BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

RE: IN THE MATTER OF ADVICE	**)**
LETTER NO. 1672-ELECTRIC FILED	**)**
BY PUBLIC SERVICE COMPANY OF	**)**
COLORADO TO REVISE ITS	**) PROCEEDING NO. 14AL-________E**
COLORADO PUC NO. 7-ELECTRIC	**)**
TARIFF TO IMPLEMENT A GENERAL	**)**
RATE SCHEDULE ADJUSTMENT AND	**)**
OTHER RATE CHANGES EFFECTIVE	**)**
JULY 18, 2014.	**)**

DIRECT TESTIMONY AND ATTACHMENT OF JEFFREY T. KOPP

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

June 17, 2014

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

RE: IN THE MATTER OF ADVICE LETTER NO. 1672-ELECTRIC FILED BY PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 7-ELECTRIC TARIFF TO IMPLEMENT A GENERAL RATE SCHEDULE ADJUSTMENT AND OTHER RATE CHANGES EFFECTIVE JULY 18, 2014.	**) PROCEEDING NO. 14AL-________E**

SUMMARY OF DIRECT TESTIMONY OF JEFFREY T. KOPP

Mr. Jeffrey T. Kopp is a manager in the Business Consulting Department of the Business & Technology Services Division of Burns & McDonnell Engineering Company, Inc. ("Burns & McDonnell"). Public Service Company of Colorado ("Public Service" or "Company") retained Burns & McDonnell to prepare an analysis ("Decommissioning Cost Study") estimating the decommissioning costs for the Company's fleet of power plants in Colorado. The Decommissioning Cost Study is included as Attachment No. JTK-1 to Mr. Kopp's Direct Testimony. The purpose of the Decommissioning Cost Study was to provide the Company with a recommendation regarding the total cost, in 2014 dollars, for decommissioning each unit and the common facilities at each of the Company's generating plants at the end of the useful life of each facility, net of salvage value for scrap materials at each plant. Mr. Kopp explains that Burns & McDonnell's cost estimates are inclusive of direct costs associated with decommissioning and demolishing the plant equipment and facilities and restoring the sites 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 closing any ponds and cleaning up potentially contaminated soil.

Mr. Kopp explains how the scope of Burns & McDonnell's work was determined through a request for proposal process conducted by the Company, which reflected principles agreed to between Public Service and the Staff of the Commission. Mr. Kopp explains that Burns & McDonnell prepared site-specific decommissioning cost estimates for a subset of the Company's generating plants under consideration and generic decommissioning cost estimates for the remaining plants. Generic cost estimates were developed from the site-specific evaluations based on units of the same technology with comparable power output ratings. The generic estimates took into account facility-specific attributes, such as pond areas, coal storage yard sizes, number of stacks, and asbestos quantities, as could be determined from aerial images, drawings reviews, or information provided to Burns & McDonnell by the Company. Mr. Kopp explains how Burns & McDonnell utilized the services of a demolition contractor, LVI Environmental Services, Inc. or LVI Services, Inc. (collectively, "LVI"), as a sub-consultant on the Decommissioning Cost Study, to assist with the development of the direct costs.

Mr. Kopp explains that Burns & McDonnell's cost estimates include indirect costs to be incurred by the Company during decommissioning and contingency. Indirect costs include costs such as preparing the plants for demolition and overseeing demolition activities. Burns & McDonnell also added contingency to the direct costs, to account for unknown, but likely to be incurred costs associated with decommissioning, such as actual quantity differences from estimates, differences in work conditions, and specific means and methods for how the work will be performed. Mr. Kopp further describes how scrap values were estimated.

Mr. Kopp recommends that the Colorado Public Utilities Commission ("Commission") find that the results of the Decommissioning Cost Study are reasonable and appropriate for use as the basis for the cost of removal estimates in the development of depreciation rates for Public Service's electric generating plants.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * * *

RE: IN THE MATTER OF ADVICE LETTER NO. 1672-ELECTRIC FILED BY PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 7-ELECTRIC TARIFF TO IMPLEMENT A GENERAL RATE SCHEDULE ADJUSTMENT AND OTHER RATE CHANGES EFFECTIVE JULY 18, 2014.	**) PROCEEDING NO. 14AL-________E**

DIRECT TESTIMONY AND ATTACHMENT OF JEFFREY T. KOPP

INDEX

SECTION **PAGE**

LIST OF ATTACHMENTS

Attachment No. JTK-1	Decommissioning Cost Study

GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym/Defined Term	Meaning
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
Commission Staff	Staff of the Colorado Public Utilities Commission
FAS	Financial Accounting Standard
LVI	LVI Environmental Services, Inc. and LVI Services, Inc.
MW	Megawatt
Public Service, or Company	Public Service Company of Colorado
PUC or Commission	Colorado Public Utilities Commission
RFP	Request for Proposal
Xcel Energy	Xcel Energy Inc.
XES	Xcel Energy Services Inc.

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

* * * * *

RE: IN THE MATTER OF ADVICE LETTER NO. 1672-ELECTRIC FILED BY PUBLIC SERVICE COMPANY OF COLORADO TO REVISE ITS COLORADO PUC NO. 7-ELECTRIC TARIFF TO IMPLEMENT A GENERAL RATE SCHEDULE ADJUSTMENT AND OTHER RATE CHANGES EFFECTIVE JULY 18, 2014.	**)**	**PROCEEDING NO. 14AL-________E**

DIRECT TESTIMONY AND ATTACHMENT OF JEFFREY KOPP

I. INTRODUCTION, QUALIFICATIONS, PURPOSE OF TESTIMONY, AND RECOMMENDATION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?

A. I am employed by Burns & McDonnell Engineering Company, Inc. ("Burns & McDonnell"), as a manager in the Business Consulting Department of the Business & Technology Services Division.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THE PROCEEDING?

A. I am testifying on behalf of Public Service Company of Colorado ("Public Service" or "Company"), a wholly-owned subsidiary of Xcel Energy.

Q. ARE YOU A PROFESSIONAL ENGINEER EXPERIENCED IN THE ELECTRIC UTILITY INDUSTRY?

A. Yes. As a manager in the Business Consulting Department, I oversee a team of 10 project managers who provide consulting services to clients primarily in the electric power generation and electric power transmission industries, but also to other industrial and commercial clients. The services provided by this group of project managers 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, generation resource planning, renewable power development, and other various related engineering and economic assessments.

In my role as a group manager, project manager, and project engineer, I have worked on and overseen consulting activities on coal, natural gas, wind, solar, hydroelectric, and biomass power generation facilities.

A description of my qualifications, duties and responsibilities is included as Attachment A.

Q. HAVE YOU PREVIOUSLY BEEN INVOLVED IN DECOMMISSIONING STUDIES FOR ELECTRIC GENERATING FACILITIES SUCH AS THOSE OWNED AND OPERATED BY PUBLIC SERVICE?

A. Yes. I have been involved in numerous decommissioning studies, 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. These decommissioning studies have been utilized in rate cases, have been used to estimate the liability associated with site demolition and retirement at the end of the facilities' useful lives, to satisfy Financial Accounting Standard ("FAS") 143 (accounting for asset retirement), or utilized for actual unit demolition planning.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to present and explain the analysis prepared by Burns & McDonnell to estimate the decommissioning costs for the Company's fleet of power plants in the state of Colorado, which is included as my Attachment No. JTK-1 ("Decommissioning Cost Study"). The resulting decommissioning cost estimates are summarized in Section 6.0 and detailed in Appendix A of the study.

I present the following in support of the Decommissioning Cost Study:

- I discuss the purpose of the study and what is included in the resulting cost estimate;
- I describe the generating units that we evaluated;
- I discuss how the scope of our work was developed during the request for proposal ("RFP") conducted by Public Service, and how in that process we addressed a set of principles that had been agreed to between Public Service and the Staff of the Colorado Public Utilities Commission ("PUC Staff");
- I discuss Burns & McDonnell's approach in preparing the Decommissioning Cost Study;

- I discuss how Burns & McDonnell utilized the services of a demolition contractor, LVI Environmental Services, Inc. or LVI Services, Inc. (collectively, "LVI"), as a sub-consultant on the Decommissioning Cost Study to assist with the development of the direct costs; and,
- Finally, I describe how we estimated scrap values.

Q. WHAT RECOMMENDATION ARE YOU MAKING IN YOUR TESTIMONY?

A. I recommend that the Colorado Public Utilities Commission ("Commission") find that the results of the Decommissioning Cost Study that I present are reasonable and appropriate for use as the basis for the cost of removal estimates in the development of depreciation rates for Public Service's electric generating plants.

II. DECOMMISSIONING COST STUDY METHODOLOGY

Q. PLEASE BEGIN BY GENERALLY DESCRIBING THE PURPOSE OF THE DECOMMISSIONING COST STUDY.

A. The Company retained Burns & McDonnell to provide it with a recommendation regarding the total cost, in 2014 dollars, for decommissioning each owned generation unit and the common facilities at each of its generating plants at the end of the useful life of each facility, net of salvage value for scrap materials at each plant. Our estimates are inclusive of direct costs associated with decommissioning and demolishing the plant equipment and facilities and restoring the sites 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 closing any ponds and cleaning up potentially contaminated soil.

Q. WHAT PLANTS DID BURNS & MCDONNELL EVALUATE IN THE DECOMMISSIONING COST STUDY?

A. We evaluated the Company's 22 electric generating plants in the State of Colorado, which consist of 19 coal-fired units, 11 natural gas-fired units (a combination of both combustion turbines and combined cycle units); 6 hydroelectric facilities, and 1 wind farm (the "Plants"). A complete listing of the Plants covered by the Decommissioning Cost Study is set forth in Table 1-1 of Attachment No. JTK-1. This list includes several coal-fired units that were recently retired by the Company, including Cherokee Units 1 and 2, Arapahoe Units 1 through 4, and Zuni Unit 1. It also includes three coal-fired units that the Company plans to retire within the next two years, including Cherokee Unit 3, Valmont Unit 5 and Zuni Unit 2.

Q. HOW WAS THE DECOMMISSIONING COST STUDY METHODOLOGY DEVELOPED?

A. A set of principles for performing decommissioning studies has been agreed to between the PUC Staff and Public Service. Public Service used this set of principles to develop an RFP for a decommissioning study to be prepared by an outside consultant. Burns & McDonnell responded to the RFP, using the RFP as the basis for developing the scope of work for the Decommissioning Study. During the interview portion of the RFP process, we discussed with Public Service the two different types of estimates – site-specific and generic – and the approach for preparing each type of estimate. As part of this discussion we addressed the process for preparing the decommissioning studies agreed to between PUC Staff and Public Service. This discussion served to further refine Burns & McDonnell's scope of work for the Decommissioning Cost Study.

Q. WERE THE DECOMMISSIONING COST ESTIMATES PREPARED UNDER YOUR DIRECTION?

A. Yes. I worked directly with all parties who prepared portions of the decommissioning costs, which included the demolition contractor and all Burns & McDonnell staff who supported the preparation of the cost estimates. I was involved in the development of the decommissioning assumptions and decommissioning methodology. I consolidated all portions of the estimates into a single comprehensive estimate for each facility.

Q. WHAT TYPES OF COST ESTIMATING METHODOLOGIES WERE UTILIZED IN DEVELOPING THE COSTS PRESENTED IN THE STUDY?

A. Site-specific cost estimates were developed, with the assistance of a demolition contractor, LVI, for a subset of the units under consideration in the Decommissioning Cost Study. Generic cost estimates were developed for the remaining units under consideration. The list of units for which site-specific cost estimates were prepared, as well as for which units generic cost estimates were prepared, is set forth in Table 1-1 of Attachment No. JTK-1.

Q. WHY WAS A DEMOLITION CONTRACTOR RETAINED AS A SUB-CONSULTANT ON THE STUDY?

A. The intent of the Decommissioning Cost Study was to develop an estimate of the costs anticipated to be incurred by the Company when the units are decommissioned. At that time, the Company will solicit bids from demolition contractors for many of the decommissioning activities required. In order to more accurately estimate the costs for activities that the demolition contractors will perform, a demolition contractor was retained to provide estimate inputs for these portions of the decommissioning study costs. Burns & McDonnell worked with a demolition contractor, LVI, as a sub-consultant on the Decommissioning Cost Study, to assist with the development of the direct costs for the site-specific estimates. LVI is the number 1 ranked abatement contractor in the United States and the number-1 ranked demolition contractor in the United States, according to the most recent data published in the Engineering News Record. LVI has been in business for 27 years, with offices in 32 locations, and has an annual revenue of approximately $400 million. LVI has completed over 61,000 abatement and demolition projects on various types of facilities, including many industrial and power generating facilities similar to those of Public Service included in the Decommissioning Cost Study.

Q. PLEASE EXPLAIN HOW SITE-SPECIFIC COST ESTIMATES WERE DEVELOPED.

A. Site-specific 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 then applying unit pricing to the quantities. Burns & McDonnell worked with LVI to develop cost estimates for a comprehensive list of the plant decommissioning tasks required at each facility where a site-specific cost estimate was developed. These estimates include labor hours, equipment rental, disposal fees, and scrap quantities for each task based on site visits, drawing reviews, and information provided by Public Service. The drawings used to develop the estimated quantities were provided by Public Service and included the original design documents to the extent that they were available, as well as drawings showing any modifications to on-site equipment that would impact the scope of demolition activities. These drawings included site layouts of the entire generating facility showing all equipment installed at each generating station, along with the balance of plant facilities, including ponds, landfills or other site features that would need to be addressed as part of the decommissioning process. Additionally, drawings showing the general arrangement of equipment and site elevation were reviewed to obtain further details on the type and size of the equipment and facilities at each generating station. The original construction design manuals were provided as well, which included quantities of materials for construction of the facilities. The combination of the drawings, design manuals, and site visit information facilitated development of a comprehensive set of decommissioning activities and quantities by Burns & McDonnell and the demolition contractor.

Drawings were reviewed to develop estimated quantities of labor hours for dismantlement, equipment necessary for demolition activities, debris for disposal, concrete crushed to meet a material specification for on-site reuse, and scrap. Current market prices for labor, equipment, and disposal were then applied to these quantities to develop direct costs for decommissioning activities. Additionally, unit pricing for scrap values was applied to the scrap quantities to determine anticipated salvage values, which were subtracted from the direct costs for demolition in order to arrive at a total net project costs.

Q. HOW WERE THE VALUES PROVIDED BY THE DEMOLITION CONTRACTOR RELIED UPON?

A. Burns & McDonnell reviewed the estimated costs provided by the demolition contractor to assess their reasonableness and made modifications where appropriate based on additional factors. Burns & McDonnell has prepared numerous decommissioning studies for various clients considering different technologies in several different states. In addition, Burns & McDonnell has provided services to clients on decommissioning project execution that has included review and evaluation of bids from demolition contractors. This experience preparing decommissioning estimates as well as reviewing demolition contractor bids was relied upon to determine the reasonableness of the costs provided by LVI.

Q. DID THE DEMOLITION CONTRACTOR PROVIDE ALL OF THE COSTS INCLUDED IN THE DECOMMISSIONING ESTIMATES?

A. No. The decommissioning contractor only provided cost inputs for the portions of the decommissioning costs that would be within their scope of work, if they were to bid on the decommissioning project in the future. This scope of work includes asbestos remediation, structural demolition, crushing of concrete for on-site reuse, and salvage of scrap metal.

Q. HOW WERE THE SITE-SPECIFIC COST INPUTS DEVELOPED THAT WERE NOT PROVIDED BY THE DEMOLITION CONTRACTOR?

A. All other cost inputs were developed by Burns & McDonnell. These included hazardous material remediation other than asbestos, pond closure costs, project indirect costs, and contingency The methodology for developing these cost items was similar to the approach followed by the demolition contractor. Drawings were reviewed to develop estimated quantities of labor hours for dismantlement, equipment necessary for demolition activities, debris for disposal, concrete crushed to meet a material specification for on-site reuse, and scrap. Current market prices for labor, equipment, and disposal were then applied to these quantities to develop direct costs for decommissioning activities.

Q. DID YOU VISIT EACH OF THE SITES FOR WHICH SITE SPECIFIC COST ESTIMATES WERE DEVELOPED?

A. Yes. I visited all sites for which site specific decommissioning cost estimates were prepared, along with the demolition contractor, other individuals from Burns & McDonnell, and representatives from the Company.

Q. PLEASE EXPLAIN HOW GENERIC COST ESTIMATES WERE DEVELOPED.

A. For a subset of the coal and natural gas fired assets, generic estimates were developed according to a “top-down” cost estimating approach, where a cost estimate for a facility of similar type and size is used as a starting point and adjusted to account for differences between the base estimate and the plant being evaluated. The first step in developing the generic estimates was to develop cost estimates for several types of site categories on a cost-per-megawatt basis from a site-specific estimate for a facility with a comparable power output rating. Categories evaluated in this manner included asbestos removal, equipment and building dismantlement, hazardous waste disposal, and scrap quantity estimation. For units which were not close in size to any site-specific estimates to be compared on a direct cost-per-MW basis, an adjustment was made to the costs in these categories to account for the difference in physical size of plant being estimated relative to the base estimate, rather than simply the difference in MW rating, since demolition costs will be determined by the physical size of the equipment and structures to be demolished.

Q. PLEASE EXPLAIN WHAT STEPS WERE TAKEN TO ENHANCE THE ACCURACY OF THESE GENERIC COST ESTIMATES.

A. Adjustments were applied to the generic costs to account for other known differences, such as the number of stacks, coal handling equipment, cooling towers, and balance of plant buildings, based on site-specific costs available for each of these categories from site-specific estimates. For example, cooling tower demolition costs were estimated on a per-megawatt of steam turbine size, since the physical size of the cooling tower will be directly proportional to the heat rejection load from the steam turbine. Lastly, pond closures, coal pile restoration, landfill closure, and seeding costs were evaluated according to individual acreages of each of these items at each plant, as determined from aerial photos or site drawings.

Q. PLEASE EXPLAIN HOW GENERIC COST ESTIMATES WERE DEVELOPED FOR THE HYDROELECTRIC PLANTS.

A. Generic estimates were developed for the hydroelectric units as well, even though site-specific estimates were not available to use as a basis for developing these costs. Additionally, the physical size of powerhouses, penstock lengths, dams, and other hydro-electric equipment is not easily relatable to MW rating of these facilities, making it difficult to develop generic costs in a similar manner to that used for the fossil-fuel based facilities. Therefore, a different approach was developed to determine generic hydro-electric decommissioning costs. Unit pricing was developed for a set of key categories including asbestos abatement, powerhouse demolition, equipment removal, penstock removal and/or filling and dam removal. The unit pricing for each of these categories was based on costs from the Means Heavy Construction Cost Data Handbook or Burns & McDonnell experience with similar projects. These costs were then applied to each hydro-electric plant based on assumed asbestos quantities, number of buildings to be demolished, generating equipment to be removed, above grade penstock to be removed, below grade penstock to be capped or filled, and dam removal, if applicable. Finally scrap quantities were estimated based on equipment sizes and scrap values applied to determine salvage values and net decommissioning costs.

III. PROJECT INDIRECT AND CONTINGENCY COSTS

Q. WHAT IS INCLUDED IN THE PROJECT INDIRECT COSTS?

A. This category includes costs expected to be incurred by Public Service during the decommissioning process, which would be in addition to the direct costs paid to a demolition contractor. This includes the costs for staff of Public Service and its service company affiliate, Xcel Energy Services Inc. ("XES"), to perform decommissioning activities prior to demolition, such as removing coal from feeders, conveyors, bunkers, and mills; water washing equipment to remove remaining fines; vacuum cleaning ash hoppers, duct work, boiler, Air Quality Control System, air heaters, etc. Also included in this category are costs associated with Public Service and XES staff providing oversight during demolition activities, inspections, and testing to confirm that remediation has been completed, as well as Public Service and XES overheads, general and administrative costs.

Q. HOW WERE THE INDIRECT COSTS DETERMINED?

A. Indirect costs were determined as a percentage of the direct costs, as is a typical approach when preparing these types of cost estimates. The percentage of direct costs that was applied to determine the indirect costs was developed by Burns & McDonnell based on input from the Company regarding their approach to managing the execution of the decommissioning projects.

Q. WHAT IS INCLUDED IN THE CONTINGENCY COSTS?

A. This category includes costs reasonably expected to be incurred by Public Service during the execution of decommissioning and demolition activities. For decommissioning projects, there is uncertainty associated with work conditions and how the work will be performed. There is also uncertainty associated with quantities for dismantlement of facilities, due to the age and limits on drawings available, and the absence of testing results for environmental contamination prior to preparation of these types of studies. This category accounts for these potential costs and are in addition to the direct costs associated with the base decommissioning bids from the demolition and remediation contractors.

Q. HOW WERE THE CONTINGENCY COSTS DETERMINED?

A. Contingency costs were determined as 20 percent of the direct costs. This is a typical approach when preparing these types of cost estimates. The percentage was based on similar decommissioning costs prepared for other facilities, including other regulatory filings.

IV. SCRAP

Q. HOW WERE SCRAP VALUES CALCULATED?

A. Scrap metal prices used in the development of the scrap credit were based on a review of current pricing trends for various types of materials published by American Metal Market, which is an industry standard publication and information subscription service (see http://www.amm.com) that reports the prices paid for scrap metals in transactions worldwide. Demolition contractors routinely rely on the values published by American Metal Market to develop the price they are willing to credit a demolition project for scrap metals, since this publication provides information regarding the price that the demolition contractors can expect to receive when they resell the scrap metals to a scrap metal broker or scrap metal processor. American Metal Market 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. American Metal Market has extensive experience in reporting scrap prices in a wide range of grades and locations. American Metal Market has been reporting on the U.S. scrap market for more than 100 years, providing benchmark prices to users in the scrap metal industry. American Metal Market develops index prices based on actual transactions, which are reported by market participants conducting scrap metal trades.

Table 5-1 at page 5-18 of the Study shows the scrap metal prices used. The market value for each scrap metal was adjusted to account for transportation costs, in order to determine the net value of the scrap material.

For example, the net scrap value of steel is included at $275 per gross-ton and the net scrap value of copper is included at $2.75 per pound, including a deduction for transportation.

V. DECOMMISSIONING COST STUDY RESULTS

Q. WHAT ARE THE TOTAL COST ESTIMATES FOR DECOMMISSIONING AND DISMANTLING PUBLIC SERVICE'S PRODUCTION PLANTS RESULTING FROM THE DECOMMISSIONING COST STUDY?

A. The resulting decommissioning cost estimates, including the credits for scrap materials, are summarized in Tables 6.1 and 6.2 in Section 6.0 and detailed in Appendix A, Appendix B, Appendix C, and Appendix D of the study. Those tables are reproduced below:

Table 6-1: Site-Specific Decommissioning Cost Summary

Asset	Fuel Type	Decommissioning Costs	Credits	Net Project Cost
Arapahoe	Coal	$ 38,493,000	$ (3,712,000)	$ 34,781,000
Cherokee	Coal	$ 56,390,000	$ (7,802,000)	$ 48,588,000
Fort Lupton	Natural Gas	$ 1,466,000	$ (251,000)	$ 1,215,000
Fort St. Vrain	Natural Gas	$ 30,044,000	$ (5,543,000)	$ 24,501,000
Ponnequin	Wind	$ 1,908,000	$ (1,190,000)	$ 718,000
Valmont Coal	Coal	$ 34,622,000	$ (3,992,000)	$ 30,630,000
Valmont Gas	Natural Gas	$ 189,000	$ (77,000)	$ 112,000
Zuni	Coal/Natural Gas	$ 24,512,000	$ (2,636,000)	$ 21,876,000

Table 6-2: Generic Site Decommissioning Cost Summary

Asset	Fuel Type	Decommissioning Costs	Credits	Net Project Cost
Comanche	Coal	$ 83,304,000	$ (16,842,000)	$ 66,462,000
Craig	Coal	$ 95,098,000	$ (11,190,000)	$ 83,908,000
Hayden	Coal	$ 53,101,000	$ (5,812,000)	$ 47,289,000
Pawnee	Coal	$ 76,824,000	$ (5,811,000)	$ 71,013,000
Alamosa	Natural Gas	$ 560,000	$ (52,000)	$ 508,000
Blue Spruce	Natural Gas	$ 6,006,000	$ (1,164,000)	$ 4,842,000
Cherokee CC	Natural Gas	$ 10,603,000	$ (2,138,000)	$ 8,465,000
Fruita	Natural Gas	$ 450,000	$ (29,000)	$ 421,000
Rocky Mtn. CC	Natural Gas	$ 17,058,000	$ (2,254,000)	$ 14,804,000
Ames	Hydro	$ 2,127,000	$ (161,000)	$ 1,966,000
Cabin Creek	Hydro	$ 27,016,000	$ (2,590,000)	$ 24,426,000
Georgetown	Hydro	$ 3,259,000	$ (54,000)	$ 3,205,000
Salida	Hydro	$ 4,049,000	$ (63,000)	$ 3,986,000
Shoshone	Hydro	$ 1,742,000	$ (435,000)	$ 1,307,000
Tacoma	Hydro	$ 7,532,000	$ (326,000)	$ 7,206,000
TOTAL DECOMMISSIONING COST (All sites)				**$ 502,229,000**

Q. ARE THESE ESTIMATED COSTS REASONABLY REFLECTIVE OF THE ACTUAL COSTS NECESSARY TO DISMANTLE THE COMPANY PLANTS?

A. Yes.

Q. ARE THESE ESTIMATED COSTS APPROPRIATE FOR USE IN THE DEVELOPMENT OF DEPRECIATION RATES FOR PUBLIC SERVICE'S ELECTRIC GENERATING PLANTS?

A. Yes.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Attachment A

Statement of Qualifications

Jeffrey T. Kopp

Mr. Kopp is a manager in the Business Consulting Department of Burns & McDonnell's Business & Technology Services Division specializing in development of energy projects including energy facility siting, power plant decommissioning estimates, feasibility studies, pro forma analysis, project development services, due diligence reviews and preliminary engineering design.

Expertise:

Plant Decommissioning Estimates, Due Diligence Evaluations, Feasibility Studies, Pro forma Analysis, Site Layouts, Siting Assessments, Site Evaluations, Preliminary Engineering Design.

Education:

B.S. in Civil Engineering, University of Missouri-Rolla, 1999
MBA, University of Kansas, 2004

Registration:

Professional Engineer, Missouri

Decommissioning Project Experience:

Plant Decommissioning Cost Evaluation, Confidential Client
Ohio River Valley, 2012
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning cost evaluation for two coal-fired power generating facilities in the Ohio River Valley. The evaluation was performed to determine the costs to demolish the units and restore the sites. The evaluation was performed to support regulatory filings regarding the facilities.

Plant Decommissioning Cost Evaluation, Progress Energy Carolinas
North Carolina & South Carolina, 2011
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning cost evaluation for all the fossil fuel-fired power generating facilities owned by Progress Energy in the states of North Carolina and South Carolina. The evaluation was performed to determine the costs to demolish the units and restore the sites. The facilities evaluated included coal-fired facilities, natural gas and fuel oil fired combustion turbines, and natural gas and fuel oil fired combined cycle generating facilities.

Plant Decommissioning Cost Evaluation, Minnesota Power
Minnesota, 2011
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning cost evaluation for three coal fired generating facilities and a biomass fired generating facility owned by Minnesota Power. The study was prepared to support planning activities by the client. The evaluation was performed to determine the costs to demolish the units and restore the sites.

Plant Decommissioning Cost Evaluation, Tampa Electric Company
Florida, 2011
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning cost evaluation for all the fossil fuel-fired power generating facilities owned by Tampa Electric Company in the state of Florida. The evaluation is being performed to determine the costs to demolish the units and restore the sites. The facilities being evaluated include coal-fired facilities, natural gas and fuel oil fired combustion turbines, and natural gas and fuel oil fired combined cycle generating facilities. Subsequent to the study, Mr. Kopp provided testimony in Tampa Electric's rate case in regards to the study findings.

Plant Decommissioning Evaluation, Electric Energy Inc
Illinois, 2011
Mr. Kopp served as the project manager for the update of a power plant decommissioning evaluation to help determine the cost to retire a 600 MW coal-fired project in Illinois at the end of its useful life. The originally study that served as the basis of the update was prepared by Burns & McDonnell and Mr. Kopp assisted on the preparation of the original study. The study was prepared to support planning activities by the client. Estimates for demolition and site restoration were included in the evaluation.

Plant Decommissioning Cost Evaluation, Minnesota Power
Minnesota, 2009
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning cost evaluation for two coal fired generating facilities owned by Minnesota Power. The study was prepared to support planning activities by the client. The evaluation was performed to determine the costs to demolish the units and restore the sites.

Plant Decommissioning Cost Evaluation, Progress Energy Florida
Florida, 2008-2009
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning 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 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, Mr. Kopp provided direct testimony in Progress Energy Florida's rate case in regards to the study findings.

Plant Decommissioning Cost Evaluation, Northern Indiana Public Service Co.
Indiana, 2008
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning 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.

Plant Decommissioning Evaluation, Old Dominion Electric Cooperative
Maryland/Virginia, 2008
Mr. Kopp served as the Burns & McDonnell project manager on several power plant decommissioning evaluations to help determine the cost to retire the facilities at the end of their useful life. The evaluation was performed to satisfy FAS 143 accounting standards and included simple cycle plants utilizing General Electric 7FA turbines and Caterpillar Diesel Gensets. Estimates for demolition and site restoration were included.

Plant Decommissioning Cost Evaluations, Horizon Wind Energy
Midwest, 2008-2010
Mr. Kopp served as the Burns & McDonnell project manager on multiple power plant decommissioning cost evaluations for several proposed wind energy facilities under development by Horizon Wind Energy. The evaluations were performed to support regulatory requirements for development of the facilities.

Plant Decommissioning Evaluation, CPS Energy
Texas, 2008
Mr. Kopp provided decommissioning cost estimates for two power plants owned by CPS Energy as part of a resource planning study. The evaluations were performed to support CPS Energy's planning activities for the plants. The estimates included natural gas fired boiler plants. Estimates for demolition and site restoration were included.

Plant Decommissioning Cost Evaluation, Tyr Energy
Various U.S. Locations, 2007
Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning cost evaluation for several generating facilities owned by Tyr Energy. The evaluation was performed to satisfy FAS 143 accounting standards and included a simple cycle and combined cycle generating facilities.

Plant Decommissioning Evaluation, Brazos Electric Cooperative

Texas, 2008

Mr. Kopp provided decommissioning cost estimates for two natural gas fired boiler power plants. The evaluations were performed to support Brazos's planning activities for the plants. Estimates for demolition and site restoration were included.

Decommissioning Study and Management, Western Farmers Electric Cooperative

Oklahoma, 2004

Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning evaluation to determine the approximate cost to retire the facilities. Subsequent to the study, Mr. Kopp prepared demolition contract documents, evaluated bids from demolition contractors, and provided support to the client throughout the execution of demolition activities. The evaluation included a duel fuel genset site.

Plant Decommissioning Evaluation, Sempra Energy

Arizona, 2003

Mr. Kopp provided a power plant decommissioning 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.

Plant Decommissioning Evaluation, Panda Energy

North Carolina, 2003

Mr. Kopp served as the Burns & McDonnell project manager on a power plant decommissioning evaluation to help determine the cost to retire the Panda-Rosemary Project at the end of its useful life. The evaluation was performed to satisfy FAS 143 accounting standards and included a combined cycle cogeneration facility in Roanoke Rapids, North Carolina. Estimates for demolition and site restoration were included in the evaluation.

Plant Decommissioning Evaluation, Peoples Energy Resources Corporation

Oregon, 2002

Mr. Kopp provided a power plant decommissioning evaluation to help determine the cost to retire a proposed combined cycle facility at the end of its useful life. The evaluation was performed to satisfy regulatory requirements associated and included estimates for demolition and site restoration.

Report on the

Decommissioning Cost Study

Xcel Energy
PUBLIC SERVICE COMPANY

Project No. 76018

May 2014

Decommissioning Cost Study

prepared for

Public Service Company of Colorado

May 2014

Project No. 76018

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

TABLE OF CONTENTS

Page No.

LIST OF TABLES

Page No.

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Burns & McDonnell Engineering Co., Inc. (Burns & McDonnell) was retained by Public Service Company of Colorado (Xcel Energy) to conduct a Decommissioning Cost Study (Study) for power generation assets (Assets) located at Xcel Energy plants (Plants) in Colorado. The purpose of the Study was to review the facilities and to make a recommendation to Xcel Energy regarding the total cost (in 2014 dollars) to decommission the facilities at the end of their useful lives.

Burns & McDonnell prepared site-specific decommissioning cost estimates for a subset of the Plants under consideration and generic decommissioning cost estimates for the remaining Plants as defined in the scope of work for the Study. The type of estimate prepared, site-specific or generic, as well as technology type of each Plant, is indicated in Table 1-1, later duplicated in this Study as Table 2-1. For site-specific cost estimates, Burns & McDonnell worked with LVI Environmental Services (LVI), a demolition contractor serving as a sub-consultant to Burns & McDonnell on the Study, to develop a cost estimate for a comprehensive list of the plant decommissioning tasks required at each facility where a site-specific cost estimate was developed. These estimates included labor hours, equipment rental, disposal fees, and scrap quantities for each task. Current market pricing for labor rates and unit pricing was then developed for each task and these rates applied to the quantities for each task at each facility to determine the total cost of decommissioning each plant. Generic cost estimates were developed based on units of the same technology from the site-specific evaluations with a comparable power output rating. The generic estimates take into account facility-specific attributes such as pond areas, coal storage yard sizes, and number of stacks, and asbestos quantities, as could be determined from aerial images, drawings reviews, or information provided to Burns & McDonnell by Xcel Energy. The Assets evaluated include a total of 22 Plants, consisting of 19 coal-fired units; 11 natural gas-fired units (a combination of both combustion turbines and combined cycle units); 6 hydroelectric facilities; and 1 wind farm. Individuals from Burns & McDonnell visited each of the Plants receiving site-specific cost evaluations in November of 2013, along with representatives from Xcel Energy and LVI, in order to review site facilities, layout, and equipment, and to discuss pertinent issues with plant staff.

Table 1-1: Facility Cost Estimate Method

	Plant/Unit	Install Year	MW Rating	Fuel Type	Site Specific Estimate	Generic Cost Estimate
Steam Production	Arapahoe Unit 1	1950	45	Coal	✓	
	Arapahoe Unit 2	1951	45	Coal	✓	
	Arapahoe Unit 3	1951	45	Coal	✓	
	Arapahoe Unit 4	1955	111	Coal	✓	
	Cherokee Unit 1	1957	107	Coal	✓	
	Cherokee Unit 2	1959	107	Coal	✓	
	Cherokee Unit 2 Condenser	2012	N/A	N/A	✓	
	Cherokee Unit 3	1962	151	Coal	✓	
	Cherokee Unit 4	1968	330	Coal	✓	
	Comanche Unit 1	1973	330	Coal		✓
	Comanche Unit 2	1975	330	Coal		✓
	Comanche Unit 3	2010	828	Coal		✓
	Craig Unit 1	1980	428	Coal		✓
	Craig Unit 2	1979	428	Coal		✓
	Hayden Unit 1	1965	184	Coal		✓
	Hayden Unit 2	1976	262	Coal		✓
	Pawnee Unit 1	1981	505	Coal		✓
	Valmont Unit 5	1964	186	Coal	✓	
	Zuni Unit 1	1948	39	Coal	✓	
	Zuni Unit 2	1953	68	Coal	✓	
Hydraulic Production	Ames	1906	3.6	Hydro		✓
	Cabin Creek	1967	324	Hydro		✓
	Georgetown	1939	1.2	Hydro		✓
	Salida	1929	1.4	Hydro		✓
	Shoshone	1908	15	Hydro		✓
	Tacoma	1949	8.5	Hydro		✓
Other Production	Fruita CT	1973	18.7	Gas		✓
	Ft. Lupton CT	1975	78.4	Gas	✓	
	Alamosa CT	1973	33.2	Gas		✓
	Blue Spruce CT 1	2003	155	Gas		✓
	Blue Spruce CT 2	2003	155	Gas		✓
	Cherokee 5,6,7 CC 2 x 1	2015	569	Gas		✓
	Fort St. Vrain ST 1	1973	300	Gas	✓	
	Fort St. Vrain 1,2,3,4 CC 3 x 1	Var.	665	Gas	✓	
	Rocky Mountain 1,2,3 CT 2 x 1	2004	600	Gas		✓
	Valmont CT	1973	45.2	Gas	✓	
	Ponnequin Wind Farm	1999	30	Wind	✓	

1.2 Results

Burns & McDonnell has prepared estimates in current dollars (2014$) for the decommissioning of the Assets. These costs are summarized in Table 1-2 and

Table 1-3, which are later duplicated in this report as Table 6-1 and Table 6-2. When Xcel Energy determines that the Assets should be removed, the above grade equipment and steel structures are assumed to have sufficient scrap value to a salvage contractor to offset a portion of the decommissioning costs. Xcel Energy will incur costs in the demolition and restoration of the sites less the salvage value of equipment and bulk steel.

Table 1-2: Site-Specific Decommissioning Cost Summary

Asset	Fuel Type	Decommissioning Costs	Credits	Net Project Cost
Arapahoe	Coal	$ 38,493,000	$ (3,712,000)	$ 34,781,000
Cherokee	Coal	$ 56,390,000	$ (7,802,000)	$ 48,588,000
Fort Lupton	Natural Gas	$ 1,466,000	$ (251,000)	$ 1,215,000
Fort St. Vrain	Natural Gas	$ 30,044,000	$ (5,543,000)	$ 24,501,000
Ponnequin	Wind	$ 1,908,000	$ (1,190,000)	$ 718,000
Valmont Coal	Coal	$ 34,622,000	$ (3,992,000)	$ 30,630,000
Valmont Gas	Natural Gas	$ 189,000	$ (77,000)	$ 112,000
Zuni	Coal/Natural Gas	$ 24,512,000	$ (2,636,000)	$ 21,876,000

Table 1-3: Generic Site Decommissioning Cost Summary

Asset	Fuel Type	Decommissioning Costs	Credits	Net Project Cost
Comanche	Coal	$ 83,304,000	$ (16,842,000)	$ 66,462,000
Craig	Coal	$ 95,098,000	$ (11,190,000)	$ 83,908,000
Hayden	Coal	$ 53,101,000	$ (5,812,000)	$ 47,289,000
Pawnee	Coal	$ 76,824,000	$ (5,811,000)	$ 71,013,000
Alamosa	Natural Gas	$ 560,000	$ (52,000)	$ 508,000
Blue Spruce	Natural Gas	$ 6,006,000	$ (1,164,000)	$ 4,842,000
Cherokee CC	Natural Gas	$ 10,603,000	$ (2,138,000)	$ 8,465,000
Fruita	Natural Gas	$ 450,000	$ (29,000)	$ 421,000
Rocky Mtn. CC	Natural Gas	$ 17,058,000	$ (2,254,000)	$ 14,804,000
Ames	Hydro	$ 2,127,000	$ (161,000)	$ 1,966,000
Cabin Creek	Hydro	$ 27,016,000	$ (2,590,000)	$ 24,426,000
Georgetown	Hydro	$ 3,259,000	$ (54,000)	$ 3,205,000
Salida	Hydro	$ 4,049,000	$ (63,000)	$ 3,986,000
Shoshone	Hydro	$ 1,742,000	$ (435,000)	$ 1,307,000
Tacoma	Hydro	$ 7,532,000	$ (326,000)	$ 7,206,000
TOTAL DECOMMISSIONING COST (All sites)				**$ 502,229,000**

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 complete environmental site restoration activities.

1.3 Statement of Limitations

In preparation of this decommissioning study, Burns & McDonnell has relied upon information provided by Xcel Energy. Burns & McDonnell acknowledges that it has requested the information from Xcel Energy that it deemed necessary to complete this study. While Burns & McDonnell has no reason to believe that the information provided and upon which it relied for the completion of this study, is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee its accuracy or completeness.

Burns & McDonnell's estimates and projections of decommissioning costs are based on Burns & McDonnell's experience, qualifications and judgment. Since Burns & McDonnell has no control over weather, cost and availability of labor, material and equipment, labor productivity, construction contractors' procedures and methods, and other factors, Burns & McDonnell does not guarantee the accuracy of its estimates and projections.

Burns & McDonnell's estimates do not include allowances for unforeseen environmental liabilities associated with unexpected environmental contamination due to events not considered part of normal operations, such as fuel tank ruptures, oil spills, etc. Estimates also do not include allowances for environmental remediation associated with changes in classification of hazardous materials or site-specific requirements imposed by regulatory agencies.

2.0 INTRODUCTION

2.1 Background

Burns & McDonnell Engineering Co., Inc. (Burns & McDonnell) was retained by Public Service Company of Colorado (Xcel Energy) to conduct a Decommissioning Cost Study (Study) for power generation assets (Assets) located at Xcel Energy plants (Plants) in Colorado. The purpose of the Study was to review the facilities and to make a recommendation to Xcel Energy regarding the total cost (in 2014 dollars) to decommission the facilities at the end of their useful lives.

The Assets evaluated include a total of 22 Plants, consisting of 19 coal-fired units; 11 natural gas-fired units (a combination of both combustion turbines and combined cycle units); 6 hydroelectric facilities; and 1 wind farm. Individuals from Burns & McDonnell visited each of the Plants receiving site-specific cost evaluations in November of 2013, along with representatives from Xcel Energy and LVI, in order to review site facilities, layout, and equipment, and to discuss pertinent issues with plant staff.

2.2 Study Methodology

Burns & McDonnell prepared site-specific decommissioning cost estimates for a subset of the Plants under consideration and generic decommissioning cost estimates for the remaining Plants as defined in the scope of work for the Study. The type of estimate prepared, site-specific or generic, as well as technology type of each Plant, is indicated in Table 2-1.

For site-specific cost estimates, decommissioning tasks, labor hours, equipment rental, disposal fees, and scrap quantities and other necessary quantity take-offs were developed using information provided by Xcel Energy, information developed by LVI, in-house data Burns & McDonnell has collected from previous project experience, along with LVI and Burns & McDonnell’s professional judgment. Current market pricing for labor rates and unit pricing was then developed and these rates applied to the quantities for each task at each facility to determine the total cost of decommissioning.

Generic cost estimates were developed based on units of the same technology from the site-specific evaluations with a comparable power output rating. The generic estimates take into account facility-specific attributes such as pond areas, coal storage yard sizes, and number of stacks, and asbestos quantities, as could be determined from aerial images, drawings reviews, or information provided to Burns & McDonnell by Xcel Energy.

All decommissioning cost estimates include the cost to return the site to an industrial condition, suitable for reuse for development as an industrial facility.

Table 2-1: Facility Cost Estimate Method

	Plant/Unit	Install Year	MW Rating	Fuel Type	Site Specific Estimate	Generic Cost Estimate
Steam Production	Arapahoe Unit 1	1950	45	Coal	✓	
	Arapahoe Unit 2	1951	45	Coal	✓	
	Arapahoe Unit 3	1951	45	Coal	✓	
	Arapahoe Unit 4	1955	111	Coal	✓	
	Cherokee Unit 1	1957	107	Coal	✓	
	Cherokee Unit 2	1959	107	Coal	✓	
	Cherokee Unit 2 Condenser	2012	N/A	N/A	✓	
	Cherokee Unit 3	1962	151	Coal	✓	
	Cherokee Unit 4	1968	330	Coal	✓	
	Comanche Unit 1	1973	330	Coal		✓
	Comanche Unit 2	1975	330	Coal		✓
	Comanche Unit 3	2010	828	Coal		✓
	Craig Unit 1	1980	428	Coal		✓
	Craig Unit 2	1979	428	Coal		✓
	Hayden Unit 1	1965	184	Coal		✓
	Hayden Unit 2	1976	262	Coal		✓
	Pawnee Unit 1	1981	505	Coal		✓
	Valmont Unit 5	1964	186	Coal	✓	
	Zuni Unit 1	1948	39	Coal	✓	
	Zuni Unit 2	1953	68	Coal	✓	
Hydraulic Production	Ames	1906	3.6	Hydro		✓
	Cabin Creek	1967	324	Hydro		✓
	Georgetown	1939	1.2	Hydro		✓
	Salida	1929	1.4	Hydro		✓
	Shoshone	1908	15	Hydro		✓
	Tacoma	1949	8.5	Hydro		✓
Other Production	Fruita CT	1973	18.7	Gas		✓
	Ft. Lupton CT	1975	78.4	Gas	✓	
	Alamosa CT	1973	33.2	Gas		✓
	Blue Spruce CT 1	2003	155	Gas		✓
	Blue Spruce CT 2	2003	155	Gas		✓
	Cherokee 5,6,7 CC 2 x 1	2015	569	Gas		✓
	Fort St. Vrain ST 1	1973	300	Gas	✓	
	Fort St. Vrain 1,2,3,4 CC 3 x 1	Var.	665	Gas	✓	
	Rocky Mountain 1,2,3 CT 2 x 1	2004	600	Gas		✓
	Valmont CT	1973	45.2	Gas	✓	
	Ponnequin Wind Farm	1999	30	Wind	✓	

2.3 Site Visits

Individuals from Burns & McDonnell visited the sites, accompanied by representatives from Xcel Energy and LVI. The site visits consisted of a tour of each facility with Plant personnel to review the equipment installed at the site.

The following Burns & McDonnell representatives comprised the site visit team:

- Mr. Jeff Pope, Project Manager, Environmental Lead
- Mr. Jeff Kopp, Decommissioning Estimate Lead
- Mr. Vic Ranalletta, Engineering Manager

The site visits were performed on the following dates.

Table 2-2: Site Visit Dates

Asset	Site Visit Date
Arapahoe	November 12, 2013
Cherokee	November 12, 2013
Fort Lupton	November 14, 2013
Fort St. Vrain	November 14, 2013
Ponnequin	November 14, 2013
Valmont	November 13, 2013
Zuni	November 13, 2013

3.0 PLANT DESCRIPTIONS

Following are plant descriptions for all of the Plants considered for the purposes of this Study.

3.1 Arapahoe

The Arapahoe plant is a coal-fired generation facility located just south of downtown Denver, CO. The facility is comprised of four units, none of which are currently operational. Units 1 and 2 have a rated output of 45 MW each and were retired in December of 2002. Unit 3 also has a rated output of 45 MW and was retired at the end of 2013. Unit 4 has a rated output of 111 MW was retired at the end of 2013. All four units were assumed to be decommissioned for purposes of this Study. A site-specific decommissioning cost estimate was developed for this facility.

3.2 Cherokee

The Cherokee plant is a coal-fired generation facility located just north of downtown Denver, CO. The facility is comprised of four units, two of which are currently operational. Units 1 and 2 each have a rated output of 107 MW. Unit 1 was retired in 2012, and Unit 2 was retired in 2011. Both were partially dismantled since their retirement. The Unit 2 generator was also converted to operate as synchronous condenser. Unit 3 has a rated output of 151 MW and is slated for retirement at the end of 2015. Unit 4 is scheduled to be converted to natural gas at the end of 2017 at which time all associated coal handling equipment will be retired. It is anticipated that this unit will be retired in its entirety by 2028. A site-specific decommissioning cost estimate was developed for the above units at this facility. A generic cost estimate was developed for the combined cycle units currently under construction, as discussed in Section 3.14.

3.3 Ft. Lupton Combustion Turbine

The Ft. Lupton natural gas combustion turbine facility, comprised of two units, has a rated output of 78.4 MW and is located near the city of Fort Lupton, CO. A site-specific decommissioning cost estimate was developed for this facility.

3.4 Fort St. Vrain Combustion Turbines and Combined Cycle Generation

Fort St. Vrain generating facility is natural gas fired located northwest of Platteville, CO and is comprised of six operational units with a total rated output of 965 MW. Units 1, 2, 3, and 4 function as a three-on-one combined cycle unit with Unit 1 steam turbine rated at 300 MW and Units 2, 3, and 4 combustion turbines each carrying a rated output of 130 MW. Units 5 and 6 are stand-alone combustion turbines with a rated output of 137.5 MW each. A site-specific decommissioning cost estimate was developed for this facility.

3.5 Ponnequin Wind Farm

The Ponnequin Wind Farm is located in the northern Colorado county of Weld, just south of the Wyoming border and east of Interstate 25. The wind farm is comprised of 44 wind turbines with a collective rated capacity of 30 MW. A site-specific decommissioning cost estimate was developed for this facility.

3.6 Valmont

The Valmont plant is located outside the city of Boulder, CO and is comprised of four coal-fired retired units (Units 1-4) and two operational units, Unit 5 and Unit 6. Unit 5 has a rated output of 186 MW and is coal-fired but equipped to run on natural gas. Valmont Unit 6 is a combustion turbine that runs on natural gas and has a rated output of 45.2 MW. For purposes of this Study, all five of the coal units and combustion turbine units will be decommissioned at the same time. A site-specific decommissioning cost estimate was developed for this facility.

3.7 Zuni

This plant is located near downtown Denver, CO, on the east bank of the South Platte River. The facility is comprised of two units that originally were coal-fired, but now run on natural gas and are also equipped to run on No. 6 fuel oil. This facility also serves as a steam supplier to Xcel Energy's thermal energy customers in downtown Denver. Unit 1 has an output rating of 39 MW, and the electric generation portion was retired at the beginning of 2010, and is expected to be fully retired in 2015. Unit 2 has a rated capacity of 68 MW and is also expected to be fully retired in 2015. A site-specific decommissioning cost estimate was developed for this facility.

3.8 Comanche

The Comanche plant is a coal-fired generation facility located in the city of Pueblo, CO. The facility is comprised of three units. Units 1 and 2 each have a rated output of 330 MW with Unit 3 having a rated output capacity of 828 MW. All three units were assumed to be decommissioned for purposes of this Study. A generic cost estimate was developed for this facility.

3.9 Craig

The Craig plant is a coal-fired generation facility located on the outskirts of the city of Craig, CO. The facility is comprised of three units; however, Xcel Energy only has an ownership stake in Unit 1 and Unit

2, both of which are currently operational. Each unit has a rated output of 428 MW. A generic cost estimate was developed for this facility.

3.10 Hayden

The Hayden plant is a coal-fired generation facility located in the city of Hayden, CO. The facility is comprised of two units, both of which are currently in operation. Unit 1 has a rated output of 184 MW and Unit 2 has a rated output of 262 MW. Both units were assumed to be decommissioned for purposes of this Study. A generic cost estimate was developed for this facility.

3.11 Pawnee

The Pawnee plant is a coal-fired generation facility located in the city of Brush, CO. The facility is comprised of a single unit which is currently in operation and has a rated output of 505 MW. A generic cost estimate was developed for this facility.

3.12 Alamosa Combustion Turbine

The Alamosa natural gas combustion turbine has a rated output of 33.2 MW and is located on the outskirts of the city of Alamosa, CO. A generic cost estimate was developed for this facility.

3.13 Blue Spruce Combustion Turbines

The Blue Spruce natural gas-fired combined cycle generation plant is located in the city of Aurora, CO and has two operating units, each with a rated output of 155 MW. Both units were assumed to be decommissioned for purposes of this Study. A generic cost estimate was developed for this facility.

3.14 Cherokee Combined Cycle

The Cherokee combined cycle units 5, 6, and 7 are currently being constructed at the Cherokee facility identified in Section 3.2 and is expected to be put into service in 2015. A generic cost estimate was developed for this facility.

3.15 Fruita Combustion Turbine

The Fruita natural gas combustion turbine has a rated output of 18.7 MW and is located on the outskirts of the city of Fruita, CO. A generic cost estimate was developed for this facility.

3.16 Rocky Mountain Combined Cycle

The Rocky Mountain generating facility is a natural gas-fired combined cycle facility with three operational units and a total rated output capacity of 600 MW. The plant is located in the city of Keenesburg, CO. A generic cost estimate was developed for this facility.

3.17 Ames

The Ames hydroelectric generating station is located near the historic district of Ophir, CO, in the Illium Valley. The facility is equipped with a single unit with a generating capacity of 3.6 MW and was issued a new license in 2010 permitting an additional 40 years of operation.

3.18 Cabin Creek

The Cabin Creek hydroelectric pumped storage power plant is located near the city of Georgetown, CO. The facility is comprised of two units, each with a rated generating capacity of 162 MW for a facility total of 324 MW. This facility is in the process of re-licensing with a new 30-year license anticipated to be issued in 2014.

3.19 Georgetown

The Georgetown hydroelectric generating station is located in historic Georgetown, CO. The facility has two units capable of producing a total of 1.2 MW and was issued a new 40-year license in 1996.

3.20 Salida

The Salida hydroelectric generating station is located on the South Arkansas River in Poncha Springs, CO. The facility is capable of producing a total of 1.4 MW and was issued a new 30-year license in 1997.

3.21 Shoshone

The Shoshone hydroelectric generating station is located in Glenwood Springs, CO and is equipped with two units with a total rated capacity of 15 MW. As this is not a FERC-regulated facility, no license is required. A major rebuild of the facility was completed in 2008 and included everything except the turbines.

3.22 Tacoma

The Tacoma hydroelectric generating station is located north of the city of Rockwood, CO in the Animas River Canyon. The facility is equipped with three units with a total rated output of 8.5 MW and was issued a new 40-year license in 2010.

4.0 DECOMMISSIONING ESTIMATE DEVELOPMENT

Burns & McDonnell has prepared decommissioning cost estimates for each of the Plants. When Xcel Energy determines that each site should be retired, the above-grade equipment and steel structures are assumed to have sufficient scrap value to a salvage contractor to offset a portion of the site decommissioning costs. However, Xcel Energy will incur costs associated with decommissioning of the Assets and restoration of the site to the extent that those costs exceed the salvage value of equipment and structural steel.

The decommissioning costs include the cost to return the site to an industrial condition, suitable for reuse for development as an industrial facility. Included are the costs to dismantle all of the assets identified by Xcel Energy for decommissioning, including power generating equipment and balance of plant facilities, as well as environmental site restoration activities.

4.1 Decommissioning Methodology

A summary of several of the means and methods that could be employed is summarized in the following sections; however, means and methods will not be dictated to the contractor by Burns & McDonnell. It will be the contractor’s responsibility to determine means and methods that result in safely decommissioning the Assets at the lowest possible cost.

Asbestos abatement 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 vandalism, to increase cash flow, and for separation of recyclable materials, in order 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, steam turbines, 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 at a local landfill.

4.2 Coal and Natural Gas-Fired Facilities

In general, boilers could be felled and cut into manageable-sized pieces on the ground. First the structures around the boilers would need to be removed using excavators equipped with shears and grapples. Stairs, grating, elevators, and other high structures would be removed using an "ultra-high reach" excavator, equipped with shears. Following removal of these structures, the boilers would be felled, using explosive blasts. The boilers would then be dismantled using equipment such as excavators equipped with shears and grapples, and the scrap metal loaded onto trailers for recycling. After the surrounding structures and ductwork have been removed, the stacks would be imploded, using controlled blasts. Following implosion the stack liners and concrete would be reduced in size to allow for handling and removal.

Balance of plant 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 meet required material specification for on-site reuse as fill where possible.

4.3 Hydroelectric Power Facilities

All power generation equipment will be removed and scrapped. Powerhouse buildings will be demolished unless designated as historic structures, as indicated in the Section 5.2. Above-grade penstock will be removed and below-grade penstock will be capped with concrete plugs or filled with concrete in areas where burial depth is relatively shallow. Dams and reservoirs will remain as-is to continue to serve as reservoirs or flood control for the local communities, unless otherwise specified.

4.4 Wind Power Facilities

Removal of the turbine nacelles, towers, and associated equipment is assumed to have sufficient value as scrap to offset the removal costs of these items. However, Xcel Energy will incur costs for removal and disposal of the blades and foundations and other project facilities and for the restoration of the site following the removal of salvageable equipment.

The wind turbine blades will be removed from the wind turbine nacelle rotors using a crane, cut into manageable sized sections, loaded onto a trailer, and hauled to a local landfill for disposal. The wind turbine blades are constructed from a composite material that is assumed to have no salvage value at the time of decommissioning. The turbine nacelles will be removed from the towers and processed to separate scrap from debris and will have a significant value for scrap due to a high content of steel and copper. The salvage value of the nacelles and towers will be utilized to offset the costs for removal. The underground cabling will be removed and scrapped.

All underground improvements, including concrete foundations, will be removed to a depth of five feet below grade. This will include the removal of the wind turbine foundations and low voltage switchgear foundations. The concrete will be demolished, loaded into a dump truck and hauled to a local landfill for disposal. The portions of the concrete foundations that are greater than five feet below grade will be abandoned in place. Voids left from the removal of the concrete footings will be backfilled with surrounding subsoil and topsoil and fine graded to achieve suitable drainage.

Finally, to the extent required, crushed rock surfacing will be removed. For purposes of this Study, it is assumed that all of the turbine access roads will be removed as part of the decommissioning of the facility. Areas where crushed rock surfacing has been removed will be fine graded to achieve suitable drainage.

4.5 Decommissioning Estimate Types

Burns & McDonnell prepared site-specific decommissioning cost estimates for a subset of the Plants under consideration and generic decommissioning cost estimates for the remaining Plants as defined in the scope of work for the Study. The methodologies used to develop each of these types of cost estimates are explained in the following sections.

4.5.1 Site-Specific Estimates

Site-specific estimates were developed using a “bottom-up” cost estimating approach, where cost estimates are developed from scratch through the development of site-specific quantities and applying unit pricing to the quantities. Burns & McDonnell worked with LVI to develop a cost estimate for a comprehensive list of the plant decommissioning tasks required at each facility where a site-specific cost estimate was developed. These estimates included labor hours, equipment rental, disposal fees, and scrap quantities for each task based on site visits, drawing reviews, and information provided by Xcel Energy.

Drawings were reviewed to develop estimated quantities of labor hours for dismantlement, equipment necessary for demolition activities, debris for disposal, concrete crushed to meet a material specification for on-site reuse, and scrap. Current market prices for labor, equipment, and disposal were then applied to these quantities to develop direct costs for decommissioning activities. Additionally unit pricing for scrap values were applied to the scrap quantities to determine anticipated salvage values, which were subtracted from the direct costs for demolition in order to arrive at a total net project costs.

4.5.2 Generic Estimates

Generic estimates were developed according to a “top-down” cost estimating approach, where a cost estimate for a facility of similar type and size is used as a starting point and adjusted to account for differences between the base estimate and the plant being evaluated. The first step in developing the generic estimates was to develop cost estimates for several types of site categories on a cost-per-megawatt basis from a site-specific estimate for a facility with a comparable power output rating. Categories evaluated in this manner included asbestos removal, equipment and building dismantlement, hazardous waste disposal, and scrap quantity estimation. For units which were not close in size to any site-specific estimates to be compared on a direct cost-per-MW basis, an adjustment was made to the costs in these categories to account for the difference in physical size of plant being estimated relative to the base estimate, rather than simply the difference in MW rating, since demolition costs will be determined by the physical size of the equipment and structures to be demolished. Adjustments were then applied to these costs to account for other known differences, such as the number of stacks, coal handling equipment, cooling towers, and balance of plant buildings, based on site-specific costs available for each of these categories from site-specific estimates. For example, cooling tower demolition costs were estimated on a per-megawatt of steam turbine size, since the physical size of the cooling tower will be directly proportional to the heat rejection load from the steam turbine. Lastly, pond closures, coal pile restoration, landfill closure, and seeding costs were evaluated according to individual acreages of each of these items at each plant, as determined from aerial photos or site drawings. An example of the methodology used to develop one of the generic estimates, based on the site specific estimates, is included in Appendix G.

Generic estimates were developed for the hydro-electric units as well, even though site-specific estimates were not available to use as a basis for developing these costs. Additionally, the physical size of powerhouses, penstock lengths, dams, and other hydro-electric equipment is not easily relatable to MW rating of these facilities, making it difficult to develop generic costs in a similar manner to that used for the fossil-fuel based facilities. Therefore, a different approach was developed to determine generic hydro-electric decommissioning costs. Unit pricing was developed for a set of key categories including asbestos abatement, powerhouse demolition, equipment removal, penstock removal and/or filling and dam removal. The unit pricing for each of these categories was based on costs from the Means Heavy Construction Cost Data Handbook or Burns & McDonnell experience with similar projects. These costs were then applied to each hydro-electric plant based on assumed asbestos quantities, number of buildings to be demolished, generating equipment to be removed, above grade penstock to be removed, below grade penstock to be capped or filled, and dam removal, if applicable. Finally scrap quantities were estimated based on equipment sizes and scrap values applied to determine salvage values and net decommissioning costs.

4.6 Development of Scrap Quantities

Scrap quantities were developed for each of the site specific estimates and then unit pricing for scrap value was applied to these quantities to determine the total value of scrap material that could be used to offset a portion of the decommissioning costs. Xcel Energy provided design manuals for each of the facilities for which a site specific decommissioning cost estimate was developed. The manuals included drawings and details on the equipment and materials that were installed at each facility. These manuals were reviewed by Burns & McDonnell and LVI. In addition, site walk downs were performed, and nameplate data was obtained for various pieces of equipment. Drawings were utilized to perform quantity takeoffs to the extent possible. Equipment sizes and ratings for items such as steam turbines, generators, large motors and pumps, GSUs, etc. were also evaluated as part of the development of scrap quantities. This data was used by LVI along with their experience demolishing similar types of facilities to estimate the amount of scrap material in each facility. Burns & McDonnell reviewed this data as well, compared these quantities to demolition cost estimates from other facilities, and knowledge of quantities for construction of similar types of facilities to confirm that the scrap quantity estimates were appropriate.

4.7 Decommissioning Cost Categories

The site specific decommissioning cost estimates were developed for several major categories. These categories were also used as the basis for development of the generic cost estimates. Following is a description of each of the major cost categories and what is included in each category. The applicability and specifics of each category as it relates to each cost estimate are as presented in Section 5.

4.7.1 Asbestos Removal

This category includes all costs associated with removal and disposal of asbestos on the structures equipment, by a licensed contractor, in accordance with applicable regulations. Included in these costs are any scaffolding requirements, maintaining negative pressure in applicable areas, and removal and disposal of the asbestos or asbestos containing materials.

4.7.2 Boiler

This category includes all costs associated with removal and disposal of the boiler and associated equipment for each unit indicated, as well as the associated foundations.

4.7.3 Steam Turbine and Building

This category includes all costs associated with removal and disposal of the steam turbine, generator, and associated equipment, as well as the steam turbine building and foundations.

4.7.4 Turbines & Foundations

This category is applicable only to simple cycle combustion turbine units and includes all costs associated with removal and disposal of the combustion turbine, generator, and associated equipment, as well as the associated foundations.

4.7.5 Turbines, HRSG & Foundations

This category is applicable only to combined cycle combustion turbine units and includes all costs associated with removal and disposal of the combustion turbine, generator, heat recovery steam generators, and associated equipment, as well as the associated foundations.

4.7.6 Turbines, Condenser & Foundations

This category is applicable only to combined cycle combustion turbine units and includes all costs associated with removal and disposal of steam turbine, generator, and associated equipment, as well as the steam turbine building and foundations.

4.7.7 Stack

This category includes all costs associated with removal and disposal of the stack for each unit indicated, as well as the associated foundations.

4.7.8 Precipitator

This category includes all costs associated with removal and disposal of the electrostatic precipitator and associated structures and equipment for each unit indicated, as well as the associated foundations.

4.7.9 Fabric Filters Dust Control

This category includes all costs associated with removal and disposal of the baghouse and associated structures and equipment for each unit indicated, as well as the associated foundations.

4.7.10 GSU and Foundation

This category includes all costs associated with removal and disposal of the generator step-up transformer and associated equipment for each unit indicated, as well as the associated foundations.

4.7.11 Hazardous Material Disposal

This category includes all costs associated with removal and disposal of hazardous material, such as refractory, that is required to be handled and disposed of separately from general construction and demolition debris for each unit indicated.

4.7.12 Mercury and Universal Waste Disposal

This category includes all costs associated with removal and disposal of mercury containing switches and devices that are required to be handled and disposed of separately from general construction and demolition debris for each unit indicated.

4.7.13 PCB Transformer Oil Disposal

This category includes costs associated with removal and disposal of any transformer oil that includes any levels of potential PCB contamination, which is required to be handled and disposed of separately from general construction and demolition debris for each unit indicated.

4.7.14 Transformer Oil Impacted Soil

This category includes removal of a portion of the soil in the immediate vicinity of the generator step-up transformers, to account for the potential that this soil contains low levels of contamination from transformer oil through normal operations over the lifetime of the plant.

4.7.15 Onsite Concrete Crushing and Reuse

This category includes the costs associated with processing concrete from the above mentioned demolition activities, by placing concrete in a hopper and feeding it through a crusher to meet required material specification for on-site reuse as fill where possible. Also included are the costs associated with placing the processed concrete in the appropriate fill areas on the site.

4.7.16 Scrap

This category includes the value for all scrap material on a given unit or common facilities as appropriate. The values listed include all scrap metals from structures and equipment being sold as scrap at the net price listed in the assumptions, which accounts for transportation to the scrap facility.

4.7.17 Dry Sodium Injection System

This category includes all costs associated with removal and disposal of the dry sodium injection system and associated structures and equipment for each unit indicated, as well as the associated foundations.

4.7.18 Cooling Towers

This category includes all costs associated with removal and disposal of the cooling towers and associated equipment for each unit indicated, as well as the associated foundations.

4.7.19 Nuclear Meter

This category includes all costs associated with removal and disposal of any nuclear meters or devices that are required to be handled and disposed of separately from general construction and demolition debris for each unit indicated.

4.7.20 Closure of Ponds

This category includes all costs associated with dewatering, closing, capping and restoring any pond areas at the site, consistent with the assumptions outlined in Section 5.

4.7.21 Precipitator

This category includes all costs associated with removal and disposal of the electrostatic precipitator and associated structures and equipment for each unit indicated, as well as the associated foundations.

4.7.22 Abandonment of Water Wells

This category includes all costs associated with closing and capping any water wells associated with the site in accordance with all applicable local, state, and federal regulations.

4.7.23 All BOP Buildings

This category includes all costs associated with removal and disposal of balance of plant buildings, structures, and equipment not already accounted for in the unit specific costs, as well as the associated foundations.

4.7.24 Coal Handling Facilities Demolition

This category includes all costs associated with removal and disposal of coal handling facilities equipment and structures, including coal conveyors, bunkers, crushers, and coal unloading facilities, as well as the associated foundations.

4.7.25 Coal Storage Area Restoration

This category includes all costs associated with restoration activities in the coal storage areas at the site, consistent with the assumptions outlined in Section 5.

4.7.26 Fuel Oil Tank Areas

This category includes removal of a portion of the soil in the immediate vicinity of the fuel oil tanks, to account for the potential that this soil contains some level of contamination from fuel oil through normal operations over the lifetime of the plant, consistent with the assumptions outlined in Section 5.

4.7.27 Fuel Oil Piping Remediation

This category includes removal of a portion of the soil in the immediate vicinity of fuel oil lines, to account for the potential that this soil contains some level of contamination from fuel oil through normal operations over the lifetime of the plant, consistent with the assumptions outlined in Section 5.

4.7.28 Landfill Closure

This category includes the closure of ash landfills using a soil cap once all ash is consolidated into the landfill, consistent with the assumptions outlined in Section 5.

4.7.29 Site Pavements and Concrete

This category includes removal of any parking lots, sidewalks, and any other miscellaneous paving and concrete not already accounted for in the unit specific costs.

4.7.30 Wind Turbine Nacelle & Tower Removal

This category includes all costs associated with removal and disposal of the wind turbine nacelles and towers.

4.7.31 Wind Turbine Blades & Foundation Removal

This category includes all costs associated with removal of the wind turbine blades and wind turbine foundations to five feet below grade, both of which have no associated scrap value, but do include significant debris for disposal.

4.7.32 Low Voltage Switchgear Removal

This category includes all costs associated with removal and disposal of wind farm switchgear on the low voltage side of the substation, not including any high voltage substation equipment. Associated foundations are included for demolition.

4.7.33 O&M Facility Building Removal Cost

This category includes all costs associated with removal and disposal of the wind farm O&M building, structures, and equipment not already accounted for in the wind turbine specific costs, as well as the associated foundations.

4.7.34 Power Collection System Removal Cost

This category includes all costs associated with removal and disposal of wind farm low voltage power collection system wiring, junction boxes, and manholes.

4.7.35 Crushed Rock Road Surface Removal Cost

This category includes all costs associated with removal of crushed rock surfaced roads to prepare these areas for restoration to green space, consistent with surrounding land.

4.7.36 Penstock Filling and Removal

This category is specific to the hydroelectric facilities and includes all costs associated with decommissioning penstock runs by removing above grade sections, filling them in areas where the burial depth is shallow, and capping and abandoning in place penstock sections where burial depth is relatively deep.

4.7.37 Powerhouse Demolition & Equipment Removal

This category is specific to the hydroelectric facilities and includes all costs associated with removal of all electric generating equipment at every site, as well as removal and disposal of the powerhouse at applicable sites.

4.7.38 Dam Removal

This category is specific to the hydroelectric facilities and includes all costs associated with removal of all or a portion of the dams, as applicable and outlined in Section 5.

4.7.39 Seeding and Restoration

This category includes all costs associated with importing and spreading topsoil and seeding the site, consistent with the assumptions outlined in Section 5.

4.7.40 Project Indirects

This category includes costs expected to be incurred by Xcel Energy in the execution of the decommissioning of the power generating facilities, in addition to the direct costs paid to a demolition contractor. This includes the costs for Xcel Energy staff to perform decommissioning activities prior to demolition, such as removing coal from feeders, conveyors, bunkers, and mills; water washing equipment to remove remaining fines; vacuum cleaning ash hoppers, duct work, boiler, Air Quality Control System (AQCS), air heaters, etc. Also included in this category are costs associated with Xcel Energy staff providing oversight during demolition activities, inspections, and testing to confirm remediation has been completed, as well as Xcel Energy overheads, general and administrative costs.

4.7.41 Contingency

This category includes costs reasonably expected to be incurred by Xcel Energy during the execution of decommissioning and demolition activities. For decommissioning projects, there is uncertainty associated with work conditions and how the work will be performed. There is also uncertainty associated with quantities for dismantlement of facilities, due to the age and limits on drawings available, and the absence of testing results for environmental contamination prior to preparation of these types of studies. This category accounts for these potential costs that would be in addition to the direct costs associated with the base decommissioning bids from the demolition and remediation contractors.

5.0 DECOMMISSIONING ESTIMATE ASSUMPTIONS

Outlined in this section are the assumptions applied to all sites considered in this study.

5.1 Assumptions Applicable to All Sites

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

1. The estimates are inclusive of all cost necessary to properly demolish all units and associated equipment and structures to three 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.

2. For purposes of this study and the included cost estimates, it is assumed that each power station will be dismantled after all the units at a single site are taken out of service, allowing dismantlement of entire sites at once.

3. 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.

4. All work will take place in the safest and most cost-efficient method.

5. Labor costs are based on non-Union labor rates for a 50 hour workweek.

6. Transmission switchyards and substations within the boundaries of the plant are not part of the demolition scope. For purposes of this study, the division between generation assets and transmission assets is at the high side of the generator step-up transformers.

7. 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.

8. Generator step up transformers (GSUs), auxiliary transformers, and spare transformers for the units in question are included for demolition and scrap in all estimates.

9. 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, stacks, ductwork or other equipment (including refractory cements), abatement will be coordinated closely with demolition.

10. 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.

11. Xcel Energy will remove or consume all fuel oil, coal, and chemicals to a reasonable extent possible prior to commencement of demolition activities.

12. 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 Xcel Energy.

13. 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.

14. Soil and concrete around the GSUs and other large transformers will be excavated to a depth of three 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.

15. 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.

16. Coal pile storage areas will be excavated to a depth of 36 inches and excavated material transported offsite for disposal as a special waste, 6-inches of topsoil imported, graded to promote drainage and seeded to establish vegetation, unless otherwise noted in the individual site assumptions.

17. 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.

18. 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.

19. All above-grade structures will be demolished. All below-grade structures, including foundations, will be removed to three feet below existing grade, unless otherwise noted in the individual site assumptions.

20. All roads, paving, 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.

21. 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.

22. Existing ash, wastewater, evaporation or coal runoff ponds will be pumped dry, excavated to a depth of 36 inches and transported offsite for disposal as a special waste, graded to promote site drainage, six inches of topsoil placed over the area and seeded to establish vegetation unless otherwise noted in the individual site assumptions.

23. Stormwater and raw water ponds will be pumped dry, graded to promote drainage, six inches of topsoil placed over the area and seeded to establish vegetation unless otherwise noted in the site-specific assumptions.

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 used processed onsite to meet a material specification for reuse as fill for building 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 will be abandoned in place. Circulating water system pipes will be removed and disposed of properly.

26. Circulating water piping will be removed due to the potential for Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) scale buildup in the piping walls. Voids will be backfilled with imported granular material to surface grade.

27. 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 fines. Costs for these activities are included in the project indirect costs in the estimates.

28. 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.

29. Sewers, catch basins, and ducts will be filled and sealed on the upstream side. Horizontal runs will be abandoned in place after being sealed.

30. Costs are included to clean out the fuel oil tank areas and lines. Costs have also been included to remove three 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.

31. 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.

32. Valuation and sale of land and all replacement generation costs are excluded from this scope.

33. 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.

34. Scrap values are based upon the materials at the site at the time of the study, and do not take into account changes of materials (such as replacing tubes) over the plant life.

35. 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.

36. 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.

37. A 20% contingency is included on the direct costs in the estimates prepared as part of this study to cover unknowns. Xcel Energy's project indirect costs were included as 15% of the direct costs.

38. Scrap value of steel is included at $275 per gross-ton based on a review of current pricing trends from the American Metals Market including a deduction for transportation.

39. Scrap value of copper is included at $2.75 per pound based on a review of current pricing trends from the American Metals Market including a deduction for transportation.

40. Pricing for all estimates is in 2014 dollars.

41. Market conditions may result in cost variations at the time of contract execution.

5.2 Assumptions Applicable to Individual Sites

Outlined in this section are the assumptions applied to each individual site considered in this study.

5.2.1 Facilities Evaluated for Site-Specific Cost Estimates

The following assumptions served as the basis of evaluation for each of the generating facilities for which site-specific decommissioning cost estimates were developed as a part of this study.

5.2.1.1 Arapahoe Coal-Fired Plant

A site-specific cost estimate was prepared for the Arapahoe plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. The tongue and groove blocks in the roof have asbestos in the grooves. The baghouses and dry sodium injection system are asbestos free. The precipitators, boilers, and all other insulation contain asbestos.

2. Soil remediation will be required in the northwest corner of the site, due to an old debris dump site being located in this area. Debris is assumed to be transported and disposed of as non-hazardous waste.

3. Ash Ponds will be excavated to a depth of 36 inches and transported offsite for disposal as a special waste, and clean fill brought in to backfill to existing grade, graded to promote drainage.

4. The coal pile storage area will be excavated to a depth of 36 inches and transported offsite for disposal as a special waste, and clean fill brought in to backfill to existing grade, graded to promote drainage.

5. The Unit 1 GSU has been removed.

6. The site will be surfaced with imported granular material and/or crushed concrete processed onsite to meet a material specification for reuse. The site will not be seeded.

7. Water intakes and discharge structures at the South Platte River will be demolished and removed.

5.2.1.2 Cherokee Coal-Fired Plant

A site-specific cost estimate was prepared for the Cherokee plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. Unit 1 and Unit 2 boilers, precipitators, baghouses, fans, duct work, cooling towers, coal mills and common stack have been removed.

2. Unit 1 and Unit 2 have had the asbestos abated from the remaining equipment except around the steam turbines. Cost for asbestos abatement remaining on these units is based on a quote from Environmental Demolition Inc. (EDI).

3. Unit 3 asbestos quantities were estimated based on discussions with plant staff. Unit 3 has the majority of asbestos remaining, with some asbestos removed when work was performed on the burners, ID fan outlet ducts, air heater inlet ducts, feedwater heaters, boiler blowdown tanks, and steam turbine. The building siding is all transite paneling.

4. The site will be surfaced with imported granular material and/or crushed concrete processed onsite to meet a material specification for reuse. The site will not be seeded.

5. The water discharge structure will be demolished and removed.

6. Circulating water piping for all four units will be removed due to potential presence of TENORM scale on the piping walls.

7. The 2x1 combined cycle gas turbine power plant is currently under construction. A removal cost is included as a separate estimate.

5.2.1.3 Fort Lupton Combustion Turbine Plant

A site-specific cost estimate was prepared for the Fort Lupton plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. Removal of the oil storage tank pump house is included. Soil will be removed within the storage tank berms to a depth of three feet and disposed of offsite as a non-hazardous waste. Excavation will be backfilled with imported granular material to 6 inches below grade and covered with topsoil and seeded to establish vegetation.

2. Concrete will be disposed of offsite.

3. The site will be seeded with native vegetation after it is graded to provide a suitable ground cover to reduce soil erosion potential.

5.2.1.4 Fort St. Vrain Combined Cycle Plant

A site-specific cost estimate was prepared for the Fort St. Vrain plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. The steam turbine and steam turbine building still have the majority of the asbestos remaining, including asbestos-containing material in the building paneling. The cooling tower louvers have had asbestos abated.

2. Asbestos abatement will be conducted in the steam turbine building and abandoned structure prior to the plant demolition.

3. The abandoned facility structure adjacent to the steam turbine building will be removed to ground surface. Equipment and structural steel that can be safely stripped out from the below-ground portion of the facility will be removed prior to backfilling. Concrete will be crushed onsite to meet a material specification for reuse and used to backfill the below-ground portion of the abandoned facility, then filled with flowable fill and graded with granular material or crushed concrete processed onsite to meet a material specification for reuse to promote drainage.

4. All materials are assumed to be reused on-site (concrete processed to meet a material specification for onsite reuse) or in an offsite municipal solid waste landfill or construction and demolition debris landfill.

5. The site will be graded and seeded.

5.2.1.5 Ponnequin Wind Farm

A site-specific cost estimate was prepared for the Ponnequin Wind Farm plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. The property leases require all construction materials be removed to a depth of five feet below grade. The surface shall be returned to its original contour as nearly as practical and contain provisions for weed control.

2. Below-grade conductor for the power collection system will be removed and scrapped.

3. Turbine foundations will be removed to five feet below grade.

4. The wind farm low voltage switchgear will be removed.

5. Turbine access roads will have crushed rock surfacing removed and be restored to green space.

6. No hazardous construction material abatement is required.

7. No environmental costs have been included to address site cleanup of contaminated soils, hazardous materials, or other conditions present onsite having a negative environmental impact.

8. Wind turbine nacelles, wind turbine towers, transformers, switches, breakers, cabling, and other electrical equipment is removed from the site by the demolition contractor and scrapped.

9. Buildings are removed as part of site demolition activities.

10. Because no topsoil or subsoil was removed from the site, the existing topsoil and subsoil will be re-graded in areas where crushed rock surfacing and foundations have been removed to achieve suitable site drainage to natural drainage patterns. No imported fill will be required.

11. Disturbed site areas will be graded and seeded.

5.2.1.6 Valmont Coal-Fired Plant and Combustion Turbines

A site-specific cost estimate was prepared for the Valmont plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. The Unit 5 boiler penthouse, hot reheat section, and lower airspace have had asbestos abated. All other asbestos remains including asbestos in the stack.

2. The reservoir is a designated wildlife area and will remain.

3. Soil to a depth of three (3) feet will be removed from the fuel oil storage tank areas (including pump house and piping runs) and disposed of offsite as a non-hazardous waste. The berms will be graded to approximately three feet above the reservoir water elevation.

4. Soil to a depth of five (5) feet will be removed at a width of five (5) feet along the underground piping runs. Below-ground piping will be drained and capped.

5. Ash will be removed from the ash ponds and disposed of at the onsite landfill. Sheet piling will be removed to a depth of five (5) feet and pond berms will be removed so that the ponds can be flooded to become part of the surrounding reservoir.

6. The onsite landfill is assumed to have 2 feet of cover soil placed on it at the time of retirement. Closure will include importing 6-inches of cover soil along with 6-inches of topsoil, and seeded to establish vegetation.

7. The boiler and steam turbine building has a below-grade basement, which will be demolished to grade, have the floor broken or perforated to allow drainage, and backfilled with imported granular material.

8. The site will be graded to promote drainage and seeded to establish vegetation.

9. Water intakes and discharge structures will be capped and backfilled on the plant side of the structures, to allow the cooling reservoir to remain as-is.

10. Combustion turbine Unit 6 is included for decommissioning in a separate estimate.

11. The site will be graded and seeded.

5.2.1.7 Zuni Coal-Fired Plant

A site-specific cost estimate was prepared for the Zuni plant, by developing labor and material quantities for the plant, based on a plant walk down, discussions with plant staff, and drawing reviews. The following assumptions were made as part of the development of the cost estimate.

1. The plant is assumed to have most of the asbestos remaining.

2. The boiler has a below-grade basement, which will be demolished to grade, have the floor broken or perforated to allow drainage, and backfilled with imported granular material.

3. The Unit 1 coal mill has been removed.

4. Removal of former oil storage tanks and foundations is included. Soil will be removed within the storage tank berms to a depth of three feet and disposed of offsite as a non-hazardous waste. Excavation will be graded to promote drainage, six inches of topsoil placed and seeded to establish vegetation.

5. Removal of the training facility is included.

6. Water intakes and discharge structures will be demolished and removed.

7. Site improvements along the river will remain.

8. Former coal area remediation will consist of the excavation of 36 inches of coal/soil and transportation offsite for disposal as a special waste. The area will be graded to promote drainage and 6-inch of topsoil imported and seed to establish vegetation.

9. The site will be graded to promote drainage.

5.2.2 Coal-Fired Facilities Evaluated for Generic Cost Estimates

The following assumptions served as the basis of evaluation for each of the coal-fired generating facilities for which generic decommissioning cost estimates were developed as a part of this study.

5.2.2.1 Comanche Coal-Fired Plant

A generic cost estimate was prepared for the Comanche plant. This estimate was prepared by using a site-specific estimate from a similar size plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants, differences in balance of plant equipment, and differences in pond sizes and other environmental costs. The following assumptions were made as part of the development of the cost estimate.

1. The plant is assumed to have a small quantity of asbestos. Unit 3 is considered to be free of asbestos. The boilers have no asbestos, and the building paneling is asbestos free. Asbestos estimates were calculated based on the Cherokee Unit 4 asbestos costs, scaled for estimated physical size differences in the units, and adjusted to reflect the percent of asbestos assumed to be remaining.

2. The Cherokee Unit 4 decommissioning costs were used as the basis for the Comanche Unit 1 and Comanche Unit 2 costs. Adjustments were made to the costs to account for the differences in AQCS equipment demolition costs estimated across all the units at the different sites.

3. Comanche Unit 3 costs were developed using Cherokee Unit 4 costs, scaled up for an estimated factor of physical size of Comanche Unit 3 compared to Cherokee Unit 4. Adjustments were made to the costs to account for the differences in AQCS equipment demolition costs estimated across all the units at the different sites.

4. Common facilities demolition was estimated based on the Cherokee common facilities on a per megawatt basis. Adjustments were made to account for cooling tower sizes and the size of the coal handling facilities.

5. Ash and wastewater pond closure costs were estimated, based on an average cost per acre for ash and wastewater pond closure, calculated from the site-specific cost estimates (Cherokee, Fort St. Vrain and Zuni) where residuals had to be excavated and disposed of offsite. This average cost per acre was then applied to the total acreage of pond closure required for the Comanche Plant.

6. Raw water pond closure cost was estimated, based on an average cost per acre for raw water pond closure cost, calculated from the Fort St. Vrain site-specific cost estimate. This average cost per acre was then applied to the total acreage of pond closure required for the Comanche Plant.

7. Coal storage area restoration costs were estimated, based on an average cost per acre for coal storage restoration, calculated from the site-specific cost estimates (Cherokee and Valmont). This average cost per acre was then applied to the total acreage of coal storage restoration required for the Comanche Plant.

8. Landfill closure costs were estimated, based on an average cost per acre for landfill closure, calculated from the Valmont site-specific estimate. This average cost per acre was then applied to the total acreage of the landfill required to be closed at the Comanche Plant.

5.2.2.2 Craig Coal-Fired Plant

A generic cost estimate was prepared for the Craig plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants, differences in balance of plant equipment, and differences in pond sizes and other environmental costs. The following assumptions were made as part of the development of the cost estimate.

1. The plant is assumed to have very little asbestos.

2. The Cherokee Unit 4 decommissioning costs were used as the basis for the Craig Unit 1 and Craig Unit 2, scaled according to megawatts. Adjustments were made to the costs to account for the differences in AQCS equipment demolition costs estimated across all the units at the different sites.

3. Common facilities demolition was estimated based on the Cherokee common facilities estimates on a per megawatt basis. Adjustments were made to account for cooling tower sizes and the size of the coal handling facilities.

4. Evaporation and wastewater pond closure costs were estimated, based on an average cost per acre for ash and wastewater pond closure, calculated from the site-specific cost estimates (Cherokee, Fort St. Vrain and Zuni) where residuals had to be excavated and disposed of offsite. This average cost per acre was then applied to the total acreage of pond closure required for the Craig Plant.

5. Raw water pond closure cost was estimated based on an average cost per acre for raw water pond closure, calculated from the Fort St. Vrain site-specific cost estimate. This average cost per acre was then applied to the total acreage of pond closure required for the Craig Plant.

6. Coal storage area restoration costs were estimated, based on an average cost per acre for coal storage restoration, calculated from the site-specific cost estimates (Cherokee and Valmont). This average cost per acre was then applied to the total acreage of coal storage restoration required for the Craig Plant.

5.2.2.3 Hayden Coal-Fired Plant

A generic cost estimate was prepared for the Hayden plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants, differences in balance of plant equipment, and differences in pond sizes and other environmental costs. The following assumptions were made as part of the development of the cost estimate.

1. The Unit 1 boiler is asbestos free. The remainder of the equipment and piping insulation is assumed to be asbestos.

2. The Cherokee Unit 3 asbestos removal and decommissioning costs were used as the basis for the Hayden Unit 1 remaining asbestos removal and structural demolition costs, scaled according to megawatts. Adjustments were made to the costs to account for the differences in AQCS equipment demolition costs estimated across all the units at the different sites.

3. The Cherokee Unit 4 asbestos removal and decommissioning costs were used as the basis for the Hayden Unit 2 remaining asbestos removal and structural demolition costs, scaled

according to megawatts. Adjustments were made to the costs to account for the differences in AQCS equipment demolition costs estimated across all the units at the different sites.

4. Common facilities demolition was estimated based on the Cherokee common facilities estimates on a per megawatt basis. Adjustments were made to account for cooling tower sizes and the size of the coal handling facilities.

5. Ash and coal runoff pond closure costs were estimated, based on an average cost per acre for ash and wastewater pond closure, calculated from the site-specific cost estimates (Cherokee, Fort St. Vrain and Zuni) where residuals had to be excavated and disposed of offsite. This average cost per acre was then applied to the total acreage of pond closure required for the Hayden Plant.

6. Raw water pond closure cost was estimated, based on an average cost per acre for raw water pond closure, calculated from the Fort St. Vrain site-specific cost estimate. This average cost per acre was then applied to the total acreage of pond closure required for the Hayden Plant.

7. Coal storage area restoration costs were estimated, based on an average cost per acre for coal storage restoration, calculated from the site-specific cost estimates (Cherokee and Valmont). This average cost per acre was then applied to the total acreage of coal storage restoration required for the Hayden Plant.

5.2.2.4 Pawnee Coal-Fired Plant

A generic cost estimate was prepared for the Pawnee plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants, differences in balance of plant equipment, and differences in pond sizes and other environmental costs. The following assumptions were made as part of the development of the cost estimate.

1. The plant is assumed to no longer contain asbestos materials.

2. The Cherokee Unit 4 decommissioning costs were used as the basis for the Pawnee Unit 1 costs, scaled according to megawatts. Adjustments were made to the costs to account for the differences in AQCS equipment demolition costs estimated across all the units at the different sites.

3. Common facilities demolition was estimated based on the Cherokee common facilities estimates on a per megawatt basis. Adjustments were made to account for cooling tower sizes and the size of the coal handling facilities.

4. The ash evaporative and wastewater pond closure costs were estimated, based on an average cost per acre for ash and wastewater closure cost, calculated from the site-specific cost estimates (Cherokee, Fort St. Vrain and Zuni) where residuals had to be excavated. This average cost per acre was then applied to the total acreage of pond closure required for the Pawnee Plant. Costs for disposal of the excavated residuals were based on constructing a lined

disposal site at the south end of the property, placing the excavated residuals in the disposal site, and constructing a soil cap over the area.

5. Coal storage area restoration costs were estimated, based on an average cost per acre for coal storage restoration, calculated from the site-specific cost estimates (Cherokee and Valmont) excluding the unit costs for offsite disposal. This average cost per acre was then applied to the total acreage of pond closure required for the Pawnee Plant. Disposal costs for the coal storage area were based on constructing a lined disposal site at the south end of the property, placing the excavated residuals in the disposal site, and constructing a soil cap over the area.

6. Raw water pond closure costs were estimated, based on an average cost per acre for raw water pond closure, calculated from the Fort St. Vrain site-specific cost estimate. This average cost per acre was then applied to the total acreage of pond closure required for the Pawnee Plant.

7. Landfill closure costs were estimated based on an average cost per acre for landfill closure, calculated from the Valmont site-specific estimate. This average cost per acre was then applied to the total acreage of the landfill required to be closed at the Pawnee Plant.

5.2.3 Natural Gas-Fired Facilities Evaluated for Generic Cost Estimates

The following assumptions served as the basis of evaluation for each of the natural gas-fired generating facilities for which generic decommissioning cost estimates were developed as a part of this study.

5.2.3.1 Alamosa Combustion Turbine Plant

A generic cost estimate was prepared for the Alamosa plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants and differences in balance of plant equipment. The following assumptions were made as part of the development of the cost estimate.

1. The Alamosa combustion turbine decommissioning costs were calculated based on the Ft. Lupton Unit 1 combustion turbine costs, on a per megawatt basis.

2. The Alamosa common facilities decommissioning costs were calculated based on the Ft. Lupton common facilities costs, on a per megawatt basis.

3. The site will be graded and seeded. The cost was based on a cost per acre for seeding, based on the Ft. Lupton common facilities costs, applied to the acreage of seeding required at the Alamosa Plant.

5.2.3.2 Blue Spruce Combustion Turbine Plant

A generic cost estimate was prepared for the Blue Spruce plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants and differences in balance of plant equipment. The following assumptions were made as part of the development of the cost estimate.

1. The Blue Spruce Unit 1 and Unit 2 combustion turbine decommissioning costs were calculated based on the Fort St. Vrain Unit 5 combustion turbine costs, on a per megawatt basis.

2. The Blue Spruce common facilities decommissioning costs were calculated based on the Ft. Lupton common facilities costs, on a per megawatt basis.

3. The site will be graded and seeded. The cost was based on a cost per acre for seeding, based on the Ft. Lupton common facilities costs, applied to the acreage of seeding required at the Blue Spruce Plant.

5.2.3.3 Cherokee Combined Cycle Plant

A generic cost estimate was prepared for the combined cycle portion of the Cherokee plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants and differences in balance of plant equipment. The following assumptions were made as part of the development of the cost estimate.

1. The combined cycle plant was under construction at the time that this report was prepared. Costs are based on comparable combined cycle facilities.

2. The costs for decommissioning of the power block were taken directly from the Fort St. Vrain Unit 1, Unit 2, and Unit 3 total costs.

3. The Cherokee combined cycle common facilities decommissioning costs were calculated based on the Ft. Lupton common facilities costs, on a per megawatt basis.

5.2.3.4 Fruita Combustion Turbine Plant

A generic cost estimate was prepared for the Fruita plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants and differences in balance of plant equipment. The following assumptions were made as part of the development of the cost estimate.

1. The Fruita combustion turbine decommissioning costs were calculated based on the Ft. Lupton Unit 1 combustion turbine costs, on a per megawatt basis.

2. The Fruita common facilities decommissioning costs were calculated based on the Ft. Lupton common facilities costs, on a per megawatt basis

3. The site will be graded and seeded. The cost was based on a cost per acre for seeding, based on the Ft. Lupton common facilities costs, applied to the acreage of seeding required at the Fruita Plant.

5.2.3.5 Rocky Mountain Combined Cycle Plant

A generic cost estimate was prepared for the Rocky Mountain plant. This estimate was prepared by using a site-specific estimate from a similar plant as a starting point, and adjusting the cost estimate to account for differences between the plants. This included adjusting the costs based on differences in the physical size of the plants and differences in balance of plant equipment. The following assumptions were made as part of the development of the cost estimate.

1. The costs for decommissioning of the power block were taken directly from the Fort St. Vrain Unit 1, Unit 2, and Unit 3 total costs.

2. The Rocky Mountain combined cycle common facilities decommissioning costs were calculated based on the Ft. Lupton common facilities costs, on a per megawatt basis.

3. The wastewater pond closure costs were estimated, based on an average cost per acre for wastewater pond closure cost, calculated from the site-specific cost estimates (Cherokee, Fort St. Vrain and Zuni) where residuals had to be excavated. This average cost per acre was then applied to the total acreage of pond closure required for the Rocky Mountain Plant.

4. Raw water pond closure costs were estimated, based on an average cost per acre for raw water pond closure, calculated from the Fort St. Vrain site-specific cost estimate. This average cost per acre was then applied to the total acreage of pond closure required for the Rocky Mountain Plant.

5. The site will be graded to promote drainage, using onsite materials, then amended with imported topsoil and seeded. The seeding cost was based on a cost per acre for seeding, based on the Ft. Lupton common facilities costs, applied to the acreage of seeding required at the Rocky Mountain Plant.

5.2.4 Hydroelectric Facilities Evaluated for Generic Cost Estimates

The following assumptions served as the basis of evaluation for each of the hydroelectric generating facilities for which generic decommissioning cost estimates were developed as a part of this study.

5.2.4.1 Ames Hydroelectric Plant

A generic cost estimate was prepared for the Ames plant. This estimate was prepared by developing generic unit pricing for closure activities required and applying them to estimated quantities for the facilities. This included equipment removal on a per unit basis adjusted for unit size, penstock removal lengths, plugging of below grade penstocks, asbestos abatement based on the size of the buildings, and differences in the level of building and dam demolition to be performed. The following assumptions were made as part of the development of the cost estimate.

1. All power generation equipment will be removed.

2. The building has been designated as a historical site. It will have asbestos abated but the structure will remain standing.

3. The dam and reservoir will remain.

4. No sediment will be removed from the dam or reservoir.

5. With the exception of the last 100 feet of pipe, all of the Howard's Fork above-ground penstock will be removed and scrapped. The Trout Lake penstock is approximately 50 percent above ground and 50 percent below ground. The above-ground portions will be removed in six separate locations.

6. Below-grade penstocks will have the openings capped with a concrete plug. The estimate includes 50 percent of the below ground pipe, or 25 percent of the total penstock length, being filled with grout due to its shallow burial depth.

7. A multiplier of 1.5 has been applied to the demolition cost estimate for this plant due its remote location.

5.2.4.2 Cabin Creek Hydroelectric Plant

A generic cost estimate was prepared for the Cabin Creek plant. This estimate was prepared by developing generic unit pricing for closure activities required and applying them to estimated quantities for the facilities. This included equipment removal on a per unit basis adjusted for unit size, penstock removal lengths, plugging of below grade penstocks, asbestos abatement based on the size of the buildings, and differences in the level of building and dam demolition to be performed. The following assumptions were made as part of the development of the cost estimate.

1. Asbestos will be abated from the powerhouse and all power generation equipment will be removed.

2. The penstock between the reservoirs will remain in place and the penstock will be plugged at both ends.

3. The upper dam will be demolished and the reservoir drained. The lower reservoir will remain in place.

4. No sediment will be removed from the dam or reservoir.

5. The powerhouse will be demolished to three feet below grade.

5.2.4.3 Georgetown Hydroelectric Plant

A generic cost estimate was prepared for the Georgetown plant. This estimate was prepared by developing generic unit pricing for closure activities required and applying them to estimated quantities for the facilities. This included equipment removal on a per unit basis adjusted for unit size, penstock removal lengths, plugging of below grade penstocks, asbestos abatement based on the size of the buildings, and differences in the level of building and dam demolition to be performed. The following assumptions were made as part of the development of the cost estimate.

1. Asbestos will be abated from the powerhouse and all power generation equipment will be removed. The building will remain intact as a historical structure.
2. The reservoir and dam will remain in place, as they serve as water storage for the city of Georgetown.
3. No sediment will be removed from the dam or reservoir.
4. The above-grade penstock piping will be removed and scrapped, and 100 percent of the below-grade penstock will be filled with grout.

5.2.4.4 Salida Hydroelectric Plant

A generic cost estimate was prepared for the Salida plant. This estimate was prepared by developing generic unit pricing for closure activities required and applying them to estimated quantities for the facilities. This included equipment removal on a per unit basis adjusted for unit size, penstock removal lengths, plugging of below grade penstocks, asbestos abatement based on the size of the buildings, and differences in the level of building and dam demolition to be performed. The following assumptions were made as part of the development of the cost estimate.

1. All asbestos will be abated and the Salida 1 and Salida 2 powerhouse buildings will be removed.
2. Approximately 60 feet of dam at Garfield Reservoir will be removed and the water drained.
3. The Fooses Reservoir will remain intact.
4. No sediment will be removed from the dam or reservoir.
5. The above-grade penstock between Garfield and Fooses Reservoir will be removed.
6. Approximately 50 percent of the penstock between Fooses Reservoir and Salida 1 will be removed in six separate locations. The remaining below-grade piping will be filled with grout.
7. Approximately 50 percent of the penstock between Salida 1 and Salida 2 forebay will be removed in four separate locations. The remaining below grade penstock will be capped, but not filled with grout.
8. Below-grade penstocks will have the openings capped with a concrete plug.

9. A multiplier of 1.25 has been applied to the demolition cost estimate for this plant due its remote location.

5.2.4.5 Shoshone Hydroelectric Plant

A generic cost estimate was prepared for the Shoshone plant. This estimate was prepared by developing generic unit pricing for closure activities required and applying them to estimated quantities for the facilities. This included equipment removal on a per unit basis adjusted for unit size, penstock removal lengths, plugging of below grade penstocks, asbestos abatement based on the size of the buildings, and differences in the level of building and dam demolition to be performed. The following assumptions were made as part of the development of the cost estimate.

1. All power generation equipment will be removed and scrapped. Asbestos will be abated and the powerhouse building will be removed.
2. The penstock between the dam and the adits will remain in place. The four access ports in the penstock will be plugged.
3. The 300 feet of above-ground penstock between the forebay and powerhouse will be removed and scrapped. The forebay and powerhouse ends will be plugged with concrete.
4. The dam and reservoir will remain.
5. No sediment will be removed from the dam or reservoir.
6. Costs associated with relinquishing control of the dam to a third party have not been included in the facility decommissioning cost estimate.

5.2.4.6 Tacoma Hydroelectric Plant

A generic cost estimate was prepared for the Tacoma plant. This estimate was prepared by developing generic unit pricing for closure activities required and applying them to estimated quantities for the facilities. This included equipment removal on a per unit basis adjusted for unit size, penstock removal lengths, plugging of below grade penstocks, asbestos abatement based on the size of the buildings, and differences in the level of building and dam demolition to be performed. The following assumptions were made as part of the development of the cost estimate.

1. Asbestos will be abated from the building, all power generation equipment will be removed, and the powerhouse will be demolished.
2. The above-ground Cascade Dam flume will be removed.
3. No sediment will be removed from the dam or reservoir.

4. The first 10 percent of the above-ground portion of the Cascade penstock will be removed. The remaining below-grade penstock will be left in place and the ends capped with concrete plugs. All of the Cascade penstock that is below grade will be filled with grout.
5. The above-ground penstock between Terminal Dam and the powerhouse will be removed. The last 100 feet is below grade and will be left in place. Cut ends will be capped with concrete plugs.
6. A multiplier of 1.5 has been applied to the demolition cost estimate for this plant due its remote location.

5.3 Scrap Metal Credit

Scrap metal prices used in the development of the scrap credit were based on prices for various types of materials published by the American Metals Market. Table 5-1 presents the basis for the scrap metal unit prices.

Table 5-1: Basis for Scrap Metal Value

Type of Material	Scrap Category	Market Value1	Units	Transport Costs2	Scrap Metal Credit
Carbon Steel	Export Yard, No. 1 Heavy Melt	$ 283.00	Gross Ton	$ 8.00	$ 275.00
Copper	No. 2 Heavy Copper and Wire	$ 2.95	Pound	$ 0.20	$ 2.75
Admiralty Brass	Yellow Brass Solids	$ 2.07	Pound	$ 0.29	$ 1.78
Aluminum	Old Aluminum, Sheet and Cast	$ 0.56	Pound	$ 0.06	$ 0.50
Nickel	Nickel-copper alloy (e.g. Monel®) castings	$ 3.10	Pound	$ 0.57	$ 2.53

Note 1: The market value for scrap metal used in this estimate is based on costs from he American Metals Market. Values represent he monthly average for January 2014

Note 2: The estimated cost for handling and transporting the materials to a scrap center in Los Angeles, CA area.

6.0 RESULTS

Burns & McDonnell has prepared estimates in current dollars (2014$) for the decommissioning of the units in question. These costs are summarized in Table 6-1 and 6-2. A breakdown of the site-specific decommissioning costs can be found in Appendix A. Appendices B, C and D contain summaries of generic site decommissioning costs for coal-fired, natural gas-fired, and hydroelectric power facilities, respectively.

Table 6-1: Site-Specific Decommissioning Cost Summary

Asset	Fuel Type	Decommissioning Costs	Credits	Net Project Cost
Arapahoe	Coal	$ 38,493,000	$ (3,712,000)	$ 34,781,000
Cherokee	Coal	$ 56,390,000	$ (7,802,000)	$ 48,588,000
Fort Lupton	Natural Gas	$ 1,466,000	$ (251,000)	$ 1,215,000
Fort St. Vrain	Natural Gas	$ 30,044,000	$ (5,543,000)	$ 24,501,000
Ponnequin	Wind	$ 1,908,000	$ (1,190,000)	$ 718,000
Valmont Coal	Coal	$ 34,622,000	$ (3,992,000)	$ 30,630,000
Valmont Gas	Natural Gas	$ 189,000	$ (77,000)	$ 112,000
Zuni	Coal/Natural Gas	$ 24,512,000	$ (2,636,000)	$ 21,876,000

Table 6-2: Generic Site Decommissioning Cost Summary

Asset	Fuel Type	Decommissioning Costs	Credits	Net Project Cost
Comanche	Coal	$ 83,304,000	$ (16,842,000)	$ 66,462,000
Craig	Coal	$ 95,098,000	$ (11,190,000)	$ 83,908,000
Hayden	Coal	$ 53,101,000	$ (5,812,000)	$ 47,289,000
Pawnee	Coal	$ 76,824,000	$ (5,811,000)	$ 71,013,000
Alamosa	Natural Gas	$ 560,000	$ (52,000)	$ 508,000
Blue Spruce	Natural Gas	$ 6,006,000	$ (1,164,000)	$ 4,842,000
Cherokee CC	Natural Gas	$ 10,603,000	$ (2,138,000)	$ 8,465,000
Fruita	Natural Gas	$ 450,000	$ (29,000)	$ 421,000
Rocky Mtn. CC	Natural Gas	$ 17,058,000	$ (2,254,000)	$ 14,804,000
Ames	Hydro	$ 2,127,000	$ (161,000)	$ 1,966,000
Cabin Creek	Hydro	$ 27,016,000	$ (2,590,000)	$ 24,426,000
Georgetown	Hydro	$ 3,259,000	$ (54,000)	$ 3,205,000
Salida	Hydro	$ 4,049,000	$ (63,000)	$ 3,986,000
Shoshone	Hydro	$ 1,742,000	$ (435,000)	$ 1,307,000
Tacoma	Hydro	$ 7,532,000	$ (326,000)	$ 7,206,000
TOTAL DECOMMISSIONING COST (All sites)				**$ 502,229,000**

APPENDIX A - SITE-SPECIFIC DECOMMISSIONING COST SUMMARIES

Table A-1: Arapahoe Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Arapahoe						
ARAPAHOE Unit 1						
Asbestos Removal	$ 875,000	$ 411,000	$ 78,000	$ -	$ 1,364,000	
Boiler	$ 565,000	$ 590,000	$ 12,000	$ -	$ 1,167,000	
Steam Turbine & Building	$ 335,000	$ 357,000	$ 23,000	$ -	$ 715,000	
Stack	$ 44,000	$ 93,000	$ 18,000	$ -	$ 155,000	
Precipitator	$ 42,000	$ 39,000	$ 2,000	$ -	$ 83,000	
GSU Foundation	$ 14,000	$ 10,000	$ 1,000	$ -	$ 25,000	
Hazardous Materials Disposal	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 13,000	$ 13,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 44,000	$ -	$ 44,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (597,000)
Subtotal	**$ 1,953,000**	**$ 1,530,000**	**$ 179,000**	**$ 13,000**	**$ 3,675,000**	**$ (597,000)**
ARAPAHOE Unit 2						
Asbestos Removal	$ 875,000	$ 411,000	$ 78,000	$ -	$ 1,364,000	
Boiler	$ 565,000	$ 590,000	$ 12,000	$ -	$ 1,167,000	
Steam Turbine & Building	$ 335,000	$ 357,000	$ 23,000	$ -	$ 715,000	
Precipitator	$ 42,000	$ 39,000	$ 2,000	$ -	$ 83,000	
GSU Foundation	$ 14,000	$ 10,000	$ 1,000	$ -	$ 25,000	
Hazardous Materials Disposal	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 3,000	$ 5,000	$ 32,000	$ -	$ 40,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 13,000	$ 13,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 30,000	$ -	$ 30,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (704,000)
Subtotal	**$ 1,912,000**	**$ 1,442,000**	**$ 179,000**	**$ 13,000**	**$ 3,546,000**	**$ (704,000)**
ARAPAHOE Unit 3						
Asbestos Removal	$ 875,000	$ 411,000	$ 78,000	$ -	$ 1,364,000	
Boiler	$ 565,000	$ 590,000	$ 12,000	$ -	$ 1,167,000	
Steam Turbine & Building	$ 335,000	$ 357,000	$ 23,000	$ -	$ 715,000	
Stack	$ 44,000	$ 93,000	$ 18,000	$ -	$ 155,000	
Precipitator	$ 42,000	$ 39,000	$ 2,000	$ -	$ 83,000	
GSU Foundation	$ 14,000	$ 10,000	$ 1,000	$ -	$ 25,000	
Nuclear Meter Removal/Disposal	$ 3,000	$ 1,000	$ 16,000	$ -	$ 20,000	
Hazardous Materials Disposal	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 3,000	$ 5,000	$ 32,000	$ -	$ 40,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 38,000	$ 38,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 44,000	$ -	$ 44,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (704,000)
Subtotal	**$ 1,959,000**	**$ 1,536,000**	**$ 227,000**	**$ 38,000**	**$ 3,760,000**	**$ (704,000)**
ARAPAHOE Unit 4						
Asbestos Removal	$ 1,023,000	$ 703,000	$ 130,000	$ -	$ 1,856,000	
Boiler	$ 766,000	$ 777,000	$ 40,000	$ -	$ 1,583,000	
Steam Turbine & Building	$ 448,000	$ 461,000	$ 25,000	$ -	$ 934,000	
Precipitator/Baghouse	$ 122,000	$ 113,000	$ 2,000	$ -	$ 237,000	
GSU Foundation	$ 14,000	$ 10,000	$ 1,000	$ -	$ 25,000	
Nuclear Meter Removal/Disposal	$ 3,000	$ 1,000	$ 16,000	$ -	$ 20,000	
Hazardous Materials Disposal	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 3,000	$ 5,000	$ 19,000	$ -	$ 27,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 65,000	$ 65,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 116,000	$ -	$ 116,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,606,000)
Subtotal	**$ 2,457,000**	**$ 2,100,000**	**$ 350,000**	**$ 65,000**	**$ 4,972,000**	**$ (1,606,000)**
ARAPAHOE Common Facilities						
Asbestos Removal	$ 1,065,000	$ 554,000	$ 124,000	$ -	$ 1,743,000	
Dry Sodium Injection System	$ 97,000	$ 96,000	$ 14,000	$ -	$ 207,000	
Cooling Towers	$ 95,000	$ 87,000	$ 100,000	$ -	$ 282,000	
Nuclear Meter Removal/Disposal	$ 1,000	$ -	$ 5,000	$ -	$ 6,000	
Closure of Pond	$ -	$ -	$ -	$ 5,983,000	$ 5,983,000	
Abandonment of Water Wells (3)	$ -	$ -	$ -	$ 30,000	$ 30,000	
All BOP Buildings	$ 181,000	$ 166,000	$ 16,000	$ -	$ 363,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 11,000	$ -	$ 11,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (76,000)
Subtotal	$ 1,439,000	$ 903,000	$ 270,000	$ 6,013,000	$ 8,625,000	$ (76,000)

ARAPAHOE Coal Handling Facilities												
Asbestos Removal	$	307,000	$	140,000	$	78,000	$	-	$	525,000		
Demolition	$	141,000	$	111,000	$	7,000	$	-	$	259,000		
Coal Storage Area Restoration	$	-	$	-	$	-	$	3,129,000	$	3,129,000		
Onsite Concrete Crushing & Reuse	$	-	$	-	$	22,000	$	-	$	22,000		
Scrap	$	-	$	-	$	-	$	-	$	-	$	(25,000)
Subtotal	**$**	**448,000**	**$**	**251,000**	**$**	**107,000**	**$**	**3,129,000**	**$**	**3,935,000**	**$**	**(25,000**
Arapahoe Subtotal	**$**	**10,168,000**	**$**	**7,762,000**	**$**	**1,312,000**	**$**	**9,271,000**	**$**	**28,513,000**	**$**	**(3,712,000**
TOTAL COST (CREDIT)									**$**	**28,513,000**	**$**	**(3,712,000)**
PROJECT INDIRECTS (15%)									**$**	**4,277,000**		
CONTINGENGY (20%)									**$**	**5,703,000**		
TOTAL PROJECT COST (CREDIT)									**$**	**38,493,000**	**$**	**(3,712,000)**
TOTAL NET PROJECT COST (CREDIT)									**$**	**34,781,000**		

Table A-2: Cherokee Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Cherokee						
CHEROKEE Unit 1						
Asbestos Removal	$ -	$ -	$ -	$ 400,000	$ 400,000	
Steam Turbine & Building	$ 540,000	$ 528,000	$ 31,000	$ -	$ 1,099,000	
GSU & Foundation	$ 34,000	$ 25,000	$ 1,000	$ 11,000	$ 71,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 5,000	$ 5,000	$ 44,000	$ -	$ 54,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 52,000	$ 52,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 21,000	$ -	$ 21,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (678,000)
Subtotal	**$ 592,000**	**$ 568,000**	**$ 97,000**	**$ 463,000**	**$ 1,720,000**	**$ (678,000)**
CHEROKEE Unit 2						
Asbestos Removal	$ -	$ -	$ -	$ 360,000	$ 360,000	
Steam Turbine & Building	$ 424,000	$ 418,000	$ 23,000	$ -	$ 865,000	
GSU & Foundation	$ 34,000	$ 25,000	$ 1,000	$ 9,000	$ 69,000	
Mercury and Universal Waste Disposal	$ 7,000	$ 5,000	$ -	$ -	$ 12,000	
PCB Transformer Oil Disposal	$ 4,000	$ 5,000	$ 22,000	$ -	$ 31,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 14,000	$ 14,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 17,000	$ -	$ 17,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (555,000)
Subtotal	**$ 469,000**	**$ 453,000**	**$ 63,000**	**$ 383,000**	**$ 1,368,000**	**$ (555,000)**
CHEROKEE Unit 2 Synchronous Condenser						
Asbestos Removal	$ -	$ -	$ -	$ 40,000	$ 40,000	
Steam Turbine & Building	$ 75,000	$ 74,000	$ 4,000	$ -	$ 153,000	
Mercury and Universal Waste Disposal	$ 7,000	$ 5,000	$ -	$ -	$ 12,000	
Onsite Concrete Crushing & Disposal	$ -	$ -	$ 3,000	$ -	$ 3,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (92,000)
Subtotal	**$ 82,000**	**$ 79,000**	**$ 7,000**	**$ 40,000**	**$ 208,000**	**$ (92,000)**
CHEROKEE Unit 3						
Asbestos Removal	$ 2,996,000	$ 1,398,000	$ 281,000	$ -	$ 4,675,000	
Boiler	$ 1,367,000	$ 1,334,000	$ 32,000	$ 100,000	$ 2,833,000	
Steam Turbine & Building	$ 612,000	$ 651,000	$ 29,000	$ -	$ 1,292,000	
Stack	$ 100,000	$ 203,000	$ 31,000	$ -	$ 334,000	
Fabric Filters Dust Control	$ 378,000	$ 350,000	$ 33,000	$ 50,000	$ 811,000	
GSU & Foundation	$ 46,000	$ 35,000	$ 1,000	$ 32,000	$ 114,000	
Hazardous Materials Disposal (Refractory)	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 4,000	$ 5,000	$ 25,000	$ -	$ 34,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 55,000	$ 55,000	
Nuclear Meter Removal/Disposal	$ 3,000	$ 1,000	$ 16,000	$ -	$ 20,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 96,000	$ -	$ 96,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,959,000)
Subtotal	**$ 5,584,000**	**$ 4,007,000**	**$ 545,000**	**$ 237,000**	**$ 10,373,000**	**$ (1,959,000)**
CHEROKEE Unit 4						
Asbestos Removal	$ 3,225,000	$ 2,159,000	$ 329,000	$ -	$ 5,713,000	
Boiler	$ 2,571,000	$ 2,449,000	$ 47,000	$ 125,000	$ 5,192,000	
Steam Turbine & Building	$ 822,000	$ 845,000	$ 36,000	$ -	$ 1,703,000	
Stack	$ 103,000	$ 323,000	$ -	$ -	$ 426,000	
Fabric Filters Dust Control	$ 866,000	$ 803,000	$ 83,000	$ 65,000	$ 1,817,000	
GSU & Foundation	$ 46,000	$ 35,000	$ 1,000	$ 40,000	$ 122,000	
Hazardous Materials Disposal (Refractory)	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 5,000	$ 5,000	$ 58,000	$ -	$ 68,000	
Nuclear Meter Removal/Disposal	$ 3,000	$ 1,000	$ 16,000	$ -	$ 20,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 151,000	$ -	$ 151,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (4,314,000)
Subtotal	**$ 7,719,000**	**$ 6,650,000**	**$ 722,000**	**$ 230,000**	**$ 15,321,000**	**$ (4,314,000)**
CHEROKEE Common Facilities						
Cooling Towers and CW Lines	$ 432,000	$ 398,000	$ 141,000	$ -	$ 971,000	
Closure of Coal Runoff Pond	$ -	$ -	$ -	$ 137,000	$ 137,000	
Closure of NW Reservoir	$ -	$ -	$ -	$ 2,372,000	$ 2,372,000	
Closure of Ash Ponds	$ -	$ -	$ -	$ 2,761,000	$ 2,761,000	
Closure of stormwater ponds	$ -	$ -	$ -	$ 579,000	$ 579,000	
All BOP Buildings	$ 226,000	$ 208,000	$ 38,000	$ -	$ 472,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 57,000	$ -	$ 57,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (124,000)
Subtotal	**$ 658,000**	**$ 606,000**	**$ 236,000**	**$ 5,849,000**	**$ 7,349,000**	**$ (124,000)**

CHEROKEE Coal Handling Facilities							
Demolition	$ 207,000	$ 162,000	$ 12,000	$ -	$ 381,000		
Coal Storage Area Restoration	$ -	$ -	$ -	$ 5,050,000	$ 5,050,000		
Scrap	$ -	$ -	$ -	$ -	$ -	$	(80,000)
Subtotal	**$ 207,000**	**$ 162,000**	**$ 12,000**	**$ 5,050,000**	**$ 5,431,000**	**$**	**(80,000)**
Cherokee Subtotal	**$ 15,311,000**	**$ 12,525,000**	**$ 1,682,000**	**$ 12,252,000**	**$ 41,770,000**	**$**	**(7,802,000)**
TOTAL COST (CREDIT)					**$ 41,770,000**	**$**	**(7,802,000)**
PROJECT INDIRECTS (15%)					**$ 6,266,000**		
CONTINGENGY (20%)					**$ 8,354,000**		
TOTAL PROJECT COST (CREDIT)					**$ 56,390,000**	**$**	**(7,802,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 48,588,000**		

Table A-3: Ft. Lupton Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Ft. Lupton						
FT LUPTON CT Unit 1						
Turbines & Foundations	$ 60,000	$ 41,000	$ 4,000	$ -	$ 105,000	
GSUs	$ 17,000	$ 9,000	$ 1,000	$ -	$ 27,000	
Fuel Oil Remediation	$ -	$ -	$ -	$ 80,000	$ 80,000	
Onsite Crush Concrete and Reuse	$ 6,000	$ 4,000	$ 4,000	$ -	$ 14,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (123,000)
Subtotal	**$ 83,000**	**$ 54,000**	**$ 9,000**	**$ 80,000**	**$ 226,000**	**$ (123,000**
FT LUPTON CT Unit 2						
Turbines & Foundations	$ 60,000	$ 41,000	$ 4,000	$ -	$ 105,000	
GSUs	$ 17,000	$ 9,000	$ 1,000	$ -	$ 27,000	
Fuel Oil Remediation	$ -	$ -	$ -	$ 80,000	$ 80,000	
Onsite Crush Concrete and Reuse	$ 6,000	$ 4,000	$ 4,000	$ -	$ 14,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (123,000)
Subtotal	**$ 83,000**	**$ 54,000**	**$ 9,000**	**$ 80,000**	**$ 226,000**	**$ (123,000**
FT LUPTON Common Facilities						
Fuel Oil Tank Areas	$ -	$ -	$ -	$ 295,000	$ 295,000	
Fuel Oil Piping Remediation	$ -	$ -	$ -	$ 19,000	$ 19,000	
Transformer Oil Disposal	$ 3,000	$ 5,000	$ 3,000	$ -	$ 11,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 15,000	$ 15,000	
Seeding & Restoration (Whole site)	$ -	$ -	$ -	$ 182,000	$ 182,000	
All BOP Buildings	$ 46,000	$ 28,000	$ 4,000	$ 15,000	$ 93,000	
Onsite Crush Concrete and Reuse	$ 7,000	$ 9,000	$ 3,000	$ -	$ 19,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (5,000)
Subtotal	**$ 56,000**	**$ 42,000**	**$ 10,000**	**$ 526,000**	**$ 634,000**	**$ (5,000**
Ft. Lupton Subtotal	**$ 222,000**	**$ 150,000**	**$ 28,000**	**$ 686,000**	**$ 1,086,000**	**$ (251,000**
TOTAL COST (CREDIT)					**$ 1,086,000**	**$ (251,000)**
PROJECT INDIRECTS (15%)					**$ 163,000**	
CONTINGENGY (20%)					**$ 217,000**	
TOTAL PROJECT COST (CREDIT)					**$ 1,466,000**	**$ (251,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 1,215,000**	

Table A-4: Fort St. Vrain Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Fort St. Vrain						
FORT ST VRAIN ST Unit 1						
Turbines, Condenser & Foundations	$ 1,050,000	$ 1,301,000	$ 144,000	$ -	$ 2,495,000	
GSUs	$ 91,000	$ 175,000	$ 9,000	$ 45,000	$ 320,000	
PCB Transformer Oil Disposal	$ 7,000	$ 5,000	$ 62,000	$ -	$ 74,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 24,000	$ 24,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 140,000	$ -	$ 140,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,371,000)
Subtotal	**$ 1,148,000**	**$ 1,481,000**	**$ 355,000**	**$ 69,000**	**$ 3,053,000**	**$ (1,371,000**
FORT ST VRAIN CT Unit 2						
Turbines, HRSG & Foundations	$ 656,000	$ 504,000	$ 33,000	$ -	$ 1,193,000	
GSUs	$ 34,000	$ 45,000	$ 3,000	$ 30,000	$ 112,000	
Transformer Oil Disposal	$ 5,000	$ 5,000	$ 39,000	$ -	$ 49,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 24,000	$ 24,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 41,000	$ -	$ 41,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (819,000)
Subtotal	**$ 695,000**	**$ 554,000**	**$ 116,000**	**$ 54,000**	**$ 1,419,000**	**$ (819,000**
FORT ST VRAIN CT Unit 3						
Turbines, HRSG & Foundations	$ 656,000	$ 504,000	$ 33,000	$ -	$ 1,193,000	
GSUs	$ 34,000	$ 45,000	$ 3,000	$ 30,000	$ 112,000	
Transformer Oil Disposal	$ 5,000	$ 5,000	$ 34,000	$ -	$ 44,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 26,000	$ 26,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 41,000	$ -	$ 41,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (819,000)
Subtotal	**$ 695,000**	**$ 554,000**	**$ 111,000**	**$ 56,000**	**$ 1,416,000**	**$ (819,000**
FORT ST VRAIN CT Unit 4						
Turbines, HRSG & Foundations	$ 656,000	$ 504,000	$ 33,000	$ -	$ 1,193,000	
GSUs	$ 34,000	$ 45,000	$ 3,000	$ 30,000	$ 112,000	
Transformer Oil Disposal	$ 5,000	$ 5,000	$ 36,000	$ -	$ 46,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 20,000	$ 20,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 41,000	$ -	$ 41,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (819,000)
Subtotal	**$ 695,000**	**$ 554,000**	**$ 113,000**	**$ 50,000**	**$ 1,412,000**	**$ (819,000**
FORT ST VRAIN CT Unit 5						
Turbines & Foundations	$ 402,000	$ 309,000	$ 12,000	$ -	$ 723,000	
GSUs	$ 34,000	$ 45,000	$ 3,000	$ 30,000	$ 112,000	
Transformer Oil Disposal	$ 5,000	$ 5,000	$ 38,000	$ -	$ 48,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 16,000	$ 16,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 22,000	$ -	$ 22,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (517,000)
Subtotal	**$ 441,000**	**$ 359,000**	**$ 75,000**	**$ 46,000**	**$ 921,000**	**$ (517,000**
FORT ST VRAIN CT Unit 6						
Turbines & Foundations	$ 402,000	$ 309,000	$ 12,000	$ -	$ 723,000	
GSUs	$ 34,000	$ 45,000	$ 3,000	$ 30,000	$ 112,000	
Transformer Oil Disposal	$ 5,000	$ 5,000	$ 36,000	$ -	$ 46,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 16,000	$ 16,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 22,000	$ -	$ 22,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (517,000)
Subtotal	**$ 441,000**	**$ 359,000**	**$ 73,000**	**$ 46,000**	**$ 919,000**	**$ (517,000**

FORT ST VRAIN Common Facilities						
Asbestos Removal	$ 1,411,000	$ 460,000	$ 60,000	$ -	$ 1,931,000	
Cooling Tower	$ 108,000	$ 100,000	$ 115,000	$ -	$ 323,000	
Site Pavements and Concrete	$ 90,000	$ 386,000	$ 135,000	$ -	$ 611,000	
Onsite Crush Concrete and Reuse	$ -	$ -	$ 33,000	$ -	$ 33,000	
Closure of Raw Water/Stormwater Ponds	$ -	$ -	$ -	$ 1,492,000	$ 1,492,000	
Closure of Wastewater/Evaporation Ponds	$ -	$ -	$ -	$ 1,438,000	$ 1,438,000	
Former Steam Plant Facility	$ 1,766,000	$ 2,585,000	$ 130,000	$ -	$ 4,481,000	
Seeding & Restoration	$ -	$ -	$ -	$ 2,422,000	$ 2,422,000	
All BOP Buildings	$ 181,000	$ 166,000	$ 37,000	$ -	$ 384,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (681,000)
Subtotal	**$ 3,556,000**	**$ 3,697,000**	**$ 510,000**	**$ 5,352,000**	**$ 13,115,000**	**$ (681,000**
Fort St. Vrain Subtotal	**$ 7,671,000**	**$ 7,558,000**	**$ 1,353,000**	**$ 5,673,000**	**$ 22,255,000**	**$ (5,543,000**
TOTAL COST (CREDIT)					**$ 22,255,000**	**$ (5,543,000)**
PROJECT INDIRECTS (15%)					**$ 3,338,000**	
CONTINGENGY (20%)					**$ 4,451,000**	
TOTAL PROJECT COST (CREDIT)					**$ 30,044,000**	**$ (5,543,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 24,501,000**	

Table A-5: Ponnequin Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Ponnequin						
Ponnequin Wind Farm						
Wind Turbine Nacelle & Tower Removal	$ 103,000	$ 89,000	$ -	$ -	$ 192,000	
Wind Turbine Blade & Foundation Removal	$ 69,000	$ 64,000	$ -	$ -	$ 133,000	
Low Voltage Switchgear Removal	$ 22,000	$ 60,000	$ 7,000	$ -	$ 89,000	
O&M Facility Building Removal Cost	$ 28,000	$ 17,000	$ 3,000	$ -	$ 48,000	
Power Colletion System Removal Cost	$ 73,000	$ 61,000	$ 5,000	$ -	$ 139,000	
Crushed Rock Road Surface Removal Cost	$ 68,000	$ 129,000	$ 461,000	$ -	$ 658,000	
Seeding	$ -	$ -	$ -	$ 65,000	$ 65,000	
Onsite Concrete Crushing & Disposal	$ -	$ -	$ 89,000	$ -	$ 89,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,190,000)
Subtotal	**$ 363,000**	**$ 420,000**	**$ 565,000**	**$ 65,000**	**$ 1,413,000**	**$ (1,190,000)**
Ponnequin Subtotal	**$ 363,000**	**$ 420,000**	**$ 565,000**	**$ 65,000**	**$ 1,413,000**	**$ (1,190,000)**
TOTAL COST (CREDIT)					**$ 1,413,000**	**$ (1,190,000)**
PROJECT INDIRECTS (15%)					**$ 212,000**	
CONTINGENGY (20%)					**$ 283,000**	
TOTAL PROJECT COST (CREDIT)					**$ 1,908,000**	**$ (1,190,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 718,000**	

Table A-6: Valmont Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Valmont						
VALMONT Unit 5						
Plant Wash Down and Disposal	$ -	$ -	$ -	$ 300,000	$ 300,000	
Asbestos Removal	$ 1,708,000	$ 759,000	$ 21,000	$ -	$ 2,488,000	
Boiler 5	$ 1,309,000	$ 1,212,000	$ 24,000	$ -	$ 2,545,000	
Stack	$ 99,000	$ 252,000	$ 21,000	$ -	$ 372,000	
Steam Turbine & Building	$ 1,634,000	$ 1,507,000	$ 192,000	$ -	$ 3,333,000	
GSU & Foundation	$ 34,000	$ -	$ 1,000	$ -	$ 35,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
PCB Transformer Oil Disposal	$ 5,000	$ 5,000	$ 43,000	$ -	$ 53,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 157,000	$ -	$ 157,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (2,495,000)
Subtotal	**$ 4,802,000**	**$ 3,745,000**	**$ 459,000**	**$ 300,000**	**$ 9,306,000**	**$ (2,495,000**
VALMONT Units 1-4 and Common Facilities						
Stacks (2)	$ 197,000	$ 504,000	$ 41,000	$ -	$ 742,000	
Dry Scrubber & Fabric Filter Dust Control	$ 548,000	$ 507,000	$ 51,000	$ -	$ 1,106,000	
Closure of Ash Ponds	$ -	$ -	$ -	$ 2,255,000	$ 2,255,000	
Closure of Fuel Oil Tank Area	$ -	$ -	$ -	$ 934,000	$ 934,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 12,000	$ 12,000	
Fuel Oil Piping Remediation	$ -	$ -	$ -	$ 103,000	$ 103,000	
Landfill Closure	$ -	$ -	$ -	$ 3,160,000	$ 3,160,000	
Seeding & Restoration (Whole site)	$ -	$ -	$ -	$ 605,000	$ 605,000	
Old Unit 4 Boiler and House	$ 1,905,000	$ 1,765,000	$ 167,000	$ -	$ 3,837,000	
All BOP Buildings	$ 690,000	$ 751,000	$ 29,000	$ -	$ 1,470,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 162,000	$ -	$ 162,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,478,000)
Subtotal	**$ 3,340,000**	**$ 3,527,000**	**$ 450,000**	**$ 7,069,000**	**$ 14,386,000**	**$ (1,478,000**
VALMONT Coal Handling Facilities						
Asbestos Removal	$ 134,000	$ 65,000	$ 29,000	$ -	$ 228,000	
Demolition	$ 109,000	$ 97,000	$ 6,000	$ -	$ 212,000	
Coal Storage Area Restoration	$ -	$ -	$ -	$ 1,514,000	$ 1,514,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (19,000)
Subtotal	**$ 243,000**	**$ 162,000**	**$ 35,000**	**$ 1,514,000**	**$ 1,954,000**	**$ (19,000**
Valmont Subtotal	**$ 8,385,000**	**$ 7,434,000**	**$ 944,000**	**$ 8,883,000**	**$ 25,646,000**	**$ (3,992,000**
TOTAL COST (CREDIT)					**$ 25,646,000**	**$ (3,992,000)**
PROJECT INDIRECTS (15%)					**$ 3,847,000**	
CONTINGENGY (20%)					**$ 5,129,000**	
TOTAL PROJECT COST (CREDIT)					**$ 34,622,000**	**$ (3,992,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 30,630,000**	
VALMONT CT Unit 6						
Turbine & Foundations	$ 74,000 00	$ 54,000.00	$ -	$ -	$ 128,000 00	
GSU	$ 7,000 00	$ 5,000.00	$ -	$ -	$ 12,000 00	
Onsite Crush Concrete and Reuse	$ -	$ -	$ -	$ -	$ -	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (77,000.00)
Subtotal	**$ 81,000.00**	**$ 59,000.00**	**$ -**	**$ -**	**$ 140,000.00**	**$ (77,000.00**
Subtotal	**$ 81,000**	**$ 59,000**	**$ -**	**$ -**	**$ 140,000**	**$ (77,000**
TOTAL COST (CREDIT)					**$ 140,000**	**$ (77,000)**
PROJECT INDIRECTS (15%)					**$ 21,000**	
CONTINGENGY (20%)					**$ 28,000**	
TOTAL PROJECT COST (CREDIT)					**$ 189,000**	**$ (77,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 112,000**	

Table A-7: Zuni Decommissioning Cost Summary

	Labor	Material and Equipment	Disposal	Environmental	Total Cost	Salvage
Zuni						
ZUNI Unit 1						
Plant Wash Down and Disposal	$ -	$ -	$ -	$ 150,000	$ 150,000	
Asbestos Removal	$ 1,646,000	$ 1,087,000	$ 176,000	$ -	$ 2,909,000	
Boilers 1A & 1B	$ 1,612,000	$ 1,494,000	$ 18,000	$ -	$ 3,124,000	
Steam Turbine & Building	$ 1,004,000	$ 926,000	$ 68,000	$ -	$ 1,998,000	
Stack	$ 53,000	$ 187,000	$ 10,000	$ -	$ 250,000	
GSU & Foundation	$ 34,000	$ 65,000	$ 1,000	$ -	$ 100,000	
Hazardous Materials Disposal (Refractory)	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 6,000	$ 6,000	
PCB Transformer Oil Disposal	$ 5,000	$ 5,000	$ -	$ -	$ 10,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 110,000	$ -	$ 110,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (1,255,000)
Subtotal	**$ 4,432,000**	**$ 3,794,000**	**$ 384,000**	**$ 156,000**	**$ 8,766,000**	**$ (1,255,000)**
ZUNI Unit 2						
Plant Wash Down and Disposal	$ -	$ -	$ -	$ 200,000	$ 200,000	
Asbestos Removal	$ 1,911,000	$ 1,096,000	$ 215,000	$ -	$ 3,222,000	
Boiler 2	$ 983,000	$ 762,000	$ 21,000	$ -	$ 1,766,000	
Steam Turbine & Building	$ 489,000	$ 415,000	$ 24,000	$ -	$ 928,000	
Stack	$ 79,000	$ 182,000	$ 9,000	$ -	$ 270,000	
GSU & Foundation	$ 46,000	$ 102,000	$ 3,000	$ -	$ 151,000	
Hazardous Materials Disposal (Refractory)	$ 65,000	$ 20,000	$ 1,000	$ -	$ 86,000	
Mercury and Universal Waste Disposal	$ 13,000	$ 10,000	$ -	$ -	$ 23,000	
Transformer Oil Impacted Soil	$ -	$ -	$ -	$ 4,000	$ 4,000	
PCB Transformer Oil Disposal	$ 5,000	$ 5,000	$ 7,000	$ -	$ 17,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 132,000	$ -	$ 132,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (959,000)
Subtotal	**$ 3,591,000**	**$ 2,592,000**	**$ 412,000**	**$ 204,000**	**$ 6,799,000**	**$ (959,000)**
ZUNI Common Facilities						
Cooling Towers	$ 89,000	$ 82,000	$ 94,000	$ -	$ 265,000	
Closure of Wastewater Settling Ponds	$ -	$ -	$ -	$ 112,000	$ 112,000	
Closure of Coal Pile Area	$ -	$ -	$ -	$ 667,000	$ 667,000	
All BOP Buildings	$ 110,000	$ 102,000	$ 17,000	$ -	$ 229,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 37,000	$ -	$ 37,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (37,000)
Subtotal	**$ 199,000**	**$ 184,000**	**$ 148,000**	**$ 779,000**	**$ 1,310,000**	**$ (37,000)**
ZUNI Fuel Oil Storage Facilities						
Tanks, Piping, and Foundations Demolition	$ 160,000	$ 83,000	$ -	$ -	$ 243,000	
Soil Removal Beneath Fuel Oil Tank	$ -	$ -	$ -	$ 975,000	$ 975,000	
Fuel Oil Piping Remediation	$ -	$ -	$ -	$ 59,000	$ 59,000	
Onsite Concrete Crushing & Reuse	$ -	$ -	$ 5,000	$ -	$ 5,000	
Scrap	$ -	$ -	$ -	$ -	$ -	$ (385,000)
Subtotal	**$ 160,000**	**$ 83,000**	**$ 5,000**	**$ 1,034,000**	**$ 1,282,000**	**$ (385,000)**
Zuni Subtotal	**$ 8,382,000**	**$ 6,653,000**	**$ 949,000**	**$ 2,173,000**	**$ 18,157,000**	**$ (2,636,000)**
TOTAL COST (CREDIT)					**$ 18,157,000**	**$ (2,636,000)**
PROJECT INDIRECTS (15%)					**$ 2,724,000**	
CONTINGENGY (20%)					**$ 3,631,000**	
TOTAL PROJECT COST (CREDIT)					**$ 24,512,000**	**$ (2,636,000)**
TOTAL NET PROJECT COST (CREDIT)					**$ 21,876,000**	

APPENDIX B - GENERIC COAL-FIRED FACILITY DECOMMISSIONING COST SUMMARIES

Table B-1: Comanche Decommissioning Cost Summary

	Total Cost	Salvage
Comanche		
COMANCHE Unit 1		
Asbestos	$ 571,000	$ -
Demolition	$ 8,898,000	$ -
Scrap	$ -	$ (4,314,000)
Subtotal	**$ 9,469,000**	**$ (4,314,000)**
COMANCHE Unit 2		
Asbestos	$ 571,000	$ -
Demolition	$ 8,898,000	$ -
Scrap	$ -	$ (4,314,000)
Subtotal	**$ 9,469,000**	**$ (4,314,000)**
COMANCHE Unit 3		
Asbestos	$ -	$ -
Demolition	$ 16,580,000	$ -
Scrap	$ -	$ (8,214,000)
Subtotal	**$ 16,580,000**	**$ (8,214,000)**
COMANCHE Common Facilities		
Pond Closures	$ 7,283,000	$ -
Coal Area Restoration	$ 13,085,000	$ -
Landfill Closure	$ 2,695,000	
Demolition	$ 3,126,000	$ -
Subtotal	**$ 26,189,000**	**$ -**
Comanche Subtotal	**$ 61,707,000**	**$ (16,842,000)**
TOTAL COST (CREDIT)	**$ 61,707,000**	**$ (16,842,000)**
PROJECT INDIRECTS (15%)	**$ 9,256,000**	
CONTINGENGY (20%)	**$ 12,341,000**	
TOTAL PROJECT COST (CREDIT)	**$ 83,304,000**	**$ (16,842,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 66,462,000**	

Table B-2: Craig Decommissioning Cost Summary

	Total Cost	Salvage
Craig		
CRAIG Unit 1		
Asbestos	$ 100,000	$ -
Demolition	$ 11,422,000	$ -
Scrap	$ -	$ (5,595,000)
Subtotal	**$ 11,522,000**	**$ (5,595,000)**
CRAIG Unit 2		
Asbestos	$ 100,000	$ -
Demolition	$ 11,422,000	$ -
Scrap	$ -	$ (5,595,000)
Subtotal	**$ 11,522,000**	**$ (5,595,000)**
CRAIG Common Facilities		
Pond Closures	$ 22,748,000	$ -
Coal Area Restoration	$ 22,459,000	$ -
Landfill Closure	$ -	
Demolition	$ 2,192,000	$ -
Subtotal	**$ 47,399,000**	**$ -**
Craig Subtotal	**$ 70,443,000**	**$ (11,190,000)**
TOTAL COST (CREDIT)	**$ 70,443,000**	**$ (11,190,000)**
PROJECT INDIRECTS (15%)	**$ 10,566,000**	
CONTINGENGY (20%)	**$ 14,089,000**	
TOTAL PROJECT COST (CREDIT)	**$ 95,098,000**	**$ (11,190,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 83,908,000**	

Table B-3: Hayden Decommissioning Cost Summary

	Total Cost	Salvage
Hayden		
HAYDEN Unit 1		
Asbestos	$ 3,987,000	$ -
Demolition	$ 6,325,000	$ -
Scrap	$ -	$ (2,387,000)
Subtotal	**$ 10,312,000**	**$ (2,387,000)**
HAYDEN Unit 2		
Asbestos	$ 4,536,000	$ -
Demolition	$ 7,047,000	$ -
Scrap	$ -	$ (3,425,000)
Subtotal	**$ 11,583,000**	**$ (3,425,000)**
HAYDEN Common Facilities		
Pond Closures	$ 9,700,000	$ -
Coal Area Restoration	$ 3,929,000	$ -
Landfill Closure	$ 2,520,000	$ -
Demolition	$ 1,290,000	$ -
Subtotal	**$ 17,439,000**	**$ -**
Hayden Subtotal	**$ 39,334,000**	**$ (5,812,000)**
TOTAL COST (CREDIT)	**$ 39,334,000**	**$ (5,812,000)**
PROJECT INDIRECTS (15%)	**$ 5,900,000**	
CONTINGENGY (20%)	**$ 7,867,000**	
TOTAL PROJECT COST (CREDIT)	**$ 53,101,000**	**$ (5,812,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 47,289,000**	

Table B-4: Pawnee Decommissioning Cost Summary

	Total Cost	Salvage
Pawnee		
PAWNEE Unit 1		
Asbestos	$ -	$ -
Demolition	$ 12,058,000	$ -
Scrap	$ -	$ (5,811,000)
Subtotal	**$ 12,058,000**	**$ (5,811,000)**
PAWNEE Common Facilities		
Pond Closures	$ 33,374,000	$ -
Coal Area Restoration	$ 7,518,000	$ -
Landfill Closure	$ 2,580,000	
Demolition	$ 1,377,000	$ -
Subtotal	**$ 44,849,000**	**$ -**
Pawnee Subtotal	**$ 56,907,000**	**$ (5,811,000)**
TOTAL COST (CREDIT)	**$ 56,907,000**	**$ (5,811,000)**
PROJECT INDIRECTS (15%)	**$ 8,536,000**	
CONTINGENGY (20%)	**$ 11,381,000**	
TOTAL PROJECT COST (CREDIT)	**$ 76,824,000**	**$ (5,811,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 71,013,000**	

APPENDIX C - GENERIC NATURAL GAS-FIRED FACILITY DECOMMISSIONING COST SUMMARIES

Table C-1: Alamosa Decommissioning Cost Summary

	Total Cost		Salvage	
Alamosa				
ALAMOSA CT Unit 1				
Demolition	$	95,000	$	-
Scrap	$	-	$	(52,000)
Subtotal	**$**	**95,000**	**$**	**(52,000)**
ALAMOSA Common Facilities				
Seeding & Restoration	$	225,000	$	-
Demolition	$	95,000	$	-
Subtotal	**$**	**320,000**	**$**	**-**
Alamosa Subtotal	**$**	**415,000**	**$**	**(52,000)**
TOTAL COST (CREDIT)	**$**	**415,000**	**$**	**(52,000)**
PROJECT INDIRECTS (15%)	**$**	**62,000**		
CONTINGENGY (20%)	**$**	**83,000**		
TOTAL PROJECT COST (CREDIT)	**$**	**560,000**	**$**	**(52,000)**
TOTAL NET PROJECT COST (CREDIT)	**$**	**508,000**		

Table C-2: Blue Spruce Decommissioning Cost Summary

	Total Cost	Salvage
Blue Spruce		
BLUE SPRUCE CT Unit 1		
Demolition	$ 1,038,000	$ -
Scrap	$ -	$ (582,000)
Subtotal	**$ 1,038,000**	**$ (582,000)**
BLUE SPRUCE CT Unit 2		
Demolition	$ 1,038,000	$ -
Scrap	$ -	$ (582,000)
Subtotal	**$ 1,038,000**	**$ (582,000)**
BLUE SPRUCE Common Facilities		
Seeding & Restoration	$ 1,928,000	$ -
Demolition	$ 445,000	$ -
Subtotal	**$ 2,373,000**	**$ -**
Blue Spruce Subtotal	**$ 4,449,000**	**$ (1,164,000)**
TOTAL COST (CREDIT)	**$ 4,449,000**	**$ (1,164,000)**
PROJECT INDIRECTS (15%)	**$ 667,000**	
CONTINGENGY (20%)	**$ 890,000**	
TOTAL PROJECT COST (CREDIT)	**$ 6,006,000**	**$ (1,164,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 4,842,000**	

Table C-3: Cherokee CC 2x1 Decommissioning Cost Summary

	Total Cost	Salvage
Cherokee		
CHEROKEE Units 5,6,7 CC 2x1		
Demolition	$ 5,887,000	$ -
Scrap	$ -	$ (2,138,000)
Subtotal	**$ 5,887,000**	**$ (2,138,000)**
CHEROKEE Common Facilities		
Demolition	$ 1,967,000	$ -
Subtotal	**$ 1,967,000**	**$ -**
Cherokee Subtotal	**$ 7,854,000**	**$ (2,138,000)**
TOTAL COST (CREDIT)	**$ 7,854,000**	**$ (2,138,000)**
PROJECT INDIRECTS (15%)	**$ 1,178,000**	
CONTINGENGY (20%)	**$ 1,571,000**	
TOTAL PROJECT COST (CREDIT)	**$ 10,603,000**	**$ (2,138,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 8,465,000**	

Table C-4: Fruita Decommissioning Cost Summary

	Total Cost	Salvage
Fruita		
FRUITA CT Unit 1		
Demolition	$ 54,000	$ -
Scrap	$ -	$ (29,000)
Subtotal	**$ 54,000**	**$ (29,000)**
FRUITA Common Facilities		
Seeding & Restoration	$ 225,000	$ -
Demolition	$ 54,000	$ -
Subtotal	**$ 279,000**	**$ -**
Fruita Subtotal	**$ 333,000**	**$ (29,000)**
TOTAL COST (CREDIT)	**$ 333,000**	**$ (29,000)**
PROJECT INDIRECTS (15%)	**$ 50,000**	
CONTINGENGY (20%)	**$ 67,000**	
TOTAL PROJECT COST (CREDIT)	**$ 450,000**	**$ (29,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 421,000**	

Table C-5: Rocky Mountain CC 2x1 Decommissioning Cost Summary

		Total Cost		Salvage
Rocky Mountain				
ROCKY MOUNTAIN 1,2,3 CC 2x1				
Demolition	$	5,887,000	$	-
Scrap	$	-	$	(2,254,000)
Subtotal	**$**	**5,887,000**	**$**	**(2,254,000)**
ROCKY MOUNTAIN Common Facilities				
Pond Closures	$	4,065,000	$	-
Seeding & Restoration	$	594,000		
Demolition	$	2,090,000	$	-
Subtotal	**$**	**6,749,000**	**$**	**-**
Rocky Mountain Subtotal	**$**	**12,636,000**	**$**	**(2,254,000)**
TOTAL COST (CREDIT)	**$**	**12,636,000**	**$**	**(2,254,000)**
PROJECT INDIRECTS (15%)	**$**	**1,895,000**		
CONTINGENGY (20%)	**$**	**2,527,000**		
TOTAL PROJECT COST (CREDIT)	**$**	**17,058,000**	**$**	**(2,254,000)**
TOTAL NET PROJECT COST (CREDIT)	**$**	**14,804,000**		

APPENDIX D - GENERIC HYDROELECTRIC FACILITY DECOMMISSIONING COST SUMMARIES

Table D-1: Ames Decommissioning Cost Summary

	Total Cost	Salvage
Ames		
AMES Hydro Facility		
Asbestos	$ 175,000	
Penstock Filling & Removal	$ 549,000	
Powerhouse Demolition & Equipment Removal	$ 852,000	
Scrap		$ (161,000)
Subtotal	**$ 1,576,000**	**$ (161,000)**
Ames Subtotal	**$ 1,576,000**	**$ (161,000)**
TOTAL COST (CREDIT)	**$ 1,576,000**	**$ (161,000)**
PROJECT INDIRECTS (15%)	**$ 236,000**	
CONTINGENGY (20%)	**$ 315,000**	
TOTAL PROJECT COST (CREDIT)	**$ 2,127,000**	**$ (161,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 1,966,000**	

Table D-2: Cabin Creek Decommissioning Cost Summary

	Total Cost	Salvage
Cabin Creek		
CABIN CREEK Hydro Facility		
Asbestos	$ 393,000	$ -
Penstock Filling & Removal	$ 3,000	
Powerhouse Demolition & Equipment Removal	$ 2,271,000	
Dam Removal	$ 17,345,000	
Scrap		$ (2,590,000)
Subtotal	**$ 20,012,000**	**$ (2,590,000)**
Cabin Creek Subtotal	**$ 20,012,000**	**$ (2,590,000)**
TOTAL COST (CREDIT)	**$ 20,012,000**	**$ (2,590,000)**
PROJECT INDIRECTS (15%)	**$ 3,002,000**	
CONTINGENGY (20%)	**$ 4,002,000**	
TOTAL PROJECT COST (CREDIT)	**$ 27,016,000**	**$ (2,590,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 24,426,000**	

Table D-3: Georgetown Decommissioning Cost Summary

		Total Cost		Salvage
Georgetown				
GEORGETOWN Hydro Facility				
Asbestos	$	164,000	$	-
Penstock Filling & Removal	$	1,114,000		
Powerhouse Demolition & Equipment Removal	$	1,136,000		
Scrap			$	(54,000)
Subtotal	**$**	**2,414,000**	**$**	**(54,000)**
Georgetown Subtotal	**$**	**2,414,000**	**$**	**(54,000)**
TOTAL COST (CREDIT)	**$**	**2,414,000**	**$**	**(54,000)**
PROJECT INDIRECTS (15%)	**$**	**362,000**		
CONTINGENGY (20%)	**$**	**483,000**		
TOTAL PROJECT COST (CREDIT)	**$**	**3,259,000**	**$**	**(54,000)**
TOTAL NET PROJECT COST (CREDIT)	**$**	**3,205,000**		

Table D-4: Salida Decommissioning Cost Summary

	Total Cost		Salvage	
Salida				
SALIDA Hydro Facility				
Asbestos	$	116,000	$	-
Penstock Filling & Removal	$	550,000		
Powerhouse Demolition & Equipment Removal	$	1,466,000		
Dam Removal	$	867,000	$	-
Scrap			$	(63,000)
Subtotal	**$**	**2,999,000**	**$**	**(63,000)**
Salida Subtotal	**$**	**2,999,000**	**$**	**(63,000)**
TOTAL COST (CREDIT)	**$**	**2,999,000**	**$**	**(63,000)**
PROJECT INDIRECTS (15%)	**$**	**450,000**		
CONTINGENGY (20%)	**$**	**600,000**		
TOTAL PROJECT COST (CREDIT)	**$**	**4,049,000**	**$**	**(63,000)**
TOTAL NET PROJECT COST (CREDIT)	**$**	**3,986,000**		

Table D-5: Shoshone Decommissioning Cost Summary

		Total Cost		Salvage
Shoshone				
SHOSHONE Hydro Facility				
Asbestos	$	121,000	$	-
Penstock Filling & Removal	$	15,000		
Powerhouse Demolition & Equipment Removal	$	1,154,000		
Scrap			$	(435,000)
Subtotal	**$**	**1,290,000**	**$**	**(435,000)**
Shoshone Subtotal	**$**	**1,290,000**	**$**	**(435,000)**
TOTAL COST (CREDIT)	**$**	**1,290,000**	**$**	**(435,000)**
PROJECT INDIRECTS (15%)	**$**	**194,000**		
CONTINGENGY (20%)	**$**	**258,000**		
TOTAL PROJECT COST (CREDIT)	**$**	**1,742,000**	**$**	**(435,000)**
TOTAL NET PROJECT COST (CREDIT)	**$**	**1,307,000**		

Table D-6: Tacoma Decommissioning Cost Summary

	Total Cost	Salvage
Tacoma		
TACOMA Hydro Facility		
Asbestos	$ 121,000	$ -
Penstock Filling & Removal	$ 2,094,000	
Powerhouse Demolition & Equipment Removal	$ 2,583,000	
Dam Removal	$ 781,000	$ -
Scrap		$ (326,000)
Subtotal	**$ 5,579,000**	**$ (326,000)**
Tacoma Subtotal	**$ 5,579,000**	**$ (326,000)**
TOTAL COST (CREDIT)	**$ 5,579,000**	**$ (326,000)**
PROJECT INDIRECTS (15%)	**$ 837,000**	
CONTINGENGY (20%)	**$ 1,116,000**	
TOTAL PROJECT COST (CREDIT)	**$ 7,532,000**	**$ (326,000)**
TOTAL NET PROJECT COST (CREDIT)	**$ 7,206,000**	

APPENDIX E - SITE-SPECIFIC ENVIRONMENTAL REMEDIATION FIGURES

Figure E-1: Arapahoe Environmental Remediation Zones

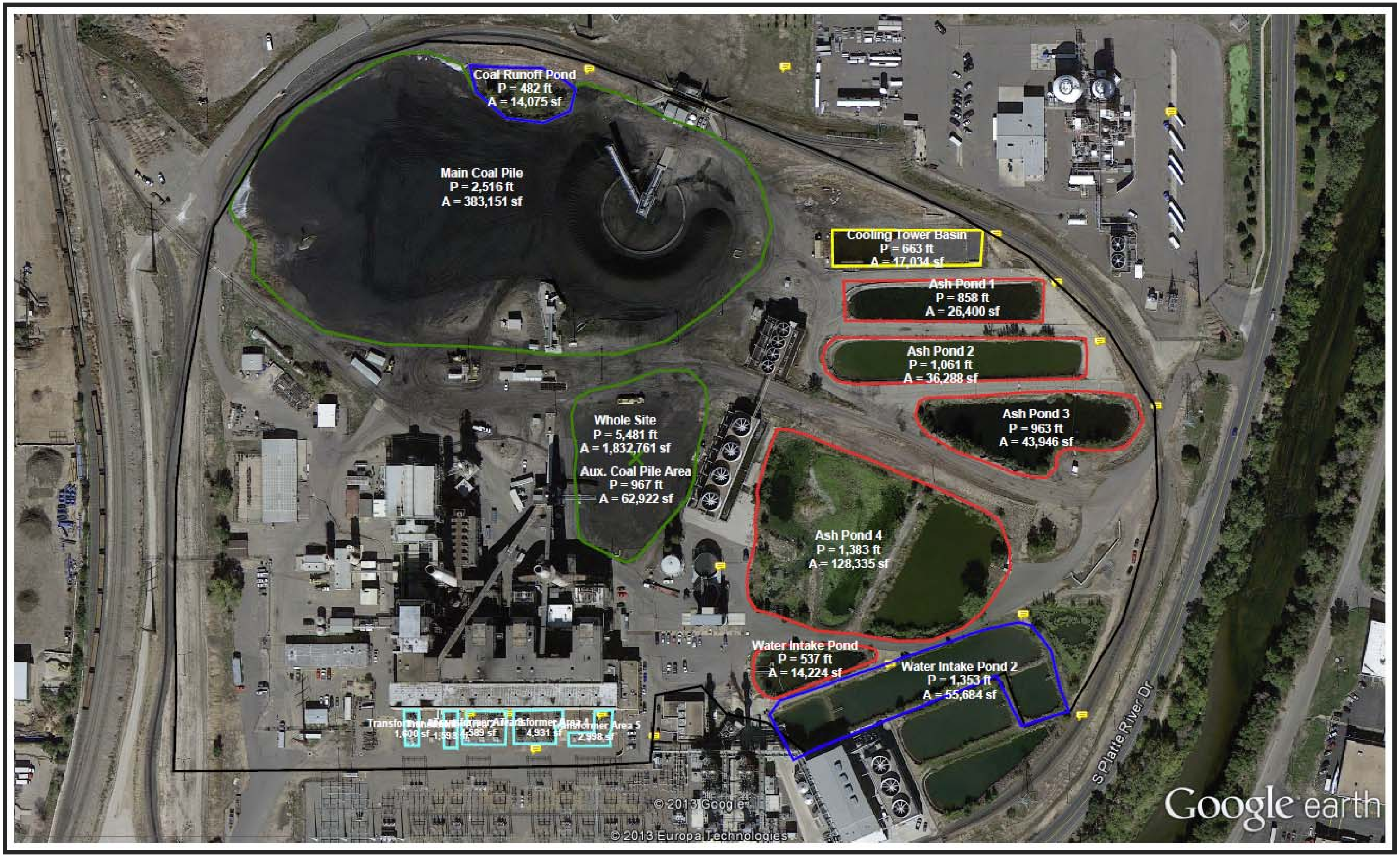


Figure E-2: Cherokee Environmental Remediation Zones

Figure E-3: Fort Lupton Environmental Remediation Zone

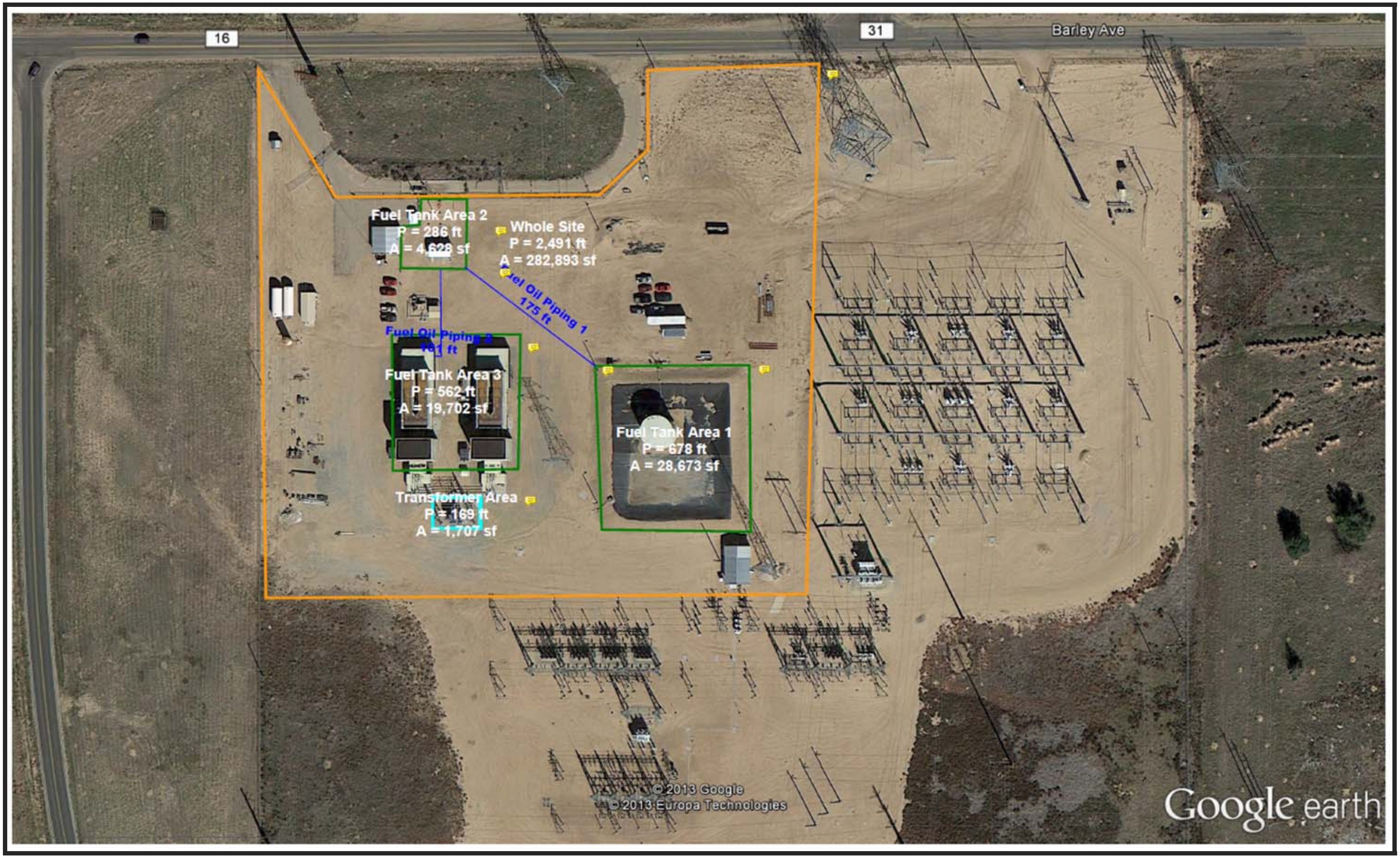


Figure E-4: Fort St. Vrain Environmental Remediation Zone

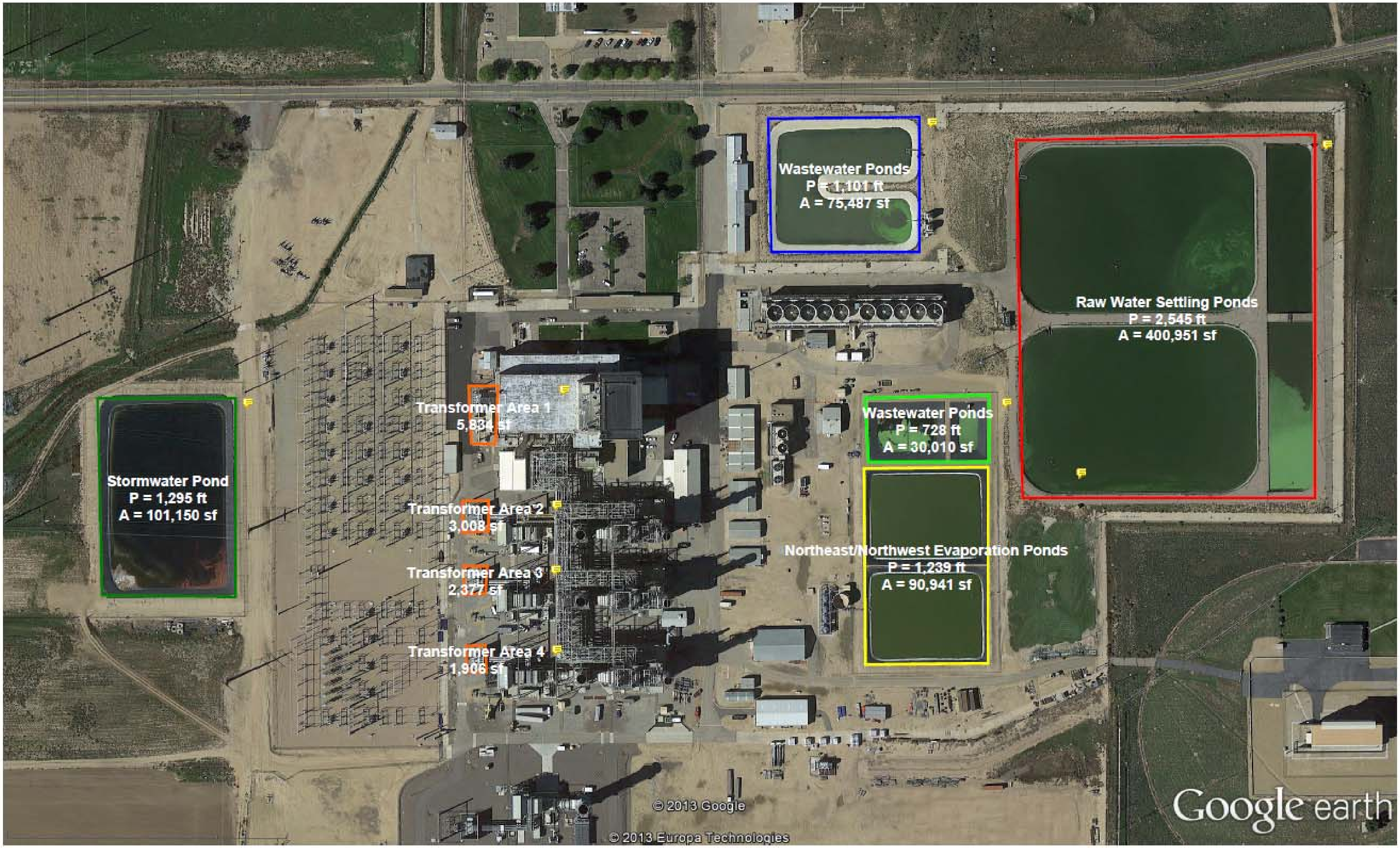


Figure E-5: Valmont Environmental Remediation Zones

Figure E-6: Valmont Ash Landfill Environmental Remediation Zones

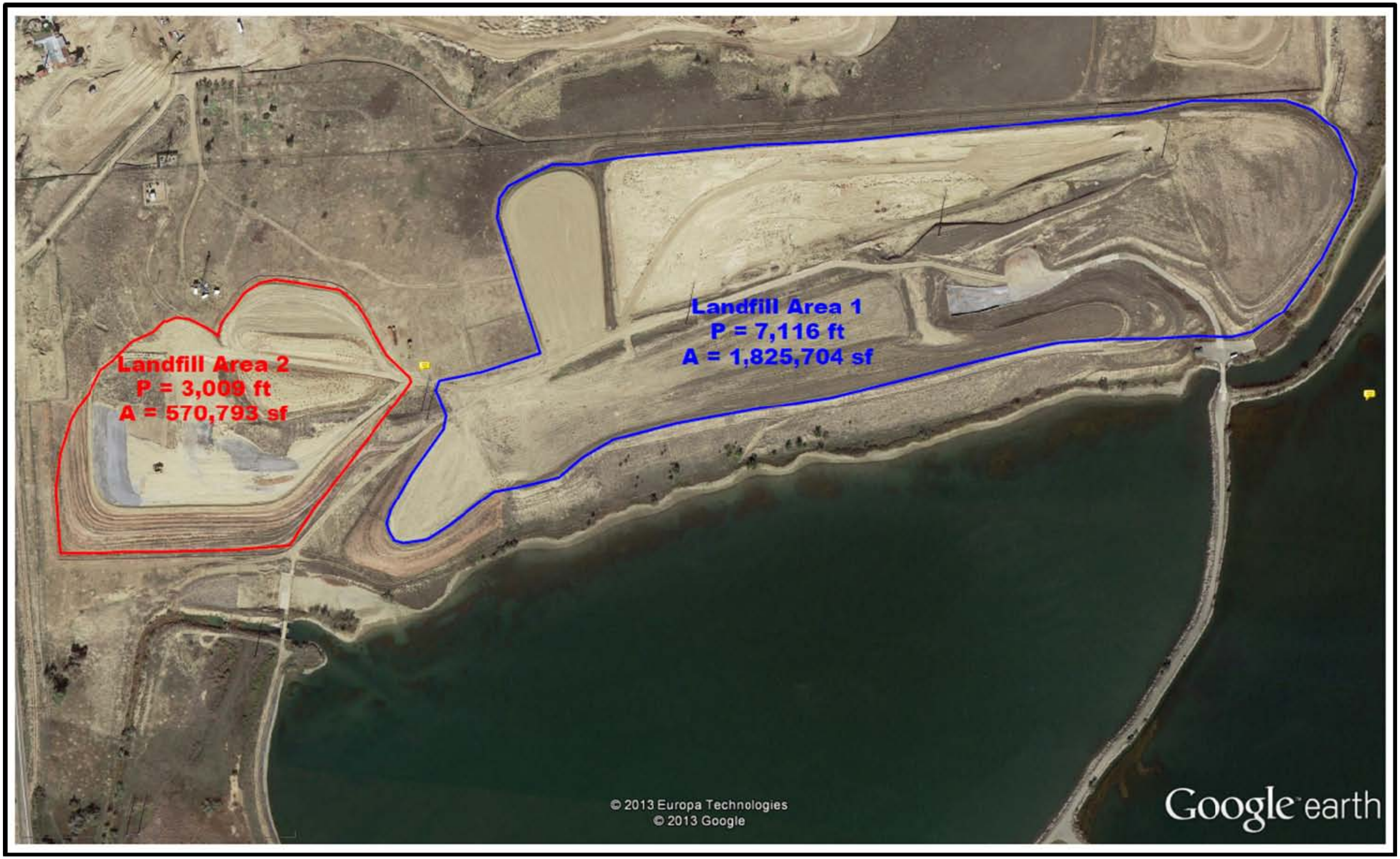
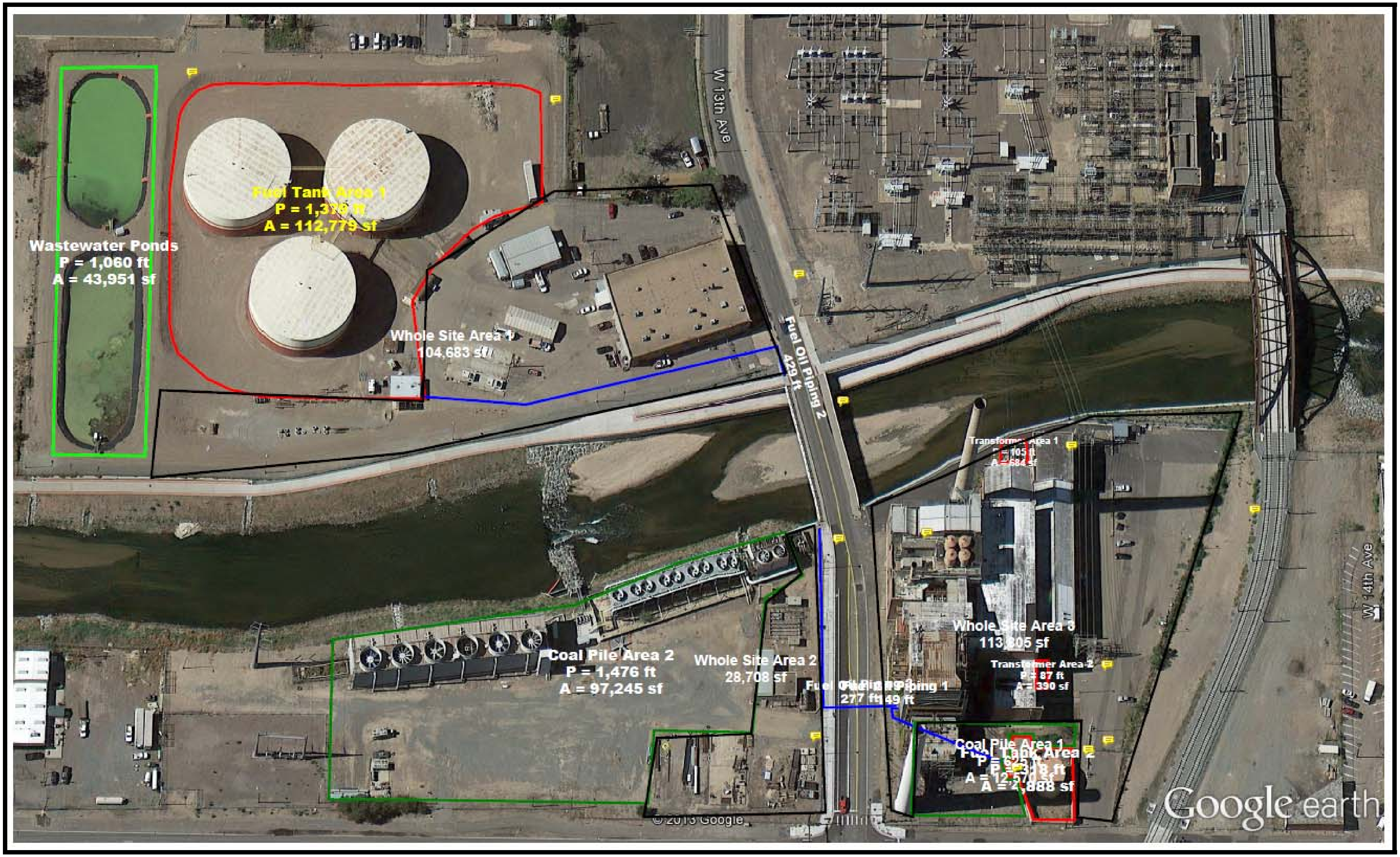


Figure E-7: Zuni Environmental Remediation Zones



APPENDIX F - GENERIC SITE ENVIRONMENTAL REMEDIATION FIGURES

Figure F-1: Comanche Environmental Remediation Zones

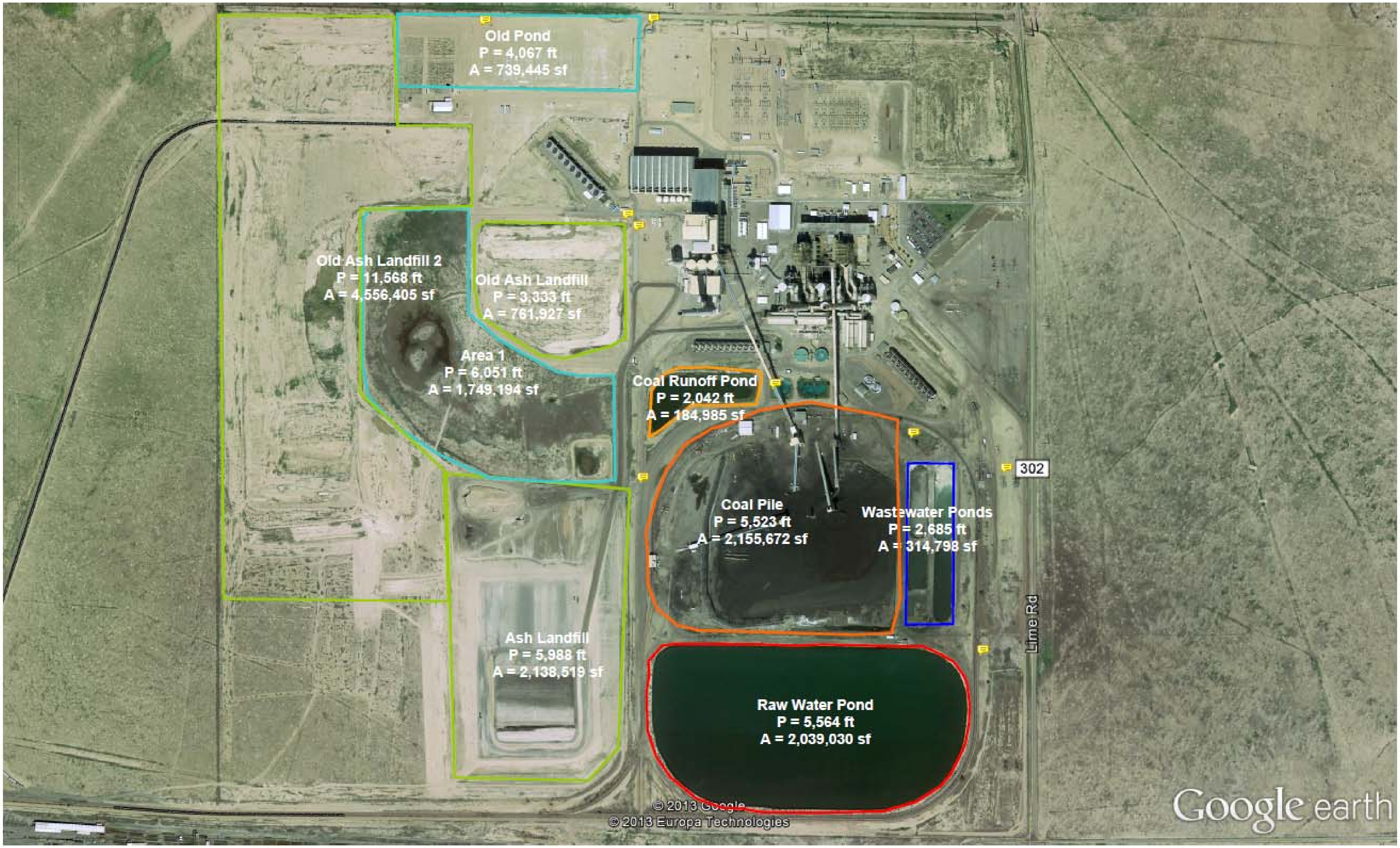


Figure F-2: Craig Environmental Remediation Zones

Figure F-3: Hayden Environmental Remediation Zones

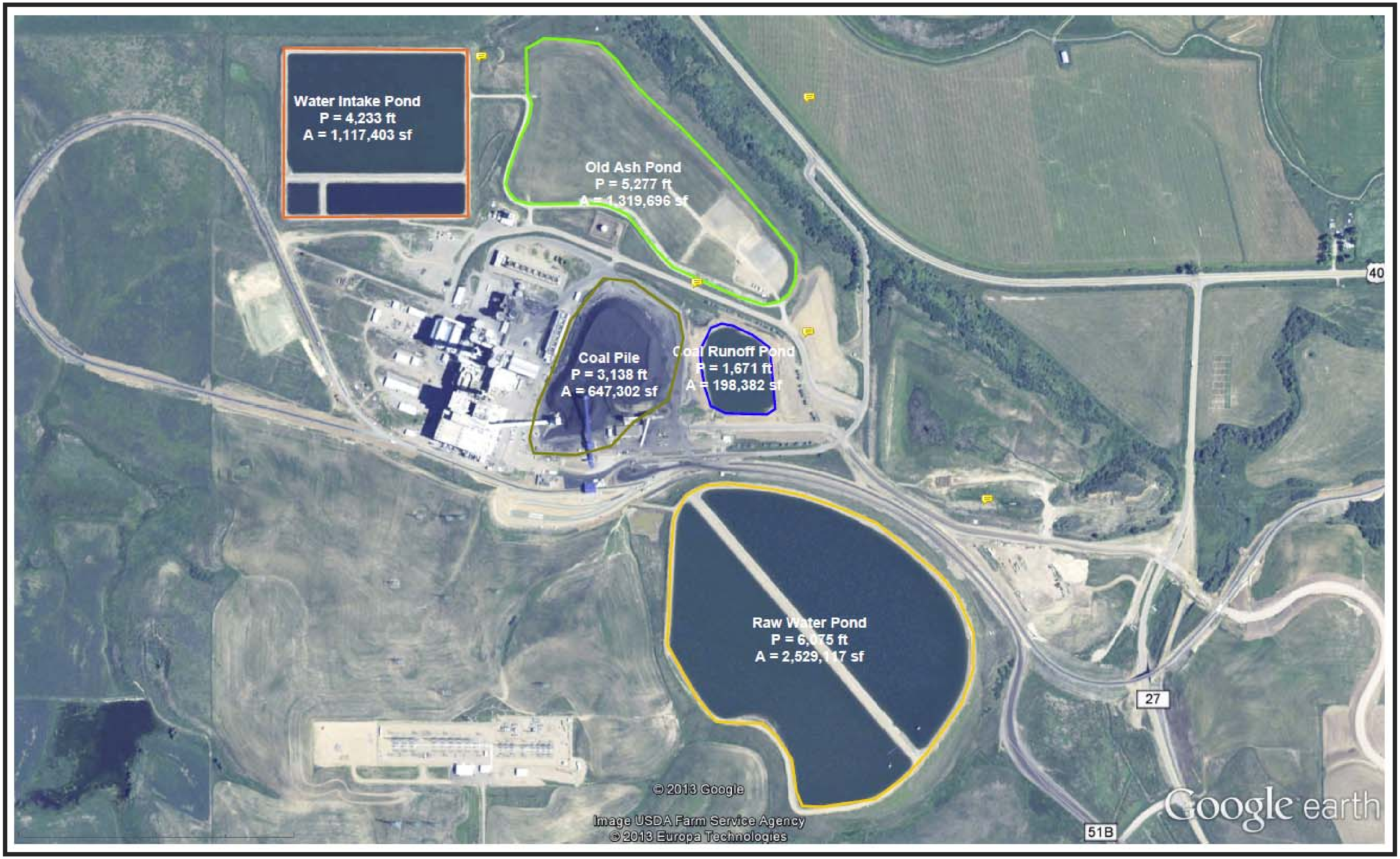


Figure F-4: Pawnee Environmental Remediation Zones

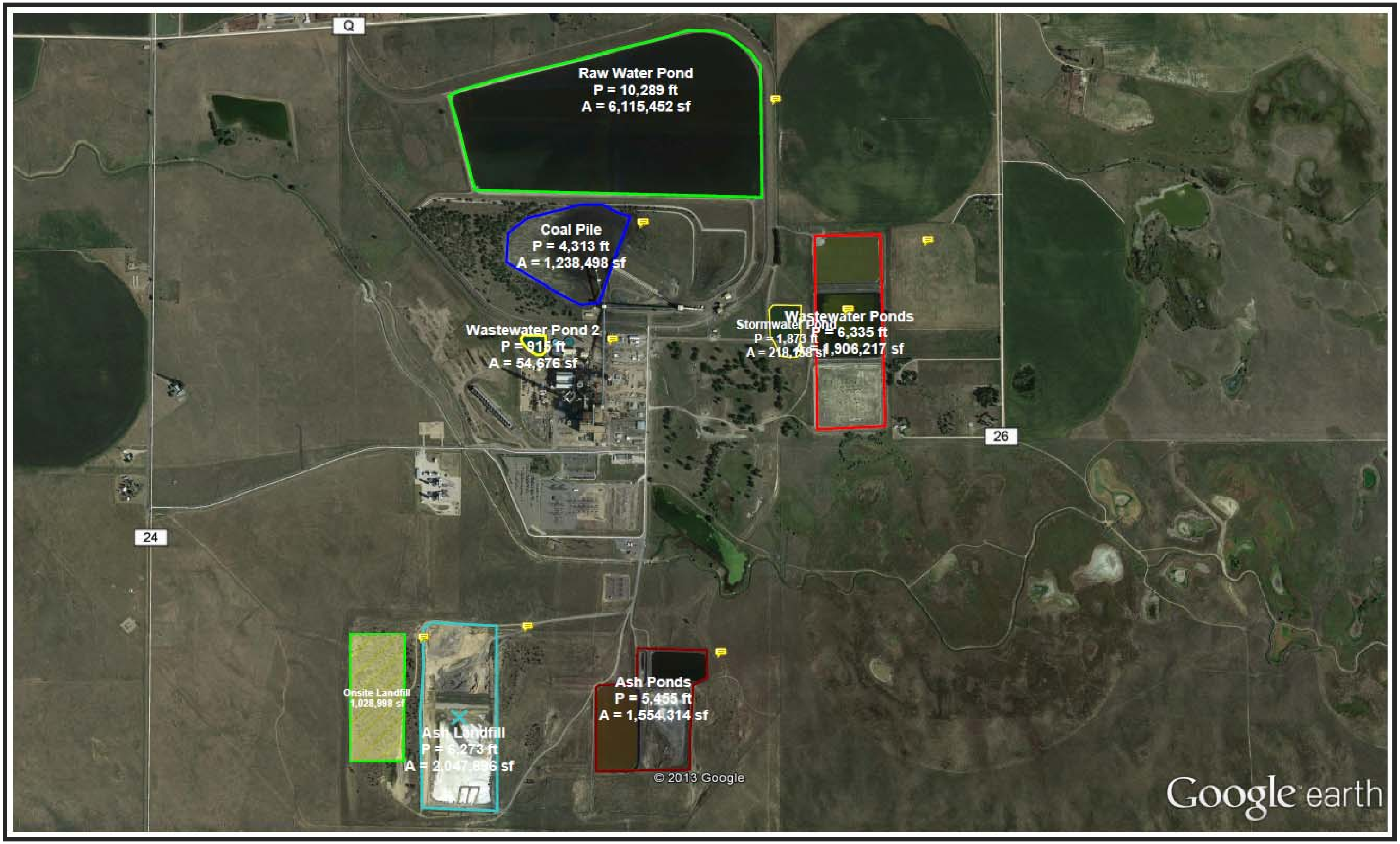
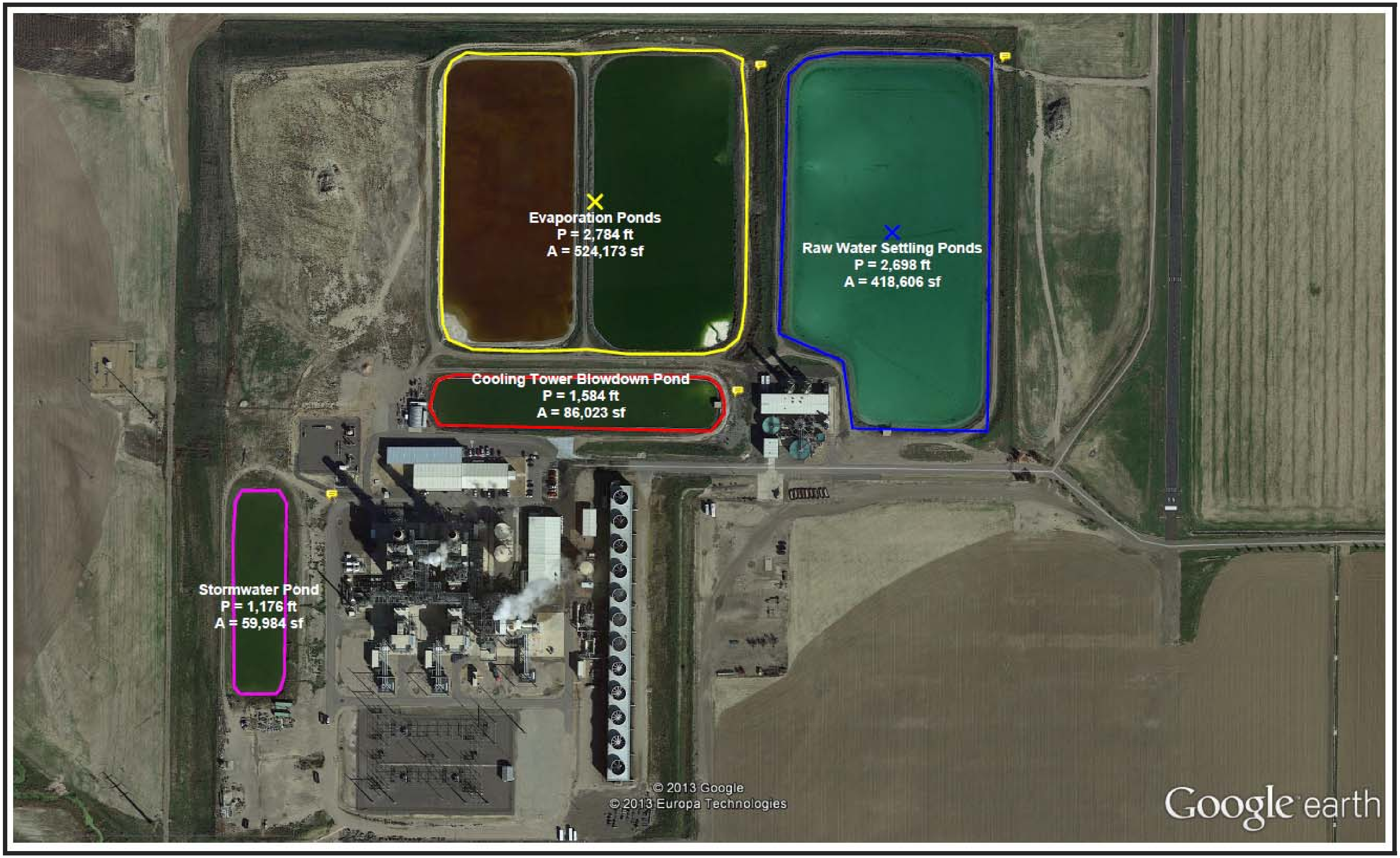


Figure F-5: Rocky Mountain Environmental Remediation Zones



APPENDIX G - EXAMPLE CALCULATION FOR GENERIC SITE ESTIMATES

EXAMPLE CALCULATION FOR GENERIC SITE ESTIMATES

Calculations are presented in this Appendix to summarize the methodology used for developing the generic cost estimates for the Craig Plant, using site-specific Cherokee Plant costs as the basis. A similar methodology was utilized for all the generic cost estimates. Following is a narrative description of the calculations for the Craig Plant estimate, followed by the calculations.

The site-specific costs from the Cherokee Plant that were used as a basis for developing the generic cost are show in Section 1. The application of these values to the Craig Plant, to determine the Craig generic estimate, is shown in Section 2. The dark grey cells from Section 2 then flow directly into Table B-2, as included in Appendix B.

The Cherokee Unit 4 site-specific cost estimate was used to calculate the estimates for Craig Unit 1. Asbestos costs were not used directly in this case, since it was known that little asbestos remained at the Craig plant; therefore, asbestos costs were estimated based directly on known plant conditions. Costs for boiler, steam turbine & building, GSUs and foundations, hazardous materials, and on-site concrete crushing and reuse were calculated on a dollar per megawatt basis for Cherokee Unit 4. These dollars per megawatt values were then applied to the megawatt size of Craig Unit 1 to determine the costs for each of these categories for Craig Unit 1. Since stack demolition does not scale well on a dollar per megawatt basis, Burns and McDonnell developed stack demolition values for ranges of unit outputs, based on all the site-specific estimates prepared, as shown in Section 3 of Table G-1. The appropriate stack demolition value was applied to Craig Unit 1. AQCS costs per megawatt were averaged over all the site-specific cost estimates, also shown in Section 3 of Table G-1, and this average value was applied to Craig Unit 1 as well. Scrap metal credits were then calculated on a megawatt basis for Craig Unit 1, using Cherokee Unit 4 as the basis. Tons of scrap steel, pounds of scrap copper, and pounds of non-ferrous scrap from Cherokee 4 were used to calculate the quantity of scrap per megawatt, as shown in Section 1. Then in Section 2, this per megawatt value was multiplied by the megawatt size of Craig Unit 1 (which would give total tons or pounds) and also multiplied by the value of scrap per ton or per pound to determine the total scrap value of each type of scrap metal for that unit. A similar approach was used to determine the Craig Unit 2 costs for each of these same categories.

Common facility costs were estimated in a different fashion, since these costs do not scale well on a per megawatt basis from individual site-specific estimates. Averages across the site-specific estimates were determined where appropriate or representative values were estimated for some common facilities, as shown in Section 3 of Table G-1. Ash pond closures, stormwater pond closures, landfill restoration, and coal pile area restoration values were estimated on a dollar per square foot basis. These values are not conducive to dollar per megawatt values, since decommissioning costs will be directly proportional to the physical size of these facilities, not the capacity of the generating facilities. Cooling tower decommissioning was estimated on a dollar per megawatt basis from the average from all the site-specific estimates, since the physical size of the cooling towers will be proportional to the megawatts of steam cycle that requires heat rejection. Balance of plant buildings were estimated in size ranges, similar to stack demolition, since these facilities will not scale up directly on a per megawatt basis. On-site concrete crushing and reuse is a relatively small portion of the common facilities decommissioning costs, and was simply calculated on a dollar per megawatt basis. Coal handling facilities were also estimated similar to stack and balance of plant buildings, by developing cost values for different size ranges; however, coal handling facilities were estimated on the size of the coal handling facilities themselves, not the megawatt output of the plant, since coal handling facility sizes can vary for several other factors, such as days storage required, number of units, length of conveyor required, etc.

Table G-1 – Example Calculation

Section 1

Site Specific Cost

Unit-Specific	Cherokee Unit 4 330 MW Total $	$/MW
Asbestos Removal ($/MW)	$ 5,713,000	$ 17,312
Boiler ($/MW)	$ 5,191,000	$ 15,730
Steam Turbine & Building ($/MW)	$ 1,703,000	$ 5,161
GSU & Foundation ($/MW)	$ 121,000	$ 368
300+ MW Stack (Average from all units)	From Section 3	$ 400,000
AQCS (Average from all units)	From Section 3	$ 3,497
Hazardous Material Disposal ($/MW)	$ 177,000	$ 536
On-site Concrete Crushing & Reuse ($/MW)	$ 151,000	$ 459

Unit-Specific	Total (Tons or Lbs)	Per MW
Scrap Steel (tons)	9,793	29.7
Scrap Copper (lbs)	391,647	1,187
Non-Ferrous Scrap (lbs)	320,000	970

Site Specific Cost

Unit-Specific	Cherokee Unit 4 330 MW Total $	$/MW
Asbestos Removal ($/MW)	$ 5,713,000	$ 17,312
Boiler ($/MW)	$ 5,191,000	$ 15,730
Steam Turbine & Building ($/MW)	$ 1,703,000	$ 5,161
GSU&Foundation ($/MW)	$ 121,000	$ 368
300+ MW Stack (Average from all units)	From Section 3	$ 400,000
AQCS (Average from all units)	From Section 3	$ 3,497
Hazardous Material Disposal ($/MW)	$ 177,000	$ 536
On-site Concrete Crushing & Reuse ($/MW)	$ 151,000	$ 459

Unit-Specific	Total (Tons or Lbs)	Per MW
Scrap Steel (tons)	9,793	30
Scrap Copper (lbs)	391,647	1,187
Non-Ferrous Scrap (lbs)	320,000	970

Site Specific Cost

Unit-Specific	Fleetwide Averages Total $	$/MW
Ash Pond Closure (Ft. Sq.)	From Section 3	$ 4.78
Stormwater Pond Closure (Ft. Sq.)	From Section 3	$ 2.40
Coal Pile Restoration (Ft. Sq.)	From Section 3	$ 6.07
Cooling Towers (MW)	From Section 3	$ 1,397
BOP Buildings (Plant Size)	From Section 3	$ 450,000
Onsite Concrete Crushing & Reuse (MW)	From Section 3	$ 81.50
Coal Handling Facilities (Facility Size)	From Section 3	$ 476,168
Landfill (Sq. Ft.)	From Section 3	$ 1.26

Section 2

Generic Cost Calculation

Craig Unit 1 428 MW $/unit measure	Quantity	Total
Adjusted from Plant Data		$ 100,000
$ 15,730	428	$ 6,732,000
$ 5,161	428	$ 2,209,000
$ 368	428	$ 158,000
$ 400,000	1	$ 400,000
$ 3,497	428	$ 1,497,000
$ 536	428	$ 230,000
$ 459	428	$ 196,000
	Subtotal	$ 11,422,000

Per MW	Quantity	Scrap Value	Total
29.7	428	$ (275 00)	$ (3,492,837)
1,187	428	$ (2.75)	$ (1,396,874)
970	428	$ (1.70)	$ (705,552)
		Subtotal	$ (5,595,262)

Generic Cost Calculation

Craig Unit 2 428 MW $/unit measure	Quantity	Total
Adjusted from Plant Data		$ 100,000
$ 15,730	428	$ 6,732,000
$ 5,161	428	$ 2,209,000
$ 368	428	$ 158,000
$ 400,000	1	$ 400,000
$ 3,497	428	$ 1,497,000
$ 536	428	$ 230,000
$ 459	428	$ 196,000
	Subtotal	$ 11,422,000

Per MW	Quantity	Scrap Value	Total
30	428	$ (275 00)	$ (3,492,837)
1,187	428	$ (2.75)	$ (1,396,874)
970	428	$ (1.70)	$ (705,552)
		Subtotal	$ (5,595,262)

Generic Cost Calculation

Craig Common Facilities 856 MW $/unit measure	Quantity	Total
$ 4.78	4,118,300	$ 19,685,500
$ 2.40	1,276,025	$ 3,062,500
	Subtotal	$ 22,748,000
$ 6.07	3,700,000	$ 22,459,000
$ 1,397	856	$ 1,196,000
	Lump Sum	$ 450,000
$ 81.50	856	$ 69,800
	Lump Sum	$ 476,200
	Subtotal	$ 2,192,000
	-	$ -
	Subtotal	$ 47,399,000

Table B-2
Craig
Decommissioning Cost Summary

	Total Cost	Salvage
Craig		
CRAIG Unit 1		
Asbestos	$ 100,000	$ -
Demolition	$ 11,422,000	$ -
Scrap	$ -	$ (5,595,000)
Subtotal	**$ 11,522,000**	**$ (5,595,000)**
CRAIG Unit 2		
Asbestos	$ 100,000	$ -
Demolition	$ 11,422,000	$ -
Scrap	$ -	$ (5,595,000)
Subtotal	**$ 11,522,000**	**$ (5,595,000)**
CRAIG Common Facilities		
Pond Closures	$ 22,748,000	$ -
Coal Area Restoration	$ 22,459,000	$ -
Landfill Closure	$ -	
Demo	$ 2,192,000	$ -
Subtotal	**$ 47,399,000**	**$ -**
Craig Subtotal	**$ 70,443,000**	**$ (11,190,000)**
TOTAL COST (CREDIT)	$ 70,443,000	$ (11,190,000)
PROJECT ND RECTS (15%)	$ 10,566,000	
CONT NGENGY (20%)	$ 14,089,000	$ -
Subtotal	**$ 95,098,000**	**$ (11,190,000)**
Subtotal	**$ 83,908,000**	

Section 3

Common Facilities Unit Average Statistics

Stacks (Unit MW)	Demo Cost
300+	$ 400,000
100-300	$ 300,000
<100	$ 200,000

BOP Buildings	Demo Cost
0-200 MW	$ 250,000
200-600 MW	$ 350,000
>600 MW	$ 450,000

Coal Handling	Demo Cost
Small	$ 280,132
Medium	$ 380,934
Large	$ 476,168

AQCS	Demo Cost
Per MW	$ 3,497

Stormwater Pond Closure	Cost
$/Sq. Ft.	$ 2.40

Coal Pile Restoration	Restoration Cost
$/Sq. Ft.	$ 6.07

Cooling Tower	Demo Cost
$/MW	$ 1,397

Landfill Restoration	Restoration Cost
$/Sq. Ft.	$ 1.26

Ash Pond Closure	Closure Cost
$/Sq. Ft.	$ 4.78

Common Concrete	Demo Cost
Per MW	$ 81 5

Seeding & Restoration	Cost
$/acre	$ 32,135

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
Phone: 816-333-9400
Fax: 816-333-3690
www.burnsmcd.com

Burns & McDonnell: Making our clients successful for more than 100 years