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DIRECT TESTIMONY

OF

STEVEN K. OWEN

On Behalf of

MISSISSIPPI POWER COMPANY

BEFORE THE MISSISSIPPI PUBLIC SERVICE COMMISSION

DOCKET NO. 2016-AD-0161

Q. Would you please state your name, position and business address?

A. My name is Steven K. Owen. I am the Project Director, Kemper County Integrated Gasification Combined Cycle (IGCC) Plant (Project¹) for Southern Company Services, Inc. (SCS). My business address is 42 Inverness Center Parkway, Birmingham, AL 35242.

Q. Please describe your education and professional experience.

A. I graduated from Auburn University in 1981 with a Bachelor of Science degree in Civil Engineering and joined Southern Company in 1981 as an assistant

¹ The Kemper Project consists of: (i) a lignite-fueled solid-fuel base load electric generating plant, comprised of a two-on-one integrated gasification combined cycle with a net summer capacity of 582 megawatts (Plant); (ii) environmental equipment for the reduction of various emissions from the facility, including but not limited to, equipment and facilities for the capture of approximately 65% of the carbon dioxide emissions from the Plant; (iii) approximately sixty miles of electric transmission lines with voltages varying from 115 kilovolts (kV) to 230 kV; (iv) three new transmission substations; (v) approximately five miles of natural gas transportation facilities to accommodate natural gas deliveries to the Plant; (vi) approximately 30 miles of water transportation facilities to accommodate the delivery of the City of Meridian treated wastewater to the Plant site for the Plant's cooling and process water needs; (vii) lignite leases, mining equipment and all facilities needed to mine lignite; (viii) approximately 60 miles of carbon dioxide pipeline necessary to transport carbon dioxide from the Plant to oil fields suitable for Enhanced Oil Recovery; and (ix) all other related facilities necessary for the Kemper Project's operation.

1 engineer. I have thirty-five years of utility experience; all but four of those years
2 have been within the Southern Company system. This experience is comprised of
3 various design, construction, startup, and commercial management positions with a
4 primary focus on project management over the last twenty years. In particular, I have
5 had management roles for large projects such as Vogtle Nuclear Plant Unit 2 and
6 Plant Miller Units 1 – 4 environmental projects, in addition to numerous smaller
7 projects. I assumed my current position of Project Director, Kemper Project, in
8 January 2010.

9 **Q. Have you previously testified before the Mississippi Public Service Commission**
10 **(MPSC or the Commission)?**

11 **A.** Yes, I have testified before the Commission in MPSC Docket No. 2013-UA-0189
12 (the 2013 Kemper Prudence Docket) and in MPSC Docket No. 2015-UN-0080 (the
13 2015 In-Service Asset Docket) as a co-witness with Mr. John Huggins, former Vice
14 President, Generation Development, for Mississippi Power Company (MPC or the
15 Company).

16 **Q. Do you adopt all of the above-referenced testimony today?**

17 **A.** Yes, I do. I would like to incorporate all of my co-authored 2013 Kemper Prudence
18 Docket and 2015 In-Service Asset Docket testimony and exhibits, as well as all
19 testimony and exhibits authored by Mr. Huggins in those cases, as authorized by
20 Commission Rule of Practice and Procedure 6.114. Prior to this adoption, I reviewed
21 all the documents and agree with the content within.

22

1 **Q. What is the purpose of your testimony in this proceeding?**

2 **A.** As stated in MPC's Compliance Filing, my testimony will address the first and third
3 item of evidence requested by the Commission:

4 1. An overview of the procedures and controls put in place by
5 management to manage the development, design, engineering,
6 procurement, construction, startup and operation of the project.

7 ...

8 3. A review of cost variances between the Commission
9 sanctioned estimated amounts and actually incurred amounts
10 (or in the case of costs that are expected to be incurred in the
11 future, cost variances between the Commission sanctioned
12 estimated amounts and forecasted amounts), along with (b) an
13 explanation for any variation where the incurred amount (or in
14 the case of costs that are expected to be incurred in the future,
15 the forecasted amount) exceeded the original estimated
16 amount, and (c) the response by management to address each
17 such cost variance. For purposes of this direction, "cost
18 variances" include variances between originally expected cost
19 offsets, such as byproduct revenues, and the realized or
20 currently forecasted value for each cost offset.

21 Specifically, my testimony serves two purposes. First, my testimony is being
22 filed to adopt Mr. Huggins' and my 2013 Kemper Prudence Docket and 2015 In-
23 Service Asset Rate Docket testimony in this case so that the Commission will be able
24 to consider a full and complete record related to the Project's previous evaluations in
25 these dockets.

26 Second, my testimony is being filed to update the Commission on the
27 Project's status, controls, procedures, cost variances, and other topics necessary to
28 support the Company's *prima facie* case for prudence of all Project costs to date.
29 Because no prudence finding was made in the 2013 Kemper Prudence docket, which
30 addressed only the Project's execution through March 31, 2013, this filing is intended

1 to present the Commission with sufficient evidence to eventually make a finding of
2 prudence on all Project costs not yet reviewed by the Commission.

3 **Q. Do you sponsor any exhibits with your testimony?**

4 **A.** Yes. There are two exhibits included with this testimony, which are listed below:

5 Exhibit____(SKO-1) Kemper IGCC Cost Summary

6 Exhibit____(SKO-2) Kemper IGCC Cost Variance Chart

7 **Q. Were these exhibits prepared under your supervision and control?**

8 **A.** Yes, they were.

9

10 **PROJECT STATUS UPDATE**

11 **Q. What is the current status of the Kemper Project?**

12 **A.** Construction of the Project commenced in June of 2010, following the issuance of a
13 certificate of public convenience and necessity (Certificate) by the Commission, and
14 now the Project is nearing completion. As shown in Exhibit____(SKO-1), as of
15 August 31, 2016, the Company has spent \$6.59 billion on the Project and is
16 estimating to spend an additional \$294 million to complete any associated required
17 tasks to bring the Project to completion.

18 The Liberty Mine, the transmission projects, the water and natural gas
19 pipelines, and the Combined Cycle portion of the Plant are complete and in-service.
20 In fact, the mine, transmission projects, and Combined Cycle are all operational and,
21 through August 31, 2016, the Combined Cycle has commercially generated more than

1 7.7 billion kWh of electricity. The Liberty Mine has mined over 1.2 million tons of
2 lignite.

3 A simplified depiction of the Project divides responsibilities among the three
4 major departments: (i) Construction, which is responsible for erecting the 27 systems
5 (of which, 26 comprise the Plant and the remaining system is part of the Project); (ii)
6 Startup, which is responsible for testing the 27 systems to verify that they are meeting
7 safety, operational, and environmental parameters; and (iii) MPC Plant Operations,
8 which is responsible for acceptance of the systems from Startup, and the operation
9 and maintenance of the systems from acceptance through the life of the Plant.

10 Before responsibility for each system is turned over, the departments involved
11 initiate and follow the Project's turnover process to formally transition ownership and
12 operational responsibility to the next department. As part of Startup's
13 responsibilities, a series of integrated testing activities (Test Packages) are executed
14 to verify they are meeting specified operational, safety, and environmental
15 parameters. To date, 81 of the 96 Test Packages, or 84% of the total, have been
16 completed. Construction and Startup are, respectively, 99% and 94% complete.

17 Additionally, the Project has identified 21 key startup activities that represent
18 notable milestones required for the declaration of in-service. Thus far, the Project has
19 achieved 16 of these critical startup milestones, including, but not limited to, first fire
20 of startup burners, and completion of air flow and fluidization testing for both
21 gasifiers. Most recently, the first syngas production milestones for Gasifiers B and A
22 were completed in July and September 2016, respectively. Since then, the Plant has

1 achieved over 1,000 hours of syngas production, validating the TRIGTM technology
2 for both of the gasifiers. The Lignite Delivery Facility (LDF) was fully
3 commissioned on July 20, 2016, and turned over to Liberty Fuels, the mine's
4 operator, for operation. The LDF has been supplying lignite to the gasifiers to
5 support Plant startup activities and testing. The Project's Commercial Operation Date
6 (COD) is currently scheduled for November 30, 2016.

7 **Q. What is the Company's current cost Estimate at Completion (EAC)?**

8 **A.** The Company's August 2016 Kemper County IGCC Project Monthly Status Report
9 (PSC Report) projected a \$6.886 billion total Project cost, of which over \$2.581
10 billion has been borne by the Company as costs in excess of the Commission's cost
11 cap. The current estimate at completion, as noted in the August 2016 PSC Report,
12 indicated that \$5.461 billion of total Project costs would be subject to the cost cap.
13 Additional detail regarding the breakdown of this estimate is provided in
14 Exhibit____(SKO-1).

15

16 **PROCEDURES AND CONTROLS**

17 **Q. Please describe the procedures and controls put in place by MPC management**
18 **to manage the development, design, engineering, procurement, construction,**
19 **start-up and operations of the Project.**

20 **A.** Rather than repeat previously filed testimony, I will incorporate herein pages 6
21 through 23 (and associated exhibits) of Mr. Huggins' Supplemental Direct testimony
22 in the 2013 Kemper Prudence Docket. Those pages discuss in detail the various

1 procedures and controls relied upon to manage the execution of the Project. I also
2 incorporate herein all subsequent testimony rebutting or responding to questions of
3 imprudence related to the development, design, engineering, procurement,
4 construction, start-up, and operations of the Project. This includes the vast majority
5 of Mr. Huggins' and my Rebuttal and Response to Surrebuttal testimony in the 2013
6 Kemper Prudence Docket. This combined testimony provides extensive discussion of
7 the Company's execution of the Project.

8 **Q. Have any new procedures or controls been put in place to govern the Project**
9 **since March 31, 2013?**

10 **A.** Yes. Although prior testimony discusses many of the procedures and controls which
11 have been implemented throughout the Project's execution, additional procedures and
12 controls have been developed and implemented, including several changes to the
13 Project's governance. These include the following:

14 ○ Reorganization of Project Team – The Project Team was restructured in
15 December 2014. Through this effort, the Project established leads for each of
16 the key Project areas (Construction, Startup, and Operations) and established a
17 Vice President of Kemper Development on site to whom all leads report. This
18 reorganization clarified roles and responsibilities and concentrated decision
19 making for all Project-related issues into one executive position. The
20 reorganization also emphasized the start-up function, given that the vast
21 majority of the remaining effort was start-up related activities.

- 1 ○ Project Governance – As the status and management of the Project has
2 evolved, oversight and reporting have adapted to meet the needs of the
3 Project. Initially, the Management Review Board, Core Team, and the
4 Executive Review Board were established to review Project status, facilitate
5 communication to Senior Management, and aid in critical decision making.
6 Additionally, the Executive Review Board reviewed the Project's costs and
7 schedule and provided approvals as needed. In 2013, MPC established the
8 Disclosure Review Board as a governance board to focus on accounting,
9 financial reporting, legal, and regulatory affairs. As a result of the Project
10 team being reorganized in 2014, the Management Review Board and Core
11 Team were disbanded, because other communication forums, including the
12 DRB, ERB and Management Council, were adequate to ensure that
13 appropriate and adequate communications have occurred.
- 14 ○ Target Operations Date (TOD) Introduction – In 2014, the Project
15 Management team began reporting identifiable schedule contingency in the
16 Kemper Project schedule. Specifically, the Project schedule is compiled to
17 generate a TOD, which reflects all required schedule activities with
18 anticipated durations. Separately, the risks associated with the overall
19 schedule activities and durations are evaluated by the Project Team to derive a
20 total amount of unassigned schedule contingency. The TOD plus the schedule
21 contingency is used to report the Project's expected COD.

1 ○ Schedule Quantitative Risk Analysis (QRA): The schedule QRA is a risk
2 analysis process initially implemented by the Project Team with September
3 2013's QRA Output Iteration 1.0. QRA is a process using statistical modeling
4 software to evaluate the uncertainty of current schedule activities and risk
5 events. The process uses quantitative methods to identify and prioritize
6 potential risks and mitigations in the schedule under evaluation. The Project
7 Team uses the QRA process to assist in quantifying the degree of uncertainty
8 in activity durations in the current Project schedule and to illustrate the
9 impacts of identified risk events and planned (or projected) mitigations.

10 The results of the QRA process produce a probabilistic range of
11 potential Project completion dates based on identified activity and schedule
12 risks. These results are not a schedule. Simply stated, the QRA produces a
13 range of statistically probable completion dates, not a single expected
14 completion date. The results of the QRA process are used in conjunction
15 with other factors to assist in the determination of an appropriate amount of
16 schedule contingency to be applied to the Project's schedule. Another
17 important outcome of the process is the generation of key focus areas for
18 reducing the Project's schedule risk. To date, the Project Team has produced
19 11 iterations of the QRA, and the QRA process has been useful in the
20 monitoring and analysis of the Project's overall schedule and, therefore, cost
21 risk and any resulting cost impact driven by schedule.

1 ○ Contingency Cost Analysis for Cost Risk – In June 2013, the Project Team
2 began employing a multi-tiered approach to determine the amount of cost
3 contingency included in the Project’s capped cost estimate. On a monthly
4 basis, the Project department cost owners conduct a line item review of the
5 Project’s estimate to completion. During this review, each line item is
6 assessed for remaining risk, and a “mid” and “high” case estimate is
7 developed for additional potential costs associated with those risks. The
8 results of the line item review are then used in a Monte-Carlo cost simulation
9 model to evaluate possible outcomes and to assist in the identification and
10 prioritization of potential risks, hazards, or opportunities. These results, in
11 conjunction with past experience and other factors from Project department
12 cost owners and the Project Team, are used to determine the appropriate
13 amount of contingency to be reported in the Project’s cost estimate each
14 month.

15 In the fourth quarter of 2015, the cost simulation model was
16 discontinued because the remaining cost risks for the Project were identifiable
17 and discrete such that the use of a simulation model was no longer necessary.
18 However, the line item analysis continues to be conducted on a monthly basis
19 to determine the appropriate level of contingency for inclusion in the Project’s
20 cost forecasts.

1 **VARIANCE REVIEW**

2 **I. Project Schedule**

3 **Q. Please describe the schedule extensions that have occurred to date.**

4 **A.** Since the Project commenced, there have been six schedule extensions resulting in a
5 change in the COD. These schedule extensions occurred throughout the Project and
6 were due to an individual or series of events impacting the overall execution of the
7 Project. These events include, but are not limited to: (i) abnormally wet weather, (ii)
8 lower than planned construction labor productivity driven by unexpected excessive
9 craft labor turnover, unanticipated installation inefficiencies, and delayed equipment
10 deliveries, (iii) complexities and challenges for startup, commissioning activities, and
11 operational readiness, and (iv) unplanned repairs and modifications to various pieces
12 of equipment. Because a large majority of the Project activities are logically and
13 sequentially interrelated, the challenges and schedule drivers listed above are not
14 independent of each other making it difficult to isolate the specific impact from any
15 one of the above challenges. Further, the Project Team continually monitors schedule
16 activity progress, critical path, and adverse impacts to the schedule caused by the
17 above challenges to evaluate and make decisions to mitigate and minimize overall
18 schedule risk and delay.

19 **Q. How were schedule risk and delays reported?**

20 **A.** The Project Schedule is reviewed on a weekly basis to verify the logic, analyze
21 critical path, identify challenges and opportunities, add detail where possible, and
22 plan upcoming activities. If a schedule extension was deemed necessary by the

1 Project Team and executive management, these resulting impacts were reported in the
2 Company's PSC Reports and related financial disclosures, as necessary. Detailed
3 information on the schedule changes were provided to the Independent Monitors
4 (IMs), through previously established processes and protocols, for their evaluation
5 and analysis. This information includes: the critical path report, three month look-
6 ahead reports, QRA reports, schedule contingency reports, milestone status reports,
7 and many other reports on a reoccurring or individually requested basis.

8 **II. Cost Variance**

9 **Q. Have there been any cost estimate increases since the Project's certificate**
10 **estimate was approved?**

11 **A.** Yes, there have. The current estimate is \$6.886 billion while the certificate estimate
12 was \$2.970 billion. Exhibit ____ (SKO-2) provides a detailed overview of cost
13 variances between the Project's certificate estimate, and the current view, which is the
14 Project's estimate at completion as of August 2016.

15 **Q. What were the drivers of these cost increases?**

16 **A.** Cost increases have been driven by many factors, primarily, (i) increased quantities of
17 commodities, (ii) continued workarounds, (iii) productivity impacts, (iv) schedule
18 extensions noted earlier in my testimony, (v) scope additions, and (vi) rework.

19 **Q. What was the response by management to address each cost variance?**

20 **A.** As the Project evolved, management continued to utilize its procedures and controls
21 to develop necessary responses. As needed, adjustments to procedures and controls
22 were revised, as noted above.

1 Factors (i), (ii), and (iii) were previously discussed drivers of the Project, and
2 have been thoroughly explained in previous testimony. Schedule extensions, factor
3 (iv), were previously discussed herein. As seen in Exhibit____(SKO-2), these
4 factors touch on many aspects of the Project.

5 Scope additions, factor (v), are tasks that were evaluated by the Project team,
6 and approved by the Vice President of Kemper Development before being added to
7 the Project. Scope additions are approved if they are required for safety,
8 environmental permitting, or base operations.

9 Rework, factor (vi), has also impacted the Project. While there are various
10 interpretations of rework in construction management literature, including quality
11 deviations, non-conformance, defects, and quality failures; there is consistent
12 understanding that rework is to be expected on all complex construction projects.

13 Similar to the schedule extensions, cost increases are driven by a wide range
14 of interrelated activities. The Project's cost drivers and schedule extensions are
15 difficult to isolate, and must be considered holistically.

16 The Project Team also addressed specific variances with targeted responses,
17 when deemed necessary. Some examples include:

- 18 • *Piping quantity increases.* As quantities increased and as piping fabrication
19 progressed, the Company grew concerned with the supplier's ability to meet
20 the originally scheduled pipe deliveries. Soon, thereafter, late piping
21 deliveries began to cause schedule changes and workarounds. It was
22 ultimately determined that the supplier could not meet the required delivery

1 schedule and the Company responded appropriately and timely by rapidly
2 developing an alternate strategy, which included moving scopes of work to
3 other suppliers as well as self-performing a portion of the work with an on-site
4 labor broker. The scope of piping supply and fabrication was completed as
5 cost effectively as possible under the circumstances.

- 6 • *Workarounds.* A workaround is a change in plans responsive to either a
7 realized risk which was identified through the risk review process, or to a
8 previously unforeseen risk with the potential to impact project cost, schedule
9 or both. As with any project, schedule modifications, or workarounds,
10 resulting from unanticipated or realized issues that inevitably occur are a
11 normal part of project execution and evolution. On the Project, MPC used
12 workarounds to promptly and creatively address challenges in an effort to
13 mitigate cost on several issues, including late delivery of CO₂ absorbers,
14 refractory installation at the fabricator, pipe fabrication, and pipe hangers
15 delivery.
- 16 • *Rework.* MPC attempts to mitigate rework by utilizing several contract
17 structures and common practices. MPC considers rework to be any corrective
18 or remedial task intended to address work that is not in accordance with the
19 Project's current requirements. Rework includes removal and installation of
20 items due to design change, design error, incorrect fabrication, installation,
21 and damage during or after installation.

1 **Q. Do you anticipate any further changes to the Project's ETC and/or schedule?**

2 **A.** The next steps for the facility include the continued operation of gasifier "A" to
3 support production of electricity using clean syngas, as well as the successful restart
4 of gasifier "B" and the generation of electricity using clean syngas from gasifier "B",
5 all of which are scheduled to occur by the end of October. If these activities do not
6 occur by the end of October, the expected in-service date and related cost estimate for
7 the Kemper IGCC may require further revision. Further cost increases and/or
8 extensions of the expected in-service date may result from factors including, but not
9 limited to, difficulties integrating the systems required for sustained operations, major
10 equipment failure, unforeseen engineering or design problems including any repairs
11 and/or modifications to systems, and/or operational performance (including additional
12 costs to satisfy any operational parameters ultimately adopted by the Commission).

13 During the start-up and commissioning process, Mississippi Power is also
14 identifying potential improvement projects that ultimately may be completed
15 subsequent to placing the remainder of the Kemper IGCC in service. If completed,
16 such improvement projects would be expected to enhance plant performance, safety
17 and/or operations. The related potential costs have yet to be fully evaluated and may
18 be subject to the \$2.88 billion cost cap. Any further changes in the estimated costs of
19 the Kemper IGCC subject to the \$2.88 billion cost cap, net of the Initial DOE Grants
20 and excluding the Cost Cap Exceptions, will be reflected in Southern Company's and
21 Mississippi Power's statements of income and these changes could be material.

22

1 **Q. Please summarize your testimony.**

2 **A,** Many challenges faced the Kemper Project; in every case, MPC and SCS acted in a
3 reasonable manner to make the best decision for the customer. The Project Team
4 promptly and creatively addressed challenges in an effort to mitigate cost and
5 schedule impact as the Project evolved. Some degree of inefficiency, particularly on
6 a project of this size, is neither unreasonable nor imprudent. Further, the previously
7 referenced cost and schedule variances do not necessarily indicate unreasonable
8 actions. MPC's and SCS's use of and adherence to proven methods and procedures
9 ensured that the effects of the Project's constraints and challenges were minimized.

10 There are more specific discussions of cost drivers and responses to those cost
11 variances found in Exhibit____(SKO-2).

12 **Q. Does this conclude your testimony?**

13 **A.** Yes, it does.

BEFORE THE MISSISSIPPI PUBLIC SERVICE COMMISSION

MISSISSIPPI POWER COMPANY
EC-120-0097-00

DOCKET NO. 2016-AD-0161

IN RE: CREATION OF DISCOVERY DOCKET TO MANAGE ALL FILINGS
RELATED TO THE PRUDENCE OF THE KEMPER COUNTY
INTEGRATED GASIFICATION COMBINED CYCLE GENERATING
FACILITY

AFFIDAVIT OF STEVEN K. OWEN

PERSONALLY appeared before the undersigned officer authorized to administer oaths, Steven K. Owen, who being duly sworn, deposes and says; that the foregoing direct testimony was prepared by him or under his supervision; that said testimony was prepared for use as direct testimony on behalf of Mississippi Power Company in the captioned proceeding; that the facts stated therein are true to the best of his knowledge, information and belief; and that if asked the questions appearing therein, his answers, under oath, would be the same.

This the 3RD day of October, 2016.


STEVEN K. OWEN

Sworn to and subscribed before me this 3rd day of October, 2016.


Notary Public

My Commission Expires:

April 23, 2019



Kemper IGCC Cost Summary

Table 1: Capped Plant Costs (in millions of dollars)

Plant Costs		Certification Amount	Actuals to Date (August 2016)	Estimate to Complete (ETC)	Current Estimate at Completion (EAC)
Land		29.4	32.4	0.0	32.4
EPC (Engineering, Procurement & Construction)		2,076.6	4,337.4	44.1	4,381.5
	Engineering	245.2	634.2	25.7	660.0
	Equipment	1,271.3	1,607.2	(3.0)	1,604.2
	Major Equipment	607.6	562.3	0.0	562.3
	BOP	663.7	1,044.9	(3.0)	1,041.9
	Construction	560.1	1,974.6	12.0	1,986.7
	Sitework	28.3	22.7	0.2	22.9
	Piling Contractor	8.8	19.2	0.0	19.2
	Concrete & Undergrounds Contractor	46.6	133.5	0.0	133.5
	Gasifier General Contractor	253.2	1,430.1	10.4	1,440.5
	CC General Contractor	84.8	151.4	(0.1)	151.4
	Water Lateral Contractor	44.5	57.6	0.0	57.6
	Other Contracts	93.7	160.0	1.5	161.5
	Scope Additions	0.0	121.4	9.4	130.8
Transmission		111.3	93.8	0.0	93.8
Fuel Facilities		99.5	154.1	1.3	155.4
Pre Commercial Operations		56.3	785.5	71.6	857.1
CC & Related Assets, Non-Incremental		0.0	31.7	3.4	35.1
Corporate / Development / Legal		51.1	71.6	5.9	77.6
Start Up Fuel / Energy / Chemical Products		41.8	20.0	28.3	48.3
CCPI 2 Funding		(245.2)	(245.3)	0.0	(245.3)
Ad Valorem		13.0	26.3	0.2	26.5
Schedule Risk		0.0	0.0	28.0	28.0
Contingency - Base Costs		161.6	0.0	26.2	26.2
Total		2,395.3	5,307.6	209.0	5,516.6
Deduction for Cap Exceptions (BC/FM/CIL)		0.0	(55.9)		
Total Plant Subject to Cost Cap		2,395.3	5,251.7	209.0	5,460.7

Table 2: Exemptions and Exceptions (in millions of dollars)

Items Excluded per the Commission Order	Certification Amount	Actuals to Date	Estimate to Complete (ETC)	Current Estimate at Completion (EAC)
NAC (Mineral Leases, Development Costs)	214.3	232.0	0.0	232.0
CO2 Pipeline	140.5	107.4	2.8	110.2
Regulatory and Other Asset Accounts	0.0	195.9	11.3	207.1
Regulatory Costs	0.0	161.8	9.9	171.7
PSC/MPUS Independent Monitors	0.0	30.2	1.4	31.6
Debt Issuance	0.0	3.8	0.0	3.8
CC & Related Assets, Incremental (Net of Revenues)	0.0	24.3	12.4	35.6
AFUDC	173.3	695.1	43.1	738.2
Process Development Allowance	46.5	29.8	16.7	46.5
Beneficial Capital	0.0	47.6		47.6
Force Majeure	0.0	2.7		2.7
Change In Law	0.0	5.6		5.6
Total Exemptions and Exceptions	574.5	1,340.5	85.2	1,425.6
Total Project	2,969.9	6,592.2	294.2	6,886.3

(i) ETC based on actuals as of August 31, 2016.

Kemper IGCC Cost Variance Chart

Table 1: Capped Plant Costs (in millions of dollars)

Plant Costs		Certification Amount	Current View (EAC)	Delta CV (EAC) v Certificate	Variance Description
Land		29.4	32.4	3.0	
Engineering, Procurement & Construction		2,076.6	4,381.5	2,305.0	
	Engineering	245.2	660.0	414.8	Additional costs in Design, Project Management, Project Support, Construction Management and Start Up Labor associated with quantity growth and schedule delays. The design process, detailed design evolution and quantity growth are discussed on pages 72 through 74 of Mr. Huggins’ and Owen’s joint-filed rebuttal testimony in Docket No. 2013-UA-0189. <i>See also</i> pages 45 and 46 of Dr. Galloway’s response to surrebuttal testimony in Docket No. 2013-UA-0189.
	Equipment	1,271.3	1,604.2	332.8	
	Major Equipment	607.6	562.3	(45.3)	Overall reduction in Major Equipment Cost. Reductions include: HRSG, coal lock vessels, and coal drying package.
	Engineering Procured	663.7	1,041.9	378.1	Increases in commodities (Piping, Valves, I&C) and equipment. Commodities and quantity growth are discussed on pages 72 through 74 of Mr. Huggins’ and Owen’s joint-filed rebuttal testimony in Docket No. 2013-UA-0189. <i>See also</i> pages 45 and 46 of Mr. Huggins’ and Owen’s joint-filed response to surrebuttal testimony in Docket No. 2013-UA-0189.
	Construction	560.1	1,986.7	1,426.6	Productivity, Schedule Delay, Quantity Growth, Rework, and Related Indirect Cost. Construction challenges, in general, are discussed in Section 9.0 (beginning on page 86) of Mr. Huggins’ and Owen’s joint-filed rebuttal testimony in Docket No. 2013-UA-0189. This discussion encompasses workarounds, rework, and productivity, all of which are referenced below. MPC’s scheduling of workarounds is addressed on pages 38 and 39 of Mr. Huggins’ and Owen’s joint-filed response to surrebutal testimony in Docket No. 2013-UA-0189.
	Site work	28.3	22.9	(5.4)	
	Piling Contractor	8.8	19.2	10.4	Increases in quantity and length of auger cast piling and caissons due to soil conditions.
	Concrete & Undergrounds Contractor	46.6	133.5	86.9	Increases in quantities and size related to concrete foundations due to requirements and weights of equipment. Increased in size and quantity of underground utilities (ductwork, piping).
	Gasifier General Contractor	253.2	1,440.5	1,187.2	Increases in the cost of commodity (pipe, steel, cable, etc.) installation. Specifically the costs related to direct labor productivity, commodity quantity growth, rework and associated indirects corresponding with direct work extensions. See Construction variance description above.
	CC General Contractor	84.8	151.4	66.5	Increases in the cost of commodity (pipe, steel, cable, etc.) installation. Specifically the costs related to direct labor productivity, commodity quantity growth, rework and associated indirects corresponding with direct work extensions. MPC addressed CC costs in detail in Dockets 2014-UA-0195 and 2015-UN-0080.
	Water Lateral Contractor	44.5	57.6	13.1	Increased cost of material installation and associated Force Majeure events.
	Other Contracts	93.7	161.5	67.8	Increase in quantities of insulation, lower productivity associated with installation of insulation and schedule delays.
	Scope Additions	0.0	130.8	130.8	Items in addition to base scope required to ensure safety, environmental permitting and base operations. Includes (but not limited to) platforms, chemical products infrastructure, isolation valves, paving, security systems, alarm management, and heat tracing.
Transmission		111.3	93.8	(17.5)	Decreased costs for construction and materials compared to estimate.
Fuel Facilities		99.5	155.4	55.9	Increased cost of Lignite Delivery Facility due to lower than expected labor productivity. Cost overruns associated with the Lignite Delivery Facility were addressed on pages 117 and 118 of Mr. Huggins’ and Mr. Owen’s joint-filed rebuttal testimony in Docket No. 2013-UA-0189.
Pre Commercial Operations		56.3	857.1	800.8	Increases in additional pre-COD operations resources (primarily labor) driven by schedule delays, and complexities and challenges for startup and commissioning activities. The cost includes additional resources in support of startup and commissioning activities, Plant Staffing, Training, and inventory for additional critical spares.
CC & Related Assets, Non-Incremental		0.0	35.1	35.1	O&M costs specifically related to the CC and associated common facilities placed in-service August 2014 that would have been incurred whether or not the assets were in-service.
Corporate / Development / Legal		51.1	77.6	26.5	Increased project support costs associated with schedule delays and the addition of the CO ₂ Test Well.
Start Up Fuel / Energy / Chemical Products		41.8	48.3	6.5	Increases in the amount of lignite used, price of lignite, syngas flared, and station service costs along with decrease in the value of energy credits, and chemical product sales. Changes driven by schedule delays, market pricing, and projected quantity differences.
CCPI 2 Funding		(245.2)	(245.3)	(0.1)	An additional DOE grant in the amount of \$136,672,000 was received in April 2016 and is included in Exhibit____(CFS-3). This additional DOE grant is expected to be used to reduce future rate impacts for customers.
Ad Valorem		13.0	26.5	13.5	Increased value and schedule delays.
Schedule Risk		0.0	28.0	28.0	Accounts for 1 month of schedule contingency. COD is November 30, 2016.
Contingency - Base Costs		161.6	-	(161.6)	Contingency related to certificate estimate and used in above categories.
Contingency – Non-schedule		-	26.2	26.2	Non-schedule related contingency as a result of direct work completion and reduction of risk associated with non schedule related items.

Total	2,395.3	5,516.6	3,121.2	
Deduction for Cap Exceptions (BC/FM/CIL)	0.0	(55.9)	(55.9)	Includes Beneficial Capital, Force Majeure and Change in Law.
Total Plant Subject to Cost Cap	2,395.3	5,460.7	3,065.4	

Table 2: Exemptions and Exceptions (in millions of dollars)

Items Excluded per the Commission Order	Certification Amount	Current View (EAC)	Delta CV EAC v Certificate	Variance Description
NAC (Mineral Leases, Development Costs)	214.3	232.0	17.8	Increase in land & mineral leases due to accelerating land control; dragline increase related to dragline carrying cost and dedication payments prior to purchase and also reliability upgrades; increase in mine development related to facility cost increase and mine infrastructure items offset by decreases in rolling stock and AFUDC expenses.
CO2 Pipeline	140.5	110.2	(30.3)	Underspend on pipe material and labor to install. Contingency not used.
Regulatory and Other Asset Accounts	0.0	207.1	207.1	
Regulatory Costs	0.0	171.7	171.7	A portion of this amount has been deemed prudent and is being amortized pursuant to the December 5, 2015, Order in Docket 2015-UN-0080.
PSC/MPUS Independent Monitors	0.0	31.6	31.6	A portion of this amount has been deemed prudent and is being amortized pursuant to the December 5, 2015, Order in Docket 2015-UN-0080.
Debt Issuance	0.0	3.8	3.8	A portion of this amount has been deemed prudent and is being amortized pursuant to the December 5, 2015, Order in Docket 2015-UN-0080.
CC & Related Assets, Incremental (Net of Revenues)	0.0	35.6	35.6	O&M costs related to the CC and associated facilities placed in service August 2014. Includes Variable O&M credit related to energy sales, net of station service. MPC addressed CC costs in detail in Dockets 2014-UA-0195 and 2015-UN-0080.
AFUDC	173.3	738.2	564.9	Supreme Court decision on CWIP, AFUDC costs associated with schedule delays. The AFUDC cap exception is addressed briefly on pages 67 and 68 of Mr. Huggins' and Owen's joint-filed rebuttal testimony in Docket No. 2013-UA-0189, although the calculation of and accounting for AFUDC are within the scope of Ms. Shaw's testimony rather than Mr. Owen's. MPC's scheduling is addressed in significant detail in prior testimony by Mr. Huggins and Owen, including in Section 7.4.a (beginning on page 53) of Mr. Huggins' and Owen's joint-filed rebuttal testimony in Docket No. 2013-UA-0189 and in Section 5.0 (beginning on page 34) of Mr. Huggins' and Owen's joint-filed response to surrebutal testimony in Docket No. 2013-UA-0189. The Project's schedule delays are discussed in the testimony filed herewith.
Process Development Allowance	46.5	46.5	0.0	MPC's Process Development Allowance estimate is discussed in Section 10.1 (beginning on page 100) of Mr. Huggins' and Owen's joint-filed rebuttal testimony in Docket No. 2013-UA-0189.
Beneficial Capital	0.0	47.6	47.6	Beneficial Capital is addressed on pages 106 through 109 of Mr. Huggins' and Mr. Owen's rebuttal testimony in Docket No. 2013-UA-0189, and pages 63 through 67 of Mr. Huggins' and Mr. Owen's joint-filed response to surrebuttal testimony in Docket No. 2013-UA-0189.
Force Majeure	0.0	2.7	2.7	Force Majeure is addressed on pages 109 through 112 of Mr. Huggins' and Mr. Owen's rebuttal testimony in Docket No. 2013-UA-0189.
Change In Law	0.0	5.6	5.6	Increased Cyber Security costs; NERC-CIP compliance. Change-in-Law is addressed on pages 113 through 115 of Mr. Huggins' and Mr. Owen's rebuttal testimony in Docket No. 2013-UA-0189.
Total	574.5	1,425.6	1,024.3	
Total Project	2,969.9	6,886.3	4,089.7	

(i) ETC based on actuals as of August 31, 2016.