SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
d/b/a CENTERPOINT ENERGY INDIANA SOUTH
(CEI SOUTH)

DIRECT TESTIMONY
OF
JEFFREY T. KOPP
SENIOR MANAGING DIRECTOR, UTILITY CONSULTING

ON

A.B. BROWN DECOMMISSIONING COSTS

SPONSORING PETITIONER'S EXHIBIT NO. 5,
ATTACHMENTS JTK-1 THROUGH JTK-2

DIRECT TESTIMONY OF JEFFREY T. KOPP

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Jeffrey ("Jeff") T. Kopp. My business address is 9400 Ward Parkway, Kansas City, Missouri 64114.

Q. By whom are you employed, and in what capacity?

A. I am employed by 1898 & Co., a division of Burns & McDonnell ("BMcD") Engineering Company, Inc., as the Senior Managing Director of the Utility Consulting Department. 1898 & Co. is a business, technology, and security solutions consulting firm serving multiple industries, including the electric power industry. As a part of BMcD, 1898 & Co. draws on over 120 years of experience. In 2020, BMcD was rated the number 1 firm in Power by the Engineering News Record.

Q. On whose behalf are you submitting this direct testimony?

A. I am submitting testimony on behalf of Southern Indiana Gas and Electric Company d/b/a CenterPoint Indiana South ("Petitioner", "CEI South" or "Company"), which is an indirect subsidiary of CenterPoint Energy, Inc.

Q. What is your role with respect to Petitioner CEI South?

A. I served as the 1898 & Co. project director on the Decommissioning Cost Study ("Decommissioning Study") that included costs for decommissioning, demolishing, and restoring the site at Units 1 and 2 of the A.B. Brown Generating Station ("Plant") in Evansville, Indiana.

Q. Please describe your educational background.

A. I have a bachelor's degree in Civil Engineering from the University of Missouri – Rolla (now the Missouri University of Science and Technology) and a Master of Business Administration from the University of Kansas. I am a registered Professional Engineer in the states of Missouri, Florida, Indiana, and Illinois.

Q. Please describe your professional experience.

A. I am a professional engineer with 20 years of experience providing consulting services to electric utilities. In my role as a group manager, project director, project manager, and project engineer, I have worked on and have overseen consulting activities for coal, natural gas, wind, solar, hydroelectric, and biomass power generation facilities. I have been involved in numerous decommissioning studies and served as project director or project manager on the majority of them. I have helped prepare decommissioning studies on all types of power plants utilizing various technologies and fuels. These decommissioning studies have been utilized in rate cases, have been used to estimate the liability associated with site demolition and retirement at the end of the facilities' useful lives, to satisfy Financial Accounting Standard ("FAS") 143 (accounting for asset retirement), and utilized for actual asset demolition planning.

Q. What are your present duties and responsibilities as Senior Managing Director?

A. As the Senior Managing Director of the Utility Consulting Department, I oversee a team of more than 130 project managers, consultants, and engineers, who provide consulting services to clients primarily in the electric power generation and electric power transmission industries, as well as to other industrial and commercial clients. The services provided by this group include decommissioning cost studies, independent engineering assessments of power generation assets, economic evaluations of capital expenditures, new power generation development and evaluation, electric and water rate analysis, electric transmission and distribution planning, generation resource planning, renewable power development, and other related engineering and economic assessments.

Q. Have you ever testified before the Indiana Utility Regulatory Commission ("Commission") or any state regulatory commission?

A. Yes. I provided written testimony before the Commission in Cause No. 45253 on behalf of Duke Energy Indiana, LLC, regarding the decommissioning costs prepared under my direction that were submitted for that case. In addition, I have provided testimony regarding power plant decommissioning costs as part of the development of depreciation rates to the following other state regulatory commissions, the details of which are provided in my resume, Petitioner's Exhibit No. 5, Attachment JTK-1.

- Florida Public Service Commission
- Public Utilities Commission of the State of Colorado
- Kentucky Public Service Commission
- North Carolina Utilities Commission
- Oklahoma Corporation Commission
- Regulatory Commission of Alaska
- Public Utility Commission of Texas
- New Mexico Public Regulation Commission

II. PURPOSE & SCOPE OF TESTIMONY

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

A. The purpose of my testimony is to describe and support the Company's Decommissioning Study prepared by me and my team for the Plant. The Decommissioning Study was completed, and a report was issued on December 13, 2021. This report sets forth the results of my decommissioning study which is provided as Petitioner's Exhibit No. 5, Attachment JTK-2.

Q. Are you sponsoring any attachments in this proceeding?

A. Yes. I am sponsoring the following exhibits in this proceeding:

- Petitioner's Exhibit No. 5, **Attachment JTK-1**: Resume
- Petitioner's Exhibit No. 5, **Attachment JTK-2**: Petitioner's Decommissioning Study prepared for Units 1 and 2 of the A.B. Brown Generating Station

Q. Were these attachments prepared by you or under your supervision?

A. Yes, they were.

III. BACKGROUND

Q. What recommendation are you making in your testimony?

A. I recommend that the Commission find that the results of the Decommissioning Study

are reasonable and appropriate for use as the basis for the cost of removal estimates in the quantification of the costs of removal and restoration, as applicable, for purposes of determining the qualified costs in this proceeding.

Q. Please describe the Decommissioning Study prepared for the Company.

A. The Company retained 1898 and Co. to provide a recommendation regarding the total cost, in 2021 dollars, for decommissioning the Plant at the end of its useful life, net of salvage value for scrap materials. Our estimate includes the direct costs associated with decommissioning and demolishing the plant equipment and facilities and restoring the sites to an industrial condition. The direct costs also include environmental remediation costs for asbestos removal and other hazardous material handling and disposal, as well as costs for closing the cooling tower ponds and cleaning up potentially contaminated soil.

Q. What was the extent of your personal involvement in the preparation of the Decommissioning Study?

A. I served as the 1898 and Co. project director on the Decommissioning Study. I worked directly with all individuals and parties involved in the preparation of the decommissioning cost estimates in the Decommissioning study. I was responsible for the overall project and was involved in the development of the dismantling and decommissioning assumptions and cost estimating methodology, preparation and review of the estimates, and preparation and review of the report. In addition, 1898 and Co. representatives and engineers visited the Plant to perform a tour of the facilities with plant personnel to review the equipment, and our team relied on information obtained during those tours in our analyses.

Q. What power generation assets did you evaluate in the Decommissioning Study?

A. Our evaluation was limited to Units 1 and 2 of the A.B. Brown Generating Station.

Q. Please summarize the results of the Decommissioning Study.

A. The total net cost for decommissioning the Plant was estimated to be $24,502,000. The breakdown of this cost is presented and discussed in Petitioner's Exhibit No. 5, Attachment JTK-2.

IV. DESCRIPTION OF DECOMMISSIONING COSTS

Q. Explain the type of costs reflected in a decommissioning study.

A. Decommissioning study cost estimates generally include direct costs associated with decommissioning and demolishing the plant equipment and facilities and restoring the sites to a suitable condition, which in this case was to an industrial condition. The environmental portion of the direct costs include environmental remediation costs for asbestos removal and other hazardous material handling and disposal, as well as costs for removing and disposing of contaminated soil. In addition to these direct costs, decommissioning studies also generally include estimates of indirect costs to be incurred by an entity during decommissioning and contingency costs, both of which I address in the next section of my testimony.

Q. What does restoring the site for industrial use require?

A. In general, restoring a site for industrial use includes the following activities and final site conditions. The site will have all above grade buildings and equipment removed, foundations removed to two feet below existing grade, be rough graded, and seeded. Underground piping will be capped and abandoned in place, except for circulating water piping, which will be filled with flowable fill. The cooling tower blowdown basins will be graded to match surrounding areas. The Plant does not have any lined ponds that were assumed to be closed as part of the Decommissioning Study; therefore, the ponds are simply graded and seeded.

In most cases, the future use of the site is unknown, so restoring the site to the standard of industrial use allows flexibility regarding the potential future use. Here, the anticipated use is as a generation site, which is consistent with industrial use. The site can alternately remain in this condition in perpetuity. In the case of the specific sites analyzed in the Decommissioning Study, each fossil unit site is restored to the standard of industrial use. This approach is consistent with our experience with overseeing decommissioning of several power generating facilities and likewise according to the standards we typically assume.

At the Plant, there are combustion turbines that are to remain in operation and an additional two combustion turbines proposed, so a portion of the site is being maintained as an active generating facility. The remainder of the site will be restored to industrial condition. Closure of ash ponds and landfills has not been included in the scope of the Decommissioning Study. Recovery of the cost of closing the ash ponds has been addressed in other proceedings, and the landfills are not anticipated to be closed.

Q. What approach was used to develop the direct cost estimates in the Decommissioning Study?

A. As mentioned above, the decommissioning cost estimates were developed based on estimates of direct costs, indirect costs, and contingency. The direct decommissioning cost estimates were based on what we would expect an outside contractor, selected through a competitive bidding process, to charge the Company to demolish the site, dismantle all equipment, address environmental issues, and restore the site to a condition suitable for industrial use, based on performing known decommissioning and demolition tasks within the set of assumptions outlined in the Decommissioning Study and under ideal conditions. Site-specific direct cost estimates were developed using a "bottom-up" cost estimating approach, where cost estimates are developed from scratch through the development of site-specific quantity estimates and the application of unit pricing to the quantity estimates. The quantity estimates include but are not limited to items such as tons of steel; pounds of other metals such as copper and stainless steel; tons of debris; cubic yards of concrete; cubic yards of site grading; acres of seeding; and the labor hours required to complete the decommissioning and demolition activities.

Q. Where are the assumptions outlined in the Decommissioning Study?

A. The assumptions applied to the cost estimates are documented in Section 4.1 of the Decommissioning Study, provided as Petitioner's Exhibit No. 5, Attachment JTK-2.

Q. How were specific quantities and unit pricing estimated for purposes of estimating site-specific direct costs?

A. The 1898 & Co. team estimated quantities based on a visual inspection of the Plant

and the facilities, discussions with plant staff, review of engineering drawings, our in-house database of plant quantities, and our professional judgment. Using this information, we estimated quantities and labor hours for the tasks required to decommission and demolish each of the subject facilities. Current market pricing for labor rates, equipment, and unit pricing were then developed for each task. These rates were applied to the quantities for the Plant to determine the total direct cost of decommissioning each site. Additionally, unit pricing for scrap values were applied to the scrap quantities to determine anticipated salvage values, as addressed later in my testimony.

Q. What sources did you rely on to develop the direct cost estimates for the units?

A. The labor rates, equipment costs, and disposal costs used to develop the Decommissioning Study cost estimates were specific to the locations in which the work is to be performed. These rates were applied to the quantities associated with each Unit to determine the total cost of decommissioning and demolishing. Disposal costs were obtained from publicly available information and communications with landfills located in the area in which the work is to be performed to result in estimates that are site-specific and account for local markets, costs, and conditions.

The RS Means online database was utilized to obtain labor rates, equipment costs, and disposal costs for the study area. RS Means labor rates are national averages and include site cost indices to provide localized costs to make the costs site specific. RS Means is widely utilized within the construction industry as a tool for estimating and projecting project costs.

Pricing developed by the American Metal Market ("AMM") was also used to develop scrap credits, as discussed in more detail in Section VI of my testimony. The AMM is an industry standard publication routinely relied upon by demolition contractors. Scrap costs also included a deduction for transportation from each site to the selected scrap market in order to result in estimates that are site-specific and account for local markets, costs, and conditions.

Q. Are these sources generally accepted in the industry and relied upon by other regulatory authorities in setting decommissioning costs?

A. Yes. These sources are recognized industry-wide, and we have relied on them for the decommissioning cost estimates we have prepared for over 300 plants. Many of these cost estimates have been approved in numerous regulatory proceedings in which I have participated.

Q. Did you consider whether the resale of any equipment would be feasible to offset your estimated decommissioning costs?

A. Yes. I do not believe resale is feasible due to the limited and opportunistic market for equipment resale. In our recent experience with power plant retirements, it has been difficult to find buyers of used equipment willing to pay more than the scrap value of the equipment because the market for specific buyers with a need for the specific equipment at the time of decommissioning is typically very limited. Furthermore, according to the U.S. Energy Information Administration, nearly 100 gigawatts of fossil-fueled capacity has been retired in the last decade and there are over 80 gigawatts ("GW") of additional announced retirements in the next 5 years, so it is anticipated the market would be flooded with used equipment and the potential buyers of that used equipment would be even further reduced, putting downward pressure on used equipment pricing. Therefore, it is reasonable to assume the expected value of the equipment should be its scrap value.

Q. Have you relied on this same methodology in preparing estimates of decommissioning costs in the past?

A. Yes. Over the years, we have worked closely with demolition contractors to develop decommissioning cost estimates more accurately for activities that the demolition contractors will perform. We have prepared numerous decommissioning studies for various clients considering different technologies in several different states and have provided services to clients on decommissioning project execution that has included review and evaluation of bids from demolition contractors. We have utilized this experience preparing decommissioning cost estimates as well as reviewing demolition contractor bids to confirm the reasonableness of the cost estimates we have prepared.

In addition, I am able to rely on my firm's long history, experience, and familiarity with demolition practices to effectively and accurately estimate costs that are consistent with the industry and trends. For instance, we have reviewed competitive bids from demolition contractors for power plant demolition projects and worked with demolition contractors over the years to refine our estimating process to align our costs with theirs.

Q. Have you used this same model to estimate decommissioning costs for fossil fuel assets in the past?

A. Yes, I have used the same methodology and model to estimate decommissioning costs for various types of non-nuclear power generating assets. These models were utilized in the development of the cost estimates for each decommissioning and decommissioning study referenced in my resume in Petitioner's Exhibit No. 5, Attachment JTK-1.

Q. Does the Decommissioning Study dictate to the demolition contractor the actual decommissioning methods that will be used to dismantle these facilities in the future and therefore does your cost estimate rely on those means and methods?

A. No. At the time the Company decides to decommission the Plant, its decommissioning contractor will determine the means and methods by which the decommissioning will occur. It will be the contractor's responsibility to determine means and methods that result in safely decommissioning and demolishing the units at the lowest reasonable cost. However, based on our experience with decommissioning projects, discussions with demolition contractors, and discussions with utilities throughout the United States, the cost estimate we prepared is reflective of what contractors would bid, through a competitive bidding process given the option to select safe and efficient means and methods.

V. PROJECT INDIRECTS AND CONTINGENCY

Q. What is included in the project indirect costs?

A. Indirect costs include those costs expected to be incurred by the Company during the

decommissioning process that are in addition to the direct costs paid to demolition contractors. This includes the internal administrative costs (e.g., permitting, fees, and Company employee allocated expense) or costs associated with third-party project managers or engineers providing oversight during demolition activities, inspections, and testing to confirm that remediation has been completed.

Q. How were the indirect costs determined?

A. Indirect costs were determined as a percentage of the direct costs, which is a typical approach when preparing these types of cost estimates. We developed the percentage of direct costs that was applied to determine the indirect costs based on our experience preparing estimates and managing the execution of decommissioning projects.

Q. What is included in the contingency costs?

A. This category includes costs reasonably expected to be incurred by the Company during the execution of decommissioning and demolition activities in addition to the direct costs. For decommissioning projects, there is uncertainty associated with work conditions and how the work will be performed. There is also some uncertainty associated with estimating the quantities for decommissioning of facilities, due to the age and limits on drawings available and the absence of testing results for environmental contamination prior to preparation of these types of studies. Contingency costs account for these unspecified but expected costs and are in addition to the direct costs associated with the base decommissioning costs for known scope items.

Q. Are contingency costs a necessary component of your cost estimates?

A. Yes. Contingency costs are a critical component for estimating the cost of almost any large construction project. They account for the potential circumstances that can result in an increase in costs over the direct costs for known scope items under ideal conditions. Some of these costs cannot be determined until the decommissioning process has begun. Therefore, contingency is applied on top of the base estimated cost to formulate a reasonable estimate to dismantle the generating facilities.

Q. Please explain.

A. It is important to note that many of these decommissioning and demolition projects will not commence until well into the future and site-specific conditions cannot always be identified until decommissioning has commenced. It is not uncommon for unexpected conditions to occur, including but not limited to items such as contractors discovering unaccounted for structures or facilities, like underground storage tanks, after demolition has begun that have to be dismantled, or a greater quantity of contaminated soil than was originally anticipated. Also, the estimated cost to dismantle assumes ideal weather and working conditions, which is an appropriate starting point for cost estimating but realistically cannot be achieved for the duration of a project and can result in cost increases. These types of circumstances can lead to significant increased costs that are difficult to specifically identify this far in advance of a project.

Q. Is including contingency costs in a decommissioning project standard industry practice?

A. Yes. The application of contingency is standard industry practice. Even on a project where firm pricing has been agreed to with a successful bidder, it is typical that a client will carry some level of contingency to cover potential change orders or other unforeseen circumstances associated with a project.

Q. Does a decommissioning project require a higher level of contingency than a greenfield construction project?

A. Yes. When compared to the contingency assigned to a new construction project, the contingency on a decommissioning project should be higher because older facilities with long operating histories often lack up-to-date site plans or drawings, well-defined quantities of structural materials, environmental records, or foundation or subsurface information. To that end, the Plant analyzed in the Decommissioning Study will have been in-service for more than 40 years by the time they are decommissioned.

Q. What contingency costs are you recommending in the Decommissioning Study?

A. I have recommended a contingency cost of 20 percent on top of the direct costs. The percentage was based on similar decommissioning cost contingencies I have

prepared for decommissioning projects for other electric utilities that have been approved by regulatory agencies.

VI. SCRAP

Q. How were scrap values calculated?

A. Scrap metal prices used in the development of the scrap credit were based on a review of current pricing trends for various types of materials published by AMM, which reports the prices paid for scrap metals in transactions worldwide. The salvage value of equipment was included in the cost estimates based on scrap metal prices from the AMM report, less a deduction for transporting the scrap to market. This methodology is appropriate because demolition contractors routinely rely on the values published by AMM to develop the prices they are willing to credit a demolition project for scrap metals as this publication also provides information regarding the price the demolition contractors can expect to receive when they resell the scrap metals to a scrap metal broker or scrap metal processor.

Q. Is AMM a reputable source for calculating scrap pricing?

A. Yes. AMM is the leading independent supplier of market intelligence and pricing to the North American metals industries and publisher of the widely used reference prices for scrap. AMM has extensive experience in reporting scrap prices in a wide range of grades and locations. AMM has been reporting on the U.S. scrap market for more than 100 years, providing benchmark prices to users in the scrap metal industry. AMM develops index prices based on actual transactions, which are reported by market participants conducting scrap metal trades.

Q. What are your recommendations for the value of scrap metal applied in the Decommissioning Study?

A. Section 4-1 in the Decommissioning Study, provided at Petitioner's Exhibit No. 5, Attachment JTK-2, shows the scrap metal prices used in the estimates. As noted above, the market value for each type of scrap metal was adjusted to account for transportation costs, in order to determine the net value of the scrap material.

Q. How were transportation costs calculated for purposes of valuing the scrap metal?

A. Transportation costs include the costs necessary to haul the scrap metal to the scrap market location.

VII. CONCLUSION

Q. Are the decommissioning costs set forth in your testimony and Attachment JTK-2 reasonable and necessary estimates for purposes of calculating depreciation rates for the Company in this proceeding?

A. Yes. These costs are reasonably reflective of the actual costs necessary for the Company to decommission the units and are an appropriate basis for estimating the costs of removal and restoration of the Plant for purposes of calculating the applicable Qualified Costs in this matter and for the Company to use for planning for decommissioning costs going forward.

Q. Does this conclude your prepared direct testimony?

A. Yes, it does.

VERIFICATION

I affirm under penalties for perjury that the foregoing representations are true to the best of my knowledge, information, and belief.

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY D/B/A CENTERPOINT ENERGY INDIANA SOUTH

Jeffrey T. Kopp, Senior Managing Director of Utility Consulting at 1898 & Co, a division of Burns & McDonnell Engineering Company, Inc.

May 5, 2022
Date

Cause No. 45722

Project Director

Jeff Kopp, PE

Managing Director – Utility Consulting

Education

B.S. / Civil Engineering
MBA / Business Administration

Registrations

- Professional Engineer (FL, IL, IN, MO)

20 years with 1898 & Co.
21 years of experience

Visit my LinkedIn profile.

Jeff is the Managing Director of Utility Consulting at 1898 & Co., part of Burns & McDonnell. He and his team specialize in consulting services for power generation and transmission and distribution projects. This includes power plant decommissioning studies, energy project development, due diligence reviews, resource planning, renewable project development, rate studies and analysis, transmission planning, distribution planning, and grid modernization.

PROJECT EXPERIENCE

Decommissioning Study / Evergy

Kansas, Missouri / 2021

Project director on a decommissioning study for the entire fleet of power generating facilities owned by Evergy in the States of Kansas and Missouri. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included several coal-fired plants, natural gas-fired simple and combined cycle units, and wind farms. Subsequent to the study, Jeff is available to provide written and oral testimony in Evergy's rate case hearing regarding the study findings.

Decommissioning Study / FPL Energy

Florida, Georgia / 2020

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by FPL Energy and Gulf Power in the States of Florida and Georgia. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included several coal-fired plants, natural gas-fired simple and combined cycle units, and solar generating facilities. Subsequent to the study, Jeff provided written testimony in FPL Energy's rate case hearing regarding the study findings.

Decommissioning Study / Xcel Energy

Colorado / 2020

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Xcel Energy in the State of Colorado. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included several coal-fired plants, natural gas-fired simple and combined cycle units, and hydroelectric plants. Subsequent to the study, Jeff was available to provide written and oral testimony in Xcel Energy's rate hearing regarding the study findings.

Decommissioning Study / Apex Clean Energy
New York / 2019

Project manager on a decommissioning study for a wind farm being developed in New York. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support Calpine's application to construct a major electric generating facility under Article 10 of the New York Public Service Law. Subsequent to the study, Jeff provided written testimony in the Article 10 public hearings regarding the study findings.

Decommissioning Study / Calpine
New York / 2019

Project manager on a decommissioning study for a wind farm being developed in New York. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support Calpine's application to construct a major electric generating facility under Article 10 of the New York Public Service Law. Subsequent to the study, Jeff provided written testimony in the Article 10 public hearings regarding the study findings.

Decommissioning Study / Southwestern Public Service
Texas, New Mexico / 2018

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Southwestern Public Service. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included coal-fired plants, natural gas-fired simple cycle units, and gas fired boiler projects. The report and results are being used in support of depreciation rates as part of the rate case filing. Jeff provided support through the regulatory process with written testimony in Southwestern Public Service's rate hearings regarding the study findings.

Decommissioning Study / Duke Energy
Indiana / 2018

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Duke Energy Indiana. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included coal-fired plants, natural gas-fired simple and combined cycle units, solar projects, and a hydro-electric plant. Jeff provided support through the regulatory process with written testimony in Duke Energy Indiana's rate hearing regarding the study findings.

Decommissioning Study / Golden Valley Electric Association
Alaska / 2018

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Golden Valley Electric Association. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included a coal-fired plant, diesel and naphtha fired combustion turbine units, a battery energy storage facility, and a wind farm. Jeff provided written testimony in Golden Valley's Compliance Hearing regarding the retirement of their Healy Unit 1 project. Jeff also provided written testimony in Golden Valley's rate hearing regarding the study findings.

Decommissioning Study / Owensboro Municipal Utilities
Kentucky / 2018

Project manager on a decommissioning study for coal fired generating facility owned by Owensboro Municipal Utilities. The evaluation was performed to determine the options for retiring the plant and associated costs. Options evaluated included placing one of the units into layup with the potential to restart at a later date, retirement in place, or full demolition and site restoration.

Decommissioning Study / Duke Energy
Florida / 2018

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Duke Energy Florida. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included a coal-fired plant, natural gas-fired simple and combined cycle units, and solar projects. Subsequent to the study, Jeff provided written testimony in Duke Energy Florida's rate hearing regarding the study findings.

Decommissioning Study / Tucson Electric Power
Arizona / 2018

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Tucson Electric Power. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included a coal-fired plant, natural gas-fired simple and combined cycle units, and solar projects. Subsequent to the study, Jeff was available to provide written and oral testimony in Tucson Electric Powers's rate hearing regarding the study findings.

Decommissioning Study / Public Service of New Mexico
New Mexico / 2018

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Duke Energy Florida. The evaluation is being performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation includes a coal-fired plant, natural gas-fired simple and combined cycle units, and solar projects.

Decommissioning Study / Capital Power
Illinois / 2018

Project manager on a decommissioning study for a wind farm being developed in Illinois. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support the county zoning application. Subsequent to the study, Jeff will be available to provide written and oral testimony in the county zoning hearings regarding the study findings.

Decommissioning Study / Calpine
New York / 2018

Project manager on a decommissioning study for a wind farm being developed in New York. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support Calpine's application to construct a major electric generating facility under Article 10 of the New York Public Service Law. Subsequent to the study, Jeff provided written and oral testimony in the Article 10 public hearings regarding the study findings.

Decommissioning Study / Tradewind Energy
Illinois / 2018

Project manager on a decommissioning study for a wind being developed in Illinois. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support the county zoning application. Subsequent to the study, Jeff will be available to provided support for the county zoning hearings regarding the study findings.

Decommissioning Study / Hawaii Electric Company
Hawaii / 2018

Project manager on a decommissioning study for a reciprocating engine plant that was under construction for Hawaii Electric Company. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life.

Decommissioning Study / EDP Renewables
Indiana / 2018

Project manager on a decommissioning study for a wind farm being developed in Indiana. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support the county zoning application. Subsequent to the study, Jeff provided written and oral testimony in the county zoning hearings regarding the study findings.

Decommissioning Study / EDP Renewables
Illinois / 2018

Project manager on a decommissioning study for a wind farm being developed in Illinois. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support the county zoning application. Subsequent to the study, Jeff provided oral testimony in the county zoning hearings regarding the study findings.

Due Diligence / Centerpoint Energy
Indiana / 2017

Project manager for a due diligence evaluation of Vectren's fleet of power plants being considered as part of a potential full acquisition of Vectren by Centerpoint. The evaluation included a technical, environmental, and contractual review

of the coal, simple cycle, and wind farm facilities. As part of the project, Jeff presented the results of the study to CenterPoint's board of directors to support their decision making process for the acquisition.

Due Diligence / PKA AIP
Michigan / 2017

Project manager for a due diligence evaluation of a combined cycle power plant being considered for potential equity investment by PKA AIP. The evaluation included a technical, environmental, and contractual review of the plant.

Decommissioning Study / Tampa Electric Company
Florida / 2017

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Tampa Electric. The evaluation is being performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation includes a coal-fired plant, natural gas-fired simple and combined cycle units, and solar projects. Subsequent to the study, Jeff will be available to provide written and oral testimony in Tampa Electric's rate hearing regarding the study findings.

Decommissioning Asset Retirement Obligation Study / NRG Energy & Clearway Energy
Various US Locations / 2017 - 2020

Project manager on a decommissioning study to evaluate the asset retirement obligation costs for numerous renewable energy facilities owned by NRG Energy throughout the United States. The evaluation was performed to determine the costs for any obligations to remove and/or demolish the facilities and equipment and perform environmental remediation and site restoration activities. The study was performed to support compliance with FAS 143 requirements.

Due Diligence / Confidential Client
Northwest / 2017

Project manager for a due diligence evaluation of three natural gas fired combine cycle power plants being considered for potential acquisition. The evaluation included a technical, environmental, and contractual review of the facilities.

Decommissioning Study / Confidential Client
Illinois / 2017

Project manager for a site retirement evaluation to help determine the cost to retire a 600 MW coal-fired project in Illinois at the end of its useful life. Estimates for demolition and site restoration were included in the evaluation. Jeff previously prepared decommissioning study estimates for this plant with the updated study being performed to reflect current pricing and changes in regulations.

Decommissioning Study / AEP
Ohio, Indiana / 2017

Project manager on a decommissioning study for two coal fired power plants owned by Ohio Valley Electric Company and Indiana Kentucky Electric Company, both of which AEP is the largest shareholder. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives for purposes of accruing the costs over the life of the plants.

Decommissioning Study / OGE Energy Corp.
Oklahoma / 2017

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by OGE Energy in Oklahoma. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support depreciation rates. The evaluation included several coal-fired plants, natural gas fired boilers, natural gas-fired simple and combined cycle units, and a wind farm. Subsequent to the study, Jeff provided written testimony, and is currently providing support in replying to discovery requests. Jeff will be available to provide oral testimony in OGE Energy's rate hearing regarding the study findings.

Decommissioning Study / Duke Energy
North Carolina, South Carolina, Kentucky / 2017

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Duke Energy Carolinas, Duke Energy Progress, and Duke Energy Kentucky. The evaluations were performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included coal-fired planst, natural gas-fired

simple and combined cycle units, gas fired boilers, hydro-electric plants, and solar projects. Subsequent to the study, Jeff provided written and oral testimony in Duke Energy rate hearings in North Carolina and Kentucky regarding the study findings.

Useful Life Assessment / Confidential Client
Southeast / 2017

Project manager on a useful life assessment for a combined cycle power plant for a confidential client. The evaluation was performed to determine the anticipated life of the facility and associated costs to achieve that life. The study supported financial modeling of the facility as part of the utility's portfolio of assets.

Useful Life Assessment / Confidential Client
Southeast / 2017

Project manager on a useful life assessment for a combined cycle power plant for a confidential client. The evaluation was performed to determine the anticipated life of the facility and associated costs to achieve that life. The study supported financial modeling of the facility as part of the utility's portfolio of assets.

Decommissioning Study / FPL Energy
Florida / 2015

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by FPL Energy in the State of Florida. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included several coal-fired plants, natural gas-fired simple and combined cycle units, solar generating facilities. Subsequent to the study, Jeff provided written and oral testimony in FPL Energy's rate case hearing regarding the study findings.

Decommissioning Study / Xcel Energy
Colorado / 2014

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Xcel Energy in the State of Colorado. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives to support regulatory filings. The evaluation included several coal-fired plants, natural gas-fired simple and combined cycle units, hydroelectric plants, and a wind farm. Subsequent to the study, Jeff is provided written and oral testimony in Xcel Energy's rate hearing regarding the study findings.

Decommissioning Cost Evaluation / Progress Energy Florida
Florida / 2008-2009

Project manager on a site retirement cost evaluation for all the fossil fuel-fired power generating facilities owned by Progress Energy in the state of Florida. The evaluation was performed to determine the costs to demolish the units and restore the sites and included a natural gas-fired steam plants, fuel oil-fired steam plants, natural gas-fired combustion turbines, coal-fired facilities, and combined cycle generating facilities. Subsequent to the study, Jeff provided direct testimony in Progress Energy Florida's rate case regarding the study findings.

Decommissioning Asset Retirement Obligation Study / NRG Energy
California / 2016

Project manager on a decommissioning study to evaluate the asset retirement obligation costs for all the fossil fuel-fired power generating facilities owned by NRG Energy in the state of California. The evaluation was performed to determine the costs for any legally obligations to demolish facilities and equipment and perform environmental remediation and site restoration activities. The facilities included a natural gas and fuel oil fired plants consisting of boilers, combustion turbines, and combined cycle generating facilities.

Due Diligence / Confidential Client
Northeast / 2016

Project manager for a due diligence evaluation of a portfolio of power generation assets. The assets included gas and oil fired boilers, combined cycle combustion turbines, and simple cycle combustion turbines. The client was considering acquiring an equity stake in the facilities. The evaluation included a technical, environmental, and contractual review of the facilities. The review primarily focused on evaluation of recent repairs to the facilities, remaining life of the equipment, and potential large capital cost requirements to identify key risks or fatal flaws.

Due Diligence / Confidential Client
Northeast / 2016

Project manager for a due diligence evaluation of a coal fired power generating facility that was being offered for sale. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the facilities. The review primarily focused on evaluation of the condition of the equipment and facilities, upgrades required to comply with environmental regulations, and other major capital or O&M projects to identify key risks or fatal flaws.

Due Diligence / Confidential Client
Northeast / 2016

Project manager for a due diligence evaluation of a combined cycle generating facility under development. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility. The review primarily focused on evaluation of the project costs, schedule, permitting, and other development activities to determine any development risks or fatal flaws.

Decommissioning Study / PacifiCorp
Oregon, Washington, Wyoming / 2016

Project manager on a decommissioning study for three wind farms owned by PacifiCorp. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives in support of determining depreciation rates.

Due Diligence / Confidential Client
Northeast / 2016

Project manager for a due diligence evaluation of a combined cycle generating facility under development. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility. The review primarily focused on evaluation of the project costs, schedule, permitting, EPC contract, equipment contracts, and other development activities to determine any development risks or fatal flaws.

Due Diligence / Confidential Client
Southeast / 2016

Project manager for a due diligence evaluation of a natural gas fired combined cycle power generating facility that was being offered for sale. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the facility. The review primarily focused on evaluation of the condition of the equipment, sufficiency of contractual arrangements, and environmental compliance to identify key risks or fatal flaws

Decommissioning Study / Big Rivers Electric Cooperative
Kentucky / 2016

Project manager on a decommissioning study for two coal-fired power generating facilities owned by Big Rivers Electric Cooperative. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives.

Due Diligence / Confidential Client
Northeast / 2016

Project manager for a due diligence evaluation of a natural gas fired combined cycle power generating facility that was being offered for sale. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the facility. The review primarily focused on evaluation of the condition of the equipment, sufficiency of contractual arrangements, design issues surrounding recent plant performance challenges, and environmental compliance to identify key risks or fatal flaws.

Useful Life Assessment / Confidential Client
Southeast / 2015

Project manager on a useful life assessment for a combined cycle power plant for a confidential client. The evaluation was performed to determine the anticipated life of the facility to support financing of the project associated with acquisition of the facility.

Decommissioning Study / Nebraska Public Power District
Nebraska / 2015

Project manager on a decommissioning study for five power generating facilities owned by Nebraska Public Power District. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives. The evaluation included two coal-fired plants, a natural gas-fired boiler plant, a combined cycle plant, and a wind farm.

Decommissioning Study / Lafayette Utilities System
Louisiana / 2015

Project manager on a decommissioning study for a coal fired generating facility in the state of Louisiana. The evaluation was performed to determine the costs for options to retire the units in place or demolish the units and restore the site now that the units are no longer operating. The costs are being used for planning purposes by the client, to determine the preferred decommissioning plan for the plant.

Decommissioning Study / Colstrip Energy
Montana / 2015

Project manager on a decommissioning study for a coal fired generating facility in the state of Montana. The evaluation was performed to determine the costs to demolish the unit and restore the site at the end of its useful life. The costs were used for planning purposes by the client, to determine the decommissioning funds that need to be accrued throughout the operating life of the facility.

Due Diligence / Confidential Client
Northeast / 2015

Project manager for a due diligence evaluation of a combined cycle generating facility under development. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility. The review primarily focused on evaluation of the project costs, schedule, permitting, and other development activities to determine whether the project was economically attractive and determine any development risks or fatal flaws.

Decommissioning Study / Apex Clean Energy
Various Locations / 2015

Project manager for a site retirement cost evaluation for three proposed wind energy facilities under development. The evaluation was performed to support permitting activities on the facilities.

Decommissioning Study / Oklahoma Gas & Electric
Oklahoma / 2014

Project manager on a decommissioning study for a power generating facility in the Midwest. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life. The plant was expected to retire within a year or two of the study, and the costs were used for planning purposes by the client.

Decommissioning Study / Basin Electric Cooperative
North Dakota & Wyoming / 2014

Project manager on a decommissioning study for five power generating facilities in the North Dakota and Wyoming. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful life. The costs are being used for planning purposes by the client.

Coal Plant Layup / Hoosier Energy
Indiana / 2014

Project manager on the preparation of a plan to place a coal fired generating facility in long term layup reserve status. The project included preparation of three manuals for the implementation of the layup plan, maintaining the plant during the layup period, and reactivating the plant at the end of the layup period. .

Decommissioning Study / Apex Clean Energy
Illinois / 2014

Project manager for a site retirement cost evaluation for a proposed wind energy facility under development. The evaluation was performed to support permitting activities on the facility.

Decommissioning Study / Confidential Client
Midwest / 2014

Project manager for a due diligence evaluation of a combined cycle generating facility under development. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility. The review primarily focused on evaluation of the

project costs, schedule, permitting, and other development activities to determine whether the project was economically attractive and determine any development risks or fatal flaws.

Due Diligence / Duke Energy
Florida / 2014

Project manager for a due diligence evaluation of the Osprey Energy Center combined cycle generating facility being offered for sale. Duke Energy was considering acquiring the facility from the current owner. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility. Duke successfully acquired the facility and utilized the Independent Engineer's Report prepared by 1898 & Co. to support the regulatory process through acquisition of the facility.

Due Diligence / Confidential Client
Southeast / 2014

Project manager for a due diligence evaluation of a cogeneration facility being offered for sale. The client was considering acquiring the facility from the current owner. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility, including a review of potential modifications to the facility due to the loss of the steam host and associated costs.

Due Diligence / Indiana Municipal Power Agency
Indiana / 2014

Project manager for a due diligence evaluation of a coal-fired generating facility being offered for sale. The client was considering acquiring the assets from the current owner. The evaluation includes a technical, environmental, and contractual review of the coal fired generation facility. .

Due Diligence / Kansas Municipal Power Agency
Missouri / 2014

Project manager for a due diligence evaluation of a combined cycle generating facility being offered for sale. The client was considering acquiring an equity stake in the facility. The evaluation included a technical, environmental, and contractual review of the natural gas fired generation facility.

Strategic Site Selection Study / Confidential Client
Midwest / 2013

Lead on site selection study for a new natural gas fired combined cycle generating resource in the Midwest. The study included evaluating greenfield and brownfield sites to determine the most attractive sites and the limiting factors to development at each site.

Strategic Site Selection Study / Confidential Client
Northeast / 2013

Lead on site selection study for a new gas processing facility in the northeast. The study included evaluating potential greenfield locations for a cryogenic gas processing plant to handle wet and dry gas from the Utica and Marcellus Shale areas.

Site Evaluations / Confidential Client
Southeast / 2013

Lead on the evaluation of three potential sites for a new natural gas fired combined cycle generating facility in the Southeast. The study included reviewing three sites previously selected by the client and ranking those sites relative to one another to determine their suitability for the natural gas-fired generation options under consideration. .

Decommissioning Study / Arizona Public Service
Arizona / 2013

Project manager on a decommissioning study for a four-steam electric generating facilities in the southwest. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives. The evaluation included two coal-fired plants, and two natural gas and fuel oil fired boilers.

Decommissioning Study / Confidential Client
Texas / 2013

Lead on a decommissioning study for a coal fired generating facility in Texas. The study included evaluating options to place the plant in reserve shutdown status or completely retire the plant and perform full plant demolition.

Decommissioning Study / Confidential Client
Upper Midwest / 2013

Project manager on a decommissioning study for a coal fired generating facility in the upper Midwest. The study included phasing the retirement dates of portions of the facility and performing selective demolition as appropriate with full demolition to be complete at the end of useful life of the entire facility. The study also included evaluating potential value of equipment for sale on the secondary market.

Decommissioning Study / Confidential Client
Ohio River Valley / 2013

Project manager on a decommissioning study for two coal fired generating facilities in the Ohio River Valley. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful life. The costs are being used for planning purposes by the client.

Decommissioning Study / EDP Renewables
Illinois / 2013

Project manager on a decommissioning study for a wind farm being developed in New York. The evaluation was performed to determine the costs to demolish the units and restore the site at the end of its useful life to support Calpine's application to construct a major electric generating facility under Article 10 of the New York Public Service Law. Subsequent to the study, Jeff will be available to provide written testimony in the Article 10 public hearings regarding the study findings.

Strategic Site Selection Study / Confidential Client
Western Kansas / 2012

Lead on a strategic site selection study for a new natural gas fired generation resource in the state of Kansas. The study resulted in the identification of multiple viable site alternatives to support the natural gas-fired generation options under consideration.

Due Diligence / Confidential Client
Northeast / 2012

Project manager for a due diligence evaluation of a coal-fired generating facility being offered for sale. The client was considering acquiring the assets from the current owner. The evaluation includes a technical, environmental, and contractual review of the coal fired generation facility.

Due Diligence / Old Dominion Electric Cooperative
Pennsylvania / 2012

Jeff provided support for a due diligence evaluation of a facility under development, that included a 2-on-1 combined cycle power block, being offered for sale. The client was considering acquiring the site from the current owner. The evaluation included a technical, environmental, and contractual review of the combined cycle generation facility. The evaluation included a review of existing agreements and permits in place to facilitate development of the generation resource. The project also included a review of the project capital costs to determine whether the costs were reasonable, and to identify any gaps that may increase the overall project cost.

Due Diligence / Old Dominion Electric Cooperative
New Jersey / 2012

Project manager for a due diligence evaluation of a facility that was under construction at the time, and was being offered for sale. The client was considering acquiring the 2-on-1 combined cycle power generating facility, from the current owner. The evaluation included a technical, environmental, and contractual review of the including a review of existing agreements and permits in place. The project also included a review of the project capital costs to determine whether the costs were reasonable, and to identify any gaps that may increase the overall project cost.

Due Diligence / Old Dominion Electric Cooperative
Virginia / 2012

Project manager for a due diligence evaluation of a facility under development, that included a 2-on-1 combined cycle power block, being offered for sale. The client was considering acquiring the site from the current owner. The evaluation included a technical, environmental, and contractual review of the combined cycle generation facility. The evaluation included a review of existing agreements and permits in place to facilitate development of the generation resource. The project also included a review of the project capital costs to determine whether

the costs were reasonable, and to identify any gaps that may increase the overall project cost.

Due Diligence / Confidential Client
Southeast / 2012

Jeff assisted with a due diligence evaluation of a facility that includes two, 2-on-1 combined cycle power blocks, being offered for sale. The client was considering acquiring the assets from the current owner. The evaluation included a technical, environmental, and contractual review of the combined cycle generation facility.

Development Assistance / Tenaska
Ohio / 2012

Project manager assisting a client with the preparation of a Certificate of Environmental Compatibility and Public Need for conversion of an existing simple cycle facility to combined cycle. The facility includes five combustion turbines, four of which will be converted to two, 2-on-1 combined cycle power blocks. The project includes full preparation of the Certificate of Environmental Compatibility and Public Need application, as well as public meeting support.

Repower Assessment / Confidential Client
North Dakota / 2011

Jeff assisted a client with an evaluation comparing the economic viability of retrofitting an existing coal-fired power plant with air quality control system equipment in comparison to replacing the plant with new natural gas fired generation. The project includes preparing capital cost estimates; operating and maintenance cost estimates, and determining the net present value of each alternative evaluate the relative economic attractiveness of each alternative.

Decommissioning Study / Progress Energy
North Carolina & South Carolina / 2011

Project manager on a decommissioning study for the entire fleet of power generating facilities owned by Progress Energy Carolinas. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives. The evaluation included several coal-fired plants, as well as several natural gas-fired and fuel oil-fired units.

Decommissioning Study / Minnesota Power
Minnesota / 2011

Project manager on a decommissioning study for several power generating facilities owned by Minnesota Power. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives. The evaluation included three coal-fired plants and a biomass fired facility. .

Strategic Site Selection Study / Old Dominion Electric Cooperative
Virginia, Maryland, Pennsylvania, Delaware / 2011

Project manager on a strategic site selection study for a 750 MW combined cycle facility. The study resulted in the identification of multiple viable site alternatives to support the natural gas-fired generation option under consideration.

Due Diligence Evaluation / Old Dominion Electric Cooperative
Pennsylvania / 2011

Project manager on a due diligence evaluation of a 2-on-1 combined cycle facility being offered for sale by Liberty Electric in Pennsylvania. The client was considering acquiring the assets from the current owner. The evaluation included a technical, environmental, and contractual review of the combined cycle generation facility.

Due Diligence Evaluation / Tyr Energy
Florida / 2011

Project manager on a due diligence evaluation of a biomass power generating facility under development by American Renewables. The client was considering an equity investment in the facility. The evaluation included a 100 MW bubbling fluidized bed boiler and steam turbine.

Due Diligence Evaluation / Electric Cooperative
Maryland / 2011

Project manager on a due diligence evaluation of a combined cycle facility under development in Maryland. The client was considering acquiring the site and all the development rights for installation of a 2-on-1 combined

cycle facility. The evaluation included a review of existing agreements and permits in place to facilitate development of the generation resource.

Decommissioning Study / Tampa Electric Co.
Florida / 2011

Project manager on a decommissioning study for the power generating facilities owned by Tampa Electric Company. The evaluation was performed to determine the costs to demolish the units and restore the sites at the end of their useful lives. The evaluation included a coal-fired plant, an integrated gasification combined cycle plant, and several natural gas-fired units.

Decommissioning Study / Confidential Client
Illinois / 2011

Project manager for a site retirement evaluation to help determine the cost to retire a 600 MW coal-fired project in Illinois at the end of its useful life. Estimates for demolition and site restoration were included in the evaluation.

Repower Assessment / Confidential Client
Minnesota / 2010

Jeff assisted a client with an evaluation comparing the economic viability of retrofitting an existing coal-fired power plant with air quality control system equipment in comparison to replacing the plant with new natural gas fired generation. The project includes preparing capital cost estimates; operating and maintenance cost estimates, and determining the net present value of each alternative evaluate the relative economic attractiveness of each alternative.

Biomass Plant Site Selection Study / Confidential Client
Texas / 2010

Project manager for a Site Selection Study for a Biomass project to be located in Texas. The project included ranking of candidate sites to determine a preferred site for development of a 20 MW biomass power generating facility.

Due Diligence Evaluation / Tyr Energy
Multiple Locations / 2010

Project manager on a due diligence evaluation for several natural gas-fired facilities being offered for sale by Tenaska. The client was considering an equity investment in the facilities. The evaluation included four combined cycle facilities and one simple cycle facility.

Power Plant Valuation Assessment / Basin Electric Power Cooperative
North Dakota / 2010

Project manager to provide a valuation assessment of the Antelope Valley Station Unit 2, which is being considered for purchase by Basin Electric Power Cooperative. The project includes valuing the 25 year old 450 MW coal fired unit in current dollars and at specified dates in the future.

Wind Farm Evaluation / Minnesota Power
North Dakota / 2010

Project manager to provide an evaluation of a proposed wind farm development in central North Dakota. The project includes wind resource assessments, conceptual engineering design, capital cost estimates, and estimated busbar costs for development of wind farm project in phases on the land currently under contract.

Decommissioning Cost Evaluations / Horizon Wind Energy
Midwest / 2008-2010

Project manager on multiple site retirement cost evaluations for several proposed wind energy facilities under development by Horizon Wind Energy. The evaluations were performed to support permitting activities on the facilities.

Due Diligence Evaluation / Tyr Energy
Hawaii / 2010

Project manager on a due diligence evaluation for a biomass gasification generating facility under development in Hawaii. The client was considering the facility for investment. The evaluation included a Primenergy gasifier with a net plant output of approximately 12 MW.

Project Development Assistance / Tradewind Energy
Kansas / 2009-2010

Project manager to provide development assistance on a wind farm facility in Southern Kansas. The development assistance includes support on land acquisition efforts for the project, transmission line routing and preliminary design, power collection system preliminary design, and general project development assistance.

Project Development Assistance / Tradewind Energy
Missouri / 2007-2010

Project manager to provide development assistance on two wind turbine facilities in Northern Missouri. The development assistance includes support on land acquisition efforts for the project, transmission line routing and preliminary design, power collection system preliminary design, and general project development assistance.

Decommissioning Cost Evaluation / Northern Indiana Public Service Co.
Indiana / 2008

Project manager on a site retirement cost evaluation for several generating facilities owned by NIPSCO. The evaluation was performed to determine the costs to demolish the units and restore the sites and included several coal-fired facilities and a combined cycle generating facility.

Due Diligence Evaluation / Grays Harbor Public Utility District
Washington / 2008

Project manager on a due diligence evaluation for a biomass-fired cogeneration facility being offered for sale in Washington. The facility evaluated was a paper mill that had been shutdown for several years. The facility included a wood waste fired boiler that provided steam to a steam turbine for electric power generation as well as providing plant process steam.

Due Diligence Evaluation / Tyr Energy
New Mexico / 2008

Project manager on a due diligence evaluation for a natural gas-fired power generating facility being offered for sale in New Mexico. The evaluation included two Mitsubishi 501F combustion turbines operating in combined cycle mode.

Decommissioning Cost Evaluation / Horizon Wind Energy
Illinois / 2008

Project manager on a site retirement cost evaluation for a wind farm being proposed by Horizon Wind Energy in Illinois. The evaluation was performed to determine the costs to demolish the units and restore the sites to meet the county zoning requirements.

Due Diligence Evaluation / Tyr Energy
Western U.S. / 2008

Project manager on a due diligence evaluation for several natural gas-fired power generating facilities being offered for sale throughout the western United States. The evaluation included several GE LM6000 combustion turbines operating in simple cycle mode, several GE LM6000 combustion turbines operating in combined cycle mode, one GE 7EA combustion turbine operating in combined cycle mode, and one GE 7FA combustion turbine operating in simple cycle mode.

Due Diligence Evaluation / Tyr Energy
Virginia / 2007

Project manager on a due diligence evaluation for a generating facility being offered for sale in Virginia. The evaluation included 7 GE LM6000 fuel oil fired combustion turbines operating in simple cycle mode.

Due Diligence Evaluation / Tyr Energy
Colorado / 2007

Project manager on a due diligence evaluation for 5 GE LM6000 combustion turbines operating in combined cycle cogeneration mode with 2 steam turbines. The facility includes a greenhouse that serves as the plant's thermal host for cogeneration operations.

Project Development Assistance / Mesa Wind Power
Texas / 2007

Jeff provided development assistance on a 4,000 MW wind turbine facility located in the panhandle of Texas. The development assistance includes pro forma economic modeling of the project.

Due Diligence Evaluation / Kelson Energy
Ohio / 2007

Project manager on a due diligence evaluation for a generating facility being offered for sale in Ohio. The evaluation included a partially constructed 2x1 Siemens Westinghouse 7FA combined cycle generating facility.

Due Diligence Evaluation / Grand River Dam Authority
Oklahoma / 2007

Project manager on a due diligence evaluation for a generating facility being offered for sale in Oklahoma. The evaluation included a 4x2 GE 7FA combined cycle generating facility.

Due Diligence Evaluation / Brazos Electric Power Cooperative
Texas / 2007

Project manager on a due diligence evaluation for the purchase of an equity share of a generating facility being constructed in Texas. The evaluation included an 890 MW supercritical pulverized coal fired generating facility.

Due Diligence Evaluation / Tyr Energy
Florida / 2007

Project manager on a due diligence evaluation for a generating facility being offered for sale in Florida. The evaluation included 3 GE 7FA combustion turbines operating in simple cycle mode. .

Cost Estimate Preparation / Direct Energy
Texas / 2007

Project manager for the preparation of planning level cost estimates for a new combined cycle facility to be constructed in Texas.

Due Diligence Evaluation / Tyr Energy
Various U.S Locations / 2007

Project manager on a due diligence evaluation for several generating facilities being offered for sale throughout the U.S. The evaluation included a coal, natural gas, and wind power facilities.

Owner's Engineer Services / Grays Harbor PUD
Washington / 2007

Project manager on an owner's engineer project to evaluate the plans for installation of a refurbished steam turbine at a paper mill. The evaluation included the review of the design for the installation of a 7 MW steam turbine.

Decommissioning Cost Evaluation / Tyr Energy
Various U.S Locations / 2007

Project manager on a site retirement cost evaluation for several generating facilities owned by Tyr Energy. The evaluation was performed to satisfy FASB 143 accounting standards and included a simple cycle and combined cycle generating facilities.

Due Diligence Evaluation / Tyr Energy
Virginia / 2006-2007

Project manager on a due diligence evaluation for a generating facility being offered for sale in Virginia. The evaluation included a 240 MW subcritical pulverized coal fired facility.

Due Diligence Evaluation / Brazos Electric Power Cooperative
Texas / 2006

Project manager on a due diligence evaluation for a generating facility being offered for sale in Texas. The evaluation included a 1x1 GE 7FA combined cycle generating facility and 2 GE 7FA combustion turbines operating in simple cycle mode.

Due Diligence Evaluation / Kelson Energy
Ohio / 2007

Project manager on a due diligence evaluation for a generating facility being offered for sale in Ohio. The evaluation included a partially constructed 2x1 Siemens Westinghouse 7FA combined cycle generating facility.

Generation Alternatives Study / Ottertail Power Company
North Dakota / 2006

Project manager on a Generation Alternatives Study for the addition of a new 600 MW coal fired unit at an existing coal fired facility. The study includes a pro forma analysis of the technologies considered.

Technology Assessment / Minnesota Power
South Dakota / 2006

Assisted with a technology assessment for the addition of a new 500 MW coal fired unit at an existing coal fired facility. The study includes a pro forma analysis of the technologies considered.

Technology Assessment & Feasibility Study / Ottertail Power Co.
Minnesota / 2006

Project manager on a feasibility study and technology assessment for the addition of a new 500 MW coal fired unit at an existing coal fired facility. The study includes conceptual site layouts, cost estimates, performance estimates, and water balances.

Project Development Assistance / Tradewind Energy
Kansas / 2005-2006

Project manager to provide development assistance on a 250MW wind turbine facility in Central Kansas. The development assistance includes conceptual design and technical support for the development phase of the project.

Siting Study & Technology Assessment / Arizona Public Service
Arizona/New Mexico / 2005-2006

Assisted with a siting study and technology assessment for a 1,800 MW coal fired facility in Arizona and Northwestern New Mexico. Development resulted in the identification of multiple viable site alternatives to support coal-fired generation options.

Due Diligence Evaluation / Tyr Energy
California / 2005-2006

Project manager on a due diligence evaluation for four generating facilities being offered for sale in California. The evaluation included simple cycle facilities consisting of Pratt & Whitney FT8 Twinpacs. Professional Services: 2005-2006

Waste-to-Energy Feasibility Study / CPS Energy
Texas / 2005

Assisted with a feasibility study for a new waste-to-energy facility in the State of Texas. The study included a pro forma analysis of the facility considered.

Due Diligence Evaluation / Tyr Energy
Oklahoma / 2006

Project manager on a due diligence evaluation for a generating facility being offered for sale in Oklahoma. The evaluation included a simple cycle facility consisting of four General Electric 7EA turbines.

Due Diligence Evaluation / Cinergy
Indiana / 2005

Project manager on a due diligence evaluation for a generating facility being offered for sale in Indiana. The evaluation included a simple cycle facility consisting of four Siemens Westinghouse 501D5A turbines.

Due Diligence Evaluation / kRoad Power
Various Locations / 2003-2004

Project manager on due diligence evaluations for several generating facilities being offered for sale throughout the United States. The evaluations included four combined cycle plants utilizing Siemens Westinghouse 501G turbines.

Due Diligence Evaluation / kRoad Power
Various Locations / 2003

Project manager on due diligence evaluations for several generating facilities being offered for sale by Duke Energy. The evaluations included two combined cycle plants and one simple cycle plant utilizing General Electric 7FA turbines and General Electric 7EA turbines respectively.

Decommissioning Cost Evaluation / Old Dominion Electric Cooperative
Maryland/Virginia / 2002-2004

Project manager on several site retirement evaluations to help determine the cost to retire the facilities at the end of their useful life. The evaluations included simple cycle plants utilizing General Electric 7FA turbines and Caterpillar

Diesel Gensets. Estimates for demolition and site restoration were included.

Decommissioning Cost Evaluation / Western Farmers Electric Cooperative
Oklahoma / 2004

Project manager on a site retirement evaluation to determine the approximate cost to retire the facilities, prepare demolition contract documents, and evaluate bids. The evaluation included a duel fuel genset site.

Decommissioning Cost Evaluation / Panda Energy
North Carolina / 2003

Project manager on a site retirement evaluation to help determine the cost to retire the Panda-Rosemary Project at the end of its useful life. The evaluation included a combined cycle cogeneration facility in Roanoke Rapids, North Carolina. Estimates for demolition and site restoration were included in the evaluation.

Independent Engineer's Report / Panda Energy
North Carolina / 2003-2004

Produced an Independent Engineer's Report for the Panda-Rosemary Project. The report included a due diligence evaluation of plant performance and financial assessment of a combined cycle cogeneration facility in Roanoke Rapids, North Carolina.

Decommissioning Cost Evaluation / Sempra Energy
Arizona / 2003

Provided a site retirement evaluation to help determine the cost to retire the Mesquite Energy Generating Facility at the end of its useful life. The evaluation included a combined cycle plant near Phoenix, Arizona. Estimates for demolition and site restoration were included in the evaluation.

Feasibility Study / Northeast Utility Service Corp
New Hampshire / 2004

Assisted with a feasibility study to replace an existing coal-fired unit with a new coal fired unit. The study included the installation of a single 600 MW unit in New Hampshire. A pro forma analysis of the new unit was prepared and benchmarked against a pro forma analysis for the existing unit.

Technology Assessment & Feasibility Study / Ottertail Power Corp
South Dakota / 2006

Assisted with a technology assessment and feasibility study for a new coal-fired generation facility in South Dakota. The study included a pro forma analysis of the alternative technologies considered.

Waste-to-Energy Feasibility Study / CPS Energy
Texas / 2005

Assisted with a feasibility study for a new waste-to-energy facility in the State of Texas. The study included a pro forma analysis of the facility considered.

Technology Assessment & Feasibility Study / Progress Energy
Florida / 2004

Assisted with a technology assessment and feasibility study for new solid fuel fired generation in the State of Florida. The study included a pro forma analysis of the alternative technologies considered.

Resources Corporation Project Development Assistance / Peoples Energy
Oregon / 2001-2004

Provided project development assistance for a 1,200 MW combined cycle power plant in Oregon. Mr. Kopp assisted in the preparation of an Energy Facility Site Certificate including preliminary engineering design, preparation and review of written exhibits, and public presentation support.

Project Development Assistance / Peoples Energy Resources Corporation
New Mexico / 2001-2004

Provided project development assistance for a simple cycle power plant in New Mexico. Mr. Kopp provided preliminary engineering design and project development assistance. This included preparing preliminary site design drawings that were approved by the county zoning commission

during the site design review process as well as public presentation support.

Decommissioning Cost Study

CenterPoint Energy Indiana South

CenterPoint Decommissioning Cost Study
Project No. 135623

2/22/2022

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
1898 & Co.	1898 & Co., part of Burns & McDonnell
BOP	Balance of Plant
CenterPoint	CenterPoint Energy Indiana South
FGD	Flue-Gas Desulfurization
Plant	AB Brown Generating Station
SCR	Selective Catalytic Reduction
Study	Decommissioning Cost Study
Units	Units 1 and 2 of AB Brown Generating Station

1.0 EXECUTIVE SUMMARY

1.1 Introduction

CenterPoint Energy Indiana South ("CenterPoint") retained 1898 & Co., a division of Burns & McDonnell Engineering Company, Inc. (hereinafter called "1898 & Co."), to conduct a Decommissioning Cost Study ("Study") for Units 1 and 2 of the AB Brown Generating Station ("Plant," "Units") in Evansville, Indiana. The Plant includes a coal-fired generating facility as well as natural gas assets. The natural gas assets are not part of the scope of this Study. The purpose of the Study was to review Units 1 and 2 of the facility and to make a recommendation to CenterPoint regarding the total cost to decommission these units at the end of their useful lives. The decommissioning costs were developed by 1898 & Co. using information provided by CenterPoint and in-house data available to 1898 & Co.

1.2 Results

1898 & Co. has prepared a cost estimate in 2021 dollars for the decommissioning of the Plant. The cost estimate is summarized in the following table. When CenterPoint determines that the Units should be retired, the above grade equipment and steel structures are assumed to have sufficient scrap value to a scrap contractor to offset a portion of the decommissioning costs. CenterPoint will incur costs in the demolition and restoration of the sites less the scrap value of equipment and bulk steel.

Table 1-1: Decommissioning Cost Summary (2021$)

Decommissioning Costs	Salvage Credits	Net Project Cost
$ 37,661,000	$ (13,159,000)	$ 24,502,000

The total project costs presented above include the costs to return the site to an industrial condition suitable for reuse for development as an industrial facility. Included are the costs to dismantle the power generating equipment and balance of plant facilities and, where applicable, to perform environmental site restoration activities.

2.0 INTRODUCTION

2.1 Background

1898 & Co. was retained by CenterPoint to conduct a Study for Units 1 and 2 of the AB Brown Plant in Evansville, Indiana to estimate the decommissioning and dismantling costs. The asset includes a coal-fired generating facility as well as natural gas assets. The natural gas assets are not part of the scope of this Study. Individuals from 1898 & Co. visited the Plant evaluated within the Study in August of 2021. The purpose of the Study was to review the facility and to make a recommendation to CenterPoint regarding the total cost to decommission and dismantle the Unit 1 and 2 facilities at the end of their useful life. 1898 & Co. has prepared over three hundred decommissioning and dismantling studies on various types of fossil fuel and renewable power plants. In addition to preparing decommissioning and dismantling estimates, 1898 & Co. has supported demolition projects as the owner's engineer. In this capacity, 1898 & Co. has evaluated demolition bids and overseen demolition activities. This has provided 1898 & Co. with insight into a broad range of competitive demolition bids, which also assists in confirming the validity of the decommissioning and dismantling estimates developed by 1898 & Co.

2.2 Methodology

The site decommissioning and dismantling costs were developed using information provided by CenterPoint and in-house data 1898 & Co. has collected from previous project experience. 1898 & Co. estimated quantities for equipment based on a visual inspection of the facilities, reviews of engineering drawings, an in-house database of plant equipment quantities, and professional judgment. For the Plant, quantities were estimated for each required task. Current market pricing for labor rates and equipment was then developed for each task. The unit pricing was developed for each site based on the labor rates, equipment costs, and disposal costs specific to the area in which the work is to be performed. These rates were applied to the quantities for the Plant to determine the total cost of decommissioning and dismantling.

The decommissioning and dismantling costs include the cost to return the site to an industrial condition, suitable for reuse for development of an industrial facility. Included are the costs to decommission and dismantle all the Unit 1 and 2 assets, including power generating equipment and Balance of Plant ("BOP") facilities.

3.0 OVERVIEW

3.1 Site Visits

Representatives from 1898 & Co. and CenterPoint visited the site on August 17, 2021. The site visit consisted of a tour of the facility along with CenterPoint representative Larry Rogers, Staff Engineer. The following 1898 & Co. representatives comprised the site visit team:

- Mr. Kyle Haas, Project Manager
- Ms. Brittany Hixon, Project Consultant
- Ms. Abby Yi, Project Analyst

3.2 Plant Description

The AB Brown Generating Station is located in Evansville, Indiana, along the northern bank of the Ohio River approximately 8 miles east of Mount Vernon, Indiana. The plant contains two coal-fired steam turbine units (Unit 1 and 2) each with a nameplate capacity of 265.2 MW. The site includes a coal handling system complete with a rail loop, coal pile, coal hoppers, and conveyors. Also on site are two cooling towers with three earth lined blow down basins. Unit 1 includes a baghouse, flue-gas desulfurization ("FGD"), and a selective catalytic reduction ("SCR") for reducing mono-nitrogen oxides ("NOx") emissions. Unit 2's environmental equipment includes a precipitator, FGD, and SCR. The Plant also has two gas turbines onsite, Units 3 and 4; however, these are not included in the scope of demolition for this Study. A summary of the units is shown in the following table.

Table 3-1: AB Brown Summary

Unit	Generation Type	Fuel Type	Capacity	In-Service Date
1	Steam Turbine	Coal	265 MW	1979
2	Steam Turbine	Coal	265 MW	1986
3	Combustion Turbine	Natural Gas/Oil	88 MW	1991
4	Combustion Turbine	Natural Gas	88 MW	2002

4.0 DECOMMISSIONING COSTS

1898 & Co. has prepared a decommissioning cost estimate for the Plant. When CenterPoint determines that the site should be retired, the above grade equipment and steel structures are assumed to have scrap value to a scrap contractor which will offset a portion of the site decommissioning costs. However, CenterPoint will incur costs of dismantling the Plant and restoration of the site to the extent that those costs exceed the scrap value of equipment and bulk steel.

The decommissioning costs for the site includes the cost to return the site to an industrial condition, suitable for reuse for development of an industrial facility. Included are the costs to dismantle all the Unit 1 and 2 assets at the site, including power generating equipment and BOP facilities, as well as the costs to perform environmental site restoration activities.

For purposes of this study, 1898 & Co. assumed that the site will be dismantled as a single project, allowing the most cost-effective demolition methods to be utilized. A summary of several of the means and methods that could be employed is summarized in the following paragraphs; however, means and methods will not be dictated to the contractor by 1898 & Co. It will be the contractor's responsibility to determine means and methods that result in safely dismantling the Plant at the lowest possible cost.

Asbestos remediation, as required, would take place prior to commencement of any other demolition activities. Abatement would need to be performed in compliance with all state and federal regulations, including, but not limited to, requirements for sealing off work areas and maintaining negative pressure throughout the removal process. Final clearances and approvals would need to be achieved prior to performing further demolition activities.

High grade assets would then be removed from the site, to the extent possible. This would include items such as transformers, transformer coils, circuit breakers, electrical wire, condenser plates and tubes, and heater tubes. High grade assets include precious alloys such as copper, aluminum-brass tubes, stainless steel tubes, and other high value metals occurring in plant systems. High grade asset removal would occur up-front in the schedule, to reduce the potential for theft, to increase cash flow, and for separation of recyclable materials to increase scrap recovery. Methods of removal vary with the location and nature of the asset. Small transformers, small equipment, and wire would likely be removed and shipped as-is for processing at a scrap yard. Large transformers, combustion turbines, steam turbine generators, and condensers would likely require some on-site disassembly prior to being shipped to a scrap yard.

Construction and Demolition ("C&D") waste includes items such as non-asbestos insulation, roofing, wood, drywall, plastics, and other non-metallic materials. C&D waste would typically be segregated from scrap and concrete to avoid cross-contaminating of waste streams or recycle streams. C&D demolition crews could remove these materials with equipment such as excavators equipped with material handling attachments, skid steers, etc. This material would be consolidated and loaded into bulk containers for disposal.

In general, boilers could be felled and cut into manageable sized pieces on the ground. First the structures around the boilers would need to be removed using excavators equipped with

shears and grapples. Stairs, grating, elevators, and other high structures would be removed using an "ultra-high reach" excavator, equipped with shears. Following removal of these structures, the boilers would be felled, using explosive blasts. The boilers would then be dismantled using equipment such as excavators equipped with shears and grapples, and the scrap metal loaded onto trailers for recycling.

After the surrounding structures and ductwork have been removed, the stacks would be imploded, using controlled blasts. Following implosion, the stack liners and concrete would be reduced in size to allow for handling and removal.

BOP structures and foundations would likely be demolished using excavators equipped with hydraulic shears, hydraulic grapples, and impact breakers, along with workers utilizing open flame cutting torches. Steel components would be separated, reduced in size, and loaded onto trailers for recycling. Clean concrete would be broken into manageable sized pieces and stockpiled for crushing on site. These concrete pieces would ultimately be loaded in a hopper and fed through a crusher to be sized for use as clean fill on-site. Contaminated concrete will be disposed of offsite.

4.1 Assumptions

The following assumptions were made as the basis of the cost estimate:

1. Pricing for the estimate is in current 2021 dollars.
2. The estimate is based on the local site cost index (Evansville, IN) for the Plant.
3. All work will take place in the most cost-efficient method.
4. Labor costs are based on Union labor rates for a 40-hour workweek.
5. For purposes of this Study, it is assumed that all generating units will be dismantled as part of a single demolition project.
6. Units will be decommissioned to zero generating output. Existing utilities will remain in place for use by the contractor for the duration of the demolition activities. Utilities to remain in place for service on the remaining units will be communicated to 1898 & Co. by CenterPoint.
7. The administration and maintenance buildings are assumed to remain to support future site operations as well as the construction services building, liquid product tank farm, and parking structures, which are also assumed to remain.
8. CenterPoint will remove or consume all burnable coal and chemicals to the reasonable extent possible prior to commencement of demolition activities. Costs for these activities are not included in the estimate.
9. No environmental costs have been included to address cleanup of contaminated soils, hazardous materials, or other conditions present on-site having a negative environmental impact, other than those specifically listed here. No allowances are included for unforeseen environmental remediation activities.

10. The existing ash pond, landfill, and secondary treatment settling pond are assumed to remain. As such, closure costs are not included.
11. The blowdown basins located to the north of the cooling towers will be removed.
12. For purposes of estimating costs, it was assumed that three (3) feet of soil will be excavated over the coal pile area and replaced with clean fill, covered with imported topsoil, and seeded.
13. The rail loop surrounding the Plant area for coal operations will be removed as well as the coal conveyors and associated equipment. The rail lines directed towards the main area of the Plant will remain for future use.
14. Abatement of asbestos will precede any other work. After final air quality clearances have been reached, demolition can proceed.
15. All demolition and abatement activities, including removal of asbestos, will be done in accordance with all applicable Federal, State and Local laws, rules and regulations.
16. Asbestos quantities of 5 percent were assumed to remain for each Unit. Quantities were not provided by CenterPoint.
17. Hazardous material abatement is included for all sites as necessary, including asbestos, mercury, and polychlorinated biphenyls ("PCBs"). Lead paint coated materials will be handled by certified personnel compliant with OSHA Standards as necessary but will not be removed prior to demolition.
18. Transmission switchyards and substations within the boundaries of the plant are not part of the demolition scope. For purposes of this study, the division between generation assets and transmission assets is at the high side of the generator step-up transformers.
19. The costs for relocation of transmission lines, or other transmission assets, are specifically excluded from the decommissioning cost estimates. Any costs necessary to support on-going operations of adjacent units will be allocated to the operating costs of the units not being decommissioned.
20. Step-up transformers and auxiliary transformers are included for demolition and scrap in the estimate. The station transformers are assumed to remain. As such, costs are not included for demolition and scrap of the station transformers.
21. The condenser tubes are assumed to be copper nickel material.
22. All above-grade structures will be demolished, unless otherwise noted herein. All below-grade foundations and piles will be removed to two (2) feet below existing grade. Foundations greater than two (2) feet below grade will be abandoned in place.
23. Existing basements will be used to bury non-hazardous debris. Concrete in trenches and basements will be perforated to create drainage. Non-hazardous debris, such as

concrete and brick, will be crushed and used as clean fill on-site once the capacity of all existing basements has been exceeded. All inert debris will likewise be used as clean fill on-site. All other material that is not sold as scrap will be disposed of at an off-site landfill.

24. Except for the circulating water lines, underground piping will be capped and abandoned in place. Circulating water piping will be excavated to the top of pipe, the top of pipe will be broken, and backfilled with flowable fill.
25. The river intake structure is not included in the scope.
26. The water storage and condensate storage tanks located by the transformers will remain in place following decommissioning.
27. Wells are assumed to remain following decommissioning and are not included in the cost estimate.
28. The following facilities are assumed to remain in service for use by the simple cycle units and will be relocated from their current location on-site:
    - Reverse Osmosis System
    - Service compressors
    - Microwave unit tower (located on Unit 1 stack at the time of the Study)
    - Oil storage
29. The road between Units 1 and 2 will be removed. All other roads are assumed to remain following decommissioning.
30. Site areas will be graded to achieve suitable site drainage to natural drainage patterns and seeded, but grading will be minimized to the extent possible.
31. Major equipment, structural steel, turbines, generators, exhaust stacks, transformers, electrical equipment, cabling, wiring, pump skids, above ground piping, and equipment enclosures for the above equipment will be sold for scrap and removed from the Plant site by the demolition contractor. All other demolished materials are considered debris.
32. For purposes of this Study, it is assumed that none of the equipment will have a salvage value in excess of the scrap value of the materials in the equipment at the time of decommissioning. The decommissioning cost estimate is based on the end of useful life of the facility. All equipment, steel, copper, and other metals will be sold as scrap. Credits for salvage value are based on scrap value alone. Resale of equipment and materials is not included.
33. To the extent possible, clean concrete will be crushed and used as clean fill on-site. All other material that is not sold for scrap will be disposed of at an off-site landfill.

34. Valuation and sale of land and all replacement generation costs are excluded from this scope.
35. Spare parts inventories were not provided to 1898 & Co. for review. 1898 & Co. assumes that to the extent possible spare parts will be sold prior to decommissioning and remaining spare parts will be scrapped by the demolition contractor.
36. The scope of the costs included in the Study is limited to the decommissioning activities that will occur at the end of useful life of the facilities. Additional on-going costs may be required, including, but not limited to groundwater monitoring associated with ash pond closure and/or other environmental monitoring activities. These costs are excluded from the cost estimates provided in this study.
37. A 20 percent contingency is included on the direct costs in the estimates prepared as part of this Study to cover unknowns. The Owner's indirect costs are included as 5 percent of the direct costs.
38. Market conditions may result in cost variations at the time of contract execution.
39. The following scrap values were used in the decommissioning estimate. The scrap values are based upon an average of monthly American Metal Market prices for October 2020 to September 2021 (i.e., one calendar year). These values include the cost to haul the scrap via truck and/or rail to Chicago.
    - Steel Scrap Value: $323.57 per net ton
    - Copper Scrap Value: $2.92 per pound
    - Stainless Steel Scrap Value: $1,443.77 per net ton

5.0 RESULTS

1898 & Co. has prepared cost estimates in 2021 dollars for the decommissioning of the Plant. The costs are summarized in the following table. When CenterPoint determines that Units 1 and 2 should be retired, the above grade equipment and steel structures are assumed to have sufficient scrap value to a scrap contractor to offset a portion of the decommissioning costs. CenterPoint will incur costs in the demolition and restoration of the sites less the salvage value of equipment and bulk steel.

Table 5-1: Decommissioning Cost Summary (2021$)

Decommissioning Costs	Salvage Credits	Net Project Cost
$ 37,661,000	$ (13,159,000)	$ 24,502,000

The total project costs presented above include the costs to return the area of Units 1 and 2 to an industrial condition suitable for reuse for development as an industrial facility. Included are the costs to dismantle all Unit 1 and 2 power generating equipment and balance of plant facilities and, where applicable, to perform environmental site restoration activities. Further details including estimates for the major cost categories of the estimate are provided in Appendix A.

STATEMENT OF LIMITATION

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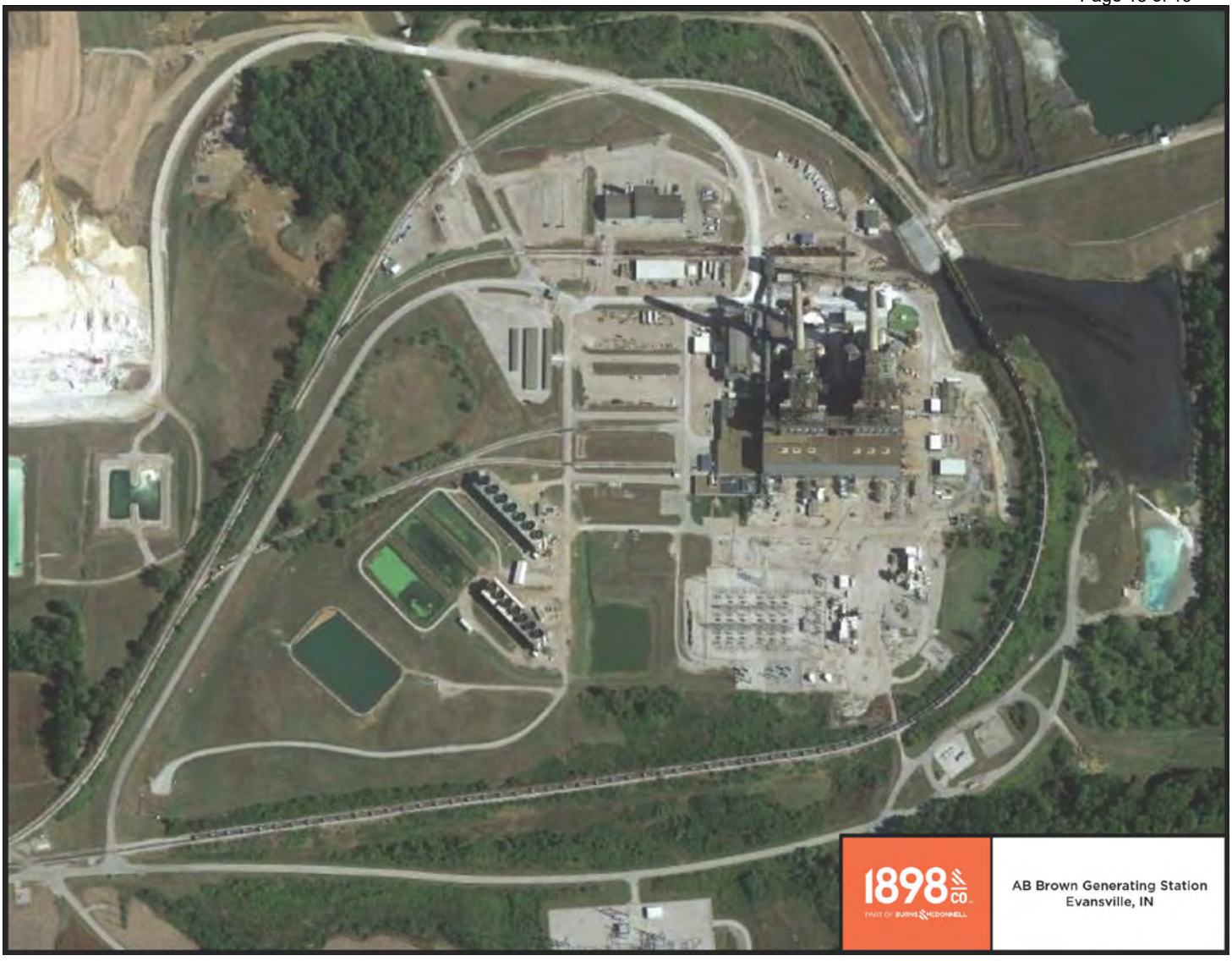
APPENDIX A – COST ESTIMATE SUMMARY

Table A-1
AB Brown Units 1 and 2
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
AB Brown Units 1 and 2						
Unit 1						
Asbestos Removal	$ -	$ -	$ -	$ 190,000	$ 190,000	$ -
Boiler	$ 2,067,000	$ 1,349,000	$ -	$ -	$ 3,416,000	$ -
Steam Turbine & Building	$ 1,273,000	$ 831,000	$ -	$ -	$ 2,104,000	$ -
SCR	$ 1,295,000	$ 845,000	$ -	$ -	$ 2,140,000	$ -
Scrubber / FGD	$ 441,000	$ 288,000	$ -	$ -	$ 729,000	$ -
Baghouse	$ 57,000	$ 37,000	$ -	$ -	$ 94,000	$ -
Stacks	$ 264,000	$ 173,000	$ -	$ -	$ 437,000	$ -
GSU & Foundation	$ 48,000	$ 31,000	$ -	$ -	$ 79,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 243,000	$ -	$ 243,000	$ -
Debris	$ -	$ -	$ 40,000	$ -	$ 40,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (6,117,000)
Subtotal	**$ 5,445,000**	**$ 3,554,000**	**$ 283,000**	**$ 190,000**	**$ 9,472,000**	**$ (6,117,000)**
Unit 2						
Asbestos Removal	$ -	$ -	$ -	$ 190,000	$ 190,000	$ -
Boiler	$ 2,060,000	$ 1,344,000	$ -	$ -	$ 3,404,000	$ -
Steam Turbine & Building	$ 1,273,000	$ 831,000	$ -	$ -	$ 2,104,000	$ -
Precipitator	$ 496,000	$ 324,000	$ -	$ -	$ 820,000	$ -
SCR	$ 1,259,000	$ 822,000	$ -	$ -	$ 2,081,000	$ -
Scrubber / FGD	$ 472,000	$ 308,000	$ -	$ -	$ 780,000	$ -
Stacks	$ 264,000	$ 173,000	$ -	$ -	$ 437,000	$ -
GSU & Foundation	$ 48,000	$ 31,000	$ -	$ -	$ 79,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 244,000	$ -	$ 244,000	$ -
Debris	$ -	$ -	$ 42,000	$ -	$ 42,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (6,663,000)
Subtotal	**$ 5,872,000**	**$ 3,833,000**	**$ 286,000**	**$ 190,000**	**$ 10,181,000**	**$ (6,663,000)**
Handling						
Coal Handling Facilites	$ 212,000	$ 138,000	$ -	$ -	$ 350,000	$ -
Coal Storage Area Restoration	$ -	$ -	$ -	$ 3,436,000	$ 3,436,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 2,000	$ -	$ 2,000	$ -
Debris	$ -	$ -	$ 33,000	$ -	$ 33,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (185,000)
Subtotal	**$ 212,000**	**$ 138,000**	**$ 35,000**	**$ 3,436,000**	**$ 3,821,000**	**$ (185,000)**
Common						
Cooling Water Intakes and Circulating Water Pumps	$ 33,000	$ 22,000	$ -	$ 885,000	$ 940,000	$ -
BOP Misc.	$ 12,000	$ 8,000	$ -	$ -	$ 20,000	$ -
Roads	$ 6,000	$ 4,000	$ -	$ -	$ 10,000	$ -
All BOP Buildings	$ 103,000	$ 67,000	$ -	$ -	$ 170,000	$ -
All Other Tanks	$ 17,000	$ 11,000	$ -	$ -	$ 28,000	$ -
Relocation of Plant Systems	$ 1,776,000	$ 2,286,000	$ -	$ -	$ 4,062,000	$ -
Cooling Tower Pond Closure	$ -	$ -	$ -	$ 144,000	$ 144,000	$ -
Cooling Towers and Basin	$ 231,000	$ 151,000	$ -	$ -	$ 382,000	$ -
Concrete Removal, Crushing, & Disposal	$ -	$ -	$ 16,000	$ -	$ 16,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 881,000	$ 881,000	$ -
Debris	$ -	$ -	$ 2,000	$ -	$ 2,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (194,000)
Subtotal	**$ 2,178,000**	**$ 2,549,000**	**$ 18,000**	**$ 1,910,000**	**$ 6,655,000**	**$ (194,000)**
AB Brown Units 1 and 2 Subtotal	**$ 13,707,000**	**$ 10,074,000**	**$ 622,000**	**$ 5,726,000**	**$ 30,129,000**	**$ (13,159,000)**
TOTAL DECOM COST (CREDIT)					**$ 30,129,000**	**$ (13,159,000)**
PROJECT INDIRECTS (5%)					**$ 1,506,000**	
CONTINGENGY (20%)					**$ 6,026,000**	
TOTAL PROJECT COST (CREDIT)					**$ 37,661,000**	**$ (13,159,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 24,502,000**	

APPENDIX B – SITE AERIAL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