical and electrical subsystems. Initial commissioning of the PWS systems will begin in January 2019, slightly ahead of schedule. B&V continues to provide OE services on the MC PWS project.



*Mill Creek PWS Facility – Site View – October 2018*



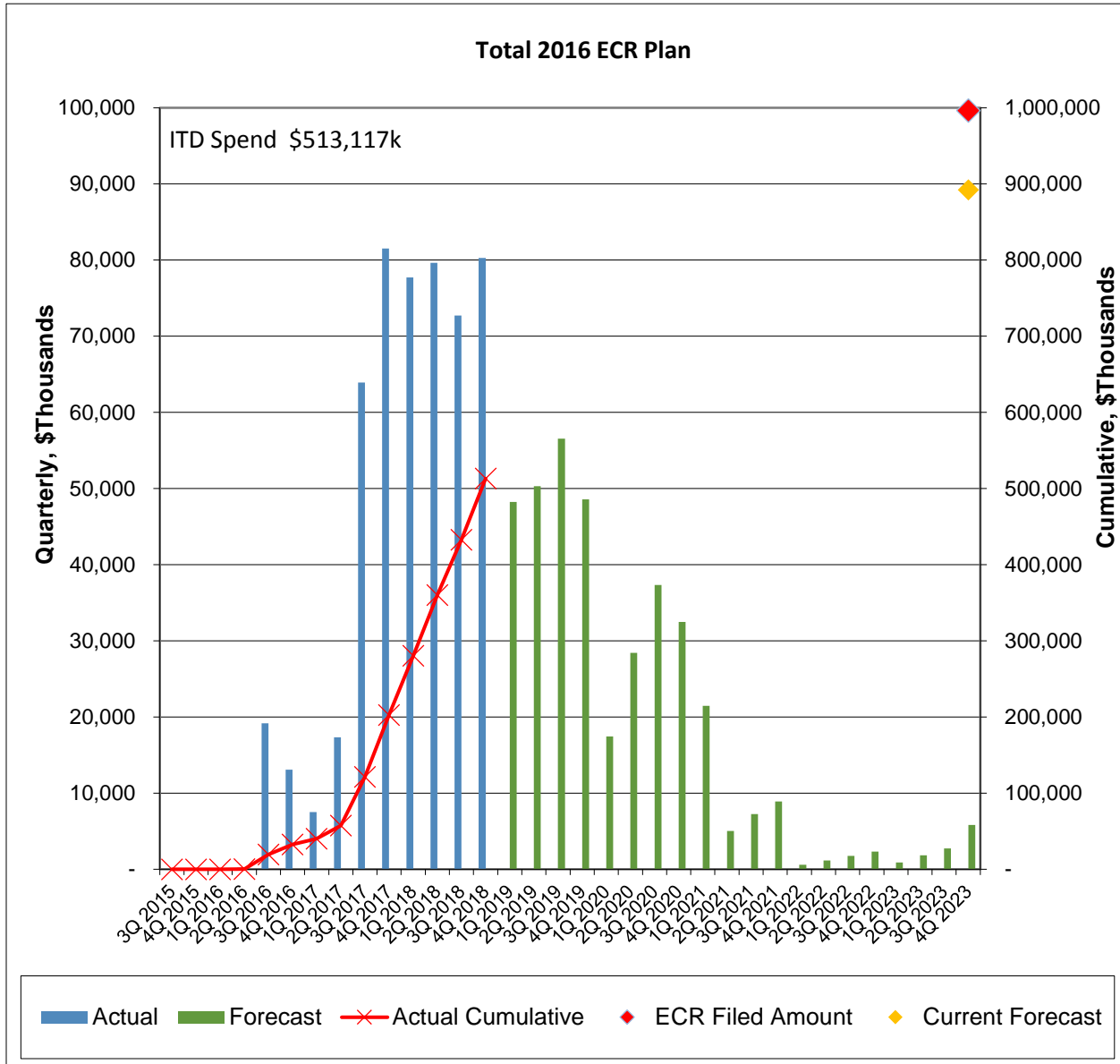
*Mill Creek PWS Facility – Site View – January 2019*



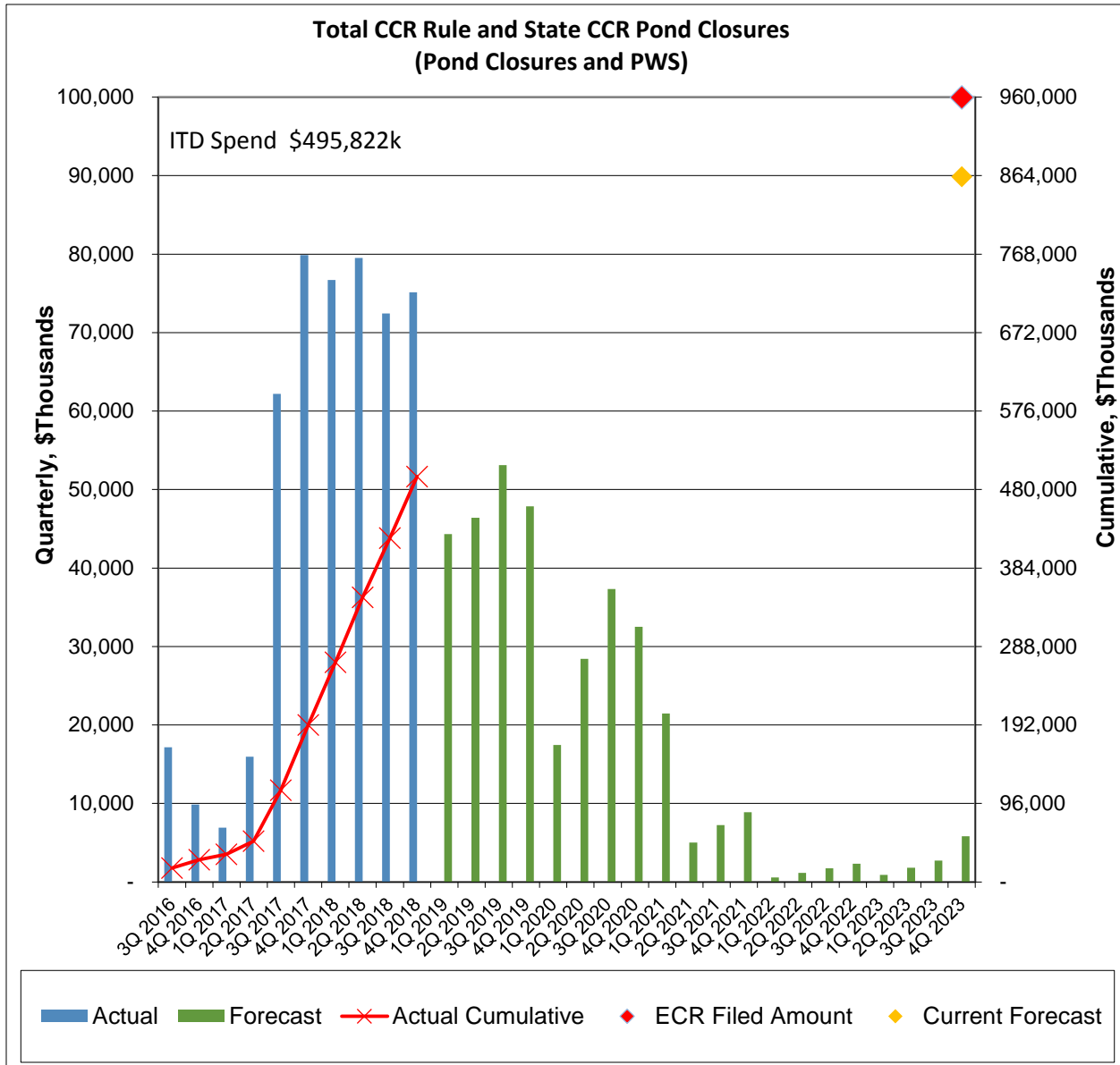
*Mill Creek Knock-Out Pond – October 2018 – No Change in January 2019*

**Financials:**

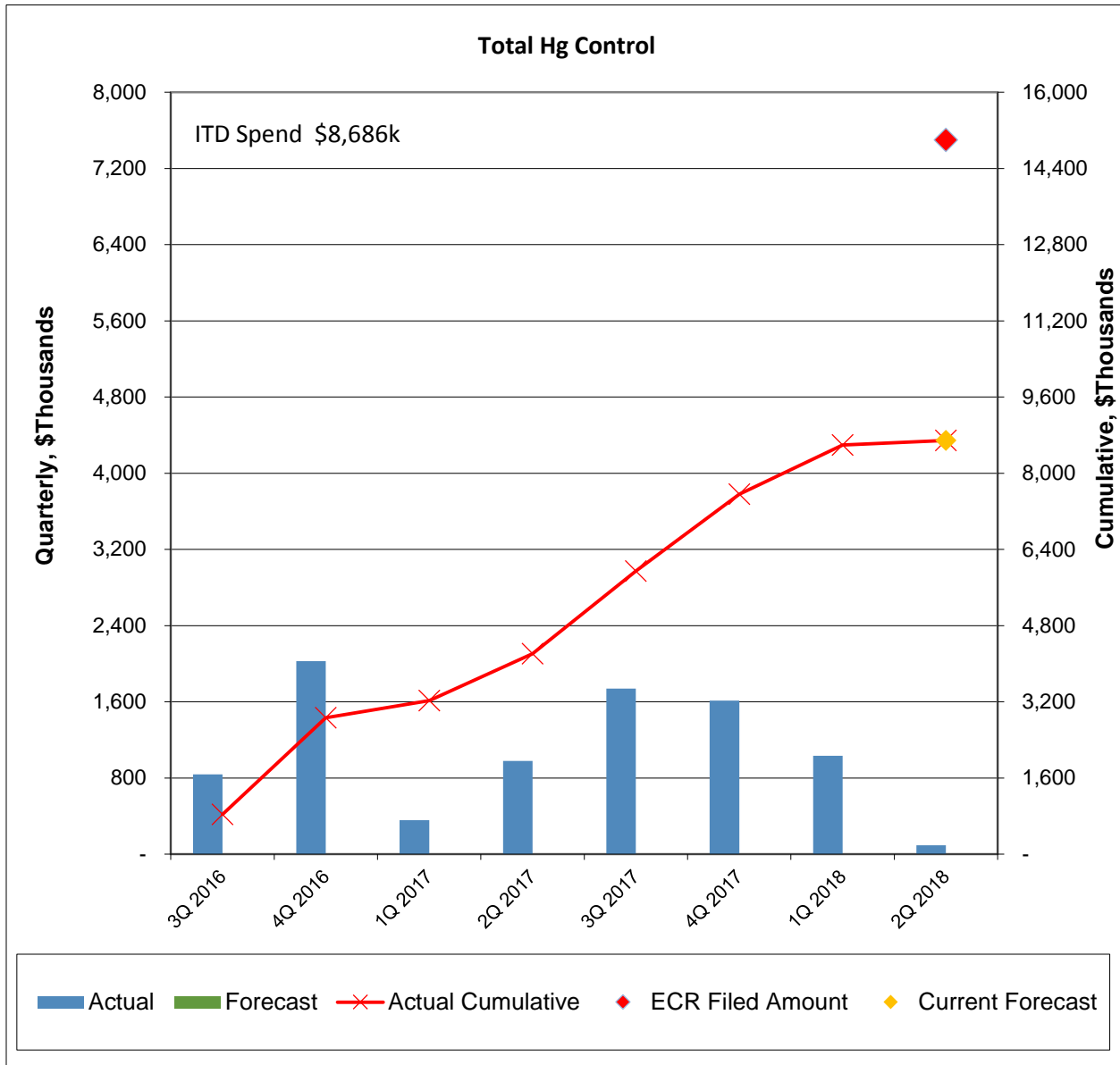
The total 2016 ECR Plan forecasted cost remains \$892.1 million (net), compared to the filed estimate of \$996.4 million (net). Total spend through December 31, 2018 has increased from \$431.8 million (net) last quarter to \$513.1 million (net). For the graph below: 1) the chart includes a symbol ( ◆ ) to show the current forecast to completion; and an (2) inception-to-date (“ITD”) Spend shown in the upper left of the chart.



The CCR Impoundment Closure total forecasted cost remained \$862.0 million (net). Total spend through December 31, 2018 has increased from \$419.7 million (net) last quarter to \$495.8 million (net). Note for the graph below: (1) the chart includes a symbol (◆) to show the current forecast to completion; and (2) ITD Spend is shown in the upper left of the chart.

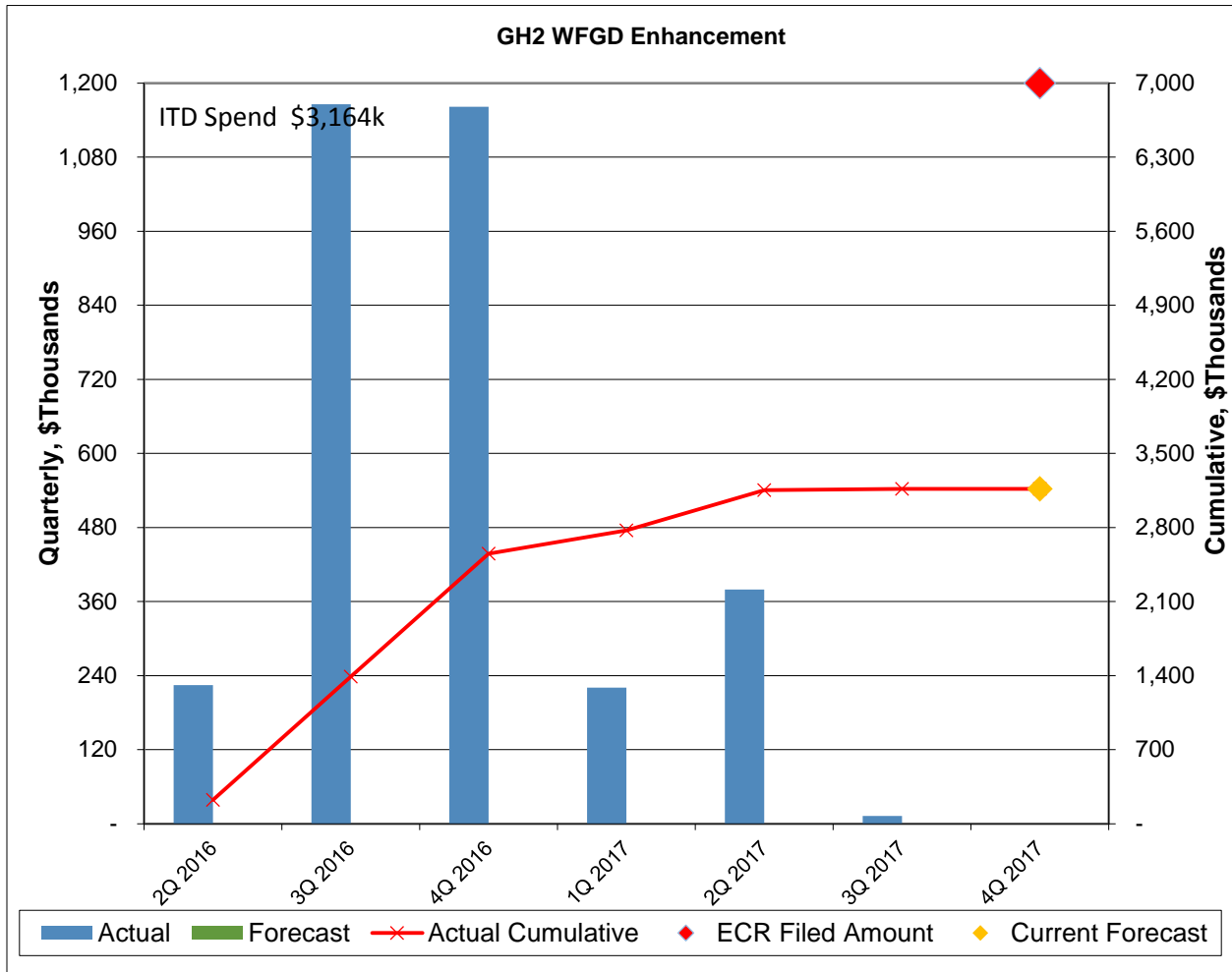


The Mercury Injection projects have been completed and commissioned. The project's total spend was \$8.7 million compared to the filed estimate of \$15.0 million.

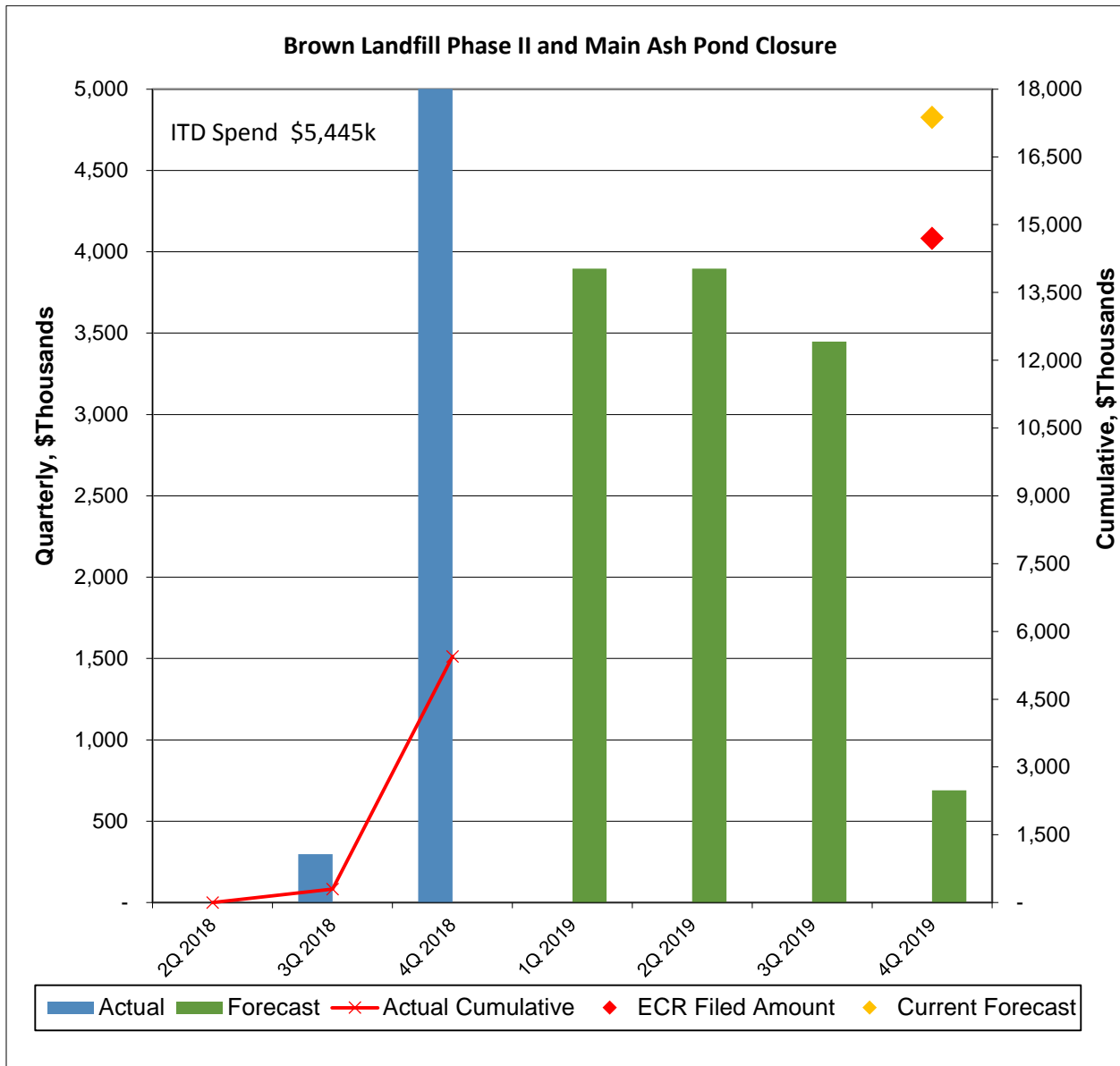




The Ghent Unit 2 WFGD Enhancement project has been completed. Total spend on the project was \$3.2 million compared to the filed estimate of \$7.0 million.



Total spend through December 2018 on the E.W. Brown Landfill Phase II and Phase III Closure project was \$5.4 million. The forecasted cost has increased from \$14.7 million to \$17.3 million to account for the final scope design, the competitively bid award to Thalle, and the delay costs associated with the record rainfall in the last four months of 2018. Note for the graph below: (1) the chart includes a symbol (◆) to show the current forecast to completion; and (2) ITD Spend is shown in the upper left of the chart.



## **Planned Activities for Next Quarter:**

### **State Division of Waste Closure Projects**

Closure work on the Green River CCR impoundments will continue as planned with completion expected in mid-2019. Thalle will also continue advancing the closure of the CCR impoundment at Pineville and Tyrone as planned with completion expected in late 2019.

### **Federal CCR Rule Closure Projects**

#### CCR Closures:

Tetra Tech will continue with Phase I and Phase II closure activities at Ghent, as well as continue engineering and execution activities associated with the recovery efforts. At Mill Creek, MAC will start closure activities on the Dead Storage Pond. The commercial activities for awarding the Mill Creek Main Ash Pond closure scope will continue with bids being received in January 2019. Construction will continue on the E.W. Brown CCR impoundment closure scope.

#### Process Water Systems:

AMEC will commence commissioning activities on the Mill Creek and Trimble County PWS projects. B&McD will continue progressing their engineering, procurement and construction efforts on the Ghent PWS project with commissioning planned to proceed into the second quarter of 2019. Both AMEC and B&McD, along with the Companies and the Companies' OE, will continue reviewing engineering designs, procurement activities, and the design and fabrication of Suez's PWS equipment and process at all three stations (Ghent, Mill Creek, and Trimble County). MAC Construction will continue constructing the Trimble County PWS ponds. Thalle will begin the construction of the new Process Pond. The E. W. Brown diffuser construction will be awarded in January 2019 with work beginning in February 2019.

### **E.W. Brown Landfill Phase II and Phase III Closure**

Thalle will continue construction on the Landfill Phase II and Phase III Closure scope of work.