VERIFIED DIRECT TESTIMONY OF JEFFREY T. KOPP

Q1. Please state your name, business address and title.

A1. My name is Jeffrey ("Jeff") T. Kopp, P.E. My business address is 9400 Ward Parkway, Kansas City, Missouri 64114. I am a Senior Managing Director of 1898 & Co., which is the consulting group within Burns & McDonnell Engineering Co., Inc. ("BMcD").

Q2. On whose behalf are you submitting this direct testimony?

A2. I am submitting this testimony on behalf of Northern Indiana Public Service Company LLC ("NIPSCO").

Q3. Please describe the business of BMcD.

A3. BMcD is a consulting environmental, engineering, and construction firm working with many industries, including electric utilities. BMcD has been in business since 1898, serving multiple industries, including the electric power industry. In 2022, BMcD was rated No. 8 overall of the Top 500 Design Firms by the Engineering News Record ("ENR"). BMcD was rated as the No. 1 engineering design firm in the United States serving the electric power industry by ENR in 2022.

1898 & Co. and BMcD have vast experience in the preparation of decommissioning studies and execution of construction projects, including hundreds of construction projects totaling more than $2 billion of construction last year alone. In order to execute over $2 billion of construction projects on an annual basis, BMcD has to win this work through competitive bidding processes, which requires us to be able to accurately prepare cost estimates.

Our long history, large market presence, and top industry rankings demonstrate our ability to effectively and accurately estimate costs. In addition, we have worked with demolition contractors over the years to refine our estimating process for decommissioning studies to align our costs with theirs.

Q4. Please describe your educational and employment background.

A4. 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 Masters of Business Administration from the University of Kansas. I am a registered Professional Engineering in the states of Florida, Missouri, Indiana, and Illinois. In my role as a group manager, 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. My resume is provided as Attachment 14-A.

Q5. What are your responsibilities as Senior Managing Director?

A5. I am a professional engineer with more than 21 years of experience consulting to electric utilities. I have been involved in decommissioning studies for several hundred facilities and served as project manager on the majority of them. I have helped prepare decommissioning studies on all types of power plants utilizing various technologies and fuels and have testified in front of utility commissions in 10 different states regarding those costs.

As the Senior Managing Director of 1898 & Co., I oversee a group of nearly 200 engineers and consultants who provide consulting services to clients primarily in the electric power generation and electric power transmission and distribution industries, but also to other industrial and commercial clients. The services provided by this group include decommissioning cost studies, independent engineering assessments of existing power generation assets, economic evaluations of capital expenditures, new power generation development and evaluation, electric and water rate analysis, electric transmission planning, electric distribution planning, generation resource planning, renewable power development, and other related engineering and economic assessments.

Q6. Have you previously submitted testimony in a proceeding before the Indiana Utility Regulatory Commission ("Commission")?

A6. Yes. I testified before the Commission in Duke Energy Indiana's 2019 electric rate case in Cause No. 45253.

Q7. Are you sponsoring any attachments to your testimony in this Cause?

A7. Yes. I am sponsoring Attachment 14-A and Attachment 14-B, both of which were prepared by me or under my direction and supervision.

Q8. What is the purpose of your direct testimony?

A8. The purpose of my direct testimony is to describe the results of the Decommissioning Cost Study (the "Study") performed by BMcD estimating the cost of demolishing certain NIPSCO electric power generating stations and remediating the sites (collectively referred to as "demolition cost"). BMcD was engaged by NIPSCO to update the prior studies that were performed for NIPSCO's 2008 electric rate case in Cause No. 43526, NIPSCO's 2016 electric rate case in Cause No. 44688; and NIPSCO's 2018 electric rate case in Cause No. 45159, and to prepare a written report on our results for this Cause. The major plant systems and equipment installed since the prior study are listed in each estimate and the cost to demolish the relevant systems and equipment have been included in the revised estimates. The Study was completed and a report was issued on July 13, 2022, which is provided as Attachment 14-B.

Q9. What was your involvement in performing the Study?

A9. I served as the BMcD project director on the Study. I supervised and directed the studies. I worked directly with all individuals and parties involved in the preparation of the cost estimates in the Study. I was responsible for the overall project and was involved in the development of the decommissioning assumptions, decommissioning estimating methodology, preparation and review of the estimates, and preparation and review of the report. In addition, BMcD representatives and engineers visited each generation unit (excluding Cavalry Solar, Dunns Bridge Solar

II, Elliott Solar, and Fairbanks Solar, which had not yet reached commercial operation at the time of the Study) to perform a tour of each facility with plant personnel to review the equipment, and I relied on information obtained during those tours in my analyses.

Q10. What power generation assets did you evaluate in the Study?

A10. We evaluated fourteen (14) generating assets, consisting of the fuel types listed in the following table:

Table 1: Power Generation Assets

Plant	Primary Fuel Type
Bailly Generating Station	Coal/Natural Gas
Cavalry Solar	Solar/Battery Energy Storage
Dunns Bridge Solar I	Solar
Dunns Bridge Solar II	Solar/Battery Energy Storage
Elliott Solar	Solar
Fairbanks Solar	Solar
Indiana Crossroads Solar	Solar
Indiana Crossroads Wind	Wind
Michigan City	Coal
Norway Hydro	Hydro
Oakdale Hydro	Hydro
R.M. Schahfer	Coal/Natural Gas
Rosewater Wind	Wind
Sugar Creek	Natural Gas

Q11. Have you personally inspected each of the generating stations for which BMcD performed demolition cost studies?

A11. Yes, excluding the solar sites which had not yet reached commercial operation at the time of the Study.

Q12. Is it common that decommissioning studies are performed for solar projects that have not yet reached commercial operation?

A12. Yes, decommissioning studies are commonly performed for solar projects prior to a facility reaching commercial operation. For instance, as part of the permitting process for solar projects, a decommissioning study is typically required. Also, many counties require financial assurance to be in place in advance of construction for the decommissioning of the project in the event the project becomes a stranded asset. In these cases, solar project decommissioning estimates are prepared based on review of drawings and other relevant documentation without a site visit, since at this stage none of the solar project equipment is in place.

Although the solar projects were not in commercial operation at the time of the Study, my team and I were able to rely on site layouts, equipment specifications, and electrical, structural, and civil drawings to prepare the Study and recommend a decommissioning cost for these facilities, which is information commonly relied on when performing decommissioning studies prior to a facility entering commercial operation.

Q13. Did you rely on other information besides the site visits for purposes of your opinions?

A13. Yes. NIPSCO has provided certain additional background information, including site and equipment drawings, information concerning asbestos and other potential environmental related issues, and general discussions of the plants during site visits. I consider the information to be reliable for purposes of my work and of a type that is generally relied upon by experts like me for purposes of estimating demolition costs.

Q14. Please explain the terms "plant site layout drawings" and "general arrangement drawings."

A14. Plant site layout drawings show all improvements made to the site, including building and equipment structures, outdoor storage tanks, plant roads, landfill areas, ash pond areas, coal and gypsum byproduct outdoor storage piles, rail line locations, parking areas, electrical switchyards, overhead high voltage electrical transmission lines and structures, water intake and water outfall structures, pumping stations, and secondary containment structures. Plant site layout drawings typically extend to the property lines of each station. General arrangement drawings are large scale drawings of, in this case, generating stations depicting the major structures and component locations. General arrangement drawings are drawn to a certain scale whereas plant site layout drawings may or may not be drawn to scale. The drawing scale allows one to determine accurately the size of the major structures, plant systems, and plant components to form the basis of the material quantity estimates.

Q15. Why is it necessary to demolish a generating station at the end of its useful life?

A15. There are multiple reasons to demolish a generating site and perform remediation activities at the end of useful life. If demolition is not performed, there are carrying costs that would be incurred, including, but not limited to items such as liability insurance and property taxes, site security, structural inspections of stacks, and maintaining environmental permits. All of these costs would be necessary to maintain a safe site and be in compliance with applicable regulations. In addition to carrying costs there are liabilities that need to be managed, including but not limited to, integrity of structures, personnel safety, site access, and scrap theft. It is not realistic to incur these carrying costs and manage these liabilities in perpetuity; therefore, the facility will eventually need to be demolished.

Once a retired station is demolished, it also allows for construction of a new generating station or an industrial redevelopment at the same site.

Q16. Please explain the demolition cost estimates of each generating station.

A16. The demolition cost estimates for each generating station assumed demolition of the complete station during one continuous demolition and remediation operation.

Q17. Explain the type of costs reflected in a decommissioning study.

A17. Decommissioning study cost estimates generally include direct costs associated with decommissioning the plant equipment and facilities and restoring the sites to a suitable condition, which in this case was to an industrial condition. 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.

Q18. What is meant by "industrial" condition?

A18. Each site will have all above grade buildings and equipment removed, have foundations removed to two feet below grade unless otherwise specified, be rough graded, and seeded. The sites also will have underground piping 24 inches and larger filled with flowable fill or grout and capped. Since the future use of each site is unknown, restoring each site to the standard of industrial use allows NIPSCO flexibility regarding the potential future use, for example to be either re-developed for industrial or heavy commercial uses. The sites can alternately remain in this condition in perpetuity. The BMcD cost estimates assume environmental remediation is performed to the extent necessary to restore the site to such condition.

Q19. Why is it reasonable to restore the fossil fuel sites to the standard for industrial use?

A19. It is reasonable to assume the sites of the fossil units would be restored to the standard of industrial use as this is a common practice, removes liabilities, and avoids future carrying costs associated with maintaining or insuring the remaining facilities that could at some point exceed the cost of demolition, while maintaining flexibility of future site use. For example, restoring the site in this manner enables the site to be reused for another power plant, to be redeveloped for industrial use, or to be sold for similar uses.

Q20. What types of liabilities and carrying costs are you referring to?

A20. These costs would include, but not be limited to, items such as liability insurance and property taxes, site security, structural inspections of stacks, and maintaining environmental permits. All of these costs would be necessary to maintain a safe site and be in compliance with applicable regulations.

Q21. How were the environmental remediation costs determined?

A21. Environmental remediation costs were added to each cost estimate based on NIPSCO internal environmental cost estimates.

Q22. Please briefly describe how BMcD developed the direct cost estimates in the Study.

A22. The direct dismantling cost estimates were based on what I would expect an outside contractor, selected through a competitive bidding process, to charge NIPSCO 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 tasks within the set of assumptions outlined in the 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; linear feet of asbestos pipe insulation; square feet of asbestos boiler insulation; cubic yards of site grading; acres of seeding; and the labor hours required to complete the decommissioning and demolition activities.

Q23. How were specific quantities and unit pricing estimated for purposes of estimating site-specific direct costs?

A23. BMcD derived these quantities based on a review of plant site layout drawings, general arrangement drawings, building and structural design drawings, selected mechanical design drawings, a visual inspection of the facilities, discussions with plant staff, our in-house database of plant quantities, and our professional judgement. Using this information, we estimated the reasonable costs 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 Plants to determine the total direct cost of dismantling each site. Additionally, unit pricing for scrap values was applied to the scrap quantities to determine anticipated salvage values, which as addressed later in my testimony.

Q24. What sources did you rely on to develop the direct cost estimates for the Plants?

A24. Pricing developed by the American Metal Market ("AMM") was used to develop scrap credits, as discussed in more detail below in 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 create estimates that are site-specific and account for local markets, costs and conditions.

The labor rates, equipment costs, and disposal costs used to develop the Study cost estimates were specific to the locations in which the work was to be performed. These rates were applied to the quantities associated with each Plant to determine the total cost of decommissioning and demolishing. Disposal costs were obtained from publicly available information and communications with landfills and scrap processors 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.

Q25. Did you rely on any other sources?

A25. Yes. 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 in order to determine costs that are as site-specific as possible. RS Means is widely utilized within the construction industry as a tool for estimating and projecting project costs.

Q26. Are these sources generally accepted in the industry and relied upon by other regulatory authorities in setting dismantling costs?

A26. Yes. These sources are recognized industry-wide, and I have relied on them for the decommissioning cost estimates I have prepared for over 300 units; furthermore, my recommended dismantling costs based on these sources have been approved in regulatory proceedings in which I have participated in other states.

Q27. Please explain the indirect costs included in the cost estimates.

A27. Indirect costs include those costs expected to be incurred by NIPSCO during the dismantling process that are in addition to the direct costs paid to demolition contractors. BMcD calculated owner's indirect costs based on the percentage of the direct costs stated in the estimates and work papers and based upon BMcD's experience with projects of similar complexity and upon discussions with NIPSCO personnel regarding their approach to managing the execution of the dismantling projects. This amount is intended to cover NIPSCO's internal costs associated with the dismantling of the generating stations, such as obtaining permits, construction services such as water and electricity, security labor and facilities, site vehicles, procurement services, legal services, and environmental monitoring.

Q28. Did BMcD apply a contingency factor in its analysis?

A28. Yes. Cost contingency is included in the cost estimate to cover expenses that are unknown at the time the estimate is prepared but are reasonably expected to be incurred during the execution of decommissioning activities.

For any project, there is always some uncertainty associated with how work will be performed and what work conditions will be like when the project is executed, and the availability of qualified demolition contractors when the work is bid and executed. When preparing a cost estimate, there is also some uncertainty associated with estimating quantities, due to the age of the Plants, limits on drawings available, and the absence of detailed data 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 dismantling costs for known scope items.

Q29. Are contingency costs standard industry practice?

A29. Yes. The application of contingency is not only appropriate, it is standard industry practice. Contingency costs are a critical component for estimating the cost of almost any large construction project, and especially one that is as large and complex as the demolition of a large power plant. Even on a project where firm pricing has been agreed upon with a successful bidder, it is typical that a client carry some level of contingency to cover potential change orders. It is even more important to carry contingency on planning-level cost estimates such as those presented in the Study. Contingency costs 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 in order to formulate a reasonable estimate to dismantle the generating facilities.

Q30. What contingency factor was included in the demolition cost estimates?

A30. Based on BMcD's experience with preparing cost estimates related to power generating facilities and dismantlement of those facilities, along with BMcD's experience with actual costs relative to estimated costs, BMcD applied a cost contingency of 20% to the demolition cost estimates. This is a reasonable contingency percentage to use in estimating the demolition costs of NIPSCO's generating stations.

Q31. How were scrap values calculated in the Study?

A31. 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 because 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.

Q32. Is AMM a reputable source for calculating scrap pricing?

A32. 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.

Q33. What positive salvage did BMcD reflect in the demolition cost estimates?

A33. Table 4-1 in the Study shows the scrap metal prices used. 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.

Q34. How were transportation costs calculated for purposes of valuing the scrap metal?

A34. Transportation costs include the costs necessary to haul the scrap metal to the scrap market location. Costs for transportation are based on published railroad tariffs and the costs to truck the material from the site to the rail line, as determined at the time my study was conducted.

Q35. What are the total estimated net costs to demolish NIPSCO's generating stations and remediate the sites to industrial condition?

A35. The resulting decommissioning cost estimates, including the credits for scrap materials, are summarized below and further detailed in Appendix A of the Study.

Table 2: Decommissioning Cost Summary (2022$)

Plant	Decommissioning Cost	Salvage Credits	Net Project Cost
Bailly Generating Station	$ 74,933,000	$ (14,412,000)	$ 60,521,000
Cavalry Solar	$ 35,763,000	$ (16,778,000)	$ 18,985,000
Dunns Bridge Solar I	$ 46,411,700	$ (21,390,900)	$ 25,020,800
Dunns Bridge Solar II	$ 80,926,900	$ (34,166,500)	$ 46,760,400
Elliott Solar	$ 33,211,400	$ (15,043,100)	$ 18,168,300
Fairbanks Solar	$ 37,370,600	$ (11,203,300)	$ 26,167,300
Indiana Crossroads Solar	$ 34,300,400	$ (17,391,800)	$ 16,908,600
Indiana Crossroads Wind	$ 12,887,500	$ (15,278,000)	$ (2,390,500)
Michigan City	$ 64,396,000	$ (14,828,000)	$ 49,568,000
Norway Hydro	$ 2,120,000	$ (274,000)	$ 1,846,000
Oakdale Hydro	$ 1,910,000	$ (341,000)	$ 1,569,000
R.M. Schahfer	$ 113,239,000	$ (33,025,000)	$ 80,214,000
Rosewater Wind	$ 4,891,250	$ (4,881,000)	$ 10,250
Sugar Creek	$ 8,605,000	$ (5,363,000)	$ 3,242,000
Fleet Total	$ 550,965,750	$ (204,375,600)	$ 346,590,150

Q36. Did BMcD apply any escalation factor beyond 2022 to the demolition cost estimates in the Study?

A36. No. All of the estimates are in 2022 dollars unless noted otherwise.

Q37. Please address the reasonableness of the demolition cost estimates contained in the Study?

A37. BMcD carefully prepared the estimates using standard and accepted estimating techniques and the best information available. Additionally, these estimates are consistent with other available data and industry experience. The assumptions listed in each report are reasonable and the costs are reasonably reflective of the actual costs necessary for NIPSCO to dismantle the Plants and are an appropriate basis for setting electric rates in this matter and for NIPSCO to use for planning for decommissioning costs going forward.

Q38. Does this conclude your prefiled direct testimony?

A38. Yes.

VERIFICATION

I, Jeffrey T. Kopp, P.E, Senior Managing Director of 1898 & Co., affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information, and belief.

Jeffrey T Kopp
____

Date: September 15, 2022

Project Director

Jeff Kopp, PE

Managing Director – Utility Consulting

Education
B.S. / Civil Engineering
MBA / Business Administration

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

21 years with 1898 & Co.
22 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 / Northern Indiana Public Service Company
Indiana / 2022

Project director on a decommissioning study for the entire fleet of power generating facilities owned by Northern Indiana Public Service Company in the state of 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 several coal-fired plants, natural gas-fired simple and combined cycle units, solar farms, wind farms, and hydroelectric plants. Subsequent to the study, Jeff is available to provide written and oral testimony in the company's rate case hearing regarding the study findings.

Decommissioning Study / CenterPoint Energy Indiana South
Indiana / 2022

Project director on a decommissioning study for the AB Brown Generating Station owned by CenterPoint in Evansville, Indiana. The evaluation was performed to determine the costs to demolish the plant and restore the site at the end of its useful life to support regulatory filings. The evaluation included several a single coal-fired plant. Subsequent to the study, Jeff provided written testimony in CenterPoint's securitization filing regarding the study findings.

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 provided written 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.

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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

Northern Indiana Public Service Company

NIPSCO Decommissioning Cost Study
Project No. 143405

7/13/2022

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
1898 & Co.	1898 & Co., part of Burns & McDonnell
BOP	Balance of Plant
CCR	Coal Combustion Residuals
C&D	Construction and Demolition
GE	General Electric
HRSG	Heat Recovery Steam Generator
MW	Megawatts
NIPSCO	Northern Indiana Public Service Company
PCB	Polychlorinated Biphenyl
Plants	Power Generation Assets
SCI	Site Cost Index
SCR	Selective Catalytic Reduction
Study	Decommissioning Cost Study

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Northern Indiana Public Service Company ("NIPSCO") retained 1898 & Co., a division of Burns & McDonnell Engineering Company, Inc. (hereinafter called "1898 & Co."), to conduct a Decommissioning Cost Study ("Study") for power generation assets ("Plants") in Indiana. The assets include wind, solar, hydroelectric, natural gas-fired, and coal-fired generating facilities. The purpose of the Study was to review the facilities and to make a recommendation to NIPSCO regarding the total cost to decommission the facilities at the end of their useful lives. The decommissioning costs were developed by 1898 & Co. using information provided by NIPSCO and in-house data available to 1898 & Co.

1.2 Results

1898 & Co. has prepared cost estimates in 2022 dollars for the decommissioning of the Plants. These cost estimates are summarized in Table 1-1. When NIPSCO determines that the Plants 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. NIPSCO 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 (2022$)

Asset	Fuel Type	Decommissioning Costs	Salvage Credits	Net Project Cost
Bailly	Coal	$ 74,933,000	$ (14,412,000)	$ 60,521,000
Cavalry Solar	Solar	$ 35,763,000	$ (16,778,000)	$ 18,985,000
Dunns Bridge Solar I	Solar	$ 46,411,700	$ (21,390,900)	$ 25,020,800
Dunns Bridge Solar II	Solar	$ 80,926,900	$ (34,166,500)	$ 46,760,400
Elliot Solar	Solar	$ 33,211,400	$ (15,043,100)	$ 18,168,300
Fairbanks Solar	Solar	$ 37,370,600	$ (11,203,300)	$ 26,167,300
Indiana Crossroads Solar	Solar	$ 34,300,400	$ (17,391,800)	$ 16,908,600
Indiana Crossroads Wind	Wind	$ 12,887,500	$ (15,278,000)	$ (2,390,500)
Michigan City	Coal	$ 64,396,000	$ (14,828,000)	$ 49,568,000
Norway Hydro	Hydro	$ 2,120,000	$ (274,000)	$ 1,846,000
Oakdale Hydro	Hydro	$ 1,910,000	$ (341,000)	$ 1,569,000
R.M. Schahfer	Coal	$ 113,239,000	$ (33,025,000)	$ 80,214,000
Rosewater Wind	Wind	$ 4,891,250	$ (4,881,000)	$ 10,250
Sugar Creek	Coal	$ 8,605,000	$ (5,363,000)	$ 3,242,000
TOTAL DECOMMISSIONING COST		$ 550,965,750	$ (204,375,600)	$ 346,590,150

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

2.0 INTRODUCTION

2.1 Background

1898 & Co. was retained by NIPSCO to conduct a Study to estimate the decommissioning costs. The assets include wind, solar, hydroelectric, natural gas-fired, and coal-fired generating facilities. Individuals from 1898 & Co. visited the Plants evaluated within the Study in March of 2022. The purpose of the Study was to review the facilities and to make a recommendation to NIPSCO regarding the total cost to decommission and dismantle the facilities at the end of their useful lives. 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 NIPSCO 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 each 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 Plants 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 assets owned by NIPSCO at the sites, including power generating equipment and Balance of Plant facilities.

2.3 Site Visits

Representatives from 1898 & Co. and NIPSCO visited the sites in March of 2022. A representative portion of the sites was visited. The site visits consisted of a tour of each facility along with NIPSCO representatives as well as plant personnel at each of the sites.

The following 1898 & Co. representatives comprised the site visit team:

- Mr. Jeff Kopp, Project Director
- Mr. Stephen Henson, Project Manager

- Ms. Abigail Yi, Project Analyst

Table 2-1Table 2-1 outlines the dates in which the site visits were performed.

Table 2-1: Site Visit Dates

Plant	Site Visit Date
Sugar Creek	March 8, 2022
Indiana Crossroads Wind	March 8, 2022
Rosewater Wind	March 8, 2022
Indiana Crossroads Solar	March 8, 2022
Oakdale Hydro	March 8, 2022
Norway Hydro	March 8, 2022
Dunn's Bridge Solar I	March 9, 2022
R.M. Schahfer	March 9, 2022
Michigan City	March 9, 2022
Bailly	March 30, 2022

3.0 PLANT DESCRIPTIONS

The following sections provide the plant descriptions considered for the purposes of this Study.

3.1 Bailly Generating Station

Bailly generating Station consists of two coal-fired boilers and steam turbine generators as well as a simple cycle unit, all of which have been retired. The coal-fired units, Units 7 and 8, are rated at 190 MW and 413 MW, respectively. Unit 8 includes a synchronous condenser. The coal fired units also include an electrostatic precipitator ("ESP") and selective catalytic reduction ("SCR") system. A common flue gas sulfur dioxide removal scrubber system serves both coal-fired units. Unit 10 consists of a 37.5 MW natural gas-fired combustion turbine generator.

Table 3-1: Bailly Summary

Unit	Generation Type	Fuel Type	Capacity	In-Service Date
7	Steam Turbine	Coal	190 MW	1962
8	Steam Turbine	Coal	413 MW	1968
10	Combustion Turbine	Natural Gas	37.5 MW	1968

3.2 Cavalry Solar

Cavalry Solar is located in White County, IN, approximately 25 miles north of Lafayette, IN. The site includes 447,220 Trina Solar Modules and 118,827 Risen solar modules. The site has a total nominal rating of approximately 200 MW and 60 MW of battery storage,

Table 3-2: Cavalry Solar Summary

Generation Type	Capacity	Number of Panels	In-Service Date
Photovoltaic	200 MW	118,827	2022
Battery Energy Storage	60 MW	-	2022

3.3 Dunns Bridge Solar I

Dunns Bridge Solar I is located in Jasper and Starke Counties, IN. The site includes 776,334 Jinko solar modules and has a planned nominal rating of approximately 301 MW.

Table 3-3: Dunns Bridge Solar I Summary

Generation Type	Capacity	Number of Panels	In-Service Date
Photovoltaic	301 MW	776,334	2022

3.4 Dunns Bridge Solar II

Dunns Bridge Solar II is to be located in White County, IN, approximately 25 miles north of Lafayette, IN. The site has a planned total nominal rating of approximately 435 MW and 75 MW of battery storage.

Table 3-4: Dunns Bridge Solar II Summary

Generation Type	Capacity	Number of Panels	In-Service Date
Photovoltaic	435 MW	Under Development	Under Construction
Battery Energy Storage	75 MW	-	Under Construction

3.5 Elliot Solar

Elliott Solar is located in Gibson County, IN. The site includes 466,991 Jinko solar modules and has a total nominal rating of approximately 200 MW.

Table 3-5: Elliot Solar Summary

Generation Type	Capacity	Number of Panels	In-Service Date
Photovoltaic	200 MW	466,991	Early Development - 2023

3.6 Fairbanks Solar

Fairbanks Solar is located in Sullivan County, IN. The site includes 611,364 Longi solar panels and has a total nominal rating of approximately 250 MW.

Table 3-6: Fairbanks Solar Summary

Generation Type	Capacity	Number of Panels	In-Service Date
Photovoltaic	250 MW	611,364	Early Development - 2023

3.7 Indiana Crossroads Solar

Indiana Crossroads Solar is located in White County, IN, approximately 25 miles north of Lafayette, IN. The site includes 519,294 solar panels and has a total nominal rating of approximately 200 MW.

Table 3-7: Indiana Crossroads Solar Summary

Generation Type	Capacity	Number of Panels	In-Service Date
Photovoltaic	200 MW	519,294	Under Construction

3.8 Indiana Crossroads Wind

Indiana Crossroads Wind is located in White County, Indiana, approximately 80-miles northwest of Indianapolis. The site includes 72 Vestas V150-4.2 MW wind turbine generators with a hub height of 105 meters. The project has a combined rating of approximately 300 MW.

Table 3-8: Indiana Crossroads Wind Summary

Generation Type	Capacity	Number of Turbines	In-Service Date
Wind Turbine	300 MW	72	2021

3.9 Michigan City

Michigan City includes three coal-fired units, two of which have been retired. At the time of this Study, Units 2 and 3 have been retired and Unit 12 is still operating. Units 2 and 3 are housed in a brick building. Unit 12 consists of a boiler and steam turbine generator rated at 540 MW. The plant proper is located on Lake Michigan and includes a water intake and discharge structure for cooling water. Unit 12 includes an

ESP, an SCR system, and a flue gas desulfurization system. The site also has dry area unloading and storage, a fly ash silo, an ash truck loading building, and a concrete stack. A stand alone, concrete natural draft cooling tower provides thermal cooling. Makeup water is supplied from the Trail Creek intake and outfall from the tower blowdown and other treated water discharges are to Lake Michigan.

Table 3-9: Michigan City Summary

Unit	Generation Type	Fuel Type	Capacity	In-Service Date
2	Steam Turbine	Coal	70 MW	1950
3	Steam Turbine	Coal	70 MW	1951
12	Steam Turbine	Coal	540 MW	1974

3.10 Norway Hydro

Norway hydroelectric generating station is located along Lake Shafer in White County, IN. The facility is comprised of three units each with a capacity of 2.0 MW and one unit with a capacity of 1.3 MW. Norway Hydro was placed in service in 1923.

Table 3-10: Norway Hydro Summary

Unit	Generation Type	Capacity	In-Service Date
1	Hydraulic Turbine	2.0 MW	1923
2	Hydraulic Turbine	2.0 MW	1923
3	Hydraulic Turbine	2.0 MW	1923
4	Hydraulic Turbine	1.2 MW	1923

3.11 Oakdale Hydro

Oakdale hydroelectric generating station is located along Lake Freeman in Carroll County, IN. The facility is comprised of two 4.3 MW units and a 3.2 MW unit. Oakdale Hydro was put in service in 1925.

Table 3-11: Oakdale Hydro Summary

Unit	Generation Type	Capacity	In-Service Date
1	Hydraulic Turbine	4.3 MW	1925
2	Hydraulic Turbine	3.2 MW	1925
3	Hydraulic Turbine	4.3 MW	1925

3.12 R.M. Schahfer

R.M. Schahfer Generating Station is a coal-fired Plant consisting of four coal-fired boilers and steam turbine generators. Units 17 and 18 are both rated at 423.5 MW, Unit 14 is rated at 540 MW, and Unit 15 is rated at 556.4 MW. Unit 14 has an ESP and SCR system. Units 15, 17, and 18 have an ESP. Units 17 and 18 each have a flue gas sulfur dioxide removal scrubber system to accommodate the high sulfur coal burned in these Units. The scrubber system includes the following: scrubber modules; slurry pump building; concrete storage silos for powdered limestone; hydrated lime powder storage tank; slurry pumps and tanks; lime truck unloading area; a gypsum belt conveyor which conveys gypsum off site to a wallboard plant owned and operated by a private commercial concern. The site utilizes open pile storage for gypsum to satisfy the contractual supply of gypsum to the wallboard plant during unit outages. Units 14 and 15 also have FGD that were commissioned in 2013 and 2014, as well as a remote ash handling facility.

In addition to the coal-fired units, the Plant includes two natural gas-fired combustion turbine generators, Units 16A and 16B, rated at approximately 78 MW and 77 MW, respectively. Each Unit has a concrete stack with a flue liner and emission monitoring systems.

Table 3-12: R.M. Schahfer Summary

Unit	Generation Type	Fuel Type	Capacity	In-Service Date
14	Steam Turbine	Coal	540 MW	1976
15	Steam Turbine	Coal	556.4 MW	1979
16A	Gas Turbine	Natural Gas	78 MW	1979
16B	Gas Turbine	Natural Gas	77 MW	1979
17	Steam Turbine	Coal	423.5 MW	1983
18	Steam Turbine	Coal	423.5 MW	1986

3.13 Rosewater Wind

Rosewater Wind Farm is located in White County, IN. The site consists of five Vestas V136 and twenty Vestas V150 wind turbines, with a combined rating of 102 MW.

Table 3-13: Rosewater Wind Summary

Generation Type	Capacity	Number of Turbines	In-Service Date
Wind Turbine	102 MW	25	2020

3.14 Sugar Creek

The Sugar Creek Generation Station is a 2 on 1 combined cycle power plant. The Plant consists of two General Electric ("GE") 7FA combustion turbines, two Vogt triple pressure heat recovery steam generators ("HRSG"), and a GE D11 condensing steam turbine generator. The Plant also includes an administration and control building, warehouse, water treatment building, two plant switchyards, and a water tank.

Table 3-14: Sugar Creek Summary

Unit	Generation Type	Fuel Type	Capacity	In-Service Date
CT01	Gas Turbine	Natural Gas	203.2 MW	2002
CT02	Gas Turbine	Natural Gas	203.2 MW	2002
ST1	Steam Turbine	Natural Gas	213 MW	2002

4.0 DECOMMISSIONING COSTS

1898 & Co. has prepared decommissioning cost estimates for the Plants. When NIPSCO determines that each 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, NIPSCO will incur costs of dismantling the Plants and restoration of the sites to the extent that those costs exceed the scrap value of equipment and bulk steel.

The decommissioning costs for each site include the cost to return each site to an industrial condition, suitable for reuse for development of an industrial facility. Included are the costs to dismantle all the assets at the sites, 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 each 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 Plants 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 and HRSGs 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 or HRSGs would be felled, either using conventional methods or using explosive blasts as determined on a case-by-case basis. 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 either be structurally cut and physically laid on the ground or explosively imploded, using controlled blasts as determined on a case-by-case basis. Following structural disassembly or implosion, the stack liners and concrete would be reduced in size as needed 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. Concrete would be broken into manageable sized pieces and stockpiled for crushing on site. Concrete pieces would ultimately be loaded in a hopper and fed through a crusher to be sized for on-site disposal.

4.1 General Assumptions

The following assumptions were made as the basis of all of the cost estimates:

1. Pricing for all estimates is in 2022 dollars.
2. Labor costs are based on non-Union labor rates for a 40-hour workweek.
3. The estimates are inclusive of all costs necessary to properly demolish all units and associated equipment and structures to two feet below grade unless otherwise specified. For purposes of this study and the included cost estimates, the sites will be restored to a condition suitable for industrial use.
4. For purposes of this study and the included cost estimates, it is assumed that for each Project all components will be dismantled as part of a single demolition project after all the units at a single site are taken out of service.
5. All units in question 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.
6. All work will take place in the safest and most cost-efficient method.
7. Transmission switchyards and substations within the boundaries of the plant are not part of the demolition scope and were not included in the decommissioning cost estimates unless otherwise

specified herein. For purposes of this study, the division between generation assets and transmission assets is at the high side of the generator step-up ("GSU") transformers.

8. 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 any remaining facilities will be allocated to the operating costs of those facilities.
9. GSUs, auxiliary transformers, and spare transformers for the units in question are included for demolition and scrap in all estimates.
10. In general, abatement of asbestos will precede any other demolition work. After final air quality clearances have been reached, demolition can proceed. However, some abatement, including the removal of non-friable gaskets and packings will commence in conjunction with the demolition. If asbestos containing materials are found within the interior of boilers, ductwork or other equipment (including refractory cements), abatement will be coordinated closely with demolition.
11. All demolition and abatement activities, including removal of asbestos, will be done in accordance with any and all applicable Federal, State and Local laws, rules and regulations.
12. NIPSCO will remove or consume all fuel oil, coal, and chemicals to a reasonable extent possible prior to commencement of demolition activities.
13. If any PCB contaminated oil is encountered, it will be removed and disposed of properly. Estimated quantities of PCB contaminated oil were developed for each site based on data provided by NIPSCO.
14. Hazardous material abatement is included for all sites as necessary, including asbestos, mercury, and PCBs. Lead paint coated materials will be handled by trained personnel as necessary but will not be removed prior to demolition.
15. Soil and concrete around the GSUs and other large transformers will be excavated to a depth of two feet and transported offsite for disposal. It is assumed that the PCB concentrations are below 50 ppm and will not be required to be disposed in a Toxic Substances and Control Act ("TSCA") permitted landfill.
16. Soil testing and any other onsite testing has not been conducted for this study. Any environmental clean-up or removal costs are based on previous testing or assumed levels of contamination.
17. Costs for remediation of coal pile storage areas are based on information provided by NIPSCO.
18. Costs for closure of the pond areas are based on information provided by NIPSCO. The study includes no costs associated with remediating ponds in conformance with CCR. There is an amount associated with three non-CCR ponds at Michigan City, which is an update of the number for this activity included in the demolition study field in Cause No. 45159. It is understood that NIPSCO has relief pending in Cause No. 45600. If that relief is granted as sought, then a portion of the amount for the non-CCR ponds would be eliminated.
19. No environmental costs have been included to address cleanup of contaminated soils, hazardous materials, or other conditions present onsite having a negative environmental impact, other than

those listed in the individual site assumptions. No allowances are included for unforeseen environmental remediation activities.

20. Site areas will be graded to achieve suitable site drainage to natural drainage patterns. Grading and the import of fill material will be minimized to the extent possible.
21. All above-grade structures will be demolished. All below-grade structures, including foundations, will be removed to two feet below existing grade, unless otherwise noted in the individual site assumptions.
22. All roads, paving, fences, gates, crushed rock surfacing, and rail lines not needed for continued operation of adjacent facilities will be removed, unless otherwise noted in the individual site assumptions.
23. Non-hazardous, inert debris, such as concrete and brick, will be crushed onsite to meet material specification for reuse as fill in basements and/or ponds onsite.
24. Major equipment, structural steel, turbines, generators, metal exhaust stacks, transformers, electrical equipment, cabling, wiring, pump skids, above ground piping, and equipment enclosures for the above-ground equipment will be sold for scrap and removed from the Plant site by the demolition contractor. Concrete and brick will be processed onsite to meet a material specification for reuse as fill for basements or former ponds at the site. All other demolished materials that cannot be recycled are considered debris and will be disposed at an offsite landfill.
25. Except for the circulating water lines, underground piping more than 2 feet below grade will be capped and abandoned in place. Circulating water system pipes will be capped and flowable filled.
26. Prior to abatement and demolition activities, coal will be removed from feeders, conveyors, bunkers, feeders and mills. Equipment will be water washed to remove remaining fine materials. Costs for these activities are included in the project indirect costs in the estimates.
27. Prior to abatement and demolition activities, ash hoppers, duct work, boiler, AQCS, air heater, etc. will be cleaned as necessary to remove residuals and ash vacuumed out. Costs for these activities are included in the project indirect costs in the estimates.
28. Sewers, catch basins, and ducts will be filled and sealed on the upstream side. Horizontal runs will be abandoned in place after being sealed.
29. Costs are included to clean out the fuel oil tank areas and lines. Costs have also been included to remove two feet of soil directly below each of the fuel oil tanks and five feet of soil beneath the fuel oil lines to account for the potential for this soil to be contaminated during normal operations.
30. Sites will be surfaced with imported granular material or crushed concrete meeting material specification for onsite reuse unless otherwise noted in the individual site assumptions.
31. Decommissioning activities for the solar generating assets will be done according to the lease agreements.
32. The meteorological towers at the wind generating facilities are assumed to be permanent, self-supporting, lattice-type towers, unless information is provided otherwise. The towers are assumed

to be fully removed as part of this Study, including their supporting foundations to a depth of three feet.

33. Valuation and sale of land and all replacement generation costs are excluded from this scope.
34. Valuation and sale of water rights are excluded from this scope.
35. 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 the decommissioning study. 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.
36. Scrap values are based upon the materials at the site at the time of the study, and do not take into account potential changes of materials (such as replacing tubes) over the remaining plant life.
37. The scope of the costs included in this Study is limited to the decommissioning activities. Additional post-demolition on-going costs may be required, including, but not limited to groundwater monitoring and/or other environmental monitoring activities. These costs are excluded from the cost estimates provided in this Study, unless otherwise noted herein.
38. Fractional ownership of facilities has not been taken into account in these estimates. All costs presented are the full costs for demolition of entire units and sites.
39. A 20 percent contingency is included on the direct costs in the estimates prepared as part of this study to cover unknowns. NIPSCO's project indirect costs were included as 8 percent of the direct costs.
40. Market conditions may result in cost variations at the time of contract execution.
41. The following scrap values were used in the decommissioning cost estimates. The scrap values are based upon the 12-month average of American Metal Market prices for March 2021 to February 2022 (i.e., one calendar year). These values include the cost to haul the scrap via truck and/or rail to the scrap market indicated below.

Table 4-1: Scrap Pricing

Asset	Scrap Market Location	Steel Scrap Value ($/net ton)	Copper Scrap Value ($/pound)	Aluminum Scrap Value ($/pound)	Stainless Steel Scrap Value ($/net ton)
Bailly	Chicago	($371.42)	($3.26)	-	-
Cavalry Solar	Chicago	($363.58)	($3.26)	($0.46)	-
Dunns Bridge Solar I	Chicago	($357.68)	($3.25)	($0.45)	-
Dunns Bridge Solar II	Chicago	($363.58)	($3.26)	($0.46)	-
Elliot Solar	Pittsburgh	($382.44)	($3.27)	($0.47)	-
Fairbanks Solar	Chicago	($360.60)	($3.25)	($0.46)	-
Indiana Crossroads Solar	Chicago	($362.53)	($3.26)	($0.46)	-
Indiana Crossroads Wind	Chicago	($360.68)	($3.25)	($0.45)	-
Michigan City	Chicago	($355.68)	($3.25)	-	($1,714.58)
Norway Hydro	Chicago	($360.68)	($3.25)	-	-
Oakdale Hydro	Chicago	($360.68)	($3.25)	-	-
R.M Schahfer	Chicago	($365.76)	($3.26)	-	($1,724.65)
Rosewater Wind	Chicago	($362.53)	($3.25)	($0.45)	-
Sugar Creek	Cincinnati	($349.61)	($3.26)	-	$28.37

4.2 Site Specific Assumptions

The following assumptions were made specific to each site, in addition to the general assumptions listed above.

4.2.1 Bailly Generating Station

1. Remaining stacks will be demolished to grade by means of structural disassembly. The stacks will not be imploded due to their proximity to Lake Michigan and Indiana Dunes National Park.
2. Rail, ties, and ballast from the rail loop will be removed and salvaged, scrapped, or disposed of properly.
3. Intake structures will remain due to sharing with the neighboring steel mill. As such, costs for removal are not included.
4. All condensate tanks are assumed to be of aluminum material.
5. Environmental quantities were provided by NIPSCO.
6. Based on South Bend, Indiana a Site Cost Index ("SCI") factor of 103.9% was applied.

4.2.2 Cavalry Solar

1. Soil testing and any other on-site testing has not been conducted as part of this Study. Any environmental clean-up or removal costs are based on assumed levels of contamination.
2. All fencing will be removed and the Plant Site will be cleared of debris at the end of the decommissioning. Grading and seeding of the Plant Site is included in the decommissioning cost estimate.
3. Roads will remain in place.
4. Substation removal was included.
5. Solar panel racking, transformers, electrical equipment, cabling, wiring, will be removed from the Plant site by the demolition contractor and salvaged. All other demolished materials are considered debris.
6. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.3 Dunn’s Bridge I Solar

1. Soil testing and any other on-site testing has not been conducted as part of this Study. Any environmental clean-up or removal costs are based on assumed levels of contamination.
2. All fencing will be removed and the Plant Site will be cleared of debris at the end of the decommissioning. Grading and seeding of the Plant Site is included in the decommissioning cost estimate.
3. Roads will remain in place.
4. Substation removal and battery storage removal was included in estimate.
5. Solar panel racking, transformers, electrical equipment, cabling, wiring, will be removed from the Plant site by the demolition contractor and salvaged. All other demolished materials are considered debris.
6. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.4 Dunn’s Bridge II Solar

1. Soil testing and any other on-site testing has not been conducted as part of this Study. Any environmental clean-up or removal costs are based on assumed levels of contamination.
2. All fencing will be removed, and the Plant Site will be cleared of debris at the end of the decommissioning. Grading and seeding of the Plant Site is included in the decommissioning cost estimate.
3. Roads will remain in place.
4. Documentation was not provided regarding the panel model. As such, panel weight and dimensions are based on Dunn’s Bridge I Solar project details.
5. Substation and battery storage removal was included in the estimate.

6. Solar panel racking, transformers, electrical equipment, cabling, wiring, will be removed from the Plant site by the demolition contractor and salvaged. All other demolished materials are considered debris.
7. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.5 Elliott Solar

1. Soil testing and any other on-site testing has not been conducted as part of this Study. Any environmental clean-up or removal costs are based on assumed levels of contamination.
2. All fencing will be removed, and the Plant Site will be cleared of debris at the end of the decommissioning. Grading and seeding of the Plant Site is included in the decommissioning cost estimate.
3. Roads will remain in place.
4. Substation removal is included in the estimate.
5. Solar panel racking, transformers, electrical equipment, cabling, wiring, will be removed from the Plant site by the demolition contractor and salvaged. All other demolished materials are considered debris.
6. Based on Evansville, Indiana an SCI factor of 109.7% was applied.

4.2.6 Fairbanks Solar

1. Soil testing and any other on-site testing has not been conducted as part of this Study. Any environmental clean-up or removal costs are based on assumed levels of contamination.
2. All fencing will be removed and the Plant Site will be cleared of debris at the end of the decommissioning. Grading and seeding of the Plant Site is included in the decommissioning cost estimate.
3. Roads will remain in place.
4. Substation removal is included in the estimate.
5. Solar panel racking, transformers, electrical equipment, cabling, wiring, will be removed from the Plant site by the demolition contractor and salvaged. All other demolished materials are considered debris.
6. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.7 Indiana Crossroads Solar

1. Soil testing and any other on-site testing has not been conducted as part of this Study. Any environmental clean-up or removal costs are based on assumed levels of contamination.
2. All fencing will be removed and the Plant Site will be cleared of debris at the end of the decommissioning. Grading and seeding of the Plant Site is included in the decommissioning cost estimate.
3. Roads will remain in place.

4. Substation removal is included in the estimate.

5. Solar panel racking, transformers, electrical equipment, cabling, wiring, will be removed from the Plant site by the demolition contractor and salvaged. All other demolished materials are considered debris.

6. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.8 Indiana Crossroads Wind

1. Plant access roads newly installed during construction of the Plant will be removed.

2. Roads that existed prior to construction of the Plant will remain along with any improvements made to these existing roads to make them suitable for Plant use.

3. The nacelle, tower components, breakers, busbar, transformers, and buildings will be removed by the demolition contractor, and salvageable materials will be sold for scrap. All other demolished materials are considered debris.

4. Cables are assumed to be buried a minimum of four (4) feet below grade. At this depth, all cables (including both power and communication cabling) will remain in place after the Plant is decommissioned.

5. Based on Lafayette, Indiana an SCI factor of 87.4% was applied

4.2.9 Michigan City

1. The remaining stack will be demolished by means of structural disassembly. The stack will not be imploded due to its proximity to Lake Michigan.

2. Rail, ties, and ballast from the rail loop will be removed and salvaged or disposed of properly.

3. Costs are included for removal of the intake structure.

4. Environmental quantities were provided by NIPSCO.

5. Water will be drained from the coal pile runoff and non-CCR ponds.

6. All condensate tanks are assumed to be of aluminum material.

7. Environmental costs are based on quantities provided by NIPSCO.

8. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.10 Norway Hydro

1. The dam is not included for removal in this Study and will remain in place for flow control purposes.

2. Since the powerhouse is structurally connected to the dam, the powerhouse will remain in place to support flow control operations. Although the powerhouse will remain, the cost of asbestos abatement in the powerhouse is included in the decommissioning cost estimates.

3. The asbestos quantities were not explicitly provided and therefore were estimated based off of known asbestos quantities at other similar hydro plants.

4. Generators, transformers, and other power generation equipment will be removed.

5. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.11 Oakdale Hydro

1. The dam is not included for removal in this Study and will remain in place for flow control purposes.

2. Since the powerhouse is structurally connected to the dam, the powerhouse will remain in place to support flow control operations. Although the powerhouse will remain, the cost of asbestos abatement in the powerhouse is included in the decommissioning cost estimates.

3. The asbestos quantities were not explicitly provided and therefore were estimated based off of known asbestos quantities at other similar hydro plants.

4. Generators, transformers, and other power generation equipment will be removed.

5. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.12 Rosewater Wind

1. Plant access roads newly installed during construction of the Plant will be removed.

2. Roads that existed prior to construction of the Plant will remain along with any improvements made to these existing roads to make them suitable for Plant use.

3. The nacelle, tower components, breakers, busbar, transformers, and buildings will be removed by the demolition contractor, and salvageable materials will be sold for scrap. All other demolished materials are considered debris.

4. Cables are assumed to be buried a minimum of four (4) feet below grade. At this depth, all cables (including both power and communication cabling) will remain in place after the Plant is decommissioned.

5. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.13 Schahfer Generating Station

1. Remaining stacks will be demolished.

2. Rail, ties, and ballast from the rail loop will be removed and salvaged or disposed of properly.

3. All condensate tanks are assumed to be of aluminum material.

4. Environmental costs are based on quantities provided by NIPSCO.

5. Based on Lafayette, Indiana an SCI factor of 87.4% was applied.

4.2.14 Sugar Creek

1. Deep wells will be closed in accordance with state requirements.

2. Plant mobile maintenance equipment, shop maintenance equipment, and spare parts will be removed and salvaged. Costs are assumed to be at the expense of NIPSCO and are not included.

3. Based on Terre Haute, Indiana an SCI factor of 110.0% was applied.

5.0 RESULTS

1898 & Co. has prepared cost estimates in 2022 dollars for the decommissioning of the Plants. These costs are summarized in the following table. When NIPSCO determines that the Plants 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. NIPSCO 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 (2022$)

Asset	Fuel Type	Decommissioning Costs	Salvage Credits	Net Project Cost
Bailly	Coal	$ 74,933,000	$ (14,412,000)	$ 60,521,000
Cavalry Solar	Solar	$ 35,763,000	$ (16,778,000)	$ 18,985,000
Dunns Bridge Solar I	Solar	$ 46,411,700	$ (21,390,900)	$ 25,020,800
Dunns Bridge Solar II	Solar	$ 80,926,900	$ (34,166,500)	$ 46,760,400
Elliot Solar	Solar	$ 33,211,400	$ (15,043,100)	$ 18,168,300
Fairbanks Solar	Solar	$ 37,370,600	$ (11,203,300)	$ 26,167,300
Indiana Crossroads Solar	Solar	$ 34,300,400	$ (17,391,800)	$ 16,908,600
Indiana Crossroads Wind	Wind	$ 12,887,500	$ (15,278,000)	$ (2,390,500)
Michigan City	Coal	$ 64,396,000	$ (14,828,000)	$ 49,568,000
Norway Hydro	Hydro	$ 2,120,000	$ (274,000)	$ 1,846,000
Oakdale Hydro	Hydro	$ 1,910,000	$ (341,000)	$ 1,569,000
R.M. Schahfer	Coal	$ 113,239,000	$ (33,025,000)	$ 80,214,000
Rosewater Wind	Wind	$ 4,891,250	$ (4,881,000)	$ 10,250
Sugar Creek	Coal	$ 8,605,000	$ (5,363,000)	$ 3,242,000
TOTAL DECOMMISSIONING COST		$ 550,965,750	$ (204,375,600)	$ 346,590,150

The total project costs presented above include the costs to return the sites to an industrial condition suitable for reuse for development as an industrial facility. Included are the costs to dismantle all 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 each plant estimate are provided in Appendix A.

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APPENDIX A – COST ESTIMATE SUMMARIES

Table A-1
Bailly
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Bailly						
Unit 7						
Asbestos Removal	$ -	$ -	$ -	$ 3,998,000	$ 3,998,000	$ -
Boiler	$ 1,273,000	$ 1,205,000	$ -	$ -	$ 2,478,000	$ -
Steam Turbine & Building	$ 958,000	$ 907,000	$ -	$ -	$ 1,865,000	$ -
Precipitators	$ 282,000	$ 267,000	$ -	$ -	$ 549,000	$ -
Scrubber / FGD	$ 477,000	$ 452,000	$ -	$ -	$ 929,000	$ -
Stacks	$ 243,000	$ 230,000	$ -	$ -	$ 473,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 9,000	$ 9,000	$ -	$ -	$ 18,000	$ -
GSU, Foundation & Electrical	$ 63,000	$ 59,000	$ -	$ -	$ 122,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 72,000	$ -	$ 72,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (4,512,000)
Subtotal	**$ 3,305,000**	**$ 3,129,000**	**$ 116,000**	**$ 3,998,000**	**$ 10,548,000**	**$ (4,512,000)**
Unit 8						
Asbestos Removal	$ -	$ -	$ -	$ 4,620,000	$ 4,620,000	$ -
Boiler	$ 1,845,000	$ 1,747,000	$ -	$ -	$ 3,592,000	$ -
Steam Turbine & Building	$ 1,261,000	$ 1,194,000	$ -	$ -	$ 2,455,000	$ -
Precipitator	$ 448,000	$ 424,000	$ -	$ -	$ 872,000	$ -
SCR	$ 301,000	$ 285,000	$ -	$ -	$ 586,000	$ -
Scrubber / FGD	$ 1,119,000	$ 1,059,000	$ -	$ -	$ 2,178,000	$ -
Stacks	$ 528,000	$ 500,000	$ -	$ -	$ 1,028,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 14,000	$ 13,000	$ -	$ -	$ 27,000	$ -
GSU, Foundation & Electrical	$ 68,000	$ 64,000	$ -	$ -	$ 132,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 88,000	$ -	$ 88,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (8,500,000)
Subtotal	**$ 5,584,000**	**$ 5,286,000**	**$ 150,000**	**$ 4,620,000**	**$ 15,640,000**	**$ (8,500,000)**
Unit 10						
Asbestos Removal	$ -	$ -	$ -	$ 15,000	$ 15,000	$ -
CTGs and HRSGs	$ 102,000	$ 96,000	$ -	$ -	$ 198,000	$ -
Stacks	$ 3,000	$ 3,000	$ -	$ -	$ 6,000	$ -
GSU, Foundation & Electrical	$ 56,000	$ 53,000	$ -	$ -	$ 109,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 4,000	$ -	$ 4,000	$ -
Debris	$ -	$ -	$ 7,000	$ -	$ 7,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (637,000)
Subtotal	**$ 161,000**	**$ 152,000**	**$ 11,000**	**$ 15,000**	**$ 339,000**	**$ (637,000)**
Handling						
Coal Handling Facilites	$ 336,000	$ 318,000	$ -	$ -	$ 654,000	$ -
Coal Storage Area Restoration	$ -	$ -	$ -	$ 2,252,000	$ 2,252,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 4,000	$ -	$ 4,000	$ -
Debris	$ -	$ -	$ 111,000	$ -	$ 111,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (411,000)
Subtotal	**$ 336,000**	**$ 318,000**	**$ 115,000**	**$ 2,252,000**	**$ 3,021,000**	**$ (411,000)**
Common						
Lagre Pipe Flowable Fill	$ -	$ -	$ -	$ 44,000	$ 44,000	$ -
BOP Misc.	$ 3,000	$ 3,000	$ -	$ -	$ 6,000	$ -
Roads	$ 81,000	$ 77,000	$ -	$ -	$ 158,000	$ -
All BOP Buildings	$ 433,000	$ 410,000	$ -	$ -	$ 843,000	$ -
Fuel Equipment	$ 5,000	$ 4,000	$ -	$ -	$ 9,000	$ -
All Other Tanks	$ 189,000	$ 179,000	$ -	$ -	$ 368,000	$ -
Transformers & Foundation	$ 10,000	$ 9,000	$ -	$ 317,000	$ 336,000	$ -
Mercury & Universal Waste Disposal	$ -	$ -	$ -	$ 718,000	$ 718,000	$ -
Below Grade Fuel Lines Removal/Remediation	$ -	$ -	$ -	$ 145,000	$ 145,000	$ -
Non-CCR Pond Closure	$ -	$ -	$ -	$ 165,000	$ 165,000	$ -
Historic Contamination associated with SWMUs	$ -	$ -	$ -	$ 23,539,000	$ 23,539,000	$ -
Hazardous Waste Disposal	$ -	$ -	$ -	$ 632,000	$ 632,000	$ -
Plant Washdown & Materials Disposal	$ -	$ -	$ -	$ 70,000	$ 70,000	$ -
Concrete Removal, Crushing, & Disposal	$ -	$ -	$ 40,000	$ -	$ 40,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 3,316,000	$ 3,316,000	$ -
Debris	$ -	$ -	$ 10,000	$ -	$ 10,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (352,000)
Subtotal	**$ 721,000**	**$ 682,000**	**$ 50,000**	**$ 28,946,000**	**$ 30,399,000**	**$ (352,000)**
Bailly Subtotal	**$ 10,107,000**	**$ 9,567,000**	**$ 442,000**	**$ 39,831,000**	**$ 59,947,000**	**$ (14,412,000)**
TOTAL DECOM COST (CREDIT)					**$ 59,947,000**	**$ (14,412,000)**
PROJECT INDIRECTS (5%)					**$ 2,997,000**	
CONTINGENGY (20%)					**$ 11,989,000**	
TOTAL PROJECT COST (CREDIT)					**$ 74,933,000**	**$ (14,412,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 60,521,000**	

Table A-2
Cavalry
Solar Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Cavalry						
Solar Farm						
O&M Building	$ 2,500	$ 3,000	$ -	$ -	$ 5,500	$ -
Solar Panel Removal/Recycling	$ 3,305,800	$ 3,942,200	$ 1,079,500	$ -	$ 8,327,500	$ -
Panel Supports/Rack	$ 3,160,000	$ 3,768,400	$ -	$ -	$ 6,928,400	$ -
Battery Containers and Racks	$ 1,934,600	$ 2,307,100	$ 2,546,300	$ -	$ 6,788,000	$ -
Electrical & Wiring	$ 643,400	$ 767,100	$ -	$ -	$ 1,410,500	$ -
Site Restoration	$ 331,900	$ 395,800	$ -	$ 4,376,300	$ 5,104,000	$ -
On-site Concrete Crushing and Removal	$ -	$ -	$ 26,700	$ -	$ 26,700	$ -
Debris	$ -	$ -	$ 19,800	$ -	$ 19,800	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (16,778,000)
Subtotal	**$ 9,378,200**	**$ 11,183,600**	**$ 3,672,300**	**$ 4,376,300**	**$ 28,610,400**	**$ (16,778,000)**
Cavalry Subtotal	**$ 9,378,200**	**$ 11,183,600**	**$ 3,672,300**	**$ 4,376,300**	**$ 28,610,400**	**$ (16,778,000)**
TOTAL DECOM COST (CREDIT)					**$ 28,610,400**	**$ (16,778,000)**
PROJECT INDIRECTS (5%)					**$ 1,430,500**	
CONTINGENGY (20%)					**$ 5,722,100**	
TOTAL PROJECT COST (CREDIT)					**$ 35,763,000**	**$ (16,778,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 18,985,000**	

Table A-3
Dunn's Bridge Solar Project
Solar Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Dunn's Bridge Solar Project						
Solar Farm						
O&M Building	$ 1,800	$ 2,100	$ -	$ -	$ 3,900	$ -
Solar Panel Removal/Recycling	$ 3,921,700	$ 4,676,700	$ 1,532,600	$ -	$ 10,131,000	$ -
Panel Supports/Rack	$ 7,729,300	$ 9,217,400	$ -	$ -	$ 16,946,700	$ -
Electrical & Wiring	$ 657,000	$ 783,500	$ -	$ -	$ 1,440,500	$ -
Site Restoration	$ 692,600	$ 825,900	$ -	$ 7,018,800	$ 8,537,300	$ -
On-site Concrete Crushing and Removal	$ -	$ -	$ 37,700	$ -	$ 37,700	$ -
Debris	$ -	$ -	$ 32,200	$ -	$ 32,200	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (21,390,900)
Subtotal	**$ 13,002,400**	**$ 15,505,600**	**$ 1,602,500**	**$ 7,018,800**	**$ 37,129,300**	**$ (21,390,900)**
Dunn's Bridge Solar Project Subtotal	**$ 13,002,400**	**$ 15,505,600**	**$ 1,602,500**	**$ 7,018,800**	**$ 37,129,300**	**$ (21,390,900)**
TOTAL DECOM COST (CREDIT)					**$ 37,129,300**	**$ (21,390,900)**
PROJECT INDIRECTS (5%)					**$ 1,856,500**	
CONTINGENGY (20%)					**$ 7,425,900**	
TOTAL PROJECT COST (CREDIT)					**$ 46,411,700**	**$ (21,390,900)**
TOTAL NET PROJECT COST (CREDIT)					**$ 25,020,800**	

Table A-4
Dunn's Bridge II
Solar Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Dunn's Bridge II						
Solar Farm						
O&M Building	$ 3,100	$ 3,700	$ -	$ -	$ 6,800	$ -
Solar Panel Removal/Recycling	$ 6,741,000	$ 8,038,800	$ 2,634,300	$ -	$ 17,414,100	$ -
Panel Supports/Rack	$ 12,492,100	$ 14,897,100	$ -	$ -	$ 27,389,200	$ -
Battery Containers and Racks	$ 1,934,600	$ 2,307,100	$ 3,703,800	$ -	$ 7,945,500	$ -
Electrical & Wiring	$ 1,049,800	$ 1,251,900	$ -	$ -	$ 2,301,700	$ -
Site Restoration	$ 991,500	$ 1,182,400	$ -	$ 7,402,000	$ 9,575,900	$ -
On-site Concrete Crushing and Removal	$ -	$ -	$ 63,500	$ -	$ 63,500	$ -
Debris	$ -	$ -	$ 44,800	$ -	$ 44,800	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (34,166,500)
Subtotal	**$ 23,212,100**	**$ 27,681,000**	**$ 6,446,400**	**$ 7,402,000**	**$ 64,741,500**	**$ (34,166,500)**
Dunn's Bridge II Subtotal	**$ 23,212,100**	**$ 27,681,000**	**$ 6,446,400**	**$ 7,402,000**	**$ 64,741,500**	**$ (34,166,500)**
TOTAL DECOM COST (CREDIT)					**$ 64,741,500**	**$ (34,166,500)**
PROJECT INDIRECTS (5%)					**$ 3,237,100**	
CONTINGENGY (20%)					**$ 12,948,300**	
TOTAL PROJECT COST (CREDIT)					**$ 80,926,900**	**$ (34,166,500)**
TOTAL NET PROJECT COST (CREDIT)					**$ 46,760,400**	

Table A-5
Elliott
Solar Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Elliott						
Solar Farm						
Solar Panel Removal/Recycling	$ 3,288,800	$ 3,922,000	$ 844,200	$ -	$ 8,055,000	$ -
Panel Supports/Rack	$ 6,204,400	$ 7,398,900	$ -	$ -	$ 13,603,300	$ -
Electrical & Wiring	$ 503,900	$ 600,900	$ -	$ -	$ 1,104,800	$ -
Site Restoration	$ 523,300	$ 624,000	$ -	$ 2,613,500	$ 3,760,800	$ -
On-site Concrete Crushing and Removal	$ -	$ -	$ 26,100	$ -	$ 26,100	$ -
Debris	$ -	$ -	$ 19,100	$ -	$ 19,100	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (15,043,100)
Subtotal	**$ 10,520,400**	**$ 12,545,800**	**$ 889,400**	**$ 2,613,500**	**$ 26,569,100**	**$ (15,043,100)**
Elliott Subtotal	**$ 10,520,400**	**$ 12,545,800**	**$ 889,400**	**$ 2,613,500**	**$ 26,569,100**	**$ (15,043,100)**
TOTAL DECOM COST (CREDIT)					**$ 26,569,100**	**$ (15,043,100)**
PROJECT INDIRECTS (5%)					**$ 1,328,500**	
CONTINGENGY (20%)					**$ 5,313,800**	
TOTAL PROJECT COST (CREDIT)					**$ 33,211,400**	**$ (15,043,100)**
TOTAL NET PROJECT COST (CREDIT)					**$ 18,168,300**	

Table A-6
Fairbanks Solar
Solar Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Fairbanks Solar						
Solar Farm						
O&M Building	$ 6,000	$ 7,100	$ -	$ -	$ 13,100	$ -
Solar Panel Removal/Recycling	$ 4,823,200	$ 5,751,800	$ 1,089,000	$ -	$ 11,664,000	$ -
Panel Supports/Rack	$ 3,496,200	$ 4,169,300	$ -	$ -	$ 7,665,500	$ -
Electrical & Wiring	$ 604,000	$ 720,300	$ -	$ -	$ 1,324,300	$ -
Site Restoration	$ 1,062,900	$ 1,267,500	$ -	$ 6,855,200	$ 9,185,600	$ -
On-site Concrete Crushing and Removal	$ -	$ -	$ 33,500	$ -	$ 33,500	$ -
Debris	$ -	$ -	$ 10,500	$ -	$ 10,500	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (11,203,300)
Subtotal	**$ 9,992,300**	**$ 11,916,000**	**$ 1,133,000**	**$ 6,855,200**	**$ 29,896,500**	**$ (11,203,300)**
Fairbanks Solar Subtotal	**$ 9,992,300**	**$ 11,916,000**	**$ 1,133,000**	**$ 6,855,200**	**$ 29,896,500**	**$ (11,203,300)**
TOTAL DECOM COST (CREDIT)					**$ 29,896,500**	**$ (11,203,300)**
PROJECT INDIRECTS (5%)					**$ 1,494,800**	
CONTINGENGY (20%)					**$ 5,979,300**	
TOTAL PROJECT COST (CREDIT)					**$ 37,370,600**	**$ (11,203,300)**
TOTAL NET PROJECT COST (CREDIT)					**$ 26,167,300**	

Table A-7
Indiana Crossroads
Solar Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Indiana Crossroads						
Solar Farm						
O&M Building	$ 2,800	$ 3,300	$ -	$ -	$ 6,100	$ -
Solar Panel Removal/Recycling	$ 3,182,700	$ 3,795,500	$ 1,116,000	$ -	$ 8,094,200	$ -
Panel Supports/Rack	$ 5,617,800	$ 6,699,300	$ -	$ -	$ 12,317,100	$ -
Electrical & Wiring	$ 532,400	$ 634,900	$ -	$ -	$ 1,167,300	$ -
Site Restoration	$ 188,200	$ 224,400	$ -	$ 5,394,300	$ 5,806,900	$ -
On-site Concrete Crushing and Removal	$ -	$ -	$ 27,000	$ -	$ 27,000	$ -
Debris	$ -	$ -	$ 21,700	$ -	$ 21,700	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (17,391,800)
Subtotal	**$ 9,523,900**	**$ 11,357,400**	**$ 1,164,700**	**$ 5,394,300**	**$ 27,440,300**	**$ (17,391,800)**
Indiana Crossroads Subtotal	**$ 9,523,900**	**$ 11,357,400**	**$ 1,164,700**	**$ 5,394,300**	**$ 27,440,300**	**$ (17,391,800)**
TOTAL DECOM COST (CREDIT)					**$ 27,440,300**	**$ (17,391,800)**
PROJECT INDIRECTS (5%)					**$ 1,372,000**	
CONTINGENCY (20%)					**$ 5,488,100**	
TOTAL PROJECT COST (CREDIT)					**$ 34,300,400**	**$ (17,391,800)**
TOTAL NET PROJECT COST (CREDIT)					**$ 16,908,600**	

Table A-8: Estimated Cost for Wind Turbine Decommissioning (2022$)

Indiana Crossroads Wind Project

Decommissioning Cost Evaluation

Wind Turbine Removal Cost		
Removal	$	5,262,000
Hauling & Disposal	$	991,000
Total	**$**	**6,253,000**
Scrap Value	**$**	**(14,878,000)**
Wind Turbine Foundation Removal Cost		
Removal	$	428,000
Hauling & Disposal	$	652,000
Total	**$**	**1,080,000**
Substation Removal Cost		
Removal	$	168,000
Hauling & Disposal	$	16,000
Total	**$**	**184,000**
Scrap Value	**$**	**(210,000)**
Transmission Line Removal Cost		
Equipment Removal	$	362,000
Hauling & Disposal	$	35,000
Total	**$**	**397,000**
Scrap Value	**$**	**(187,000)**
Civil Works Removal Cost		
Removal	$	232,000
Hauling & Disposal	$	1,939,000
Grading & Seeding Costs	$	165,000
Total	**$**	**2,336,000**
Met Tower Removal		
Removal	$	16,000
Total	**$**	**16,000**
Scrap Value	**$**	**(3,000)**
Other Costs		
Oils & Chemicals Removal & Disposal	$	44,000
Total	**$**	**44,000**
Total Estimated Cost	**$**	**10,310,000**
Owner Indirects (5%)	**$**	**515,500**
Contingency (20%)	**$**	**2,062,000**
Total Gross Cost	**$**	**12,887,500**
Total Scrap Value	**$**	**(15,278,000)**
Total Net Cost	**$**	**(2,390,500)**

Table A-9
Michigan City
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Michigan City						
Unit 12						
Asbestos Removal	$ -	$ -	$ -	$ 4,155,000	$ 4,155,000	$ -
Boiler	$ 2,200,000	$ 2,083,000	$ -	$ -	$ 4,283,000	$ -
Steam Turbine & Building	$ 1,152,000	$ 1,091,000	$ -	$ -	$ 2,243,000	$ -
Precipitators	$ 608,000	$ 576,000	$ -	$ -	$ 1,184,000	$ -
SCR	$ 359,000	$ 340,000	$ -	$ -	$ 699,000	$ -
Scrubber / FGD	$ 1,671,000	$ 1,582,000	$ -	$ -	$ 3,253,000	$ -
Cooling Towers & Basin	$ 3,419,000	$ 3,237,000	$ -	$ -	$ 6,656,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 15,000	$ 14,000	$ -	$ 199,000	$ 228,000	$ -
GSU, Foundation & Electrical	$ 239,000	$ 227,000	$ -	$ -	$ 466,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 404,000	$ -	$ 404,000	$ -
Debris	$ -	$ -	$ 62,000	$ -	$ 62,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (9,484,000)
Subtotal	**$ 9,663,000**	**$ 9,150,000**	**$ 466,000**	**$ 4,354,000**	**$ 23,633,000**	**$ (9,484,000)**
Retired Units						
Asbestos Removal	$ -	$ -	$ -	$ 1,350,000	$ 1,350,000	$ -
Boiler	$ 1,289,000	$ 1,221,000	$ -	$ -	$ 2,510,000	$ -
Steam Turbine & Building	$ 1,505,000	$ 1,425,000	$ -	$ -	$ 2,930,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 11,000	$ 10,000	$ -	$ 144,000	$ 165,000	$ -
Switchgear & Electrical	$ 11,000	$ 10,000	$ -	$ -	$ 21,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 108,000	$ -	$ 108,000	$ -
Debris	$ -	$ -	$ 49,000	$ -	$ 49,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (4,905,000)
Subtotal	**$ 2,816,000**	**$ 2,666,000**	**$ 157,000**	**$ 1,494,000**	**$ 7,133,000**	**$ (4,905,000)**
Handling						
Coal Handling Facilites	$ 240,000	$ 227,000	$ -	$ -	$ 467,000	$ -
Coal Storage Area Restoration	$ -	$ -	$ -	$ 3,700,000	$ 3,700,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 7,000	$ -	$ 7,000	$ -
Debris	$ -	$ -	$ 34,000	$ -	$ 34,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (257,000)
Subtotal	**$ 240,000**	**$ 227,000**	**$ 41,000**	**$ 3,700,000**	**$ 4,208,000**	**$ (257,000)**
Common						
BOP Misc.	$ 114,000	$ 108,000	$ -	$ -	$ 222,000	$ -
Roads	$ 52,000	$ 49,000	$ -	$ -	$ 101,000	$ -
All BOP Buildings	$ 181,000	$ 171,000	$ -	$ -	$ 352,000	$ -
Fuel Equipment	$ 2,000	$ 1,000	$ -	$ -	$ 3,000	$ -
All Other Tanks	$ 118,000	$ 112,000	$ -	$ -	$ 230,000	$ -
Historic Contamination associated with SWMUs	$ -	$ -	$ -	$ 1,074,000	$ 1,074,000	$ -
Universal Waste Disposal	$ -	$ -	$ -	$ 425,000	$ 425,000	$ -
Nuclear Device Disposal	$ -	$ -	$ -	$ 34,000	$ 34,000	$ -
Non-CCR Pond Closure	$ -	$ -	$ -	$ 10,797,000	$ 10,797,000	$ -
Hazardous Waste Disposal	$ -	$ -	$ -	$ 797,000	$ 797,000	$ -
Plant Washdown & Materials Disposal	$ -	$ -	$ -	$ 70,000	$ 70,000	$ -
Concrete Removal, Crushing, & Disposal	$ -	$ -	$ 25,000	$ -	$ 25,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 2,403,000	$ 2,403,000	$ -
Debris	$ -	$ -	$ 10,000	$ -	$ 10,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (182,000)
Subtotal	**$ 467,000**	**$ 441,000**	**$ 35,000**	**$ 15,600,000**	**$ 16,543,000**	**$ (182,000)**
Michigan City Subtotal	**$ 13,186,000**	**$ 12,484,000**	**$ 699,000**	**$ 25,148,000**	**$ 51,517,000**	**$ (14,828,000)**
TOTAL DECOM COST (CREDIT)					**$ 51,517,000**	**$ (14,828,000)**
PROJECT INDIRECTS (5%)					**$ 2,576,000**	
CONTINGENGY (20%)					**$ 10,303,000**	
TOTAL PROJECT COST (CREDIT)					**$ 64,396,000**	**$ (14,828,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 49,568,000**	

Table A-10
Norway
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Norway						
Norway: Unit 1						
Demolition	$ 721,000	$ 752,000	$ -	$ -	$ 1,473,000	$ -
BOP Buildings	$ 19,000	$ 23,000	$ -	$ -	$ 42,000	$ -
Roads	$ 11,000	$ 13,000	$ -	$ -	$ 24,000	$ -
Debris	$ -	$ -	$ 12,000	$ -	$ 12,000	$ -
On Site Crushing	$ -	$ -	$ 1,000	$ -	$ 1,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 44,000	$ 44,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (274,000)
Subtotal	**$ 751,000**	**$ 788,000**	**$ 13,000**	**$ 44,000**	**$ 1,596,000**	**$ (274,000)**
Norway: Facilities Environmental						
Asbestos Removal	$ -	$ -	$ -	$ 83,000	$ 83,000	$ -
Mercury & Universal Waste Disposal	$ -	$ -	$ -	$ 11,000	$ 11,000	$ -
Transformer Oil Disposal	$ -	$ -	$ -	$ 3,000	$ 3,000	$ -
Transformer Pad and Soil Removal	$ -	$ -	$ -	$ 3,000	$ 3,000	$ -
Subtotal	**$ -**	**$ -**	**$ -**	**$ 100,000**	**$ 100,000**	**$ -**
Norway Subtotal	**$ 751,000**	**$ 788,000**	**$ 13,000**	**$ 144,000**	**$ 1,696,000**	**$ (274,000)**
TOTAL DECOM COST (CREDIT)					**$ 1,696,000**	**$ (274,000)**
PROJECT INDIRECTS (5%)					**$ 85,000**	
CONTINGENGY (20%)					**$ 339,000**	
TOTAL PROJECT COST (CREDIT)					**$ 2,120,000**	**$ (274,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 1,846,000**	

Table A-11
Oakdale
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Oakdale						
Oakdale: Unit 1						
Demolition	$ 572,000	$ 598,000	$ -	$ -	$ 1,170,000	$ -
BOP Buildings	$ 28,000	$ 34,000	$ -	$ -	$ 62,000	$ -
Roads	$ 19,000	$ 23,000	$ -	$ -	$ 42,000	$ -
Debris	$ -	$ -	$ 18,000	$ -	$ 18,000	$ -
On Site Crushing	$ -	$ -	$ 2,000	$ -	$ 2,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 103,000	$ 103,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (341,000)
Subtotal	**$ 619,000**	**$ 655,000**	**$ 20,000**	**$ 103,000**	**$ 1,397,000**	**$ (341,000)**
Oakdale: Facilities Environmental						
Asbestos Removal	$ -	$ -	$ -	$ 117,000	$ 117,000	$ -
Mercury & Universal Waste Disposal	$ -	$ -	$ -	$ 11,000	$ 11,000	$ -
Transformer Oil Disposal	$ -	$ -	$ -	$ 3,000	$ 3,000	$ -
Subtotal	**$ -**	**$ -**	**$ -**	**$ 131,000**	**$ 131,000**	**$ -**
Oakdale Subtotal	**$ 619,000**	**$ 655,000**	**$ 20,000**	**$ 234,000**	**$ 1,528,000**	**$ (341,000)**
TOTAL DECOM COST (CREDIT)					**$ 1,528,000**	**$ (341,000)**
PROJECT INDIRECTS (5%)					**$ 76,000**	
CONTINGENGY (20%)					**$ 306,000**	
TOTAL PROJECT COST (CREDIT)					**$ 1,910,000**	**$ (341,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 1,569,000**	

Table A-12
R.M. Schahfer
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
R.M. Schahfer						
Unit 14						
Asbestos Removal	$ -	$ -	$ -	$ 377,000	$ 377,000	$ -
Boiler	$ 1,314,000	$ 1,244,000	$ -	$ -	$ 2,558,000	$ -
Steam Turbine & Building	$ 1,243,000	$ 1,177,000	$ -	$ -	$ 2,420,000	$ -
Precipitators	$ 371,000	$ 351,000	$ -	$ -	$ 722,000	$ -
SCR	$ 396,000	$ 375,000	$ -	$ -	$ 771,000	$ -
Scrubber / FGD	$ 493,000	$ 466,000	$ -	$ -	$ 959,000	$ -
Cooling Towers & Basin	$ 439,000	$ 415,000	$ -	$ -	$ 854,000	$ -
Stacks	$ 148,000	$ 140,000	$ -	$ -	$ 288,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 13,000	$ 13,000	$ -	$ 90,000	$ 116,000	$ -
GSU, Foundation & Electrical	$ 59,000	$ 56,000	$ -	$ -	$ 115,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 318,000	$ -	$ 318,000	$ -
Debris	$ -	$ -	$ 22,000	$ -	$ 22,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (8,075,000)
Subtotal	**$ 4,476,000**	**$ 4,237,000**	**$ 340,000**	**$ 467,000**	**$ 9,520,000**	**$ (8,075,000)**
Unit 15						
Asbestos Removal	$ -	$ -	$ -	$ 887,000	$ 887,000	$ -
Boiler	$ 1,375,000	$ 1,302,000	$ -	$ -	$ 2,677,000	$ -
Steam Turbine & Building	$ 1,357,000	$ 1,284,000	$ -	$ -	$ 2,641,000	$ -
Precipitator	$ 465,000	$ 440,000	$ -	$ -	$ 905,000	$ -
Scrubber / FGD	$ 481,000	$ 455,000	$ -	$ -	$ 936,000	$ -
Cooling Towers & Basin	$ 440,000	$ 417,000	$ -	$ -	$ 857,000	$ -
Stacks	$ 148,000	$ 140,000	$ -	$ -	$ 288,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 13,000	$ 13,000	$ -	$ 111,000	$ 137,000	$ -
GSU, Foundation & Electrical	$ 59,000	$ 56,000	$ -	$ -	$ 115,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 330,000	$ -	$ 330,000	$ -
Debris	$ -	$ -	$ 26,000	$ -	$ 26,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (7,437,000)
Subtotal	**$ 4,338,000**	**$ 4,107,000**	**$ 356,000**	**$ 998,000**	**$ 9,799,000**	**$ (7,437,000)**
Unit 17 & 18						
Asbestos Removal	$ -	$ -	$ -	$ -	$ -	$ -
Boiler	$ 2,628,000	$ 2,487,000	$ -	$ -	$ 5,115,000	$ -
Steam Turbine & Building	$ 1,808,000	$ 1,712,000	$ -	$ -	$ 3,520,000	$ -
Precipitator	$ 638,000	$ 604,000	$ -	$ -	$ 1,242,000	$ -
Scrubber / FGD	$ 984,000	$ 932,000	$ -	$ -	$ 1,916,000	$ -
Cooling Towers & Basin	$ 655,000	$ 620,000	$ -	$ -	$ 1,275,000	$ -
Stacks	$ 294,000	$ 278,000	$ -	$ -	$ 572,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 23,000	$ 22,000	$ -	$ 280,000	$ 325,000	$ -
GSU, Foundation & Electrical	$ 130,000	$ 123,000	$ -	$ -	$ 253,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 493,000	$ -	$ 493,000	$ -
Debris	$ -	$ -	$ 62,000	$ -	$ 62,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (11,163,000)
Subtotal	**$ 7,160,000**	**$ 6,778,000**	**$ 555,000**	**$ 280,000**	**$ 14,773,000**	**$ (11,163,000)**
CT 16A & B						
Asbestos Removal	$ -	$ -	$ -	$ 188,000	$ 188,000	$ -
CTGs and HRSGs	$ 238,000	$ 225,000	$ -	$ -	$ 463,000	$ -
Stacks	$ 6,000	$ 6,000	$ -	$ -	$ 12,000	$ -
Switchgear & Electrical	$ 12,000	$ 11,000	$ -	$ -	$ 23,000	$ -
Debris	$ -	$ -	$ 21,000	$ -	$ 21,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,367,000)
Subtotal	**$ 256,000**	**$ 242,000**	**$ 21,000**	**$ 188,000**	**$ 707,000**	**$ (1,367,000)**
Handling						
Coal Handling Facilites	$ 2,448,000	$ 2,317,000	$ -	$ -	$ 4,765,000	$ -
Coal Storage Area Restoration	$ -	$ -	$ -	$ 9,981,000	$ 9,981,000	$ -
Limestone Handling Facilities	$ 31,000	$ 30,000	$ -	$ -	$ 61,000	$ -
Remote Ash Handling Facilities	$ 469,000	$ 444,000	$ -	$ -	$ 913,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 52,000	$ -	$ 52,000	$ -
Debris	$ -	$ -	$ 425,000	$ -	$ 425,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (4,714,000)
Subtotal	**$ 2,948,000**	**$ 2,791,000**	**$ 477,000**	**$ 9,981,000**	**$ 16,197,000**	**$ (4,714,000)**
Common						
Water Treatment Equipment and Piping	$ 23,000	$ 22,000	$ -	$ -	$ 45,000	$ -
Roads	$ 94,000	$ 89,000	$ -	$ -	$ 183,000	$ -
All BOP Buildings	$ 613,000	$ 581,000	$ -	$ -	$ 1,194,000	$ -
Fuel Equipment	$ 379,000	$ 359,000	$ -	$ -	$ 738,000	$ -
All Other Tanks	$ 181,000	$ 171,000	$ -	$ -	$ 352,000	$ -
Nuclear Device Disposal	$ -	$ -	$ -	$ 85,000	$ 85,000	$ -
Landfill Closure	$ -	$ -	$ -	$ 7,825,000	$ 7,825,000	$ -
Retired Waste Disposal Area (RWDA) Closure	$ -	$ -	$ -	$ 20,985,000	$ 20,985,000	$ -
Storage Tank Removal/Remediation	$ -	$ -	$ -	$ 636,000	$ 636,000	$ -
Below Grade Fuel Lines Removal/Remediation	$ -	$ -	$ -	$ 882,000	$ 882,000	$ -
Mecury Vapor, and Fluorescent and Unviersal Waste	$ -	$ -	$ -	$ 1,431,000	$ 1,431,000	$ -
Fuel Area Remediation	$ -	$ -	$ -	$ 866,000	$ 866,000	$ -

Closure of Deep Wells	$ -	$ -	$ -	$ 46,000	$ 46,000	$ -
Non-CCR Pond Characterization	$ -	$ -	$ -	$ 1,586,000	$ 1,586,000	$ -
Hazardous Waste Disposal	$ -	$ -	$ -	$ 840,000	$ 840,000	$ -
Plant Washdown & Materials Disposal	$ -	$ -	$ -	$ 59,000	$ 59,000	$ -
Concrete Removal, Crushing, & Disposal	$ -	$ -	$ 85,000	$ -	$ 85,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 1,616,000	$ 1,616,000	$ -
Debris	$ -	$ -	$ 12,000	$ -	$ 12,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (269,000)
Subtotal	**$ 1,290,000**	**$ 1,222,000**	**$ 97,000**	**$ 36,857,000**	**$ 39,466,000**	**$ (269,000)**
R.M. Schahfer Subtotal	**$ 20,512,000**	**$ 19,419,000**	**$ 1,889,000**	**$ 48,771,000**	**$ 90,591,000**	**$ (33,025,000)**
TOTAL DECOM COST (CREDIT)					**$ 90,591,000**	**$ (33,025,000)**
PROJECT INDIRECTS (5%)					**$ 4,530,000**	
CONTINGENGY (20%)					**$ 18,118,000**	
TOTAL PROJECT COST (CREDIT)					**$ 113,239,000**	**$ (33,025,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 80,214,000**	

Table A-13: Estimated Cost for Wind Turbine Decommissioning (2022$)

Rosewater Wind Wind Project
Decommissioning Cost Evaluation

Wind Turbine Removal Cost		
Removal	$	1,835,000
Hauling & Disposal	$	380,000
Total	**$**	**2,215,000**
Scrap Value	**$**	**(4,676,000)**
Wind Turbine Foundation Removal Cost		
Removal	$	143,000
Hauling & Disposal	$	228,000
Total	**$**	**371,000**
Collection System Removal Cost		
Removal	$	42,000
Total	**$**	**42,000**
Substation Removal Cost		
Removal	$	115,000
Hauling & Disposal	$	19,000
Total	**$**	**134,000**
Scrap Value	**$**	**(202,000)**
Transmission Line Removal Cost		
Equipment Removal	$	7,000
Hauling & Disposal	$	1,000
Total	**$**	**8,000**
Scrap Value	**$**	**(2,000)**
Civil Works Removal Cost		
Removal	$	89,000
Hauling & Disposal	$	945,000
Grading & Seeding Costs	$	60,000
Total	**$**	**1,094,000**
Met Tower Removal		
Removal	$	8,000
Total	**$**	**8,000**
Scrap Value	**$**	**(1,000)**
Other Costs		
Oils & Chemicals Removal & Disposal	$	41,000
Total	**$**	**41,000**
Total Estimated Cost	**$**	**3,913,000**
Owner Indirects (5%)	**$**	**195,650**
Contingency (20%)	**$**	**782,600**
Total Gross Cost	**$**	**4,891,250**
Total Scrap Value	**$**	**(4,881,000)**
Total Net Cost	**$**	**10,250**

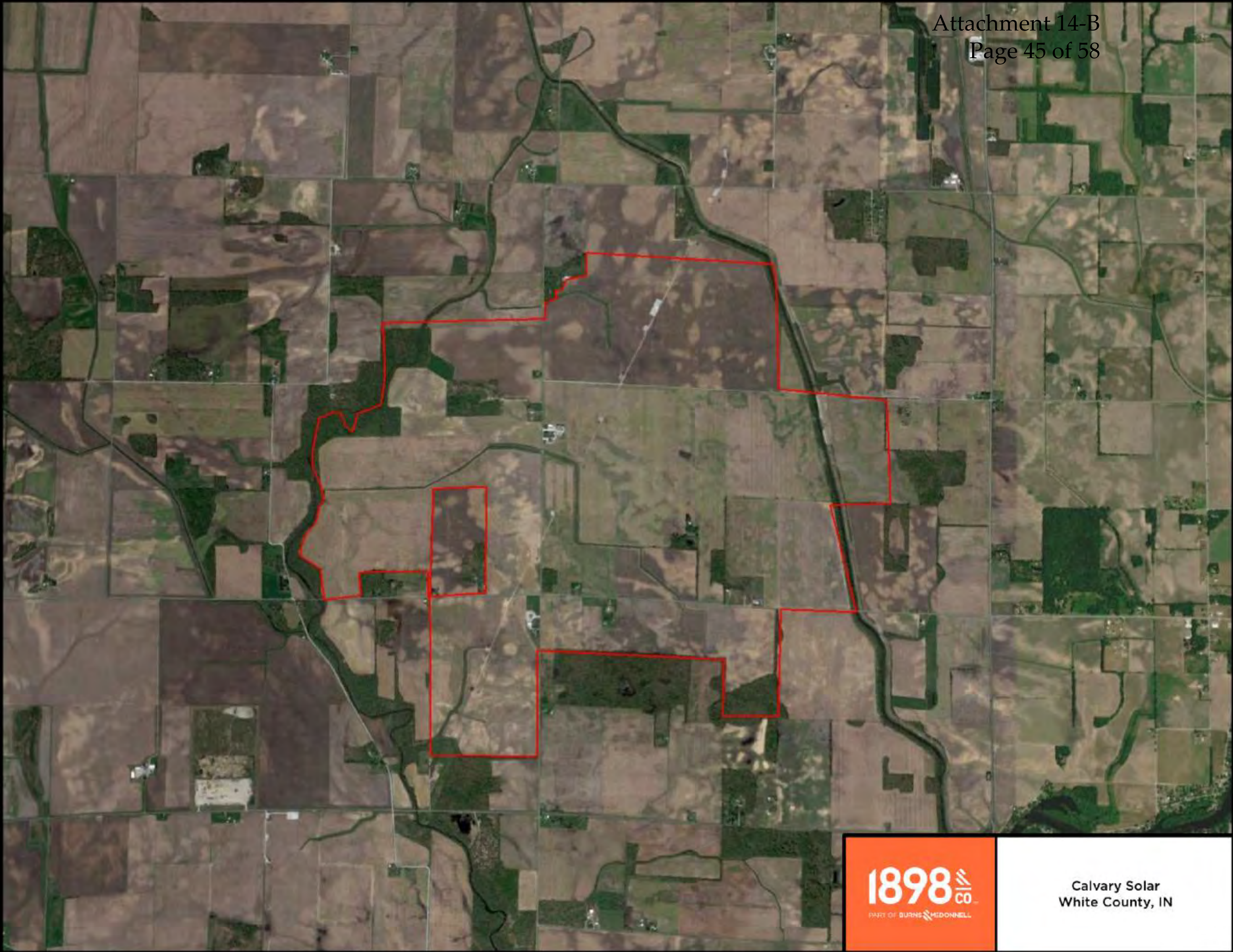
Table A-14
Sugar Creek
Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Scrap Value
Sugar Creek						
CT01 & 02						
CTGs and HRSGs	$ 1,698,000	$ 1,608,000	$ -	$ -	$ 3,306,000	$ -
Stacks	$ 74,000	$ 70,000	$ -	$ -	$ 144,000	$ -
Cooling Water Intakes and Circulating Water Pumps	$ 2,000	$ 2,000	$ -	$ -	$ 4,000	$ -
GSU & Foundation	$ 97,000	$ 92,000	$ -	$ -	$ 189,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 18,000	$ -	$ 18,000	$ -
Debris	$ -	$ -	$ 25,000	$ -	$ 25,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (4,266,000)
Subtotal	**$ 1,871,000**	**$ 1,772,000**	**$ 43,000**	**$ -**	**$ 3,686,000**	**$ (4,266,000)**
ST1						
Steam Turbine & Building	$ 512,000	$ 485,000	$ -	$ -	$ 997,000	$ -
SCR	$ 66,000	$ 63,000	$ -	$ -	$ 129,000	$ -
GSU & Foundation	$ 67,000	$ 63,000	$ -	$ -	$ 130,000	$ -
On-site Concrete Crushing & Disposal	$ -	$ -	$ 30,000	$ -	$ 30,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (647,000)
Subtotal	**$ 645,000**	**$ 611,000**	**$ 30,000**	**$ -**	**$ 1,286,000**	**$ (647,000)**
Common						
Cooling Water Intakes and Circulating Water Pumps	$ 15,000	$ 14,000	$ -	$ -	$ 29,000	$ -
BOP Misc.	$ 19,000	$ 18,000	$ -	$ -	$ 37,000	$ -
Roads	$ 25,000	$ 23,000	$ -	$ -	$ 48,000	$ -
All BOP Buildings	$ 179,000	$ 169,000	$ -	$ -	$ 348,000	$ -
Fuel Equipment	$ 5,000	$ 5,000	$ -	$ -	$ 10,000	$ -
All Other Tanks	$ 128,000	$ 121,000	$ -	$ -	$ 249,000	$ -
Transformers & Foundation	$ 4,000	$ 4,000	$ -	$ -	$ 8,000	$ -
Closure of Deep Wells	$ -	$ -	$ -	$ 58,000	$ 58,000	$ -
Pond Closure	$ -	$ -	$ -	$ 192,000	$ 192,000	$ -
Cooling Towers and Basin	$ 267,000	$ 252,000	$ -	$ -	$ 519,000	$ -
Concrete Removal, Crushing, & Disposal	$ -	$ -	$ 29,000	$ -	$ 29,000	$ -
Grading & Seeding	$ -	$ -	$ -	$ 381,000	$ 381,000	$ -
Debris	$ -	$ -	$ 4,000	$ -	$ 4,000	$ -
Scrap	$ -	$ -	$ -	$ -	$ -	$ (450,000)
Subtotal	**$ 642,000**	**$ 606,000**	**$ 33,000**	**$ 631,000**	**$ 1,912,000**	**$ (450,000)**
Sugar Creek Subtotal	**$ 3,158,000**	**$ 2,989,000**	**$ 106,000**	**$ 631,000**	**$ 6,884,000**	**$ (5,363,000)**
TOTAL DECOM COST (CREDIT)					**$ 6,884,000**	**$ (5,363,000)**
PROJECT INDIRECTS (5%)					**$ 344,000**	
CONTINGENGY (20%)					**$ 1,377,000**	
TOTAL PROJECT COST (CREDIT)					**$ 8,605,000**	**$ (5,363,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 3,242,000**	

APPENDIX B – SITE AERIALS

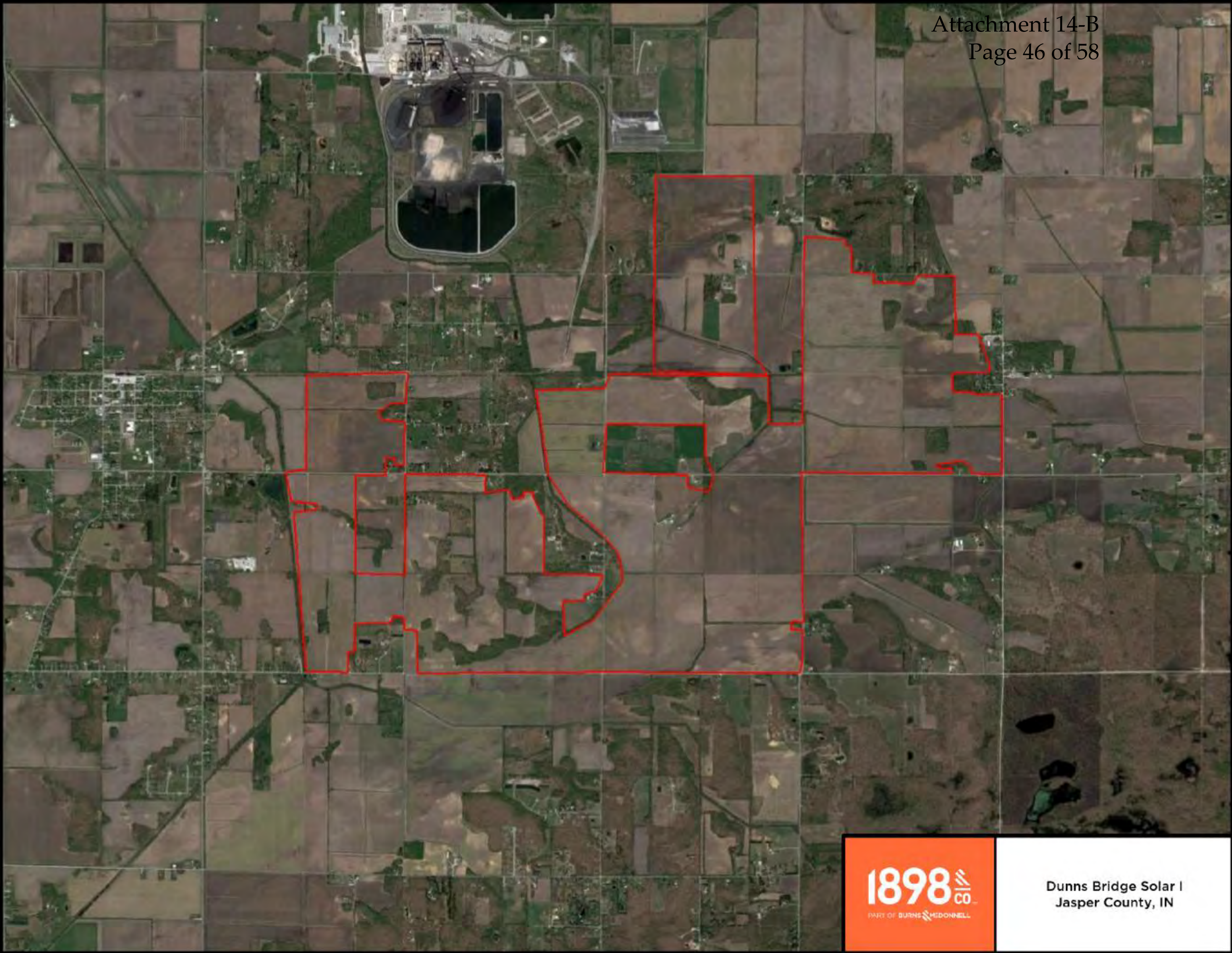
1898 & Co.
PART OF BURNS & McDONNELL

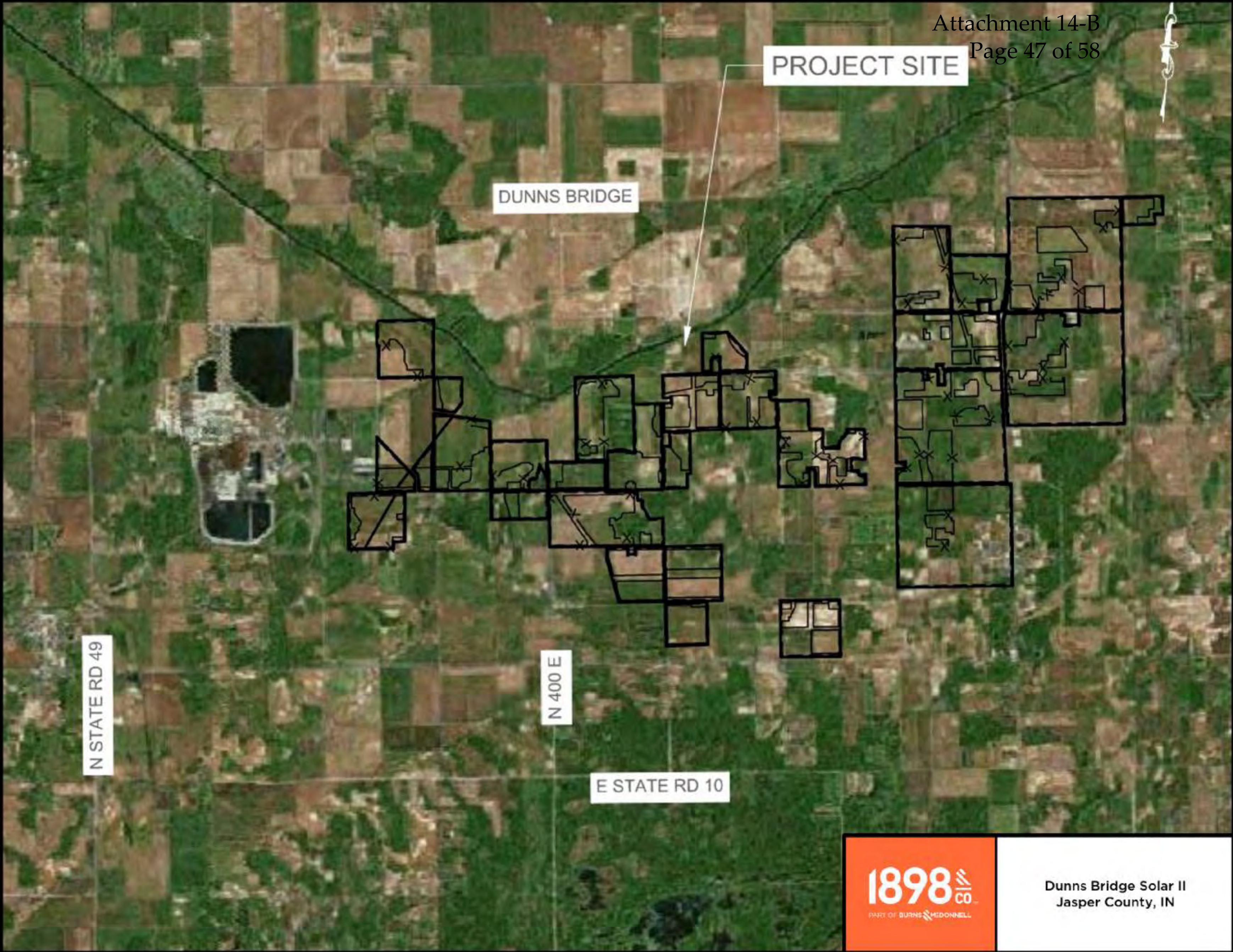
Bailly
Burns Harbor, IN

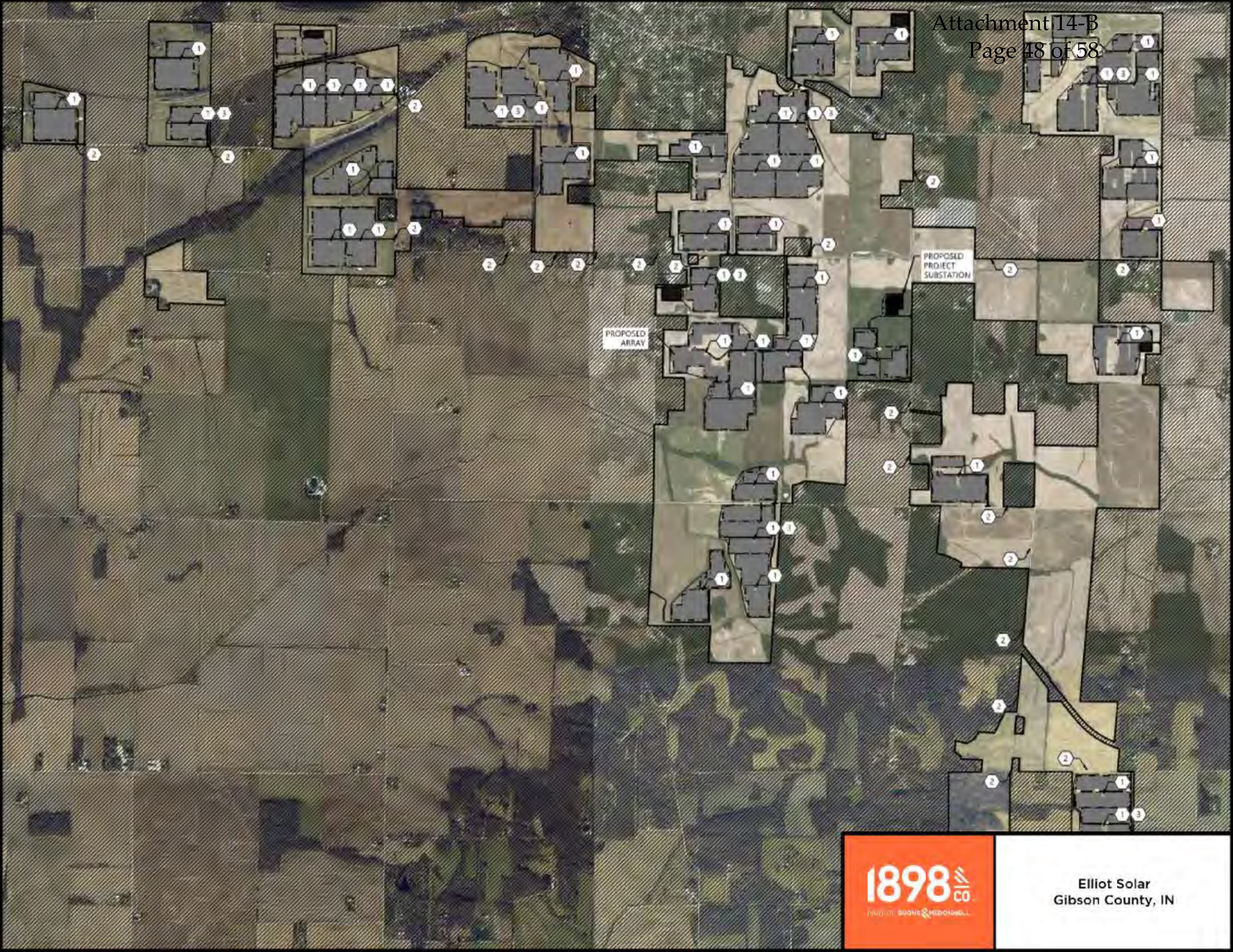


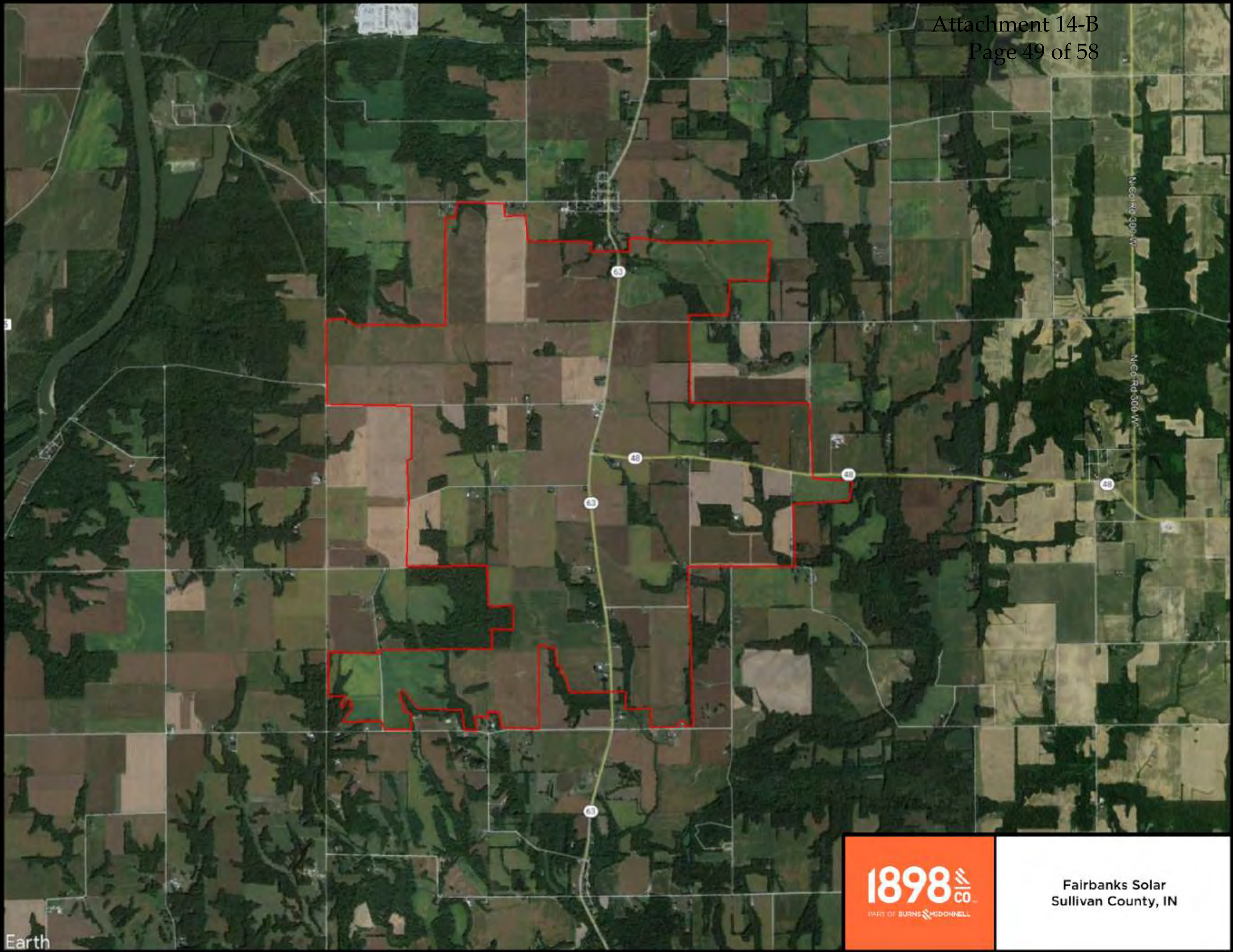
1898 & Co. Part of Burns & McDonnell

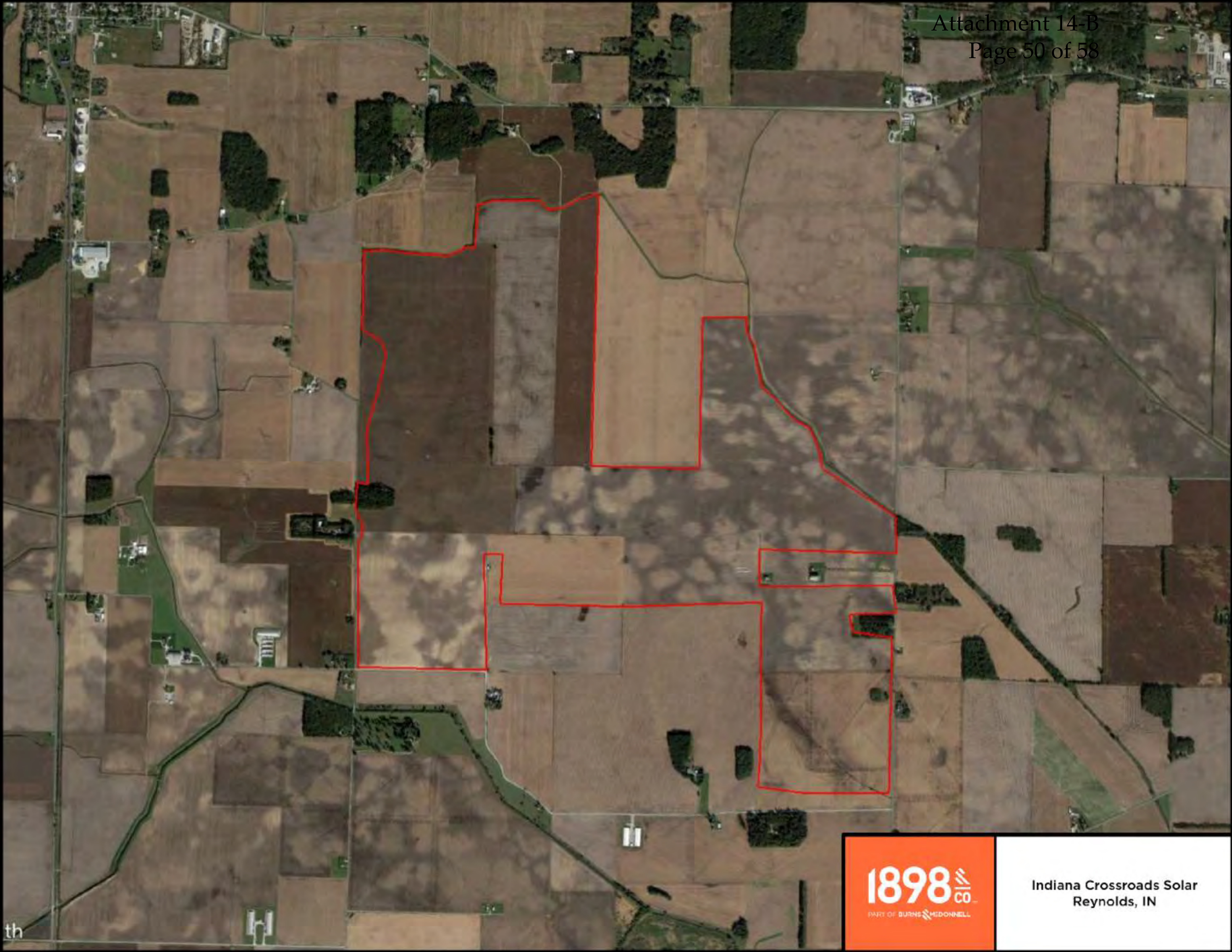
Calvary Solar
White County, IN

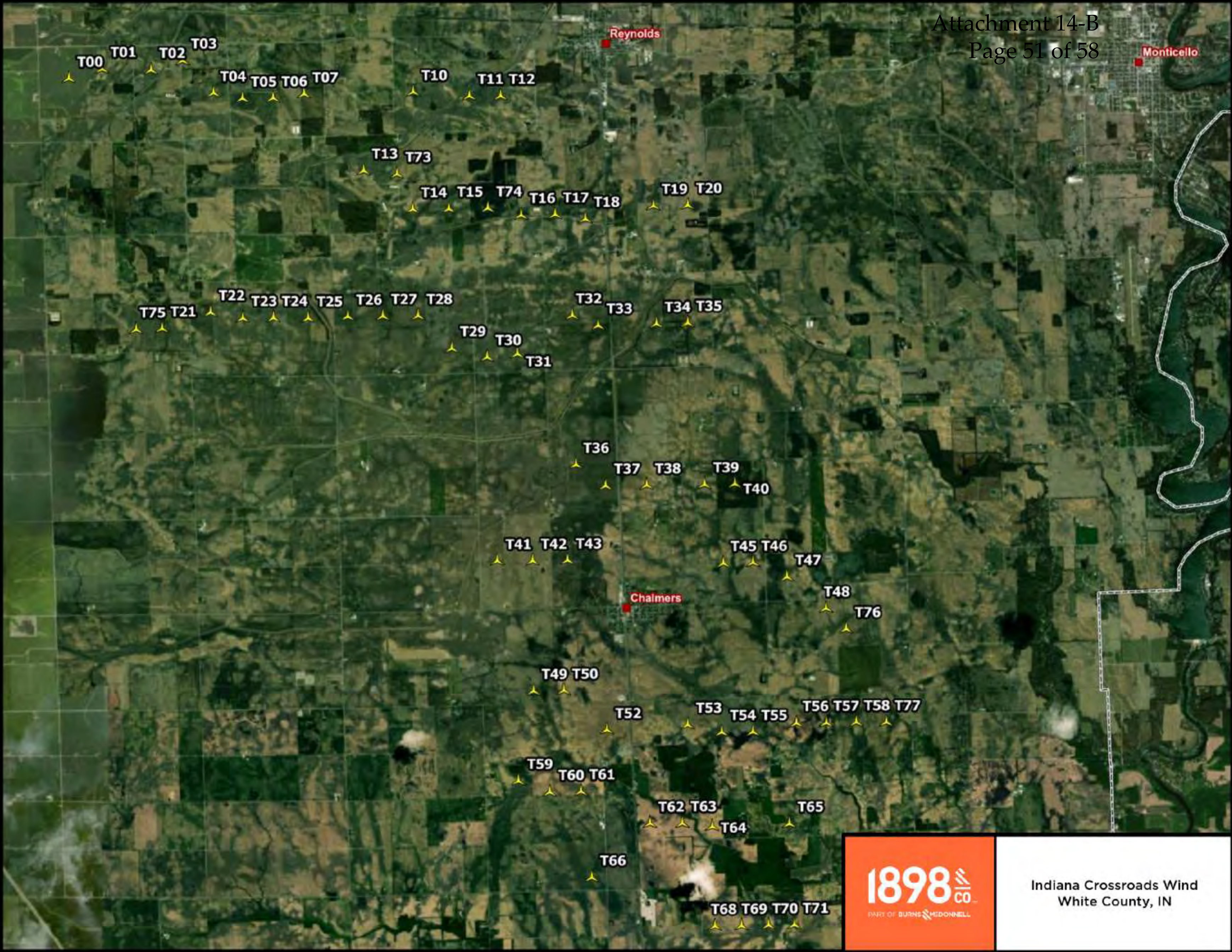

1898 & CO.
PART OF BURNS & MCDONNELL
Dunns Bridge Solar I
Jasper County, IN


PROJECT SITE
DUNNS BRIDGE
N STATE RD 49
N 400 E
E STATE RD 10
1898 & CO.
PART OF BURNS & MCDONNELL
Dunns Bridge Solar II
Jasper County, IN


PROPOSED PROJECT SUBSTATION
PROPOSED ARRAY
1898 & CO
Elliot Solar
Gibson County, IN


63
48
N Co Rd 300 W
Earth
Fairbanks Solar
Sullivan County, IN


1898 & CO.
PART OF BURNS & McDONNELL
Indiana Crossroads Solar
Reynolds, IN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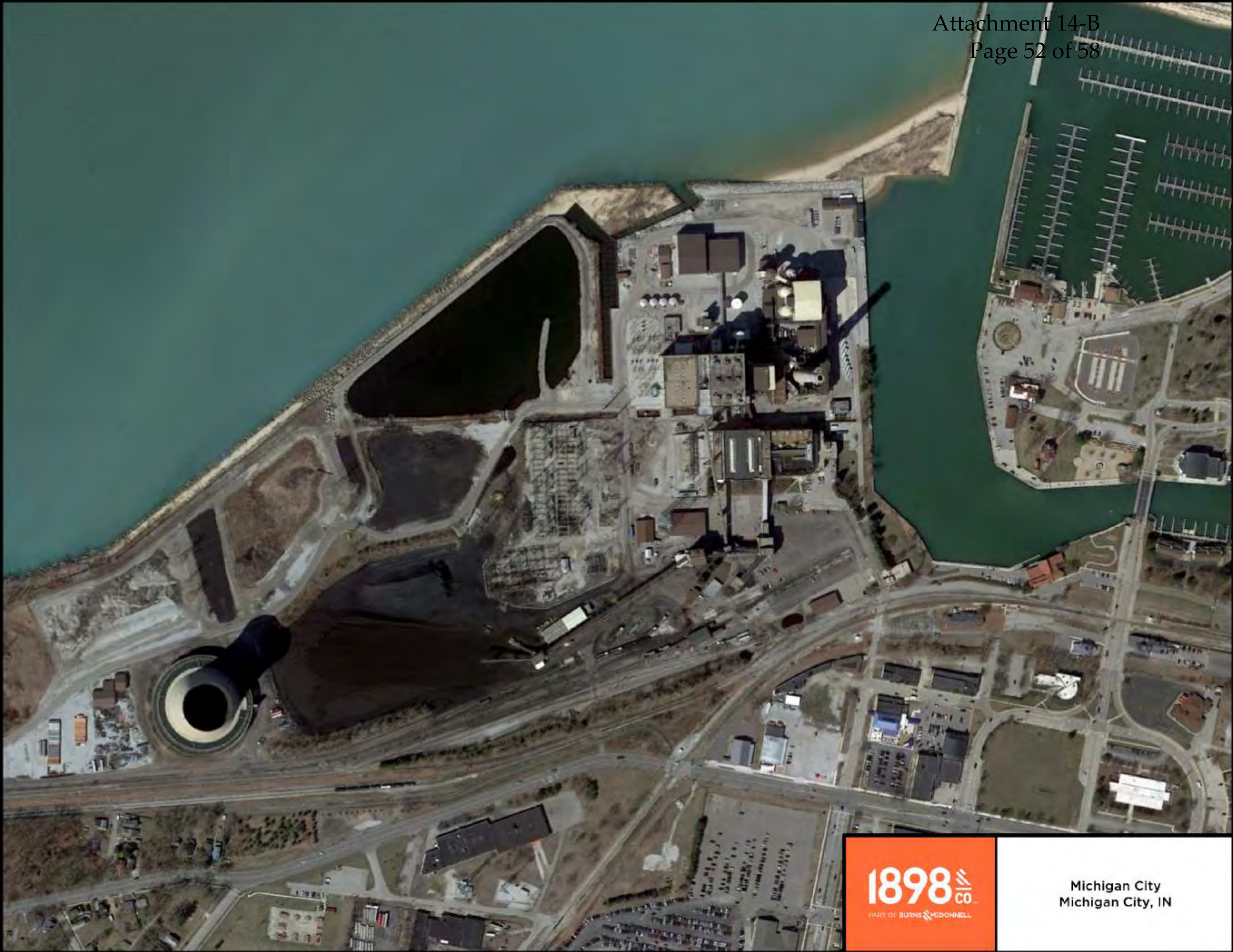
PART OF BURNS & McDONNELL
Indiana Crossroads Wind
White County, IN



1898 & Co.
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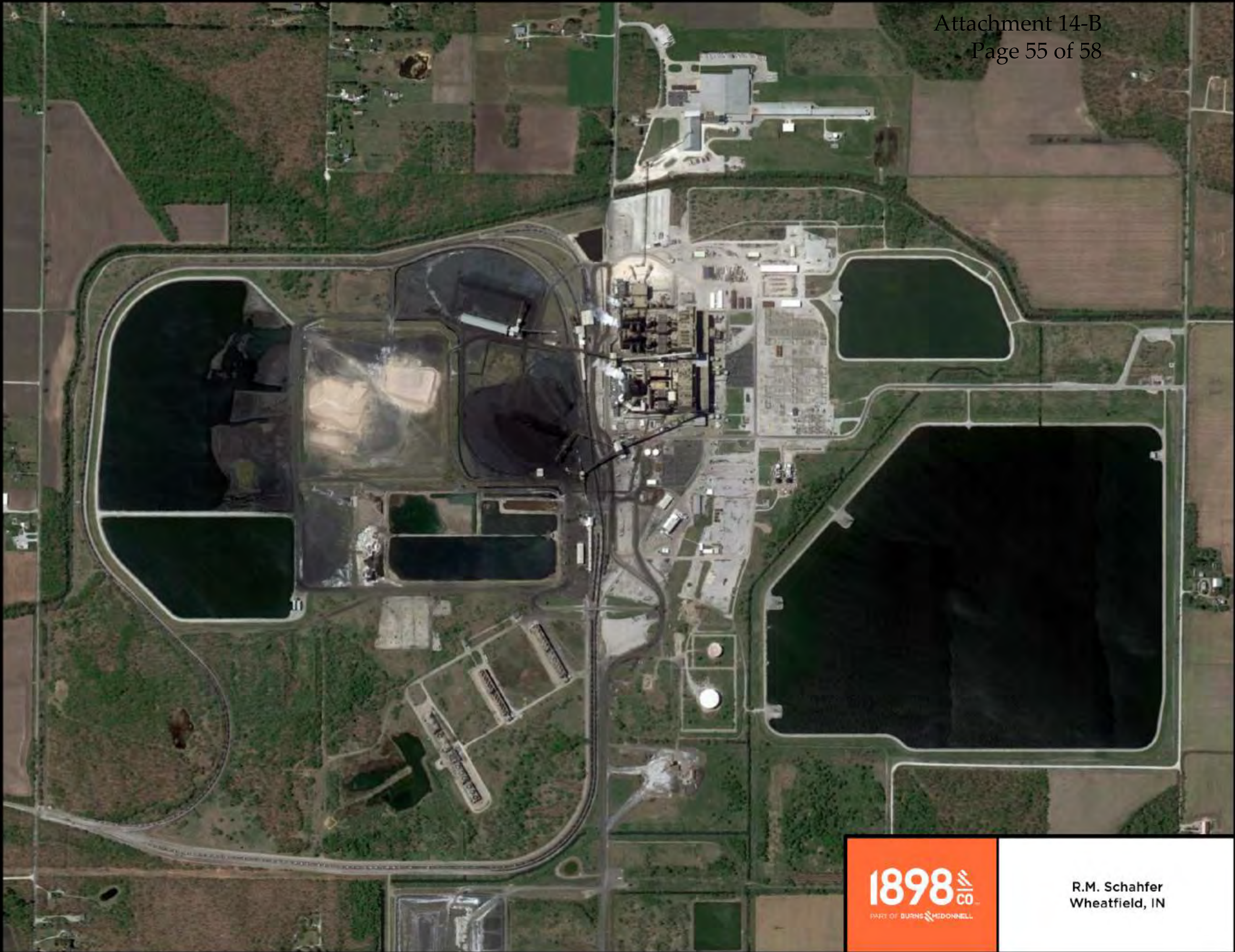
Michigan City
Michigan City, IN


Norway Hydro
White County, IN

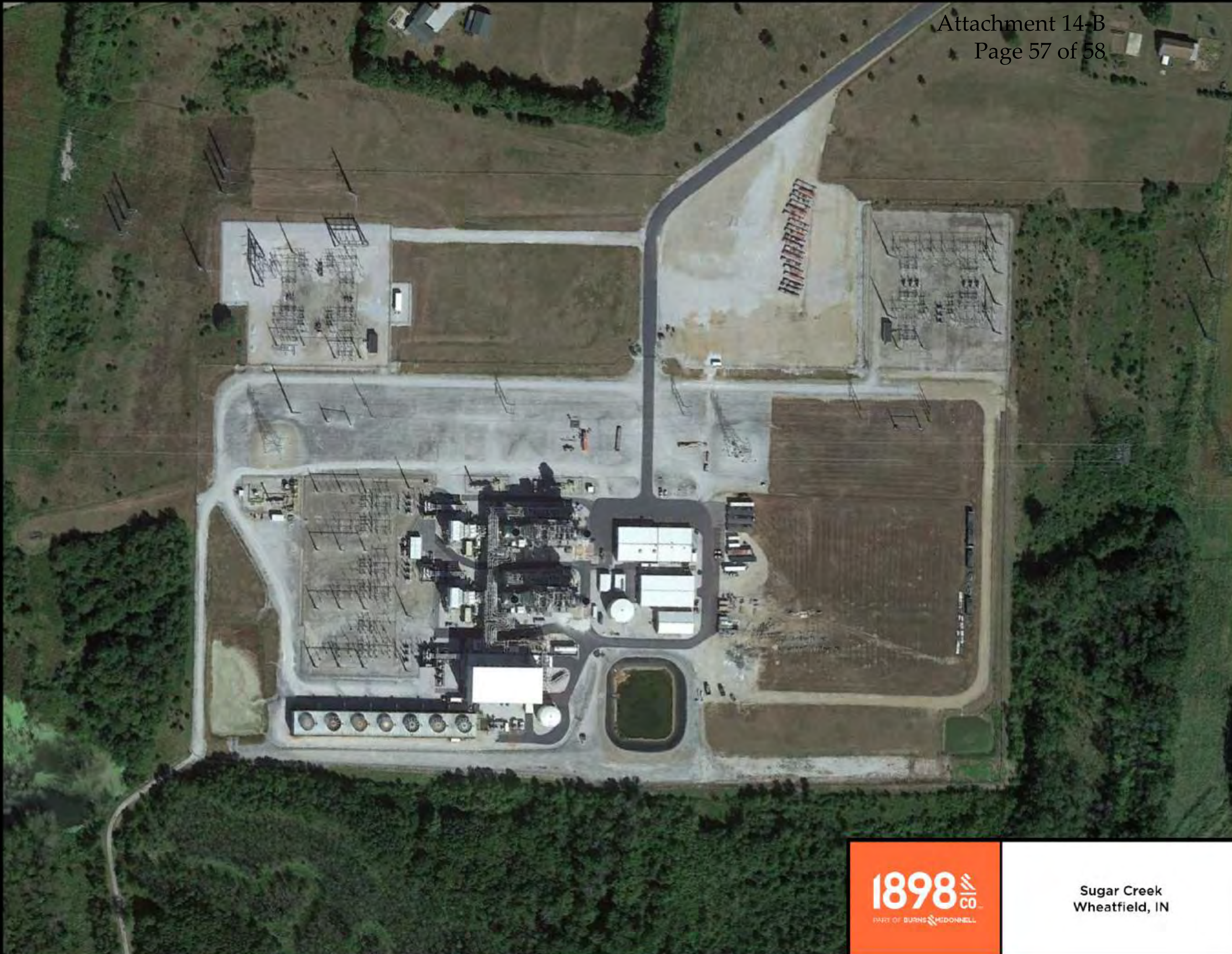
1898 & CO. PART OF BURNS & MCDONNELL

Oakdale Hydro
Carol County, IN



R.M. Schahfer
Wheatfield, IN


1898 & CO.
PART OF BURNS & McDONNELL
Rosewater Wind
White County, IN


Sugar Creek
Wheatfield, IN

9400 Ward Parkway
Kansas City, MO

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