Exhibit No.:
Issues: Depreciation
Witness: Ronald E. White
Sponsoring Party: Aquila Networks-L&P
Case No.: HR-

Before the Public Service Commission
of the State of Missouri

Direct Testimony

of

Ronald E. White

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI
DIRECT TESTIMONY OF DR. RONALD E. WHITE
ON BEHALF OF AQUILA, INC.
D/B/A AQUILA NETWORKS-L&P
CASE NO. HR-_____

Q. Would you Please state your name and business address?

A. My name is Ronald E. White. My business address is 17595 S. Tamiami Trail, Suite 212, Fort Myers, Florida 33908.

Q. What is your occupation?

A. I am an Executive Vice President and Senior Consultant of Foster Associates, Inc.

QUALIFICATIONS

Q. Would you briefly describe your educational training and professional background?

A. I received a B.S. degree (1965) in Engineering Operations and an M.S. degree (1968) and Ph.D. (1977) in Engineering Valuation from Iowa State University. I have taught graduate and undergraduate courses in industrial engineering, engineering economics, and engineering valuation at Iowa State University and previously served on the faculty for Depreciation Programs for public utility Commissions, companies, and consultants, sponsored by Depreciation Programs, Inc., in cooperation with Western Michigan University. I also conduct courses in depreciation and public utility economics for clients of the firm.

I have prepared and presented a number of papers to professional organizations, committees, and conferences and have published several articles on matters relating to depreciation, valuation and economics. I am a past member of the Board of Directors of the Iowa State Regulatory Conference and an affiliate member of the joint American Gas Associa-

tion (A.G.A.) – Edison Electric Institute (EEI) Depreciation Accounting Committee, where I previously served as chairman of a standing committee on capital recovery and its effect on corporate economics. I am also a member of the American Economic Association, the Financial Management Association, the Midwest Finance Association, the Electric Cooperatives Accounting Association (ECAA), and a founding member of the Society of Depreciation Professionals.

Q. What is your professional experience?

A. I joined the firm of Foster Associates in 1979, as a specialist in depreciation, the economics of capital investment decisions, and cost of capital studies for ratemaking applications. Before joining Foster Associates, I was employed by Northern States Power Company (1968-1979) in various assignments related to finance and treasury activities. As Manager of the Corporate Economics Department, I was responsible for book depreciation studies, studies involving staff assistance from the Corporate Economics Department in evaluating the economics of capital investment decisions, and the development and execution of innovative forms of project financing. As Assistant Treasurer at Northern States, I was responsible for bank relations, cash requirements planning, and short-term borrowings and investments.

Q. Have you previously testified before a regulatory body?

A. Yes. I have testified in numerous proceedings before administrative and judicial bodies in Alabama, Arizona, California, Colorado, Delaware, Hawaii, Idaho, Illinois, Iowa, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, Wisconsin, and the

District of Columbia. I have also testified before the Federal Energy Regulatory Commission, the Federal Power Commission, the Alberta Energy Board, the Ontario Energy Board, and the Securities and Exchange Commission. I have sponsored position statements before the Federal Communication Commission and numerous local franchising authorities in matters relating to the regulation of telephone and cable television. A more detailed description of my professional qualifications is contained in attached Schedule REW–1.

PURPOSE OF TESTIMONY

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

A. Foster Associates was engaged by Aquila Networks ("Aquila" or "Company") to conduct depreciation studies for its electric, industrial steam and common utility properties operated by Aquila Networks—MPS and Aquila Networks—SJLP. The engagement also included a 2003 Depreciation Rate Study of Aquila Corporate Assets shared with other business units, including MPS and SJLP. The purpose of my testimony is to sponsor the study conducted by Foster Associates for SJLP industrial steam operations.

DEVELOPMENT OF DEPRECIATION RATES

Q. Would you please explain why depreciation studies are needed for accounting and ratemaking purposes?

A. The goal of depreciation accounting is to charge to operations a reasonable estimate of the cost of the service potential of an asset (or group of assets) consumed during an accounting interval. A number of depreciation systems have been developed to achieve this objective, most of which employ time as the apportionment base.

Implementation of a time-based (or age-life system) of depreciation accounting requires the estimation of several parameters or statistics related to a plant account. The average service life of a vintage, for example, is a statistic that will not be known with certainty until all units from the original placement have been retired from service. A vintage average service life, therefore, must be estimated initially and periodically revised as indications of the eventual average service life become more certain. Future net salvage rates and projection curves, which describe the expected distribution of retirements over time, are also estimated parameters of a depreciation system that are subject to future revisions. Depreciation studies should be conducted periodically to assess the continuing reasonableness of parameters and accrual rates derived from prior estimates.

The need for periodic depreciation studies is also a derivative of the ratemaking process which establishes prices for utility services based on costs. Absent regulation, deficient or excessive depreciation rates will produce no adverse consequence other than a systematic over or understatement of the accounting measurement of earnings. While a continuance of such practices may not comport with the goals of depreciation accounting, the achievement of capital recovery is not dependent upon either the amount or the timing of depreciation expense for an unregulated firm. In the case of a regulated utility, however, recovery of investor-supplied capital is dependent upon allowed revenues, which are in turn dependent upon approved levels of depreciation expense. Periodic reviews of depreciation rates are, therefore, essential to the achievement of timely capital recovery for a regulated utility.

It is also important to recognize that revenue associated with depreciation is a significant source of internally generated funds used to finance plant replacements and new capacity

additions. It can be shown that given the same financing requirements and the same dividend payout ratio, an increase in internal cash generation will accelerate per-share growth in earnings, dividends, and book value over the business life of a firm. Financial theory provides that the marginal cost of external financing will be reduced by these enhanced measurements of financial performance. This is not to suggest that internal cash generation should be substituted for the goals of depreciation accounting. However, the potential for realizing a reduction in the marginal cost of external financing provides an added incentive for conducting periodic depreciation studies and adopting proper depreciation rates.

Q. What are the principal activities involved in conducting a depreciation study?

A. The first step in conducting a depreciation study is the collection of plant accounting data needed to conduct a statistical analysis of past retirement experience. Data are also collected to permit an analysis of the relationship between retirements and realized gross salvage and removal expense. The data collection phase should include a verification of the accuracy of the plant accounting records and a reconciliation of the assembled data to the official plant records of the company.

The next step in a depreciation study is the estimation of service life statistics from an analysis of past retirement experience. The term *life analysis* is used to describe the activities undertaken in this step to obtain a mathematical description of the forces of retirement acting upon a plant category. The mathematical expressions used to describe these forces are known as survival functions or survivor curves.

Life indications obtained from an analysis of past retirement experience are blended with expectations about the future to obtain an appropriate projection life curve. This step,

called *life estimation*, is concerned with predicting the expected remaining life of property units still exposed to the forces of retirement. The amount of weight given to the analysis of historical data will depend upon the extent to which past retirement experience is considered descriptive of the future.

An estimate of the net salvage rate applicable to future retirements is usually obtained from an analysis of the gross salvage and removal expense realized in the past. An analysis of past experience (including an examination of trends over time) provides a baseline for estimating future salvage and cost of removal. Consideration, however, should be given to events that may cause deviations from the net salvage realized in the past. Among the factors which should be considered are the age of plant retirements; the portion of retirements that will be reused; changes in the method of removing plant; the type of plant to be retired in the future; inflation expectations; the shape of the projection life curve; and economic conditions that may warrant greater or lesser weight to be given to the net salvage observed in the past.

A comprehensive depreciation study will also include an analysis of the adequacy of the recorded depreciation reserve. The purpose of such an analysis is to compare the current balance in the recorded reserve with the balance required to achieve the goals and objectives of depreciation accounting if the amount and timing of future retirements and net salvage are realized exactly as predicted. The difference between the required (or theoretical) reserve and the recorded reserve provides a measurement of the expected excess or shortfall that will remain in the depreciation reserve if corrective action is not taken to extinguish the reserve imbalance.

Although reserve records are typically maintained by various account classifications, the total reserve for a company is the most important measure of the status of the company's depreciation practices and procedures. Differences between the theoretical reserve and the recorded reserve will arise as a normal occurrence when service lives, dispersion patterns and salvage estimates are adjusted in the course of depreciation reviews. Differences will also arise due to plant accounting activity such as transfers and adjustments, which require an identification of reserves at a different level from that maintained in the accounting system. It is appropriate, therefore, and consistent with group depreciation theory, to periodically redistribute recorded reserves among primary accounts based on the most recent estimates of retirement dispersion and salvage. A redistribution of the recorded reserve will provide an initial reserve balance for each primary account consistent with the estimates of retirement dispersion selected to describe mortality characteristics of the accounts and establish a baseline against which future comparisons can be made. Finally, parameters estimated from service life and net salvage studies are integrated into an appropriate formulation of an accrual rate based upon a selected depreciation system. Three elements are needed to describe a depreciation system. These elements (*i.e.*, method, procedure and technique) can be visualized as three dimensions of a cube in which each face describes a variety of sub-elements that can be combined to form a system. A depreciation system is therefore formed by selecting a sub-element from each face such that the system contains one method, one procedure and one technique. The sub-elements commonly used in constructing a depreciation system are shown in Table 1.

METHODS	PROCEDURES	TECHNIQUES
Retirement	Total Company	Whole-Life
Compound-Interest	Broad Group	Remaining-Life
Sinking-Fund	Vintage Group	Probable-Life
Straight-Line	Equal-Life Group	
Declining Balance	Unit Summation	
Sum-of-Years'-Digits	Item	
Expensing		
Unit-of-Production		
Net Revenue		

TABLE 1. ELEMENTS OF A DEPRECIATION SYSTEM

2002 SJLP DEPRECIATION RATE STUDY

Q. Did Aquila provide Foster Associates plant accounting data for conducting the 2002 SJLP depreciation study?

A. Yes, they did. The database used in the 2002 study was compiled from two sources. Detailed accounting transactions were extracted from these sources and assigned transaction codes which identify the nature of the accounting activity. Transaction codes for plant additions, for example, are used to distinguish normal additions from acquisitions, purchases, reimbursements and adjustments. Similar transaction codes are used to distinguish normal retirements from sales, reimbursements, abnormal retirements and adjustments. Transaction codes are also assigned to transfers, capital leases and other accounting activity which should be considered in a depreciation study.

The first data source was an electronic file used by SJLP in conducting its 1998 depreciation rate study. The legacy database was updated by SJLP to include activity years 1998 through 2000. The earliest activity year in the updated file was 1980. An electronic worksheet was used by Foster Associates to create a coded database in a format compatible with the software used to conduct the 2002 depreciation study.

The second source of data was the current CPR system installed by Aquila in 1998. The database obtained from this system included activity year transactions for calendar year 2001 and the age distribution of surviving plant at December 31, 2001. Plant transactions for 2001 were added to the legacy database to generate age distributions at December 31, 2001. The resulting age distributions were then compared to the age distributions extracted from the current CPR. Differences were coded as vintage adjustments in 2001 to interconnect and provide continuity between the two databases. Care was taken in creating the Foster Associates database to ensure a proper mapping of the legacy system account structure to the current CPR account structure.

The accuracy and completeness of the assembled database was verified by Foster Associates for activity year 2001 by comparing additions, retirements, transfers and adjustments, and the ending plant balance derived for 2001 to the official plant records of the Company. The legacy database contains adjustments for depreciation study purposes which prevents reconciling the database to the official plant records for activity years prior to 2001.

Q. Did Foster Associates conduct a statistical life analysis for SJLP industrial steam operations?

A. Yes, we did. As discussed in Schedule REW–2, all plant accounts were analyzed using a technique in which first, second and third degree polynomials were fitted to a set of observed retirement ratios. The resulting function can be expressed as a survivorship function, which is numerically integrated to obtain an estimate of the average service life. The smoothed survivorship function is then fitted by a weighted least-squares procedure to the Iowa-curve family to obtain a mathematical description or classification of the disper-

sion characteristics of the data. Service life indications derived from the statistical analyses were blended with informed judgment and expectations about the future to obtain an appropriate projection life curve for each plant category.

Plant classified in the Steam Production, Industrial Steam and Other Production functions were identified by location and treated as life-span categories in the 2002 study. The life-span method requires the selection of a coterminous retirement date for all plant additions to a specific facility. A composite depreciation rate was calculated for each facility using the technique of harmonic weighting of the expected life span of each vintage addition. The resulting accrual rate was adjusted for interim retirements anticipated prior to the terminal retirement date of the facility.

Q. Did Foster Associates conduct a net salvage analysis for SJLP industrial steam operations?

A. Yes, we did. A traditional, historical analysis using a five-year moving average of the ratio of realized salvage and removal expense to the associated retirements was used in the study to a) estimate a realized net salvage rate; b) detect the emergence of historical trends; and c) establish a basis for estimating a future net salvage rate. Cost of removal and salvage opinions obtained from SJLP operating personnel were blended with judgment and historical net salvage indications in developing estimates of the future.

The average net salvage rate for an account was estimated using direct dollar weighting of historical retirements with the historical net salvage rate, and future retirements (*i.e.*, surviving plant) with the estimated future net salvage rate.

Q. Did Foster Associates conduct an analysis of the recorded depreciation reserve for SJLP industrial steam operations?

A. Yes, we did. Statement C (page 19) of Schedule REW–2 provides a comparison of the computed and recorded reserves for SJLP industrial steam production plant on December 31, 2001. The recorded reserve was $1,359,211 or 43.0 percent of the depreciable plant investment. The corresponding computed reserve is $1,970,810 or 62.3 percent of the depreciable plant investment. A proportionate amount of the measured reserve imbalance of $611,599 will be amortized over the composite weighted-average remaining life of each rate category.

Q. Is Foster Associates recommending a rebalancing of depreciation reserves for SJLP industrial steam operations?

A. Yes, we are. A redistribution of recorded reserves is appropriate for SJLP. Although recorded reserves have been maintained by primary account (and locations within primary accounts), these reserves were largely ignored in the development of the presently prescribed whole-life accrual rates. Present industrial steam rates were established pursuant to a Stipulation Agreement in Formal Case No. HR-99-245 dated August 17, 1999. The failure to address prior reserve imbalances in the currently prescribed rates produces an added dimension of instability in accrual rates beyond the variability attributable to the parameters estimated in the current study. A redistribution of the recorded reserve is necessary, therefore, to develop an initial reserve balance for each primary account consistent with the age distributions and estimates of retirement dispersion developed in this study. Reserves were also realigned in the 2002 study to reflect implementation of the vintage group procedure.

A redistribution of the recorded reserve was achieved for SJLP by multiplying the calculated reserve for each primary account within a function by the ratio of the function total

recorded reserve to the function total calculated reserve. The sum of the redistributed reserves within a function is, therefore, equal to the function total recorded depreciation reserve before the redistribution.

Q. Would you please describe the depreciation system currently approved by the Commission for SJLP?

A. SJLP is presently using a depreciation system composed of the straight-line method, broad group procedure, whole-life technique. The level of asset grouping identified in the broad group procedure is the total plant in service from all vintages in an account. Each vintage is estimated to have the same average service life. The formulation of an account depreciation accrual rate using the straight-line method, broad group procedure, whole-life technique is given by:

$$Accrual\ Rate = \frac{1.0 - Average\ Net\ Salvage\ Rate}{Average\ Life}.$$

Q. Is Foster Associates recommending a change in the depreciation system for SJLP?

A. Yes, we are. It is the opinion of Foster Associates that the objectives of depreciation accounting can be more nearly achieved using the vintage group procedure combined with the remaining life technique. Unlike the broad group procedure in which each vintage is estimated to have the same average service life, consideration is given to the realized life of each vintage when average service lives and remaining lives are derived using the vintage group procedure. The vintage group procedure distinguishes average service lives among vintages and composite life statistics are computed for each plant account. The formulation of an account accrual rate using the straight-line method, vintage group procedure, remaining-life technique is given by:

$$Accrual\ Rate = \frac{1.0 - Reserve\ Ratio - Future\ Net\ Salvage\ Rate}{Remaining\ Life}.$$

Q. What is the relationship between a whole-life rate and a remaining-life rate?

A. The principal distinction between a whole-life rate and a remaining-life rate is the treatment of depreciation reserve imbalances caused largely by imprecise estimates of service life statistics and net salvage rates. A reserve imbalance is measured as the difference between a theoretical or computed reserve and the corresponding recorded reserve for a rate category. A remaining-life rate is the sum of two components: a) a whole-life rate; and b) an amortization of any reserve imbalance over the composite weighted average remaining life of a rate category. In other words, a remaining-life accrual rate is equivalent to

$$Accrual\ Rate = \frac{1.0 - Average\ Net\ Savage\ Rate}{Average\ Life} + \frac{Computed\ Reserve - Recorded\ Reserve}{Remaining\ Life}$$

where both the computed reserve and the recorded reserve are expressed as ratios to the plant in service.

Unlike the currently prescribed whole-life rates in which reserve imbalances are addressed by the presence of compensating deviations in the estimated average service life of each vintage, the remaining-life technique provides a systematic amortization of these imbalances over the composite weighted average remaining life of a rate category. A permanent excess or deficiency will be created in the depreciation reserve by a continued application of the whole-life technique if service life deviations are not exactly offsetting. The potential for a permanent reserve imbalance can be eliminated by an application of the remaining-life technique.

Q. Would you please summarize the depreciation rates and accruals Foster Associates recommended for SJLP industrial steam operations in the 2002 study?

A. Table 2 provides a summary of the changes in annual rates and accruals for SJLP industrial steam production plant resulting from adoption of the parameters and depreciation system recommended in the 2002 study.

	Accrual Rate			2003 Annualized Accrual		
Function	Present	Proposed	Difference	Present	Proposed	Difference
Industrial Steam	3.04%	6.16%	3.12%	$96,156	$194,924	$98,768

TABLE 2. 2002 SJLP INDUSTRIAL STEAM RATES AND ACCRUALS

Foster Associates recommended primary account depreciation rates equivalent to a composite rate of 6.16 percent. Depreciation expense is presently accrued at an equivalent composite rate of 3.04 percent. The recommended change in the composite depreciation rate is, therefore, an increase of 3.12 percentage points.

A continued application of rates currently prescribed would provide annualized depreciation expense of $96,156 compared to an annualized expense of $194,924 using the rates developed in the 2002 study. The proposed 2002 expense increase is $98,768. Of this increase, $59,779 represents amortization of a $611,599 reserve imbalance. The remaining portion of the increase is attributable to changes in service life and net salvage parameters.

2003 AQUILA CORPORATE ASSETS DEPRECIATION RATE STUDY

Q. Did Aquila provide Foster Associates plant accounting data for conducting the 2003 Corporate Assets depreciation study?

A. Yes, they did. The database used in the 2003 study was compiled from the current CPR system installed by Aquila in 1998. The database was provided to Foster Associates in an

electronic format containing activity year transactions over the period 1999 through September 30, 2002. Forecasted plant additions and depreciation accruals were provided over the period October 1 through December 31, 2002.

Transaction codes are used to describe the nature of the detailed accounting activity extracted from the CPR. Transaction codes for plant additions, for example, are used to distinguish normal additions from acquisitions, purchases, reimbursements and adjustments. Similar transaction codes are used to distinguish normal retirements from sales, reimbursements, abnormal retirements and adjustments. Transaction codes are also assigned to transfers, capital leases and other accounting activity which should be considered in a depreciation study.

The database was initially constructed to provide a reverse calculation of the historical arrangement over the period 1998–2002 for each account. Age distributions of plant exposed to retirement at the beginning of each activity year were obtained by adding (or subtracting) transaction amounts to the coded age distribution of surviving plant at the end of 2002. Plant additions for each activity year and age distributions of surviving plant at the beginning of 1999 derived from these transactions were subsequently coded and added to the database. The age distribution of surviving plant at the end of 2002 was then removed from the database. This conversion of the database from a reverse construction to a forward construction of the historical arrangement was made to facilitate maintaining the database for future depreciation studies. Future activity-year transactions (including plant additions) can now be appended to the database without removing or adjusting prior coded transactions.

The accuracy and completeness of the assembled data base was verified by Foster Associates for activity years 1999 through September 30, 2002 by comparing the beginning plant balance, additions, retirements, transfers and adjustments, and the ending plant balance derived for each activity year to the official plant records of the Company. Forecasted plant and reserve activity could not be reconciled to any official plant records of the Company.

Q. Did Foster Associates conduct a statistical life analysis for Corporate Assets operations?

A. Yes, we did. As discussed in Schedule REW–3, all plant accounts were analyzed using a technique in which first, second and third degree polynomials were fitted to a set of observed retirement ratios. The resulting function can be expressed in terms of a survivorship function, which is numerically integrated to obtain an estimate of the average service life. The smoothed survivorship function is then fitted by a weighted least-squares procedure to the Iowa-curve family to obtain a mathematical description or classification of the dispersion characteristics of the data. Service life indications derived from the statistical analyses were blended with informed judgment and expectations about the future to obtain an appropriate projection life curve for each plant category.

Without exception, service life indications were indeterminate from a statistical analysis of the available activity years. Much of the plant activity over the period 1999–2002 consisted of transfers, adjustments, and several large retirements associated with the formation of the Corporate Assets business unit. Service life indications were generally much shorter than either experience or the anticipated future use of the assets would suggest. Absent meaningful indications from the analysis of historical retirement activity, the service-life statistics recommended in this study were based largely on judgment and a con-

sideration of the parameters approved for similar assets managed by other Aquila business units.

Q. Did Foster Associates conduct a net salvage analysis for Corporate Assets operations?

A. Yes, we did. A traditional, historical analysis using a five-year moving average of the ratio of realized salvage and removal expense to the associated retirements was used in the study to a) estimate a realized net salvage rate; b) detect the emergence of historical trends; and c) establish a basis for estimating a future net salvage rate. Cost of removal and salvage opinions obtained from Aquila operating personnel were blended with judgment and historical net salvage indications in developing estimates of the future.

Account 390001 (Structures and Improvements) is the only account for which net salvage has been recorded. Salvage proceeds resulted from the sale of infrastructure improvements on developable land. Foster Associates was advised by Aquila that any future interim salvage from Corporate Assets will, most likely, be offset by removal expense. Accordingly, a future net salvage rate of zero percent is recommended for all Corporate Asset accounts.

The average net salvage rate for Account 390001was estimated using direct dollar weighting of historical retirements with the historical net salvage rate, and future retirements (*i.e.*, surviving plant) with the estimated future net salvage rate.

Q. Did Foster Associates conduct an analysis of the recorded depreciation reserve for Corporate Assets operations?

A. Yes, we did. Statement C (page 26) of Schedule REW–3 provides a comparison of the computed and recorded reserves forecasted for Corporate Assets – SJLP on December 31, 2002. The recorded reserve is $697,985, or 4.1 percent of the depreciable plant in-

vestment. The corresponding computed reserve is $4,718,586 or 27.6 percent of the depreciable plant investment. A proportionate amount of the measured reserve imbalance of $4,020,601 will be amortized over the composite weighted-average remaining life of each rate category.

Q. Is Foster Associates recommending a rebalancing of depreciation reserves for Corporate Assets?

A. Yes, we are. A redistribution of recorded reserves is appropriate for Corporate Assets. Although recorded reserves have been maintained by primary account, these reserves were largely ignored in the development of the currently used whole-life accrual rates. Depreciation rates currently used for Corporate Assets allocated to Missouri were approved by the Missouri Public Service Commission pursuant to a Stipulation and Agreement in consolidated Case Nos. ER-2001-672 and EC-2002-265 (Agreement dated February 5, 2002). The rates adopted for Corporate Assets were established by negotiations and compromise without specifying the projection curve and reserve ratios contemplated in the settled rates.

The failure to address prior reserve imbalances produces an added dimension of instability in accrual rates beyond the variability attributable to the parameters estimated in the current study. A redistribution of the recorded reserve is necessary, therefore, to develop an initial reserve balance for each primary account consistent with the age distributions and estimates of retirement dispersion developed in this study. Reserves should also be realigned in this study to reflect implementation of the vintage group procedure.[1]

[1]Depreciation reserves allocated to Missouri are adjusted for differences in the accrual rates prescribed in Missouri and those currently used for all other jurisdictions and non-regulated business units. The reserve adjustment is the cumulative difference in accruals resulting from the application of unique depreciation rates in Missouri. Reserve adjustments are shown on Statement C of Schedule REW–3.

A redistribution of the recorded reserve was achieved for Corporate Assets by multiplying the calculated reserve for each primary account within the general function by the ratio of the function total recorded reserve to the function total calculated reserve. The sum of the redistributed reserves within the general function is, therefore, equal to the function total recorded depreciation reserve before redistribution.

Q. Would you please describe the depreciation system currently approved by the Commission for Corporate Assets?

A. Aquila is presently using a depreciation system composed of the straight-line method, broad group procedure, whole-life technique. The level of asset grouping identified in the broad group procedure is the total plant in service from all vintages in an account. Each vintage is estimated to have the same average service life. The formulation of an account depreciation accrual rate using the straight-line method, broad group procedure, whole-life technique is given by:

$$Accrual\ Rate = \frac{1.0 - Average\ Net\ Salvage\ Rate}{Average\ Life}.$$

Q. Is Foster Associates recommending a change in the depreciation system for Corporate Assets?

A. Yes, we are. It is the opinion of Foster Associates that the objectives of depreciation accounting can be more nearly achieved using the vintage group procedure combined with the remaining life technique. Unlike the broad group procedure in which each vintage is estimated to have the same average service life, consideration is given to the realized life of each vintage when average service lives and remaining lives are derived using the vintage group procedure. The vintage group procedure distinguishes average service lives among vintages and composite life statistics are computed for each plant account.

The formulation of an account accrual rate using the straight-line method, vintage group procedure, remaining-life technique is given by:

$$Accrual\ Rate = \frac{1.0 - Reserve\ Ratio - Future\ Net\ Salvage\ Rate}{Remaining\ Life}.$$

Q. What is the relationship between a whole-life rate and a remaining-life rate?

A. The principal distinction between a whole-life rate and a remaining-life rate is the treatment of depreciation reserve imbalances caused largely by imprecise estimates of service life statistics and net salvage rates. A reserve imbalance is measured as the difference between a theoretical or computed reserve and the corresponding recorded reserve for a rate category. A remaining-life rate is the sum of two components: a) a whole-life rate; and b) an amortization of any reserve imbalance over the composite weighted average remaining life of a rate category. In other words, a remaining-life accrual rate is equivalent to

$$Accrual\ Rate = \frac{1.0 - Average\ Net\ Savage\ Rate}{Average\ Life} + \frac{Computed\ Reserve - Recorded\ Reserve}{Remaining\ Life}$$

where both the computed reserve and the recorded reserve are expressed as ratios to the plant in service.

Unlike the currently prescribed whole-life rates in which reserve imbalances are addressed by the presence of compensating deviations in the estimated average service life of each vintage, the remaining-life technique provides a systematic amortization of these imbalances over the composite weighted average remaining life of a rate category. A permanent excess or deficiency will be created in the depreciation reserve by a continued application of the whole-life technique if service life deviations are not exactly offsetting.

The potential for a permanent reserve imbalance can be eliminated by an application of the remaining-life technique.

Q. Would you please summarize the depreciation rates and accruals Foster Associates recommended for Corporate Assets in the 2003 study?

A. Table 3 provides a summary of the changes in annual depreciation rates and accruals applicable to Corporate Assets devoted to SJLP operations.

	Accrual Rate			2003 Annualized Accrual		
Function	Present	Proposed	Difference	Present	Proposed	Difference
General Plant	1.41%	11.97%	10.56%	$241,203	$2,046,124	$1,804,921

TABLE 3. 2003 CORPORATE ASSETS – SJLP RATES AND ACCRUALS

The composite accrual rate recommended for SJLP operations is 11.97 percent. The current equivalent rate is 1.41 percent. The recommended change in the composite rate is an increase of 10.56 percentage points.

A continued application of rates currently adopted for SJLP would provide annualized depreciation expense of $241,203 compared to an annualized expense of $2,046,124 using the rates developed in this study. The proposed expense increase is $1,804,921. Of this increase, $663,511 represents amortization of a $4,020,601 reserve imbalance. The remaining portion of the increase is attributable to recommended changes in service life parameters.

Q. Does this conclude your direct testimony?

A. Yes, it does.

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Ronald E. White, Ph.D.

Education

1961 - 1964 Valparaiso University
Major: Electrical Engineering

1965 Iowa State University
B.S., Engineering Operations

1968 Iowa State University
M.S., Engineering Valuation
Thesis: The Multivariate Normal Distribution and the Simulated Plant Record Method of Life Analysis

1977 Iowa State University
Ph.D., Engineering Valuation
Minor: Economics
Dissertation: A Comparative Analysis of Various Estimates of the Hazard Rate Associated With the Service Life of Industrial Property

Employment

1996 - Present Foster Associates, Inc.
Executive Vice President

1988 - 1996 Foster Associates, Inc.
Senior Vice President

1979 - 1988 Foster Associates, Inc.
Vice President

1978 - 1979 Northern States Power Company
Assistant Treasurer

1974 - 1978 Northern States Power Company
Manager, Corporate Economics

1972 - 1974 Northern States Power Company
Corporate Economist

1970 - 1972 Iowa State University
Graduate Student and Instructor

1968 - 1970 Northern States Power Company
Valuation Engineer

1965 - 1968 Iowa State University
Graduate Student and Teaching Assistant

Publications

A New Set of Generalized Survivor Tables, Journal of the Society of Depreciation Professionals, October, 1992.

The Theory and Practice of Depreciation Accounting Under Public Utility Regulation, Journal of the Society of Depreciation Professionals, December, 1989.

Standards for Depreciation Accounting Under Regulated Competition, paper presented at The Institute for Study of Regulation, Rate Symposium, February, 1985.

The Economics of Price-Level Depreciation, paper presented at the Iowa State University Regulatory Conference, May, 1981.

Depreciation and the Discount Rate for Capital Investment Decisions, paper presented at the National Communications Forum - National Electronics Conference, October 1979.

A Computerized Method for Generating a Life Table From the 'h-System' of Survival Functions, paper presented at the American Gas Association - Edison Electric Institute Depreciation Accounting Committee Meeting, December, 1975.

The Problem With AFDC is ..., paper presented at the Iowa State University Conference on Public Utility Valuation and the Rate Making Process, May, 1973.

The Simulated Plant-Record Method of Life Analysis, paper presented at the Missouri Public Service Commission Regulatory Information Systems Conference, May, 1971.

Simulated Plant-Record Survivor Analysis Program (User's Manual), special report published by Engineering Research Institute, Iowa State University, February, 1971.

A Test Procedure for the Simulated Plant-Record Method of Life Analysis, Journal of the American Statistical Association, September, 1970.

Modeling the Behavior of Property Records, paper presented at the Iowa State University Conference on Public Utility Valuation and the Rate Making Process, May, 1970.

A Technique for Simulating the Retirement Experience of Limited-Life Industrial Property, paper presented at the National Conference of Electric and Gas Utility Accountants, May, 1969.

How Dependable are Simulated Plant-Record Estimates?, paper presented at the Iowa State University Conference on Public Utility Valuation and the Rate Making Process, April, 1968.

Expert Opinion

Alabama Public Service Commission, Docket No. 18488, General Telephone Company of the Southeast; testimony concerning engineering economy study techniques.

Alabama Public Service Commission, Docket No. 20208, General Telephone Company of the South; testimony concerning the equal-life group procedure and remaining-life technique.

Alberta Energy and Utilities Board, Application No. 1250392, Aquila Networks Canada; rebuttal testimony supporting proposed depreciation rates.

Alberta Energy and Utilities Board, Case No. RE95081, Edmonton Power Inc.; rebuttal evidence concerning appropriate depreciation rates.

Alberta Energy and Utilities Board, 1999/2000 General Tariff Application, Edmonton Power Inc.; direct and rebuttal evidence concerning appropriate depreciation rates.

Arizona Corporation Commission, Docket No. T-01051B-97-0689, U S West Communications, Inc.; testimony concerning appropriate depreciation rates.

Arizona Corporation Commission, Docket No. G-1032A-02-0598, Citizens Communications Company; testimony supporting proposed depreciation rates.

Arizona State Board of Equalization, Docket No. 6302-07-2, Arizona Public Service Company; testimony concerning valuation and assessment of contributions in aid of construction.

California Public Utilities Commission, Case Nos. A.92-06-040, 92-06-042, GTE California Incorporated; rebuttal testimony supporting depreciation study techniques.

Public Utilities Commission of the State of Colorado, Application No. 36883-Reopened. U S WEST Communications; testimony concerning equal-life group procedure.

Delaware Public Service Commission, Docket No. 81-8, Diamond State Telephone Company; testimony concerning the amortization of inside wiring.

Delaware Public Service Commission, Docket No. 82-32, Diamond State Telephone Company; testimony concerning the equal-life group procedure and remaining-life technique.

Public Service Commission of the District of Columbia, Formal Case No. 842, District of Columbia Natural Gas; testimony concerning depreciation rates.

Public Service Commission of the District of Columbia, Formal Case No. 1016, Washington Gas Light Company - District of Columbia; testimony supporting proposed depreciation rates.

Federal Communications Commission, Prescription of Revised Depreciation Rates for AT&T Communications; statement concerning depreciation, regulation and competition.

Federal Communications Commission, Petition for Modification of FCC Depreciation Prescription Practices for AT&T; statement concerning alignment of depreciation expense used for financial reporting and regulatory purposes.

Federal Communications Commission, Docket No. 99-117, Bell Atlantic; affidavit concerning revenue requirement and capital recovery implications of omitted plant retirements.

Federal Energy Regulatory Commission, Docket No. ER95-267-000, New England Power Company; testimony supporting proposed depreciation rates.

Federal Energy Regulatory Commission, Docket No. RP89-248, Mississippi River Transmission Corporation; rebuttal testimony concerning appropriateness of net salvage component in depreciation rates.

Federal Energy Regulatory Commission, Docket No. ER91-565, New England Power Company; testimony supporting proposed depreciation rates.

Federal Energy Regulatory Commission, Docket No. ER78-291, Northern States Power Company; testimony concerning rate of return and general financial requirements.

Federal Energy Regulatory Commission, Docket Nos. RP80-97 and

RP81-54, Tennessee Gas Pipeline Company; testimony concerning offshore plant depreciation rates.

Federal Power Commission, Docket No. E-8252, Northern States Power Company; testimony concerning general financial requirements and measurements of financial performance.

Federal Power Commission, Docket No. E-9148, Northern States Power Company; testimony concerning general financial requirements and measurements of financial performance.

Federal Power Commission, Docket No. ER76-818, Northern States Power Company; testimony concerning rate of return and general financial requirements.

Federal Power Commission, Docket No. RP74-80, *Northern* Natural Gas Company; testimony concerning depreciation expense.

Public Utilities Commission of the State of Hawaii, Docket No. 00-0309, The Gas Company; testimony supporting proposed depreciation rates.

Public Utilities Commission of the State of Hawaii, Docket No. 94-0298, GTE Hawaiian Telephone Company Incorporated; testimony concerning the need for shortened service lives and disclosure of asset impairment losses.

Idaho Public Utilities Commission, Case No. U-1002-59, General Telephone Company of the Northwest, Inc.; testimony concerning the remaining-life technique and the equal-life group procedure.

Illinois Commerce Commission, Docket No. 94-0481, Citizens Utilities Company of Illinois; rebuttal testimony concerning applications of the Simulated Plant-Record method of life analysis.

Iowa State Commerce Commission, Docket No. RPU 82-47, North Central Public Service Company; testimony on depreciation rates.

Iowa State Commerce Commission, Docket No. RPU 84-34, General Telephone Company of the Midwest; testimony concerning the remaining-life technique and the equal-life group procedure.

Iowa State Utilities Board, Docket No. DPU-86-2, Northwestern Bell Telephone Company; testimony concerning capital recovery in competition.

Iowa State Utilities Board, Docket No. RPU-84-7, Northwestern Bell Telephone Company; testimony concerning the deduction of a reserve deficiency from the rate base.

Iowa State Utilities Board, Docket No. DPU-88-6, U S WEST Communications; testimony concerning depreciation subject to refund.

Iowa State Utilities Board, Docket No. RPU-90-9, Central Telephone Company of Iowa; testimony concerning depreciation rates.

Iowa State Utilities Board, Docket No. RPU-93-9, U S WEST Communications; testimony concerning principles of depreciation accounting and abandonment of FASB 71.

Iowa State Utilities Board, Docket No. DPU-96-1, U S WEST Communications; testimony concerning principles of depreciation accounting and abandonment of FASB 71.

Kentucky Public Service Commission, Case No. 97-224, Jackson Purchase Electric Cooperative Corporation; rebuttal testimony supporting proposed depreciation rates.

Maryland Public Service Commission, Case No. 8485, Baltimore Gas and Electric Company; testimony supporting proposed depreciation rates.

Maryland Public Service Commission, Case No. 7689, Washington Gas Light Company; testimony concerning life analysis and net salvage.

Maryland Public Service Commission, Case No. 8960, Washington Gas Light Company; testimony supporting proposed depreciation rates.

Massachusetts Department of Public Utilities, Case No. DPU 91-52, Massachusetts Electric Company; testimony supporting proposed depreciation rates which include a net salvage component.

Michigan Public Service Commission, Case No. U-13393, Aquila Networks – MGU; testimony supporting proposed depreciation rates.

Michigan Public Service Commission, Case No. U-12395, Michigan Gas Utilities; testimony supporting proposed depreciation rates including amortization accounting and redistribution of recorded reserves.

Michigan Public Service Commission, Case No. U-6587, General Telephone Company of Michigan; testimony concerning use of a theoretical depreciation reserve with the remaining-life technique.

Michigan Public Service Commission, Case No. U-7134, General Telephone Company of Michigan; testimony concerning the equal-life group depreciation procedure.

Minnesota District Court. In Re: Northern States Power Company v. Ronald G. Blank, *et. al.* File No. 394126; testimony concerning depreciation and engineering economics.

Minnesota Public Service Commission, Docket No. E-611, Northern States Power Company; testimony concerning rate of return and general financial requirements.

Minnesota Public Service Commission, Docket No. E-1086, Northern States Power Company; testimony concerning depreciation rates.

Minnesota Public Service Commission, Docket No. G-1015, Northern States Power Company; testimony concerning rate of return and general financial requirements.

Public Service Commission of the State of Missouri, Case No. ER-2001-672, Missouri Public Service, a division of Utilicorp United Inc.; surrebuttal testimony regarding computation of income tax expense.

Public Service Commission of the State of Missouri, Case No. TO-82-3, Southwestern Bell Telephone Company; rebuttal testimony concerning the remaining-life technique and the equal-life group procedure.

Public Service Commission of the State of Missouri, Case No. GO-97-79, Laclede Gas Company; rebuttal testimony concerning adequacy of database for conducting depreciation studies.

Public Service Commission of the State of Missouri, Case No. GR-99-315, Laclede Gas Company; rebuttal testimony concerning treatment of net salvage in development of depreciation rates.

Public Service Commission of the State of Montana, Docket No. 88.2.5, Mountain State Telephone and Telegraph Company; rebuttal testimony concerning the equal-life group procedure and amortization of reserve imbalances.

Montana Public Service Commission, Docket No. D95.9.128, The Montana Power Company; testimony supporting proposed depreciation rates.

Public Service Commission of Nevada, Docket No. 92-7002, Central Telephone Company-Nevada; testimony supporting proposed depreciation rates.

Public Service Commission of Nevada, Docket No. 91-5054, Central Telephone Company-Nevada; testimony supporting proposed depreciation rates.

New Hampshire Public Utilities Commission, Docket No. DR95-169, Granite State Electric Company; testimony supporting proposed net salvage rates.

New Jersey Board of Public Utilities, Docket No. GR 87060552, New Jersey Natural Gas Company; testimony concerning depreciation rates.

New Jersey Board of Regulatory Commissioners, Docket No. GR93040114J, New Jersey Natural Gas Company; testimony concerning depreciation rates.

North Carolina Utilities Commission, Docket No. E-7, SUB 487, Duke Power Company; rebuttal testimony ong proposed depreciation rates.

North Carolina Utilities Commission, Docket No. P-19, SUB 207, General Telephone Company of the South; rebuttal testimony concerning the equal-life group depreciation procedure.

North Dakota Public Service Commission, Case No. 8860, Northern States Power Company; testimony concerning general financial requirements.

North Dakota Public Service Commission, Case No. 9634, Northern States Power Company; testimony concerning rate of return and general financial requirements.

North Dakota Public Service Commission, Case No. 9666, Northern States Power Company; testimony concerning rate of return and general financial requirements.

North Dakota Public Service Commission, Case No. 9741, Northern States Power Company; testimony concerning rate of return and general financial requirements.

Ontario Energy Board, E.B.R.O. 385, Tecumseh Gas Storage Limited; testimony concerning depreciation rates.

Ontario Energy Board, E.B.R.O. 388, Union Gas Limited; testimony concerning depreciation rates.

Ontario Energy Board, E.B.R.O. 456, Union Gas Limited; testimony concerning depreciation rates.

Ontario Energy Board, E.B.R.O. 476-03, Union Gas Limited; testimony concerning depreciation rates.

Public Utilities Commission of Ohio, Case No. 81-383-TP-AIR, General

Telephone Company of Ohio; testimony in support of the remaining-life technique.

Public Utilities Commission of Ohio, Case No. 82-886-TP-AIR, General Telephone Company of Ohio; testimony concerning the remaining-life technique and the equal-life group procedure.

Public Utilities Commission of Ohio, Case No. 84-1026-TP-AIR, General Telephone Company of Ohio; testimony in support of the equal-life group procedure and the remaining-life technique.

Public Utilities Commission of Ohio, Case No. 81-1433, The Ohio Bell Telephone Company; testimony concerning the remaining-life technique and the equal-life group procedure.

Public Utilities Commission of Ohio, Case No. 83-300-TP-AIR, The Ohio Bell Telephone Company; testimony concerning straight-line age-life depreciation.

Public Utilities Commission of Ohio, Case No. 84-1435-TP-AIR, The Ohio Bell Telephone Company; testimony in support of test period depreciation expense.

Public Utilities Commission of Oregon, Docket No. UM 204, GTE of the Northwest; testimony concerning the theory and practice of depreciation accounting under public utility regulation.

Public Utilities Commission of Oregon, Docket No. UM 840, GTE Northwest Incorporated; rebuttal testimony concerning principles of capital recovery.

Pennsylvania Public Utility Commission, Docket No. R-80061235, The Bell Telephone Company of Pennsylvania; testimony concerning the proper depreciation reserve to be used with an original cost rate base.

Pennsylvania Public Utility Commission, Docket No. R-811512, General Telephone Company of Pennsylvania; testimony concerning the proper depreciation reserve to be used with an original cost rate base.

Pennsylvania Public Utility Commission, Docket No. R-811819, The Bell Telephone Company of Pennsylvania; testimony concerning the proper depreciation reserve to be used with an original cost rate base.

Pennsylvania Public Utility Commission, Docket No. R-822109, General Telephone Company of Pennsylvania; testimony in support of the remaining-life technique.

Pennsylvania Public Utility Commission, Docket No. R-850229, General Telephone Company of Pennsylvania; testimony in support of the remaining-life technique and the proper depreciation reserve to be used with an original cost rate base.

Pennsylvania Public Utility Commission, Docket No. C-860923, The Bell Telephone Company of Pennsylvania; testimony concerning capital recovery under competition.

Rhode Island Public Utilities Commission, Docket No. 2290, The Narragansett Electric Company; testimony supporting proposed net salvage rates and depreciation rates.

South Carolina Public Service Commission, Docket No. 91-216-E, Duke Power Company; testimony supporting proposed depreciation rates.

Public Utilities Commission of the State of South Dakota, Case No. F-3062, Northern States Power Company; testimony concerning general financial requirements and measurements of financial performance.

Public Utilities Commission of the State of South Dakota, Case No. F-3188, Northern States Power Company; testimony concerning rate of return and general financial requirements.

Securities and Exchange Commission, File No. 3-5749, Northern States Power Company; testimony concerning the financial and ratemaking implications of an affiliation with Lake Superior District Power Company.

Tennessee Public Service Commission, Docket No. 89-11041, United Inter-Mountain Telephone Company; testimony concerning depreciation principles and capital recovery under competition.

State of Vermont Public Service Board, Docket No. 6596, Citizens Communications Company – Vermont Electric Division, testimony supporting recommended depreciation rates.

Commonwealth of Virginia State Corporation Commission, Case No. PUE-2002-00364, Washington Gas Light Company; testimony supporting proposed depreciation rates.

Public Service Commission of Wisconsin, Docket No. 2180-DT-3, General Telephone Company of Wisconsin; testimony concerning the equal-life group depreciation procedure.

Other Consulting Activities

Moran Towing Corporation. In Re: Barge TEXAS-97 CIV. 2272 (ADS) and Tug HEIDE MORAN – 97 CIV. 1947 (ADS), United States District Court, Southern District of New York.

John Reigle, et al. v. Baltimore Gas & Electric Co., et al., Case No. C-2001-73230-CN, Circuit Court for Anne Arundel County, Maryland.

BellSouth Telecommunications, Inc. v. Citizens Utilities Company d/b/a/ Louisiana Gas Service Company, CA No. 95-2207, United States District Court, Eastern District of Louisiana.

Affidavit on behalf of Continental Cablevision, Inc. and its operating cable television systems regarding basic broadcast tier and equipment and installation cost-of-service rate justification.

Office of Chief Counsel, Internal Revenue Service. In Re: Kansas City Southern Railway Co., et. al. Docket Nos. 971-72, 974-72, and 4788-73.

Office of Chief Counsel, Internal Revenue Service. In Re: Northern Pacific Railway Co., Docket No. 4489-69.

United States Department of Justice. In Re: Burlington Northern Inc. v. United States, Ct. Cl. No. 30-72.

Faculty

Depreciation Programs for public utility commissions, companies, and consultants, sponsored by Depreciation Programs, Inc., in cooperation with Western Michigan University. (1980 - 1999)

United States Telephone Association (USTA), Depreciation Training Seminar, November 1999.

Depreciation Advocacy Workshop, a three-day team-training workshop on preparation, presentation, and defense of contested depreciation issues, sponsored by Gilbert Associates, Inc., October, 1979.

Corporate Economics Course, Employee Education Program, Northern States Power Company. (1968 - 1979)

Perspectives of Top Financial Executives, Course No. 5-300, University of Minnesota, September, 1978.

Depreciation Programs for public utility commissions, companies, and consultants, jointly sponsored by Western Michigan University and Michigan Technological University, 1973.

Professional Associations

Advisory Committee to the Institute for Study of Regulation, sponsored by the American University and The University of Missouri-Columbia.

American Economic Association.

American Gas Association - Edison Electric Institute Depreciation Accounting Committee.

Board of Directors, Iowa State Regulatory Conference.

Edison Electric Institute, Energy Analysis Division, Economic Advisory Committee, 1976-1980.

Financial Management Association.

The Institute of Electrical and Electronics Engineers, Inc., Power Engineering Society, Engineering and Planning Economics Working Group.

Midwest Finance Association.

Society of Depreciation Professionals (Founding Member and Chairman, Policy Committee

Moderator

Depreciation Open Forum, Iowa State University Regulatory Conference, May 1991.

The Quantification of Risk and Uncertainty in Engineering Economic Studies, Iowa State University Regulatory Conference, May 1989.

Plant Replacement Decisions with Added Revenue from New Service Offerings, Iowa State University Regulatory Conference, May 1988.

Economic Depreciation, Iowa State University Regulatory Conference, May 1987.

Opposing Views on the Use of Customer Discount Rates in Revenue Requirement Comparisons, Iowa State University Regulatory Conference, May 1986.

Cost of Capital Consequences of Depreciation Policy, Iowa State University Regulatory Conference, May 1985.

Concepts of Economic Depreciation, Iowa State University Regulatory Conference, May 1984.

Ratemaking Treatment of Large Capacity Additions, Iowa State University Regulatory Conference, May 1983.

The Economics of Excess Capacity, Iowa State University Regulatory Conference, May 1982.

New Developments in Engineering Economics, Iowa State University Regulatory Conference, May 1980.

Training in Engineering Economy, Iowa State University Regulatory

Conference, May 1979.

The Real Time Problem of Capital Recovery, Missouri Public Service Commission, Regulatory Information Systems Conference, September 1974.

Speaker

Finding the "D" in RCNLD (Valuation Applications of Depreciation), Society of Depreciation Professionals Annual Meeting, September 2001.

Capital Asset and Depreciation Accounting, City of Edmonton Value Engineering Workshop, April 2001.

A Valuation View of Economic Depreciation, Society of Depreciation Professionals Annual Meeting, October 1999.

Capital Recovery in a Changing Regulatory Environment, Pennsylvania Electric Association Financial-Accounting Conference, May 1999.

Depreciation Theory and Practice, Southern Natural Gas Company Accounting and Regulatory Seminar, March 1999.

Depreciation Theory Applied to Special Franchise Property, New York Office of Real Property Services, March 1999.

Capital Recovery in a Changing Regulatory Environment, PowerPlan Consultants Annual Client Forum, November 1998.

Economic Depreciation, AGA Accounting Services Committee and EEI Property Accounting and Valuation Committee, May 1998.

Discontinuation of Application of FASB Statement No. 71, Southern Natural Gas Company Accounting Seminar, April 1998.

Forecasting in Depreciation, Society of Depreciation Professionals Annual Meeting, September 1997.

Economic Depreciation In Response to Competitive Market Pricing, 1997 TELUS Depreciation Conference, June 1997.

Valuation of Special Franchise Property, City of New York, Department of Finance Valuation Seminar, March 1997.

Depreciation Implications of FAS Exposure Draft 158-B, 1996 TLG Decommissioning Conference, October 1996.

Why Economic Depreciation?, American Gas Association Depreciation Accounting Committee Meeting, August 1995.

The Theory of Economic Depreciation, Society of Depreciation Professionals Annual Meeting, November 1994.

Vintage Depreciation Issues, G & T Accounting and Finance Association Conference, June 1994.

Pricing and Depreciation Strategies for Segmented Markets (Regulated and Competitive), Iowa State Regulatory Conference, May 1990.

Principles and Practices of Depreciation Accounting, Canadian Electrical Association and Nova Scotia Power Electric Utility Regulatory Seminar, December 1989.

Principles and Practices of Depreciation Accounting, Duke Power Accounting Seminar, September 1989.

The Theory and Practice of Depreciation Accounting Under Public Utility

Regulation, GTE Capital Recovery Managers Conference, February 1989.

Valuation Methods for Regulated Utilities, GTE Capital Recovery Managers Conference, January 1988.

Depreciation Principles and Practices for REA Borrowers, NRECA 1985 National Accounting and Finance Conference, September 1985.

Depreciation Principles and Practices for REA Borrowers, Kentucky Association of Electric Cooperatives, Inc., Summer Accountants Association Meeting, June 1985.

Considerations in Conducting a Depreciation Study, NRECA 1984 National Accounting and Finance Conference, October 1984.

Software for Conducting Depreciation Studies on a Personal Computer, United States Independent Telephone Association, September 1984.

Depreciation—An Assessment of Current Practices, NRECA 1983 National Accounting and Finance Conference, September 1983

Depreciation—An Assessment of Current Practices, REA National Field Conference, September 1983.

An Overview of Depreciation Systems, Iowa State Commerce Commission, October 1982.

Depreciation Practices for Gas Utilities, Regulatory Committee of the Canadian Gas Association, September 1981.

Practice, Theory, and Needed Research on Capital Investment Decisions in the Energy Supply Industry, workshop, sponsored by Michigan State University and the Electric Power Research Institute, November 1977.

Depreciation Concepts Under Regulation, Public Utilities Conference, sponsored by The University of Texas at Dallas, July 1976.

Electric Utility Economics, Mid-Continent Area Power Pool, May 1974.

Honors and Awards

The Society of Sigma Xi.

Professional Achievement Citation in Engineering, Iowa State University, 1993.

Schedule REW–2

2002 Depreciation Rate Study

Aquila Networks—SJLP
(Electric, Steam and Common)

Prepared by
Foster Associates, Inc.

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EXECUTIVE SUMMARY

INTRODUCTION

This report presents the findings and recommendations developed in a 2002 Depreciation Rate Study for utility plant owned by Aquila Networks – SJLP (Electric, Industrial Steam and Common). Work on the study, conducted by Foster Associates, Inc., commenced in January 2003 and progressed through mid-March 2003, at which time the project was completed.

Foster Associates, Inc. is a public utility economic consulting firm headquartered in Bethesda, Maryland offering economic research and consulting services on issues and problems arising from governmental regulation of business. The areas of specialization supported by our Fort Myers office include property life forecasting, technological forecasting, depreciation estimation, and valuation of industrial property.

Foster Associates has undertaken numerous depreciation engagements for both public and privately owned corporations including detailed statistical life studies, analyses of required net salvage rates, and the selection of depreciation systems that will most nearly achieve the goals of depreciation accounting under the constraints of either government regulation or competitive market pricing. Foster Associates is widely recognized for industry leadership in the development of depreciation systems, life analysis techniques and computer software for conducting depreciation and valuation studies.

Electric and Common depreciation rates currently used by SJLP were approved by the Missouri Public Service Commission (Commission) pursuant to a Stipulation and Agreement in Formal Case No. ER-99-247 and Case No. EC-98-573 dated August 17, 1999. Net salvage rates and service life statistics (*i.e.*, projection lives, projection curves and average service lives) used to derive the settled depreciation rates were included in work papers related to the case.

Industrial Steam depreciation rates currently used by SJLP were approved by the Commission pursuant to a Stipulation and Agreement in Formal Case No. HR-99-245 dated August 17, 1999. Net salvage rates and service life statistics used to derive the settled depreciation rates were not included in either the Stipulation and Agreement or in other documents related to the case.

The principal findings and recommendations of the SJLP Depreciation Rate Study are summarized in the Statements section of this report. Statement A provides a comparative summary of present and proposed annual depreciation rates for each rate category. Statement B provides a comparison of present and proposed annual depreciation accruals. Statement C provides a comparison of the computed, recorded and redistributed depreciation reserves for each rate category. Statement D provides a summary of the components used to obtain a weighted-average net salvage rate for each plant account. Statement E provides a computation of the estimated future net salvage rate for steam production facilities. State-

ment F provides a comparative summary of present and proposed parameters including projection life, projection curve, average service life, and average remaining life.

SCOPE OF STUDY

The principal activities undertaken in the current study included:

- Collection of plant and net salvage data;
- Reconciliation of data to the official records of the Company;
- Discussions with Aquila plant accounting personnel;
- On-site plant inspections;
- Estimation of projection lives and retirement dispersion patterns;
- Analysis of gross salvage and removal expense;
- Analysis and redistribution of recorded depreciation reserves; and
- Development of recommended accrual rates for each rate category.

DEPRECIATION SYSTEM

A depreciation rate is formed by combining the elements of a depreciation system. A depreciation system is composed of a method, a procedure and a technique. A depreciation method (*e.g.*, straight-line) describes the component of the system that determines the acceleration or deceleration of depreciation accruals in relation to either time or use. A depreciation procedure (*e.g.*, vintage group) identifies the level of grouping or sub-grouping of assets within a plant category. The level of grouping specifies the weighting used to obtain composite life statistics for an account. A depreciation technique (*e.g.*, remaining-life) describes the life statistic used in the system.

SJLP is presently using a depreciation system composed of the straight-line method, broad group procedure, whole-life technique for all plant categories. The rates proposed in this study are derived from a system composed of the straight-line method, vintage group procedure, whole-life technique with amortization of reserve imbalances over the estimated remaining life of each rate category. This formulation of the accrual rate is equivalent to a straight-line method, vintage group procedure, remaining-life technique.

The matching and expense recognition principles of accounting provide that the cost of an asset (or group of assets) should be allocated to operations over an estimate of the economic life of the asset in proportion to the consumption of service potential. It is the opinion of Foster Associates that the objectives of depreciation accounting can be more nearly achieved using the vintage-group procedure combined with the remaining-life technique. Unlike the broad group procedure in which each vintage is estimated to have the same average service life, the

vintage group procedure distinguishes average service lives among vintages and provides cost apportionment over the estimated weighted-average remaining life or average life of a rate category.

The level of asset grouping identified in the broad group procedure is the total plant in service from all vintages in an account. Each vintage is estimated to have the same average service life. It is highly unlikely, therefore, that compensating deviations (*i.e.,* over and underestimates of average service life) will be created among vintages to achieve cost allocation over the average service life of each vintage. The level of asset grouping identified in the vintage group procedure is the plant in service from each vintage. The average service life (or remaining life) is estimated for each vintage and composite life statistics are computed for each plant account. It is more likely, therefore, that compensating deviations will be created with a vintage group procedure than with a broad group procedure.

The dependency of both the broad group procedure and the vintage group procedure on compensating deviations in the estimate of service lives is attributable to the use of the whole-life technique. A permanent excess or deficiency will be created in the depreciation reserve by a continued application of the whole-life technique if these deviations are not exactly offsetting. The potential for a permanent reserve imbalance can be eliminated, however, by an application of the remaining-life technique.

The principal distinction between a whole-life rate and a remaining-life rate is the treatment of depreciation reserve imbalances. A reserve imbalance is the difference between a theoretical or computed reserve and the corresponding recorded reserve for a rate category. The remaining-life technique provides a systematic amortization of these differences over the composite weighted average remaining life of a rate category.

Although the emergence of economic factors such as bypass and incentive forms of regulation may ultimately encourage abandonment of the straight-line method, no attempt was made in the current study to address these concerns.

PROPOSED DEPRECIATION RATES

Table 1 provides a summary of the changes in annual rates and accruals resulting from adoption of the parameters and depreciation system recommended in this study.

Rates and Accruals

Function	Accrual Rate			2002 Annualized Accrual		
	Present	Proposed	Difference	Present	Proposed	Difference
Steam Production	3.84%	4.56%	0.72%	$5,106,031	$6,069,973	$963,942
Other Production	3.83%	1.37%	-2.46%	620,501	222,546	-397,955
Transmission	2.89%	1.59%	-1.30%	721,231	396,668	-324,563
Distribution	3.43%	2.72%	-0.71%	4,689,115	3,716,828	-972,287
General Plant	4.36%	2.26%	-2.10%	34,547	17,891	-16,656
Total Electric	3.58%	3.34%	-0.24%	$11,171,425	$10,423,906	$-747,519
Common Plant	5.13%	2.95%	-2.18%	1,457,454	837,671	-619,783
Industrial Steam	3.04%	6.16%	3.12%	96,156	194,924	98,768
Total SJLP	3.71%	3.34%	-0.37%	$12,725,035	$11,456,501	$-1,268,534

TABLE 1. PRESENT AND PROPOSED RATES AND ACCRUALS

Foster Associates is recommending primary account depreciation rates equivalent to a composite rate of 3.34 percent. Depreciation expense is presently accrued at an equivalent composite rate of 3.71 percent. The recommended change in the composite depreciation rate is, therefore, a decrease of 0.37 percentage points.

A continued application of rates currently prescribed would provide annualized depreciation expense of $12,725,035 compared to an annualized expense of $11,456,501 using the rates developed in this study. The proposed expense decrease is $1,268,534. Of this decrease, ($1,267,709) represents amortization of a ($25,104,272) reserve imbalance. The remaining portion of the decrease is attributable to recommended changes in service life and net salvage parameters.

Of the 82 primary accounts included in the 2002 study, Foster Associates is recommending rate reductions for 51 accounts and rate increases for 31 accounts.

STUDY PROCEDURE

INTRODUCTION

The purpose of a depreciation study is to analyze the mortality characteristics, net salvage rates and adequacy of the depreciation accrual and recorded depreciation reserve for each rate category. This study provides the foundation and documentation for recommended changes in the depreciation accrual rates used by Aquila for its SJLP (Electric, Industrial Steam and Common) operations. The proposed rates are subject to approval by the Missouri Public Service Commission.

SCOPE

The steps involved in conducting a depreciation study can be grouped into five major tasks:

- Data Collection;
- Life Analysis and Estimation;
- Net Salvage Analysis;
- Depreciation Reserve Analysis; and
- Development of Accrual Rates.

The scope of the 2002 study for SJLP included a consideration of each of these tasks as described below.

DATA COLLECTION

The minimum database required to conduct a statistical life study consists of a history of vintage year additions and unaged activity year retirements, transfers and adjustments. These data must be appropriately adjusted for transfers, sales and other plant activity that would otherwise bias the measured service life of normal retirements. The age distribution of surviving plant for unaged data can be estimated by distributing the plant in service at the beginning of the study year to prior vintages in proportion to the theoretical amount surviving from a projection or survivor curve identified in the life study. The statistical methods of life analysis used to examine unaged plant data are known as *semi-actuarial techniques*.

A far more extensive database is required to apply the statistical methods of life analysis known as *actuarial techniques*. Plant data used in an actuarial life study most often include the age distribution of surviving plant at the beginning of the study year and the vintage year, activity year, and dollar amounts associated with normal retirements, reimbursed retirements, sales, abnormal retirements, transfers, corrections, and extraordinary adjustments over a series of prior activity years. An actuarial database may include the age distribution of surviving plant at the beginning of the earliest activity year, rather than at the beginning of the study year. Plant additions, however, must be included in a database contain-

ing an opening age distribution to derive aged survivors at the beginning of the study year. All activity year transactions with vintage year identification are coded and stored in a data file. The data are processed by a computer program and transaction summary reports are created in a format reconcilable to the Company's official plant records. The availability of such detailed information is dependent upon an accounting system that supports aged property records. The Continuing Property Record (CPR) system used by Aquila for SJLP assets provides aged transactions for all plant accounts.

The database used in the 2002 study was compiled from two sources. Detailed accounting transactions were extracted from these sources and assigned transaction codes which identify the nature of the accounting activity. Transaction codes for plant additions, for example, are used to distinguish normal additions from acquisitions, purchases, reimbursements and adjustments. Similar transaction codes are used to distinguish normal retirements from sales, reimbursements, abnormal retirements and adjustments. Transaction codes are also assigned to transfers, capital leases and other accounting activity which should be considered in a depreciation study.

The first data source was an electronic file used by SJLP in conducting its 1998 depreciation rate study. The legacy data base was updated by SJLP to include activity years 1998 through 2000. The earliest activity year in the updated file was 1980. An electronic worksheet was used by Foster Associates to create a coded database in a format compatible with the software used to conduct the current depreciation study.

The second source of data was the current CPR system installed by Aquila in 1998. The database obtained from this system included activity year transactions for calendar year 2001 and the age distribution of surviving plant at December 31, 2001. Plant transactions for 2001 were added to the legacy database to generate age distributions at December 31, 2001. The resulting age distributions were then compared to the age distributions extracted from the current CPR. Differences were coded as vintage adjustments in 2001 to interconnect and provide continuity between the two databases. Care was taken in creating the Foster Associates database to ensure a proper mapping of the legacy system account structure to the current CPR account structure.

The accuracy and completeness of the assembled data base was verified by Foster Associates for activity year 2001 by comparing additions, retirements, transfers and adjustments, and the ending plant balance derived for 2001 to the official plant records of the Company. The legacy database contains adjustments for depreciation study purposes which prevents reconciling the database to the official plant records for activity years prior to 2001.

LIFE ANALYSIS AND ESTIMATION

Life analysis and life estimation are terms used to describe a two-step procedure for estimating the mortality characteristics of a plant category. The first step (*i.e.*, life analysis) is largely mechanical and primarily concerned with history. Statistical techniques are used in this step to obtain a mathematical description of the forces of retirement acting upon a plant category and an estimate of service life known as the *projection life* of the account. The mathematical expressions used to describe these life characteristics are known as *survival functions* or *survivor curves*.

The second step (*i.e.*, life estimation) is concerned with predicting the expected remaining life of property units still exposed to the forces of retirement. It is a process of blending the results of the life analysis with informed judgment (including expectations about the future) to obtain an appropriate projection life and curve. The amount of weight given to the life analysis will depend upon the extent to which past retirement experience is considered descriptive of the future.

The analytical methods used in a life analysis are broadly classified as actuarial and semi-actuarial techniques. Actuarial techniques can be applied to plant accounting records that reveal the age of a plant asset at the time of its retirement from service. Stated differently, each property unit must be identifiable by date of installation and age at retirement. Semi-actuarial techniques can be used to derive service life and dispersion estimates when age identification of retirements is not maintained or readily available.

An actuarial life analysis program designed and developed by Foster Associates was used in this study. The first step in an actuarial analysis involves a systematic treatment of the available data for the purpose of constructing an observed life table. A complete life table contains the life history of a group of property units installed during the same accounting period and various probability relationships derived from the data. A life table is arranged by age-intervals (usually defined as one year) and shows the number of units (or dollars) entering and leaving each age-interval and probability relationships associated with this activity. A life table minimally shows the age of each survivor and the age of each retirement from a group of units installed in a given accounting year.

A life table can be constructed in any one of at least five alternative methods. The annual-rate or retirement-rate method was used in this study. The mechanics of the annual-rate method require the calculation of a series of ratios obtained by dividing the number of units (or dollars) surviving at the beginning of an age interval into the number of units (or dollars) retired during the same interval. This ratio (or set of ratios) is commonly referred to as retirement ratios. The cumulative proportion surviving is obtained by multiplying the retirement ratio for each age interval by the proportion of the original group surviving at the beginning of

that age interval and subtracting this product from the proportion surviving at the beginning of the same interval. The annual-rate method is applied to multiple groups or vintages by combining the retirements and/or survivors of like ages for each vintage included in the analysis.

The second step in an actuarial analysis involves graduating or smoothing the observed life table and fitting the smoothed series to a family of survival functions. The functions used in this study are the Iowa-type curves which are mathematically described in terms of the Pearson frequency curve family. The observed life table was smoothed by a weighted least-squares procedure in which first, second and third degree polynomials were fitted to the observed retirement ratios. The resulting function can be expressed in terms of a survivorship function which is numerically integrated to obtain an estimate of the average service life. The smoothed survivorship function is then fitted by a weighted least-squares procedure to the Iowa-curve family to obtain a mathematical description or classification of the dispersion characteristics of the data.

The set of computer programs used in this analysis provides multiple rolling-band and shrinking-band analyses of an account. Observation bands are defined for a "retirement era" which restricts the analysis to the retirement activity of all vintages represented by survivors at the beginning of a selected era. In a rolling-band analysis, a year of retirement experience is added to each successive retirement band and the earliest year from the preceding band is dropped. A shrinking-band analysis begins with the total retirement experience available and the earliest year from the preceding band is dropped for each successive band. Rolling and shrinking band analyses are used to detect the emergence of trends in the behavior of the dispersion and average service life.

Options available in the actuarial life analysis program developed by Foster Associates include the width and location of both placement and observation bands; the interval of years included in a selected rolling or shrinking band analysis; the estimator of the hazard rate (actuarial, conditional proportion retired, or maximum likelihood); the elements to include on the diagonal of a weight matrix (exposures, inverse of age, inverse of variance, or unweighted); and the age at which an observed life table is truncated. The program also provides tabular and graphics output as an aid in the analysis and optionally produces data output files used in the calculation of depreciation accruals.

While actuarial and semi-actuarial statistical methods are well suited to an analysis of plant categories containing a large number of homogeneous units (*e.g.*, poles and conductors), the concept of retirement dispersion is inappropriate for plant categories composed of major items of plant that will most likely be retired as a single unit. Plant retirements from an integrated system prior to the retirement of the entire facility are more properly viewed as interim retirements that

will be replaced in order to maintain the integrity of the system. Additionally, plant facilities may be added to the existing system (*i.e.*, interim additions) in order to expand or enhance its productive capacity without extending the service life of the present system. A proper depreciation rate can be developed for an integrated system using a life-span method.

The life-span method requires the selection of a coterminous retirement date for all plant additions to a specific facility. A composite depreciation rate is calculated for the facility using the technique of harmonic weighting of the expected life span of each vintage addition. The resulting accrual rate must be adjusted for interim retirements to the extent that such retirements can be reasonably expected. Absent this adjustment, the depreciation accumulated over the life span of the facility will be deficient by an amount equal to a portion of the interim retirements. Properly implemented, the life-span method does not include plant additions or replacements of interim retirements until such activity is reported. Plant accounts classified in the Steam Production, Industrial Steam and Other Production functions were identified by location and treated as life-span categories in this study.

NET SALVAGE ANALYSIS

Depreciation rates designed to achieve the goals and objectives of depreciation accounting will include a parameter for future net salvage and a variable for average net salvage which reflects both realized and future net salvage rates.

An estimate of the net salvage rate applicable to future retirements is most often obtained from an analysis of gross salvage and removal expense realized in the past. An analysis of past experience (including an examination of trends over time) provides an appropriate basis for estimating future salvage and cost of removal. However, consideration should also be given to events that may cause deviations from net salvage realized in the past. Among the factors that should be considered are the age of plant retirements; the portion of retirements likely to be reused; changes in the method of removing plant; the type of plant to be retired in the future; inflation expectations; the shape of the projection life curve; and economic conditions that may warrant greater or lesser weight to be given to the net salvage observed in the past.

Special consideration should also be given to the treatment of insurance proceeds and other forms of third-party reimbursements credited to the depreciation reserve. A properly conducted net salvage study will exclude such activity from the estimate of future parameters and include the activity in the computation of realized and average net salvage rates.

A traditional, historical analysis using a five-year moving average of the ratio of realized salvage and removal expense to the associated retirements was used in this study to a) estimate a realized net salvage rate; b) detect the emergence of

historical trends; and c) establish a basis for estimating a future net salvage rate. Cost of removal and salvage opinions obtained from Company engineers were blended with judgment and historical net salvage indications in developing estimates of the future.

Consideration was also given in the 2002 SJLP depreciation study to the cost of dismantling the Lake Road and Iatan generating stations. The projected cost of dismantling these facilities was derived, as shown in Table 2, from an estimated cost of $50 per kW, denominated in 2001 dollars. This cost estimate is intended to serve as a placeholder pending completion of a detailed dismantling cost study. The Company is prepared to undertake a dismantling cost study upon receipt of authorization by the Commission to include removal expense in the accrual for depreciation.

Plant	Capacity (MW)	Cost per kW	2001 Cost	Inflation Rate	AYFR	Dismantlement Cost
Lake Road	152.0	$50.00	$7,600,000	1.50%	2012	$8,952,412
Iatan	121.0	50.00	6,050,000	1.50%	2015	7,452,122

Table 2. Dismantlement Cost

The average net salvage rate for an account was estimated using direct dollar weighting of historical retirements with the historical net salvage rate, and future retirements (*i.e.*, surviving plant) with the estimated future net salvage rate. The computation of the estimated average net salvage rate for each rate category is shown in Statement D. Future net salvage rates estimated for Lake Road and Iatan are shown in Statement E.

DEPRECIATION RESERVE ANALYSIS

The purpose of a depreciation reserve analysis is to compare the current level of the recorded reserve with the level required to achieve the goals or objectives of depreciation accounting if the amount and timing of future retirements and net salvage are realized as predicted. The difference between the required depreciation reserve and the recorded reserve provides a measurement of the expected excess or shortfall that will remain in the depreciation reserve if corrective action is not taken to eliminate the reserve imbalance.

Unlike a recorded reserve which represents the net amount of depreciation expense charged to previous periods of operations, a theoretical reserve is a measure of the implied reserve requirement at the beginning of a study year if the timing of future retirements and net salvage is in exact conformance with a survivor curve chosen to predict the probable life of property still exposed to the forces of retirement. Stated differently, a theoretical depreciation reserve is the difference between the recorded cost of plant presently in service and the sum of the depreciation and net salvage that will be charged in the future if retirements are

distributed over time according to a specified retirement frequency distribution.

The survivor curve used in the calculation of a theoretical depreciation reserve is intended to describe forces of retirement that will be operative in the future. However, retirements caused by forces such as accidents, physical deterioration and changing technology seldom, if ever, remain stable over time. It is unlikely, therefore, that a probability or retirement frequency distribution can be identified that will accurately describe the age of plant retirements over the complete life cycle of a vintage. It is for this reason that depreciation rates should be reviewed periodically and adjusted for observed or expected changes in the parameters chosen to describe the underlying forces of mortality.

Although reserve records are commonly maintained by various account classifications, the total reserve for a company is the most important measure of the status of the company's depreciation practices. If statistical life studies have not been conducted or retirement dispersion has been ignored in setting depreciation rates, it is likely that some accounts will be over-depreciated and other accounts will be under-depreciated relative to a calculated theoretical reserve. Differences between the theoretical reserve and the recorded reserve also will arise as a normal occurrence when service lives, dispersion patterns and net salvage estimates are adjusted in the course of depreciation reviews. It is appropriate, therefore, and consistent with group depreciation theory to periodically redistribute or rebalance the total recorded reserve among the various primary accounts based upon the most recent estimates of retirement dispersion and net salvage rates.

A redistribution of recorded reserves is appropriate for SJLP at this time. Although recorded reserves have been maintained by primary account (and locations within primary accounts), these reserves were largely ignored in the development of the presently prescribed whole-life accrual rates. This failure to address prior reserve imbalances produces an added dimension of instability in accrual rates beyond the variability attributable to the parameters estimated in the current study. A redistribution of the recorded reserve is necessary, therefore, to establish an initial reserve balance for each account consistent with the age distributions and estimates of retirement dispersion developed in this study. Reserves should also be realigned in this study to reflect adoption of the vintage group procedure.

A redistribution of the recorded reserve was achieved for SJLP by multiplying the calculated reserve for each primary account within a function by the ratio of the function total recorded reserve to the function total calculated reserve. The sum of the redistributed reserves within a function is, therefore, equal to the function total recorded depreciation reserve before the redistribution.

Statement C provides a comparison of the computed and recorded reserves for SJLP on December 31, 2001. The recorded reserve was $191,504,496, or 55.8 percent of the depreciable plant investment. The corresponding computed reserve

is $166,400,224 or 48.5 percent of the depreciable plant investment. A proportionate amount of the measured reserve imbalance of ($25,104,272) will be amortized over the composite weighted-average remaining life of each rate category using the remaining life depreciation rates proposed in this study.

DEVELOPMENT OF ACCRUAL RATES

The goal or objective of depreciation accounting is cost allocation over the economic life of an asset in proportion to the consumption of service potential. Ideally, the cost of an asset—which represents the cost of obtaining a bundle of service units—should be allocated to future periods of operation in proportion to the amount of service potential expended during an accounting interval. The service potential of an asset is the present value of future net revenue (*i.e.*, revenue less expenses exclusive of depreciation and other non-cash expenses) or cash inflows attributable to the use of that asset alone.

Cost allocation in proportion to the consumption of service potential is often approximated by the use of depreciation methods employing time rather than net revenue as the apportionment base. Examples of time-based methods include sinking-fund, straight-line, declining balance, and sum-of-the-years' digits. The advantage of using a time-based method is that it does not require an estimate of the remaining amount of service capacity an asset will provide or the amount of capacity actually consumed during an accounting interval. Using a time-based allocation method, however, does not change the goal of depreciation accounting. If it is predictable that the net revenue pattern of an asset will either decrease or increase over time, then an accelerated or decelerated time-based method should be used to approximate the rate at which service potential is actually consumed.

The time period over which the cost of an asset will be allocated to operations is determined by the combination of a procedure and a technique. A depreciation procedure describes the level of grouping or sub-grouping of assets within a plant category. The broad group, vintage group, equal-life group, and item or unit are a few of the more widely used procedures. A depreciation technique describes the life statistic used in a depreciation system. The whole life and remaining life (or expectancy) are the most common techniques.

Depreciation rates recommended in this study were developed using a system composed of the straight-line method, vintage group procedure, whole-life technique with amortization of reserve imbalances over the estimated remaining life of each rate category. This formulation of the accrual rate is equivalent to a straight-line method, vintage group procedure, remaining-life technique. It is the opinion of Foster Associates that this system will remain appropriate for SJLP, provided depreciation studies are conducted periodically and parameters are routinely adjusted to reflect changing operating conditions.

STATEMENTS

INTRODUCTION

This section provides a comparative summary of depreciation rates, annual depreciation accruals, recorded and computed depreciation reserves, and present and proposed service life and net salvage statistics recommended for SJLP electric, industrial steam and common operations. The content of these statements is briefly described below.

- *Statement A provides a comparative summary of present and proposed* annual depreciation rates using the vintage group procedure, whole-life technique with amortization of reserve imbalances.
- Statement B provides a comparison of the present and proposed annualized 2002 depreciation accruals based upon the rates developed in Statement A.
- Statement C provides a comparison of the recorded, computed and redistributed reserves for each rate category at December 31, 2001.
- Statement D provides a summary of the components used to obtain a weighted average net salvage rate for each rate category.
- Statement E provides a computation of the estimated future net salvage rate for steam production facilities.
- Statement F provides a comparative summary of present and proposed parameters including projection life, projection curve, average service life, and average remaining life.

Present depreciation accruals shown on Statement B are the product of the plant investment (Column B) and the present depreciation rates (Column D) shown on Statement A. These are the effective rates used by the Company for the mix of investments recorded on December 31, 2001. Similarly, proposed depreciation accruals shown on Statement B are the product of the plant investment and the proposed depreciation rates (Column I) shown on Statement A. Proposed accrual rates shown on Statement A are given by:

$$Accrual\ Rate = \frac{1.0 - Average\ Net\ Salvage}{Average\ Life} + \frac{Computed\ Reserve - Recorded\ Reserve}{Remaining\ Life}$$

where *Average Net Salvage*, *Computed Reserve* and *Recorded Reserve* are expressed in percent. This formulation of the accrual rate is equivalent to

$$Accrual\ Rate = \frac{1.0 - Reserve\ Ratio - Future\ Net\ Salvage\ Rate}{Remaining\ Life}.$$

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement A

Comparison of Present and Proposed Accrual Rates
Present: BG Procedure / WL Technique
Proposed: VG Procedure / RL Technique

Account Description	Present Avg. Life	Present Net Salvage	Present Accrual Rate	Proposed Avg. Life	Proposed Avg. Net Salvage	Proposed W/L Rate	Proposed Amorti-zation	Proposed R/L Rate
A	B	C	D	E	F	G	H	I=G+H
STEAM PRODUCTION								
311000 Structures and Improvements			4.09%	22.70	-14.1%	5.03%	0.04%	5.07%
312001 Boiler Plant Equipment			3.90%	24.47	-12.3%	4.59%	0.03%	4.62%
314000 Turbogenerator Units			3.50%	27.69	-14.0%	4.12%	0.04%	4.16%
315000 Accessory Electric Equipment			3.43%	27.87	-12.8%	4.05%	0.02%	4.07%
316000 Miscellaneous Power Plant Equipment			3.50%	23.69	-14.6%	4.84%	0.02%	4.86%
353000 Station Equipment			2.20%	31.43	-10.0%	3.50%		3.50%
391001 Office Furniture and Equipment			7.14%	18.68		5.35%	0.02%	5.37%
391003 Computer Hardware				12.82		7.80%	0.04%	7.84%
391004 Computer Software			14.30%	12.38		8.08%	0.01%	8.09%
392000 Transportation Equipment			6.20%	15.04	19.4%	5.36%	0.12%	5.48%
393000 Stores Equipment			4.99%	30.04		3.33%		3.33%
394000 Tools, Shop and Garage Equipment			4.40%	25.19		3.97%	0.02%	3.99%
395000 Laboratory Equipment			3.40%	25.71		3.89%	0.03%	3.92%
396002 Power Operated Equipment			3.90%	18.38	25.0%	4.08%	0.04%	4.12%
397000 Communication Equipment			2.50%	25.03	-5.1%	4.20%		4.20%
398000 Miscellaneous Equipment			3.60%	25.51	-3.1%	4.04%	0.02%	4.06%
Total Steam Production Plant			3.84%	24.83	-12.4%	4.53%	0.03%	4.56%
OTHER PRODUCTION (Lake Road)								
341000 Structures and Improvements	22.00			35.49	-5.0%	2.96%	-2.62%	0.34%
342000 Fuel Holders and Accessories	22.00			38.64	-5.0%	2.72%	-2.78%	-0.06%
343000 Prime Movers	22.00		4.70%	28.00	-5.1%	3.75%	-2.10%	1.65%
344001 Generators	22.00		4.70%	33.49	-15.2%	3.44%	-2.31%	1.13%
345000 Accessory Electric Equipment	22.00			29.36	-5.0%	3.58%	-2.22%	1.36%
Total Other Production Plant			3.83%	29.89	-7.1%	3.58%	-2.21%	1.37%
TRANSMISSION PLANT								
352000 Structures and Improvements	53.00		1.90%	60.02	-10.0%	1.83%	-0.45%	1.38%
353000 Station Equipment	27.00	-5.0%	3.90%	30.17	3.4%	3.20%	-1.43%	1.77%
355000 Poles and Fixtures	53.00	-37.0%	2.60%	60.76	-30.8%	2.15%	-0.51%	1.64%
356000 Overhead Conductors and Devices	50.00	-17.0%	2.30%	60.30	-29.1%	2.14%	-0.77%	1.37%
357000 Underground Conduit	58.00		1.70%	60.00	-5.0%	1.75%	-0.20%	1.55%
358000 Underground Conductors and Devices	41.00		2.40%	60.75	-5.0%	1.73%	-0.41%	1.32%
Total Transmission Plant			2.89%	48.05	-18.3%	2.46%	-0.87%	1.59%
DISTRIBUTION PLANT								
361000 Structures and Improvements	50.00		2.00%	50.15	-10.0%	2.19%	-0.03%	2.16%
362000 Station Equipment	30.00	-16.0%	3.90%	50.27	-19.3%	2.37%	-0.11%	2.26%
364000 Poles, Towers and Fixtures	44.00	-53.0%	3.50%	45.37	-65.1%	3.64%	-0.28%	3.36%
365000 Overhead Conductors and Devices	47.00	-37.0%	2.90%	55.30	-37.1%	2.48%	-0.15%	2.33%
366000 Underground Conduit	50.00		2.00%	55.03	-40.0%	2.54%	-0.09%	2.45%
367000 Underground Conductors and Devices	58.00	-14.0%	2.00%	49.98	-15.0%	2.30%	-0.08%	2.22%
368000 Line Transformers			2.87%	40.22	-19.3%	2.97%	-0.22%	2.75%
369001 Overhead Services	40.00	-78.0%	4.50%	50.22	-101.8%	4.02%	-0.38%	3.64%
369002 Underground Services	40.00	-78.0%	4.50%	35.07	-10.0%	3.14%	-0.18%	2.96%
370001 Meters	29.00	1.0%	3.40%	40.63	0.1%	2.46%	-0.26%	2.20%
371000 Installations on Customers' Premises	13.00	7.0%	7.20%	17.07	9.1%	5.33%	-0.33%	5.00%
373000 Street Lighting and Signal Systems	18.00	-25.0%	6.90%	25.29	-17.7%	4.65%	-0.21%	4.44%
Total Distribution Plant			3.43%	44.54	-29.1%	2.90%	-0.18%	2.72%
GENERAL PLANT								
391001 Office Furniture and Equipment			7.08%	16.11	2.6%	6.05%	-4.08%	1.97%
391003 Computer Hardware				10.01	4.2%	9.57%	-3.83%	5.74%
391004 Computer Software	7.00		14.30%	11.09		9.02%	-4.43%	4.59%
393000 Stores Equipment	20.00		5.00%	26.78		3.73%	-2.68%	1.05%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON) Statement A

Comparison of Present and Proposed Accrual Rates
Present: BG Procedure / WL Technique
Proposed: VG Procedure / RL Technique

Account Description	Present Avg. Life	Present Net Salvage	Present Accrual Rate	Proposed Avg. Life	Proposed Avg. Net Salvage	Proposed W/L Rate	Proposed Amorti-zation	Proposed R/L Rate
A	B	C	D	E	F	G	H	I=G+H
394000 Tools, Shop and Garage Equipment	22.00	4.0%	4.40%	24.38	-53.6%	6.30%	0.48%	6.78%
395000 Laboratory Equipment	27.00	7.0%	3.40%	23.27	0.8%	4.26%	-5.02%	-0.76%
397000 Communication Equipment	21.00	-2.0%	4.90%	25.36	-4.4%	4.12%	-3.57%	0.55%
398000 Miscellaneous Equipment	28.00		3.60%	25.69	-25.4%	4.88%	-1.84%	3.04%
Total General Plant			4.36%	19.17		5.22%	-2.96%	2.26%
TOTAL ELECTRIC UTILITY			3.58%	33.19	-19.5%	3.60%	-0.26%	3.34%
COMMON UTILITY								
390001 Structures and Improvements	31.00	3.0%	3.10%	40.19	-9.2%	2.72%	-1.06%	1.66%
391001 Office Furniture and Equipment			7.96%	20.17		4.96%	-1.53%	3.43%
391003 Computer Hardware				13.97		7.16%	-3.14%	4.02%
391004 Computer Software	7.00		14.30%	13.40		7.46%	-2.31%	5.15%
392000 Transportation Equipment	12.00	26.0%	6.20%	12.99	18.8%	6.25%	-3.08%	3.17%
393000 Stores Equipment	20.00		5.00%	30.66		3.26%	-1.81%	1.45%
394000 Tools, Shop and Garage Equipment	22.00	4.0%	4.40%	25.59		3.91%	-1.20%	2.71%
395000 Laboratory Equipment	27.00	7.0%	3.40%	26.34		3.80%	-1.76%	2.04%
396002 Power Operated Equipment	18.00	30.0%	3.90%	18.91	20.4%	4.21%	-2.14%	2.07%
397000 Communication Equipment	21.00	-2.0%	4.90%	25.62	-5.0%	4.10%	-0.87%	3.23%
398000 Miscellaneous Equipment	28.00		3.60%	25.62	-5.0%	4.10%	-0.91%	3.19%
Total Common Utility			5.13%	20.89	-0.1%	4.79%	-1.84%	2.95%
TOTAL ELECTRIC AND COMMON UTILITY			3.71%	31.87	-17.9%	3.70%	-0.39%	3.31%
INDUSTRIAL STEAM PRODUCTION								
311009 Structures and Improvements			4.40%	32.05	-27.6%	3.98%	2.17%	6.15%
312009 Boiler Plant Equipment			4.00%	33.09	-24.9%	3.77%	2.22%	5.99%
315009 Accessory Electric Equipment			3.80%	23.46	-11.2%	4.74%	1.91%	6.65%
375009 Structures and Improvements			2.00%	22.48	-5.6%	4.70%	1.58%	6.28%
376009 Mains			2.50%	26.72	-3.1%	3.86%	2.00%	5.86%
379009 Measuring and Regulating Equpment			3.00%	21.49	-4.7%	4.87%	1.68%	6.55%
380009 Services			3.00%	25.79	-4.9%	4.07%	1.93%	6.00%
381009 Meters			4.00%	19.19	-0.1%	5.22%	1.42%	6.64%
Total Industrial Steam Production Plant			3.04%	25.08	-7.2%	4.27%	1.89%	6.16%
TOTAL SJLP			3.71%	31.80	-17.8%	3.70%	-0.36%	3.34%
STEAM PRODUCTION								
Lake Road								
311000 Structures and Improvements	54.00	-31.0%	4.40%	20.82	-15.1%	5.53%	0.06%	5.59%
312001 Boiler Plant Equipment			4.18%	20.26	-15.4%	5.70%	0.06%	5.76%
314000 Turbogenerator Units	33.00	-33.0%	3.90%	24.16	-15.0%	4.76%	0.07%	4.83%
315000 Accessory Electric Equipment	39.00	-9.0%	3.80%	23.29	-13.7%	4.88%	0.07%	4.95%
316000 Miscellaneous Power Plant Equipment	32.00		3.50%	19.26	-22.4%	6.36%	0.05%	6.41%
353000 Station Equipment								
391001 Office Furniture and Equipment			7.16%	18.64		5.36%	0.02%	5.38%
391003 Computer Hardware				12.82		7.80%	0.04%	7.84%
391004 Computer Software			14.30%	12.37		8.08%	0.03%	8.11%
392000 Transportation Equipment			6.20%	15.04	19.4%	5.36%	0.12%	5.48%
393000 Stores Equipment			5.00%	30.00		3.33%	0.01%	3.34%
394000 Tools, Shop and Garage Equipment			4.40%	25.21		3.97%	0.02%	3.99%
395000 Laboratory Equipment			3.40%	25.74		3.89%	0.03%	3.92%
396002 Power Operated Equipment			3.90%	18.40	25.0%	4.08%	0.04%	4.12%
397000 Communication Equipment								
398000 Miscellaneous Equipment			3.60%	25.49	-3.1%	4.04%	0.03%	4.07%
Total Lake Road			4.17%	20.95	-14.4%	5.46%	0.06%	5.52%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON) Statement A

Comparison of Present and Proposed Accrual Rates
Present: BG Procedure / WL Technique
Proposed: VG Procedure / RL Technique

		Present			Proposed				
	Account Description	Avg. Life	Net Salvage	Accrual Rate	Avg. Life	Avg. Net Salvage	W/L Rate	Amorti-zation	R/L Rate
A		B	C	D	E	F	G	H	I=G+H
Iatan									
311000	Structures and Improvements	30.50	-1.0%	3.30%	29.64	-11.4%	3.76%		3.76%
312001	Boiler Plant Equipment	28.60	-4.0%	3.60%	32.14	-8.8%	3.39%		3.39%
314000	Turbogenerator Units	32.30	-1.0%	3.10%	32.62	-13.0%	3.46%	0.01%	3.47%
315000	Accessory Electric Equipment	31.30	-1.0%	3.20%	31.72	-12.2%	3.54%		3.54%
316000	Miscellaneous Power Plant Equipment	28.00	2.0%	3.50%	25.41	-10.1%	4.33%	0.01%	4.34%
353000	Station Equipment	42.00	6.0%	2.20%	31.43	-10.0%	3.50%		3.50%
391001	Office Furniture and Equipment	18.40	1.0%	5.40%	21.26		4.70%	0.01%	4.71%
391003	Computer Hardware								
391004	Computer Software			14.30%	12.38		8.08%		8.08%
392000	Transportation Equipment								
393000	Stores Equipment								
394000	Tools, Shop and Garage Equipment								
395000	Laboratory Equipment								
396002	Power Operated Equipment								
397000	Communication Equipment	38.80	3.0%	2.50%	25.03	-5.1%	4.20%		4.20%
398000	Miscellaneous Equipment								
	Total Iatan			3.46%	31.73	-10.0%	3.47%		3.47%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON) Statement B

Comparison of Present and Proposed Accruals
Present: BG Procedure / WL Technique
Proposed: VG Procedure / RL Technique

Account Description	12/31/01 Plant Investment	2002 Annualized Accrual				
			Proposed			
		Present	Whole-Life	Amortization	Total	Difference
A	B	C	D	E	F=D+E	G=F-C
STEAM PRODUCTION						
311000 Structures and Improvements	$15,203,556	$621,317	$764,102	$6,523	$770,625	$149,308
312001 Boiler Plant Equipment	83,114,290	3,242,269	3,813,882	25,878	3,839,760	597,491
314000 Turbogenerator Units	21,863,116	766,162	900,123	8,816	908,939	142,777
315000 Accessory Electric Equipment	8,369,106	286,835	338,753	2,219	340,972	54,137
316000 Miscellaneous Power Plant Equipment	965,048	33,777	46,681	192	46,873	13,096
353000 Station Equipment	1,032,185	22,708	36,126		36,126	13,418
391001 Office Furniture and Equipment	173,724	12,408	9,300	35	9,335	(3,073)
391003 Computer Hardware	145,037		11,313	58	11,371	11,371
391004 Computer Software	263,961	37,746	21,328	32	21,360	(16,386)
392000 Transportation Equipment	270,805	16,790	14,515	325	14,840	(1,950)
393000 Stores Equipment	841	42	28		28	(14)
394000 Tools, Shop and Garage Equipment	416,418	18,322	16,532	83	16,615	(1,707)
395000 Laboratory Equipment	319,441	10,861	12,426	96	12,522	1,661
396002 Power Operated Equipment	864,775	33,726	35,283	346	35,629	1,903
397000 Communication Equipment	109,934	2,748	4,617		4,617	1,869
398000 Miscellaneous Equipment	8,882	320	359	2	361	41
Total Steam Production Plant	$133,121,119	$5,106,031	$6,025,368	$44,605	$6,069,973	$963,942
OTHER PRODUCTION (Lake Road)						
341000 Structures and Improvements	$1,298,083		$38,423	($34,010)	$4,413	$4,413
342000 Fuel Holders and Accessories	605,108		16,459	(16,822)	(363)	(363)
343000 Prime Movers	10,409,845	489,263	390,369	(218,607)	171,762	(317,501)
344001 Generators	2,792,302	131,238	96,055	(64,502)	31,553	(99,685)
345000 Accessory Electric Equipment	1,116,283		39,963	(24,782)	15,181	15,181
Total Other Production Plant	$16,221,621	$620,501	$581,269	($358,723)	$222,546	($397,955)
TRANSMISSION PLANT						
352000 Structures and Improvements	$272,023	$5,168	$4,978	($1,224)	$3,754	($1,414)
353000 Station Equipment	7,586,890	295,889	242,780	(108,492)	134,288	(161,601)
355000 Poles and Fixtures	9,088,521	236,302	195,403	(46,351)	149,052	(87,250)
356000 Overhead Conductors and Devices	7,949,371	182,836	170,117	(61,211)	108,906	(73,930)
357000 Underground Conduit	16,148	275	283	(33)	250	(25)
358000 Underground Conductors and Devices	31,692	761	548	(130)	418	(343)
Total Transmission Plant	$24,944,645	$721,231	$614,109	($217,441)	$396,668	($324,563)
DISTRIBUTION PLANT						
361000 Structures and Improvements	$1,892,325	$37,847	$41,442	($568)	$40,874	$3,027
362000 Station Equipment	29,270,625	1,141,554	693,714	(32,198)	661,516	(480,038)
364000 Poles, Towers and Fixtures	21,560,742	754,626	784,811	(60,370)	724,441	(30,185)
365000 Overhead Conductors and Devices	19,226,885	557,580	476,827	(28,841)	447,986	(109,594)
366000 Underground Conduit	5,089,186	101,784	129,265	(4,580)	124,685	22,901
367000 Underground Conductors and Devices	12,922,690	258,454	297,222	(10,338)	286,884	28,430
368000 Line Transformers	22,711,503	651,820	674,532	(49,966)	624,566	(27,254)
369001 Overhead Services	3,565,101	160,430	143,317	(13,547)	129,770	(30,660)
369002 Underground Services	7,294,246	328,241	229,039	(13,129)	215,910	(112,331)
370001 Meters	6,465,205	219,817	159,044	(16,809)	142,235	(77,582)
371000 Installations on Customers' Premises	3,010,295	216,741	160,449	(9,934)	150,515	(66,226)
373000 Street Lighting and Signal Systems	3,771,314	260,221	175,366	(7,920)	167,446	(92,775)
Total Distribution Plant	$136,780,117	$4,689,115	$3,965,028	($248,200)	$3,716,828	($972,287)
GENERAL PLANT						
391001 Office Furniture and Equipment	$46,917	$3,322	$2,838	($1,914)	$924	($2,398)
391003 Computer Hardware	90,755		8,685	(3,476)	5,209	5,209
391004 Computer Software	1,556	223	140	(69)	71	(152)
393000 Stores Equipment	12,698	635	474	(341)	133	(502)
394000 Tools, Shop and Garage Equipment	120,242	5,291	7,575	577	8,152	2,861
395000 Laboratory Equipment	6,433	219	274	(323)	(49)	(268)
397000 Communication Equipment	488,864	23,954	20,141	(17,452)	2,689	(21,265)
398000 Miscellaneous Equipment	25,081	903	1,224	(462)	762	(141)
Total General Plant	$792,546	$34,547	$41,351	($23,460)	$17,891	($16,656)
TOTAL ELECTRIC UTILITY	$311,860,048	$11,171,425	$11,227,125	($803,219)	$10,423,906	($747,519)

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON) Statement B

Comparison of Present and Proposed Accruals
Present: BG Procedure / WL Technique
Proposed: VG Procedure / RL Technique

Account Description	12/31/01 Plant Investment	2002 Annualized Accrual				
			Proposed			
		Present	Whole-Life	Amortization	Total	Difference
A	B	C	D	E	F=D+E	G=F-C
COMMON UTILITY						
390001 Structures and Improvements	$10,660,323	$330,470	$289,961	($113,000)	$176,961	($153,509)
391001 Office Furniture and Equipment	1,425,582	113,476	70,709	(21,812)	48,897	(64,579)
391003 Computer Hardware	3,783,535		270,901	(118,803)	152,098	152,098
391004 Computer Software	3,831,650	547,926	285,841	(88,511)	197,330	(350,596)
392000 Transportation Equipment	4,214,102	260,046	263,381	(129,794)	133,587	(126,459)
393000 Stores Equipment	137,302	6,865	4,476	(2,485)	1,991	(4,874)
394000 Tools, Shop and Garage Equipment	1,164,568	51,241	45,535	(13,975)	31,560	(19,681)
395000 Laboratory Equipment	225,497	7,667	8,569	(3,969)	4,600	(3,067)
396002 Power Operated Equipment	470,793	18,361	19,820	(10,075)	9,745	(8,616)
397000 Communication Equipment	2,398,872	117,545	98,354	(20,870)	77,484	(40,061)
398000 Miscellaneous Equipment	107,147	3,857	4,393	(975)	3,418	(439)
Total Common Utility	$28,419,371	$1,457,454	$1,361,940	($524,269)	$837,671	($619,783)
TOTAL ELECTRIC AND COMMON UTILITY	$340,279,419	$12,628,879	$12,589,065	($1,327,488)	$11,261,577	($1,367,302)
INDUSTRIAL STEAM PRODUCTION						
311009 Structures and Improvements	$84,675	$3,726	$3,370	$1,838	$5,208	$1,482
312009 Boiler Plant Equipment	294,172	11,767	11,090	6,531	17,621	5,854
315009 Accessory Electric Equipment	270,046	10,262	12,800	5,158	17,958	7,696
375009 Structures and Improvements	78,278	1,566	3,679	1,237	4,916	3,350
376009 Mains	1,448,150	36,204	55,899	28,963	84,862	48,658
379009 Measuring and Regulating Equpment	582,661	17,480	28,376	9,788	38,164	20,684
380009 Services	102,362	3,071	4,166	1,976	6,142	3,071
381009 Meters	302,006	12,080	15,765	4,288	20,053	7,973
Total Industrial Steam Production Plant	$3,162,350	$96,156	$135,145	$59,779	$194,924	$98,768
TOTAL SJLP	$343,441,769	$12,725,035	$12,724,210	($1,267,709)	$11,456,501	($1,268,534)
STEAM PRODUCTION						
Lake Road						
311000 Structures and Improvements	$10,872,761	$478,401	$601,264	$6,523	$607,787	$129,386
312001 Boiler Plant Equipment	43,130,173	1,802,841	2,458,420	25,878	2,484,298	681,457
314000 Turbogenerator Units	11,050,685	430,977	526,013	7,735	533,748	102,771
315000 Accessory Electric Equipment	3,170,631	120,484	154,727	2,219	156,946	36,462
316000 Miscellaneous Power Plant Equipment	241,084	8,438	15,333	120	15,453	7,015
353000 Station Equipment						
391001 Office Furniture and Equipment	171,982	12,314	9,218	35	9,253	(3,061)
391003 Computer Hardware	145,037		11,313	58	11,371	11,371
391004 Computer Software	106,199	15,186	8,581	32	8,613	(6,573)
392000 Transportation Equipment	270,805	16,790	14,515	325	14,840	(1,950)
393000 Stores Equipment	841	42	28		28	(14)
394000 Tools, Shop and Garage Equipment	416,418	18,322	16,532	83	16,615	(1,707)
395000 Laboratory Equipment	319,441	10,861	12,426	96	12,522	1,661
396002 Power Operated Equipment	864,775	33,726	35,283	346	35,629	1,903
397000 Communication Equipment						
398000 Miscellaneous Equipment	8,882	320	359	2	361	41
Total Lake Road	$70,769,714	$2,948,702	$3,864,012	$43,452	$3,907,464	$958,762
Iatan						
311000 Structures and Improvements	$4,330,795	$142,916	$162,838		$162,838	$19,922
312001 Boiler Plant Equipment	39,984,117	1,439,428	1,355,462		1,355,462	(83,966)
314000 Turbogenerator Units	10,812,431	335,185	374,110	1,081	375,191	40,006
315000 Accessory Electric Equipment	5,198,475	166,351	184,026		184,026	17,675
316000 Miscellaneous Power Plant Equipment	723,964	25,339	31,348	72	31,420	6,081
353000 Station Equipment	1,032,185	22,708	36,126		36,126	13,418
391001 Office Furniture and Equipment	1,742	94	82		82	(12)
391003 Computer Hardware						
391004 Computer Software	157,762	22,560	12,747		12,747	(9,813)
392000 Transportation Equipment						
393000 Stores Equipment						
394000 Tools, Shop and Garage Equipment						
395000 Laboratory Equipment						
396002 Power Operated Equipment						
397000 Communication Equipment	109,934	2,748	4,617		4,617	1,869
398000 Miscellaneous Equipment						
Total Iatan	$62,351,405	$2,157,329	$2,161,356	$1,153	$2,162,509	$5,180

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement C

Depreciation Reserve Summary
Vintage Group Procedure
December 31, 2001

Account Description	Plant Investment	Recorded Reserve		Computed Reserve		Redistributed Reserve	
		Amount	Ratio	Amount	Ratio	Amount	Ratio
A	B	C	D=C/B	E	F=E/B	G	H=G/B
STEAM PRODUCTION							
311000 Structures and Improvements	$15,203,556	$5,702,041	37.50%	$8,835,838	58.12%	$8,759,314	57.61%
312001 Boiler Plant Equipment	83,114,290	52,428,372	63.08%	50,615,784	60.90%	50,302,528	60.52%
314000 Turbogenerator Units	21,863,116	14,218,525	65.03%	14,312,098	65.46%	14,218,657	65.03%
315000 Accessory Electric Equipment	8,369,106	6,338,187	75.73%	5,415,491	64.71%	5,387,617	64.38%
316000 Miscellaneous Power Plant Equipment	965,048	653,858	67.75%	514,858	53.35%	513,020	53.16%
353000 Station Equipment	1,032,185	112,949	10.94%	597,505	57.89%	596,820	57.82%
391001 Office Furniture and Equipment	173,724	892	0.51%	37,630	21.66%	37,187	21.41%
391003 Computer Hardware	145,037	46,187	31.84%	43,330	29.88%	42,810	29.52%
391004 Computer Software	263,961	86,364	32.72%	51,651	19.57%	51,373	19.46%
392000 Transportation Equipment	270,805	276,950	102.27%	140,598	51.92%	138,910	51.30%
393000 Stores Equipment	841	114	13.59%	97	11.57%	96	11.43%
394000 Tools, Shop and Garage Equipment	416,418	222,375	53.40%	121,737	29.23%	120,276	28.88%
395000 Laboratory Equipment	319,441	165,759	51.89%	128,695	40.29%	127,149	39.80%
396002 Power Operated Equipment	864,775	326,888	37.80%	297,854	34.44%	294,277	34.03%
397000 Communication Equipment	109,934	37,728	34.32%	25,879	23.54%	25,849	23.51%
398000 Miscellaneous Equipment	8,882	1,502	16.91%	2,842	31.99%	2,807	31.61%
Total Steam Production Plant	$133,121,119	$80,618,691	60.56%	$81,141,887	60.95%	$80,618,691	60.56%
OTHER PRODUCTION (Lake Road)							
341000 Structures and Improvements	$1,298,083	$1,186,441	91.40%	$793,828	61.15%	$1,298,200	100.01%
342000 Fuel Holders and Accessories	605,108	601,415	99.39%	391,840	64.76%	640,803	105.90%
343000 Prime Movers	10,409,845	8,469,967	81.36%	5,127,834	49.26%	8,385,891	80.56%
344001 Generators	2,792,302	2,792,302	100.00%	1,507,488	53.99%	2,465,296	88.29%
345000 Accessory Electric Equipment	1,116,283	687,372	61.58%	579,262	51.89%	947,306	84.86%
Total Other Production Plant	$16,221,621	$13,737,496	84.69%	$8,400,252	51.78%	$13,737,496	84.69%
TRANSMISSION PLANT							
352000 Structures and Improvements	$272,023	$155,256	57.07%	$83,905	30.84%	$136,929	50.34%
353000 Station Equipment	7,586,890	3,900,934	51.42%	3,462,861	45.64%	5,651,255	74.49%
355000 Poles and Fixtures	9,088,521	7,473,943	82.23%	3,220,107	35.43%	5,255,090	57.82%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement C

Depreciation Reserve Summary
Vintage Group Procedure
December 31, 2001

Account	Description	Plant Investment	Recorded Reserve Amount	Recorded Reserve Ratio	Computed Reserve Amount	Computed Reserve Ratio	Redistributed Reserve Amount	Redistributed Reserve Ratio
A		B	C	D=C/B	E	F=E/B	G	H=G/B
356000	Overhead Conductors and Devices	7,949,371	5,606,990	70.53%	3,739,204	47.04%	6,102,236	76.76%
357000	Underground Conduit	16,148	2,890	17.90%	2,642	16.36%	4,312	26.70%
358000	Underground Conductors and Devices	31,692	24,684	77.89%	9,115	28.76%	14,875	46.94%
	Total Transmission Plant	$24,944,645	$17,164,698	68.81%	$10,517,833	42.16%	$17,164,698	68.81%
	DISTRIBUTION PLANT							
361000	Structures and Improvements	$1,892,325	$205,256	10.85%	$200,062	10.57%	$229,420	12.12%
362000	Station Equipment	29,270,625	12,370,556	42.26%	8,755,987	29.91%	10,040,884	34.30%
364000	Poles, Towers and Fixtures	21,560,742	9,970,543	46.24%	12,210,176	56.63%	14,001,957	64.94%
365000	Overhead Conductors and Devices	19,226,885	8,655,258	45.02%	7,912,656	41.15%	9,073,798	47.19%
366000	Underground Conduit	5,089,186	1,182,646	23.24%	1,472,100	28.93%	1,688,123	33.17%
367000	Underground Conductors and Devices	12,922,690	3,168,535	24.52%	2,997,195	23.19%	3,437,019	26.60%
368000	Line Transformers	22,711,503	13,137,259	57.84%	9,159,150	40.33%	10,503,209	46.25%
369001	Overhead Services	3,565,101	2,547,403	71.45%	2,772,320	77.76%	3,179,143	89.17%
369002	Underground Services	7,294,246	2,696,509	36.97%	2,267,310	31.08%	2,600,027	35.64%
370001	Meters	6,465,205	3,998,735	61.85%	2,707,277	41.87%	3,104,556	48.02%
371000	Installations on Customers' Premises	3,010,295	888,793	29.53%	844,782	28.06%	968,749	32.18%
373000	Street Lighting and Signal Systems	3,771,314	1,238,032	32.83%	1,074,904	28.50%	1,232,640	32.68%
	Total Distribution Plant	$136,780,117	$60,059,526	43.91%	$52,373,919	38.29%	$60,059,526	43.91%
	GENERAL PLANT							
391001	Office Furniture and Equipment	$46,917	$28,461	60.66%	$16,140	34.40%	$36,914	78.68%
391003	Computer Hardware	90,755	105,606	116.36%	21,530	23.72%	49,242	54.26%
391004	Computer Software	1,556	1,860	119.54%	429	27.59%	982	63.11%
393000	Stores Equipment	12,698	8,523	67.12%	4,547	35.81%	10,400	81.90%
394000	Tools, Shop and Garage Equipment	120,242	41,292	34.34%	(7,482)	-6.22%	(17,111)	-14.23%
395000	Laboratory Equipment	6,433	5,570	86.59%	3,074	47.78%	7,030	109.27%
397000	Communication Equipment	488,864	369,881	75.66%	206,600	42.26%	472,511	96.65%
398000	Miscellaneous Equipment	25,081	12,412	49.49%	5,963	23.78%	13,638	54.38%
	Total General Plant	$792,546	$573,605	72.38%	$250,802	31.65%	$573,605	72.38%
	TOTAL ELECTRIC UTILITY	$311,860,048	$172,154,015	55.20%	$152,684,692	48.96%	$172,154,015	55.20%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement C

Depreciation Reserve Summary
Vintage Group Procedure
December 31, 2001

Account Description	Plant Investment	Recorded Reserve Amount	Recorded Reserve Ratio	Computed Reserve Amount	Computed Reserve Ratio	Redistributed Reserve Amount	Redistributed Reserve Ratio
A	B	C	D=C/B	E	F=E/B	G	H=G/B
COMMON UTILITY							
390001 Structures and Improvements	$10,660,323	$4,778,843	44.83%	$4,957,212	46.50%	$7,593,755	71.23%
391001 Office Furniture and Equipment	1,425,582	604,510	42.40%	523,020	36.69%	801,193	56.20%
391003 Computer Hardware	3,783,535	3,608,923	95.38%	1,708,955	45.17%	2,617,880	69.19%
391004 Computer Software	3,831,650	3,831,650	100.00%	1,409,704	36.79%	2,159,469	56.36%
392000 Transportation Equipment	4,214,102	3,025,869	71.80%	1,622,160	38.49%	2,484,922	58.97%
393000 Stores Equipment	137,302	108,389	78.94%	70,129	51.08%	107,428	78.24%
394000 Tools, Shop and Garage Equipment	1,164,568	464,922	39.92%	425,506	36.54%	651,816	55.97%
395000 Laboratory Equipment	225,497	146,827	65.11%	104,872	46.51%	160,650	71.24%
396002 Power Operated Equipment	470,793	221,076	46.96%	172,358	36.61%	264,028	56.08%
397000 Communication Equipment	2,398,872	1,154,481	48.13%	717,695	29.92%	1,099,409	45.83%
398000 Miscellaneous Equipment	107,147	45,782	42.73%	33,110	30.90%	50,720	47.34%
Total Common Utility	$28,419,371	$17,991,270	63.31%	$11,744,722	41.33%	$17,991,270	63.31%
TOTAL ELECTRIC AND COMMON UTILITY	$340,279,419	$190,145,285	55.88%	$164,429,414	48.32%	$190,145,285	55.88%
INDUSTRIAL STEAM PRODUCTION							
311009 Structures and Improvements	$84,675	$1,513	1.79%	$61,299	72.39%	$42,276	49.93%
312009 Boiler Plant Equipment	294,172	68,903	23.42%	217,491	73.93%	149,997	50.99%
315009 Accessory Electric Equipment	270,046	123,025	45.56%	172,543	63.89%	118,998	44.07%
375009 Structures and Improvements	78,278	28,069	35.86%	40,735	52.04%	28,094	35.89%
376009 Mains	1,448,150	695,327	48.01%	950,609	65.64%	655,607	45.27%
379009 Measuring and Regulating Equpment	582,661	254,868	43.74%	321,958	55.26%	222,045	38.11%
380009 Services	102,362	72,671	70.99%	65,012	63.51%	44,837	43.80%
381009 Meters	302,006	114,834	38.02%	141,164	46.74%	97,356	32.24%
Total Industrial Steam Production Plant	$3,162,350	$1,359,211	42.98%	$1,970,810	62.32%	$1,359,211	42.98%
TOTAL SJLP	$343,441,769	$191,504,496	55.76%	$166,400,224	48.45%	$191,504,496	55.76%
STEAM PRODUCTION							
Lake Road							
311000 Structures and Improvements	$10,872,761	$3,755,763	34.54%	$6,113,364	56.23%	$6,039,958	55.55%
312001 Boiler Plant Equipment	43,130,173	24,090,086	55.85%	23,501,601	54.49%	23,219,407	53.84%
314000 Turbogenerator Units	11,050,685	7,725,161	69.91%	7,093,113	64.19%	7,007,943	63.42%
315000 Accessory Electric Equipment	3,170,631	2,332,554	73.57%	1,995,065	62.92%	1,971,109	62.17%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement C

Depreciation Reserve Summary
Vintage Group Procedure
December 31, 2001

Account	Description	Plant Investment	Recorded Reserve Amount	Recorded Reserve Ratio	Computed Reserve Amount	Computed Reserve Ratio	Redistributed Reserve Amount	Redistributed Reserve Ratio
A		B	C	D=C/B	E	F=E/B	G	H=G/B
316000	Miscellaneous Power Plant Equipment	241,084	160,176	66.44%	114,902	47.66%	113,523	47.09%
353000	Station Equipment							
391001	Office Furniture and Equipment	171,982	(105)	-0.06%	36,814	21.41%	36,372	21.15%
391003	Computer Hardware	145,037	46,187	31.84%	43,330	29.88%	42,810	29.52%
391004	Computer Software	106,199	31,161	29.34%	20,175	19.00%	19,933	18.77%
392000	Transportation Equipment	270,805	276,950	102.27%	140,598	51.92%	138,910	51.30%
393000	Stores Equipment	841	114	13.59%	97	11.57%	96	11.43%
394000	Tools, Shop and Garage Equipment	416,418	222,375	53.40%	121,737	29.23%	120,276	28.88%
395000	Laboratory Equipment	319,441	165,759	51.89%	128,695	40.29%	127,149	39.80%
396002	Power Operated Equipment	864,775	326,888	37.80%	297,854	34.44%	294,277	34.03%
397000	Communication Equipment							
398000	Miscellaneous Equipment	8,882	1,502	16.91%	2,842	31.99%	2,807	31.61%
	Total Lake Road	$70,769,714	$39,134,571	55.30%	$39,610,188	55.97%	$39,134,571	55.30%
	Iatan							
311000	Structures and Improvements	$4,330,795	$1,946,278	44.94%	$2,722,474	62.86%	$2,719,356	62.79%
312001	Boiler Plant Equipment	39,984,117	28,338,286	70.87%	27,114,183	67.81%	27,083,121	67.73%
314000	Turbogenerator Units	10,812,431	6,493,364	60.05%	7,218,985	66.77%	7,210,715	66.69%
315000	Accessory Electric Equipment	5,198,475	4,005,632	77.05%	3,420,426	65.80%	3,416,508	65.72%
316000	Miscellaneous Power Plant Equipment	723,964	493,682	68.19%	399,955	55.25%	399,497	55.18%
353000	Station Equipment	1,032,185	112,949	10.94%	597,505	57.89%	596,820	57.82%
391001	Office Furniture and Equipment	1,742	997	57.24%	816	46.85%	815	46.79%
391003	Computer Hardware							
391004	Computer Software	157,762	55,203	34.99%	31,476	19.95%	31,440	19.93%
392000	Transportation Equipment							
393000	Stores Equipment							
394000	Tools, Shop and Garage Equipment							
395000	Laboratory Equipment							
396002	Power Operated Equipment							
397000	Communication Equipment	109,934	37,728	34.32%	25,879	23.54%	25,849	23.51%
398000	Miscellaneous Equipment							
	Total Iatan	$62,351,405	$41,484,120	66.53%	$41,531,699	66.61%	$41,484,120	66.53%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)
Average Net Salvage

Statement D

Account Description	Plant Investment			Salvage Rate		Net Salvage			Average
	Additions	Retirements	Survivors	Realized	Future	Realized	Future	Total	Rate
A	B	C	D=B-C	E	F	G=E*C	H=F*D	I=G+H	J=I/B
STEAM PRODUCTION									
311000 Structures and Improvements	$15,995,047	$791,491	$15,203,556	-29.1%	-13.3%	($230,567)	($2,017,834)	($2,248,401)	-14.1%
312001 Boiler Plant Equipment	92,207,631	9,093,341	83,114,290	-4.7%	-13.1%	(430,856)	(10,900,556)	(11,331,413)	-12.3%
314000 Turbogenerator Units	22,745,723	882,607	21,863,116	-37.3%	-13.1%	(328,776)	(2,865,021)	(3,193,797)	-14.0%
315000 Accessory Electric Equipment	8,949,392	580,286	8,369,106	-9.8%	-13.0%	(57,045)	(1,088,242)	(1,145,286)	-12.8%
316000 Miscellaneous Power Plant Equipment	1,304,571	339,523	965,048	-19.5%	-12.9%	(66,267)	(124,490)	(190,757)	-14.6%
353000 Station Equipment	1,032,185		1,032,185		-10.0%		(103,219)	(103,219)	-10.0%
391001 Office Furniture and Equipment	245,489	71,765	173,724						
391003 Computer Hardware	280,665	135,628	145,037						
391004 Computer Software	264,693	732	263,961						
392000 Transportation Equipment	279,764	8,959	270,805		20.0%		54,161	54,161	19.4%
393000 Stores Equipment	841		841						
394000 Tools, Shop and Garage Equipment	471,495	55,077	416,418						
395000 Laboratory Equipment	397,501	78,060	319,441						
396002 Power Operated Equipment	864,775		864,775		25.0%		216,194	216,194	25.0%
397000 Communication Equipment	111,029	1,095	109,934	-19.8%	-5.0%	(217)	(5,497)	(5,714)	-5.1%
398000 Miscellaneous Equipment	14,105	5,223	8,882		-5.0%		(444)	(444)	-3.1%
Total Steam Production Plant	$145,164,906	$12,043,787	$133,121,119	-9.2%	-12.6%	($1,113,728)	($16,834,947)	($17,948,675)	-12.4%
OTHER PRODUCTION (Lake Road)									
341000 Structures and Improvements	$1,302,967	$4,884	$1,298,083		-5.0%		($64,904)	($64,904)	-5.0%
342000 Fuel Holders and Accessories	607,958	2,850	605,108		-5.0%		(30,255)	(30,255)	-5.0%
343000 Prime Movers	10,456,606	46,761	10,409,845	-24.4%	-5.0%	(11,410)	(520,492)	(531,902)	-5.1%
344001 Generators	3,333,871	541,569	2,792,302	-68.0%	-5.0%	(368,267)	(139,615)	(507,882)	-15.2%
345000 Accessory Electric Equipment	1,129,814	13,531	1,116,283	-5.9%	-5.0%	(798)	(55,814)	(56,612)	-5.0%
Total Other Production Plant	$16,831,216	$609,595	$16,221,621	-62.4%	-5.0%	($380,475)	($811,081)	($1,191,556)	-7.1%
TRANSMISSION PLANT									
352000 Structures and Improvements	$272,240	$217	$272,023		-10.0%		($27,202)	($27,202)	-10.0%
353000 Station Equipment	9,833,749	2,246,859	7,586,890	48.5%	-10.0%	1,089,727	(758,689)	331,038	3.4%
355000 Poles and Fixtures	9,871,724	783,203	9,088,521	-40.7%	-30.0%	(318,764)	(2,726,556)	(3,045,320)	-30.8%
356000 Overhead Conductors and Devices	8,456,993	507,622	7,949,371	-15.6%	-30.0%	(79,189)	(2,384,811)	(2,464,000)	-29.1%
357000 Underground Conduit	16,148		16,148		-5.0%		(807)	(807)	-5.0%
358000 Underground Conductors and Devices	31,692		31,692		-5.0%		(1,585)	(1,585)	-5.0%
Total Transmission Plant	$28,482,546	$3,537,901	$24,944,645	19.6%	-23.7%	$691,774	($5,899,651)	($5,207,877)	-18.3%
DISTRIBUTION PLANT									
361000 Structures and Improvements	$1,948,562	$56,237	$1,892,325	-10.1%	-10.0%	($5,680)	($189,233)	($194,912)	-10.0%
362000 Station Equipment	31,418,807	2,148,182	29,270,625	-9.2%	-20.0%	(197,633)	(5,854,125)	(6,051,758)	-19.3%
364000 Poles, Towers and Fixtures	23,214,543	1,653,801	21,560,742	-66.5%	-65.0%	(1,099,778)	(14,014,482)	(15,114,260)	-65.1%
365000 Overhead Conductors and Devices	20,983,728	1,756,843	19,226,885	-5.1%	-40.0%	(89,599)	(7,690,754)	(7,780,353)	-37.1%
366000 Underground Conduit	5,119,534	30,348	5,089,186	-35.7%	-40.0%	(10,834)	(2,035,674)	(2,046,509)	-40.0%
367000 Underground Conductors and Devices	13,224,201	301,511	12,922,690	-13.0%	-15.0%	(39,196)	(1,938,404)	(1,977,600)	-15.0%
368000 Line Transformers	24,973,904	2,262,401	22,711,503	-12.2%	-20.0%	(276,013)	(4,542,301)	(4,818,314)	-19.3%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)
Average Net Salvage

Statement D

Account Description	Plant Investment			Salvage Rate		Net Salvage			Average Rate
	Additions	Retirements	Survivors	Realized	Future	Realized	Future	Total	
A	B	C	D=B-C	E	F	G=E*C	H=F*D	I=G+H	J=I/B
369001 Overhead Services	3,895,791	330,690	3,565,101	-121.0%	-100.0%	(400,135)	(3,565,101)	(3,965,236)	-101.8%
369002 Underground Services	7,531,368	237,122	7,294,246	-9.3%	-10.0%	(22,052)	(729,425)	(751,477)	-10.0%
370001 Meters	6,990,213	525,008	6,465,205	1.3%		6,825		6,825	0.1%
371000 Installations on Customers' Premises	4,243,933	1,233,638	3,010,295	19.2%	5.0%	236,858	150,515	387,373	9.1%
373000 Street Lighting and Signal Systems	4,277,593	506,279	3,771,314	-0.5%	-20.0%	(2,531)	(754,263)	(756,794)	-17.7%
Total Distribution Plant	$147,822,177	$11,042,060	$136,780,117	-17.2%	-30.1%	($1,899,768)	($41,163,246)	($43,063,014)	-29.1%
GENERAL PLANT									
391001 Office Furniture and Equipment	$966,882	$919,965	$46,917	2.7%		$24,839		$24,839	2.6%
391003 Computer Hardware	4,969,762	4,879,007	90,755	4.3%		209,797		209,797	4.2%
391004 Computer Software	29,760	28,204	1,556						
393000 Stores Equipment	83,165	70,467	12,698						
394000 Tools, Shop and Garage Equipment	332,984	212,742	120,242	-83.9%		(178,491)		(178,491)	-53.6%
395000 Laboratory Equipment	105,772	99,339	6,433	0.8%		795		795	0.8%
397000 Communication Equipment	1,036,045	547,181	488,864	-3.8%	-5.0%	(20,793)	(24,443)	(45,236)	-4.4%
398000 Miscellaneous Equipment	53,437	28,356	25,081	-43.5%	-5.0%	(12,335)	(1,254)	(13,589)	-25.4%
Total General Plant	$7,577,807	$6,785,261	$792,546	0.4%	-3.2%	$23,813	($25,697)	($1,884)	
TOTAL ELECTRIC UTILITY	$345,878,652	$34,018,604	$311,860,048	-7.9%	-20.8%	($2,678,384)	($64,734,622)	($67,413,007)	-19.5%
COMMON UTILITY									
390001 Structures and Improvements	$11,387,883	$727,560	$10,660,323	2.4%	-10.0%	$17,461	($1,066,032)	($1,048,571)	-9.2%
391001 Office Furniture and Equipment	1,427,731	2,149	1,425,582	4.1%		88		88	
391003 Computer Hardware	3,783,535		3,783,535						
391004 Computer Software	3,831,650		3,831,650						
392000 Transportation Equipment	5,349,991	1,135,889	4,214,102	14.3%	20.0%	162,432	842,820	1,005,253	18.8%
393000 Stores Equipment	137,302		137,302						
394000 Tools, Shop and Garage Equipment	1,164,568		1,164,568						
395000 Laboratory Equipment	225,497		225,497						
396002 Power Operated Equipment	652,319	181,526	470,793	8.3%	25.0%	15,067	117,698	132,765	20.4%
397000 Communication Equipment	2,398,872		2,398,872		-5.0%		(119,944)	(119,944)	-5.0%
398000 Miscellaneous Equipment	107,147		107,147		-5.0%		(5,357)	(5,357)	-5.0%
Total Common Utility	$30,466,495	$2,047,124	$28,419,371	9.5%	-0.8%	$195,048	($230,815)	($35,766)	-0.1%
TOTAL ELECTRIC AND COMMON UTILITY	$376,345,147	$36,065,728	$340,279,419	-6.9%	-19.1%	($2,483,336)	($64,965,437)	($67,448,773)	-17.9%
INDUSTRIAL STEAM PRODUCTION									
311009 Structures and Improvements	$110,697	$26,022	$84,675	-73.3%	-13.6%	($19,074)	($11,516)	($30,590)	-27.6%
312009 Boiler Plant Equipment	445,407	151,235	294,172	-48.0%	-13.0%	(72,593)	(38,242)	(110,835)	-24.9%
315009 Accessory Electric Equipment	315,032	44,986	270,046	-0.2%	-13.0%	(90)	(35,106)	(35,196)	-11.2%
375009 Structures and Improvements	83,591	5,313	78,278	-87.7%		(4,660)		(4,660)	-5.6%
376009 Mains	1,669,539	221,389	1,448,150	9.2%	-5.0%	20,368	(72,408)	(52,040)	-3.1%
379009 Measuring and Regulating Equpment	624,602	41,941	582,661	-0.4%	-5.0%	(168)	(29,133)	(29,301)	-4.7%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)
Average Net Salvage

Statement D

Account Description	Plant Investment			Salvage Rate		Net Salvage			Average Rate
	Additions	Retirements	Survivors	Realized	Future	Realized	Future	Total	
A	B	C	D=B-C	E	F	G=E*C	H=F*D	I=G+H	J=I/B
380009 Services	104,033	1,671	102,362		-5.0%		(5,118)	(5,118)	-4.9%
381009 Meters	373,420	71,414	302,006	-0.4%		(286)		(286)	-0.1%
Total Industrial Steam Production Plant	$3,726,321	$563,971	$3,162,350	-13.6%	-6.1%	($76,502)	($191,523)	($268,025)	-7.2%
TOTAL SJLP	$380,071,466	$36,629,699	$343,441,769	-7.0%	-19.0%	($2,559,838)	($65,156,959)	($67,716,798)	-17.8%
STEAM PRODUCTION									
Lake Road									
311000 Structures and Improvements	$11,545,176	$672,415	$10,872,761	-40.7%	-13.5%	($273,673)	($1,467,823)	($1,741,496)	-15.1%
312001 Boiler Plant Equipment	48,470,256	5,340,083	43,130,173	-30.7%	-13.5%	(1,639,405)	(5,822,573)	(7,461,979)	-15.4%
314000 Turbogenerator Units	11,595,409	544,724	11,050,685	-46.4%	-13.5%	(252,752)	(1,491,842)	(1,744,594)	-15.0%
315000 Accessory Electric Equipment	3,509,378	338,747	3,170,631	-15.2%	-13.5%	(51,490)	(428,035)	(479,525)	-13.7%
316000 Miscellaneous Power Plant Equipment	479,588	238,504	241,084	-31.3%	-13.5%	(74,652)	(32,546)	(107,198)	-22.4%
353000 Station Equipment									
391001 Office Furniture and Equipment	243,747	71,765	171,982						
391003 Computer Hardware	280,665	135,628	145,037						
391004 Computer Software	106,731	532	106,199						
392000 Transportation Equipment	279,764	8,959	270,805		20.0%		54,161	54,161	19.4%
393000 Stores Equipment	841		841						
394000 Tools, Shop and Garage Equipment	471,495	55,077	416,418						
395000 Laboratory Equipment	397,501	78,060	319,441						
396002 Power Operated Equipment	864,775		864,775		25.0%		216,194	216,194	25.0%
397000 Communication Equipment									
398000 Miscellaneous Equipment	14,105	5,223	8,882		-5.0%		(444)	(444)	-3.1%
Total Lake Road	$78,259,431	$7,489,717	$70,769,714	-30.6%	-12.7%	($2,291,972)	($8,972,909)	($11,264,881)	-14.4%
Iatan									
311000 Structures and Improvements	$4,449,871	$119,076	$4,330,795	36.2%	-12.7%	$43,106	($550,011)	($506,905)	-11.4%
312001 Boiler Plant Equipment	43,737,375	3,753,258	39,984,117	32.2%	-12.7%	1,208,549	(5,077,983)	(3,869,434)	-8.8%
314000 Turbogenerator Units	11,150,314	337,883	10,812,431	-22.5%	-12.7%	(76,024)	(1,373,179)	(1,449,202)	-13.0%
315000 Accessory Electric Equipment	5,440,014	241,539	5,198,475	-2.3%	-12.7%	(5,555)	(660,206)	(665,762)	-12.2%
316000 Miscellaneous Power Plant Equipment	824,983	101,019	723,964	8.3%	-12.7%	8,385	(91,943)	(83,559)	-10.1%
353000 Station Equipment	1,032,185		1,032,185		-10.0%		(103,219)	(103,219)	-10.0%
391001 Office Furniture and Equipment	1,742		1,742						
391003 Computer Hardware									
391004 Computer Software	157,962	200	157,762						
392000 Transportation Equipment									
393000 Stores Equipment									
394000 Tools, Shop and Garage Equipment									
395000 Laboratory Equipment									
396002 Power Operated Equipment									
397000 Communication Equipment	111,029	1,095	109,934	-19.8%	-5.0%	(217)	(5,497)	(5,714)	-5.1%
398000 Miscellaneous Equipment									
Total Iatan	$66,905,475	$4,554,070	$62,351,405	25.9%	-12.6%	$1,178,243	($7,862,038)	($6,683,794)	-10.0%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement E

Future Net Salvage
Steam Production

Account Description	Derived Additions	12/31/01 Plant Investment	Interim Retirements		Interim Net Salvage Realized		Interim Net Salvage Future		Future Rate
			Historical	Future	Rate	Amount	Rate	Amount	
A	B	C	D=B-C	E	F	G=D*F	H	I=E*H	J=I/C
STEAM PRODUCTION									
Lake Road									
311000 Structures and Improvements	$11,545,176	$10,872,761	$672,415	$284,526	-40.7%	($273,673)	-30.0%	($85,358)	
312001 Boiler Plant Equipment	48,470,256	43,130,173	5,340,083	1,125,690	-30.7%	(1,639,405)	-10.0%	(112,569)	
314000 Turbogenerator Units	11,595,409	11,050,685	544,724	295,590	-46.4%	(252,752)	-30.0%	(88,677)	
315000 Accessory Electric Equipment	3,509,378	3,170,631	338,747	84,183	-15.2%	(51,490)	-10.0%	(8,418)	
316000 Miscellaneous Power Plant Equipment	479,588	241,084	238,504	6,268	-31.3%	(74,652)	-10.0%	(627)	
Interim Net Salvage	$75,599,807	$68,465,334	$7,134,473	$1,796,257	-32.1%	($2,291,972)	-16.5%	($295,649)	-0.4%
Dismantlement Cost								(8,952,412)	-13.1%
Total Lake Road		$68,465,334						($9,248,061)	-13.5%
Iatan									
311000 Structures and Improvements	$4,449,871	$4,330,795	$119,076	$147,688	36.2%	$43,106	-30.0%	($44,306)	
312001 Boiler Plant Equipment	43,737,375	39,984,117	3,753,258	1,369,821	32.2%	1,208,549	-10.0%	(136,982)	
314000 Turbogenerator Units	11,150,314	10,812,431	337,883	370,548	-22.5%	(76,024)	-30.0%	(111,164)	
315000 Accessory Electric Equipment	5,440,014	5,198,475	241,539	177,914	-2.3%	(5,555)	-10.0%	(17,791)	
316000 Miscellaneous Power Plant Equipment	824,983	723,964	101,019	24,446	8.3%	8,385	-10.0%	(2,445)	
Interim Net Salvage	$65,602,557	$61,049,782	$4,552,775	$2,090,417	25.9%	$1,178,460	-15.0%	($312,689)	-0.5%
Dismantlement Cost								(7,452,122)	-12.2%
Total Iatan		$61,049,782						($7,764,811)	-12.7%
Total Steam Production Plant	$141,202,364	$129,515,116	$11,687,248	$3,886,674	-9.5%	($1,113,512)	-15.7%	($17,012,872)	-13.1%

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)
Proposed Parameters
Vintage Group Procedure

Statement F

Account Description	Present Parameters P-Life/ AYFR	Curve Shape	BG ASL	Rem. Life	Avg. Sal.	Fut. Sal.	Proposed Parameters P-Life/ AYFR	Curve Shape	VG ASL	Rem. Life	Avg. Sal.	Fut. Sal.
A	B	C	D	E	F	G	H	I	J	K	L	M
STEAM PRODUCTION												
311000 Structures and Improvements								200-SC	22.70	8.36	-14.1	
312001 Boiler Plant Equipment								200-SC	24.47	8.55	-12.3	
314000 Turbogenerator Units								200-SC	27.69	8.41	-14.0	
315000 Accessory Electric Equipment								200-SC	27.87	8.74	-12.8	
316000 Miscellaneous Power Plant Equipment								200-SC	23.69	9.64	-14.6	
353000 Station Equipment								200-SC	31.43	12.05	-10.0	
391001 Office Furniture and Equipment								200-SC	18.68	14.63		
391003 Computer Hardware								200-SC	12.82	8.99		
391004 Computer Software								200-SC	12.38	9.95		
392000 Transportation Equipment								200-SC	15.04	8.89	19.4	
393000 Stores Equipment								200-SC	30.04	26.60		
394000 Tools, Shop and Garage Equipment								200-SC	25.19	17.82		
395000 Laboratory Equipment								200-SC	25.71	15.36		
396002 Power Operated Equipment								200-SC	18.38	16.01	25.0	
397000 Communication Equipment								200-SC	25.03	18.21	-5.1	
398000 Miscellaneous Equipment								200-SC	25.51	16.83	-3.1	
Total Steam Production Plant									24.83	11.42	-12.4	-12.6
OTHER PRODUCTION (Lake Road)												
341000 Structures and Improvements	22.00		22.00				2017	100-SC	35.49	14.82	-5.0	-5.0
342000 Fuel Holders and Accessories	22.00		22.00				2017	100-SC	38.64	14.81	-5.0	-5.0
343000 Prime Movers	22.00		22.00				2017	100-SC	28.00	14.85	-5.1	-5.0
344001 Generators	22.00		22.00				2017	100-SC	33.49	14.83	-15.2	-5.0
345000 Accessory Electric Equipment	22.00		22.00				2017	100-SC	29.36	14.85	-5.0	-5.0
Total Other Production Plant									29.89	14.81	-7.1	-5.0
TRANSMISSION PLANT												
352000 Structures and Improvements	53.00		53.00				60.00	S3	60.02	43.19	-10.0	-10.0
353000 Station Equipment	27.00	L3	27.00		-5.0	-5.0	30.00	L2	30.17	20.10	3.4	-10.0
355000 Poles and Fixtures	53.00	L1	53.00		-37.0	-37.0	60.00	R1.5	60.76	43.93	-30.8	-30.0

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Proposed Parameters
Vintage Group Procedure

Statement F

Account Description	Present Parameters P-Life/ AYFR	Curve Shape	BG ASL	Rem. Life	Avg. Sal.	Fut. Sal.	Proposed Parameters P-Life/ AYFR	Curve Shape	VG ASL	Rem. Life	Avg. Sal.	Fut. Sal.
A	B	C	D	E	F	G	H	I	J	K	L	M
356000 Overhead Conductors and Devices	50.00	R2.5	50.00		-17.0	-17.0	60.00	R2.5	60.30	38.75	-29.1	-30.0
357000 Underground Conduit	58.00		58.00				60.00	R4	60.00	50.65	-5.0	-5.0
358000 Underground Conductors and Devices	41.00		41.00				60.00	R1.5	60.75	44.11	-5.0	-5.0
Total Transmission Plant									48.05	34.52	-18.3	-23.7
DISTRIBUTION PLANT												
361000 Structures and Improvements	50.00		50.00				50.00	R3	50.15	45.33	-10.0	-10.0
362000 Station Equipment	30.00	L0	30.00		-16.0	-16.0	50.00	R2	50.27	37.96	-19.3	-20.0
364000 Poles, Towers and Fixtures	44.00	S4	44.00		-53.0	-53.0	45.00	R3	45.37	29.78	-65.1	-65.0
365000 Overhead Conductors and Devices	47.00	R1	47.00		-37.0	-37.0	55.00	R2	55.30	39.87	-37.1	-40.0
366000 Underground Conduit	50.00		50.00				55.00	R4	55.03	43.66	-40.0	-40.0
367000 Underground Conductors and Devices	58.00	R2	58.00		-14.0	-14.0	50.00	R3	49.98	39.90	-15.0	-15.0
368000 Line Transformers							40.00	S2	40.22	26.86	-19.3	-20.0
369001 Overhead Services	40.00	R4	40.00		-78.0	-78.0	50.00	R4	50.22	30.42	-101.8	-100.0
369002 Underground Services	40.00	R4	40.00		-78.0	-78.0	35.00	S3	35.07	25.16	-10.0	-10.0
370001 Meters	29.00	R2	29.00		1.0	1.0	40.00	R3	40.63	23.64	0.1	
371000 Installations on Customers' Premises	13.00	O1	13.00		7.0	7.0	17.00	L0.5	17.07	12.57	9.1	5.0
373000 Street Lighting and Signal Systems	18.00	R2	18.00		-25.0	-25.0	25.00	L1	25.29	19.66	-17.7	-20.0
Total Distribution Plant									44.54	31.72	-29.1	-30.1
GENERAL PLANT												
391001 Office Furniture and Equipment							18.00	L0	16.11	10.85	2.6	
391003 Computer Hardware							12.00	SC	10.01	7.97	4.2	
391004 Computer Software	7.00		7.00				12.00	SC	11.09	8.03		
393000 Stores Equipment	20.00	L3	20.00				30.00	S1.5	26.78	17.19		
394000 Tools, Shop and Garage Equipment	22.00	L0.5	22.00		4.0	4.0	25.00	L2	24.38	16.86	-53.6	
395000 Laboratory Equipment	27.00	R1.5	27.00		7.0	7.0	25.00	S1	23.27	12.25	0.8	
397000 Communication Equipment	21.00	R1.5	21.00		-2.0	-2.0	25.00	L1.5	25.36	15.24	-4.4	-5.0
398000 Miscellaneous Equipment	28.00	O3	28.00				25.00	L1	25.69	16.64	-25.4	-5.0
Total General Plant									19.17	13.66		-3.2
TOTAL ELECTRIC UTILITY									33.19	19.63	-19.5	-20.8

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement F

Proposed Parameters
Vintage Group Procedure

Account Description	Present Parameters P-Life/ AYFR	Curve Shape	BG ASL	Rem. Life	Avg. Sal.	Fut. Sal.	Proposed Parameters P-Life/ AYFR	Curve Shape	VG ASL	Rem. Life	Avg. Sal.	Fut. Sal.
A	B	C	D	E	F	G	H	I	J	K	L	M
COMMON UTILITY												
390001 Structures and Improvements	31.00	R4	31.00		3.0	3.0	40.00	R3	40.19	23.37	-9.2	-10.0
391001 Office Furniture and Equipment							18.00	L0	20.17	12.77		
391003 Computer Hardware							12.00	SC	13.97	7.66		
391004 Computer Software	7.00		7.00				12.00	SC	13.40	8.47		
392000 Transportation Equipment	12.00	L1.5	12.00		26.0	26.0	12.00	L1.5	12.99	6.64	18.8	20.0
393000 Stores Equipment	20.00	L3	20.00				30.00	S1.5	30.66	15.00		
394000 Tools, Shop and Garage Equipment	22.00	L0.5	22.00		4.0	4.0	25.00	L2	25.59	16.24		
395000 Laboratory Equipment	27.00	R1.5	27.00		7.0	7.0	25.00	S1	26.34	14.09		
396002 Power Operated Equipment	18.00	L2	18.00		30.0	30.0	17.00	R1	18.91	9.12	20.4	25.0
397000 Communication Equipment	21.00	R1.5	21.00		-2.0	-2.0	25.00	L1.5	25.62	18.32	-5.0	-5.0
398000 Miscellaneous Equipment	28.00	O3	28.00				25.00	L1	25.62	18.08	-5.0	-5.0
Total Common Utility									20.89	12.72	-0.1	-0.8
TOTAL ELECTRIC AND COMMON UTILITY									31.87	19.10	-17.9	-19.1
INDUSTRIAL STEAM PRODUCTION												
311009 Structures and Improvements							2012	200-SC	32.05	10.35	-27.6	-13.6
312009 Boiler Plant Equipment							2012	200-SC	33.09	10.35	-24.9	-13.0
315009 Accessory Electric Equipment							2012	200-SC	23.46	10.36	-11.2	-13.0
375009 Structures and Improvements							2012	100-SC	22.48	10.21	-5.6	
376009 Mains							2012	100-SC	26.72	10.20	-3.1	-5.0
379009 Measuring and Regulating Equpment							2012	100-SC	21.49	10.21	-4.7	-5.0
380009 Services							2012	100-SC	25.79	10.20	-4.9	-5.0
381009 Meters							2012	100-SC	19.19	10.21	-0.1	
Total Industrial Steam Production Plant									25.08	10.23	-7.2	-6.1
TOTAL SJLP									31.80	18.96	-17.8	-19.0
STEAM PRODUCTION												
Lake Road												
311000 Structures and Improvements	54.00	O1	54.00		-31.0	-31.0	2012	200-SC	20.82	10.36	-15.1	-13.5
312001 Boiler Plant Equipment							2012	200-SC	20.26	10.36	-15.4	-13.5
314000 Turbogenerator Units	33.00		33.00		-33.0	-33.0	2012	200-SC	24.16	10.36	-15.0	-13.5
315000 Accessory Electric Equipment	39.00	S4	39.00		-9.0	-9.0	2012	200-SC	23.29	10.36	-13.7	-13.5

AQUILA NETWORKS - SJLP (ELECTRIC AND COMMON)

Statement F

Proposed Parameters

Vintage Group Procedure

Account Description	Present Parameters P-Life/ AYFR	Curve Shape	BG ASL	Rem. Life	Avg. Sal.	Fut. Sal.	Proposed Parameters P-Life/ AYFR	Curve Shape	VG ASL	Rem. Life	Avg. Sal.	Fut. Sal.
A	B	C	D	E	F	G	H	I	J	K	L	M
316000 Miscellaneous Power Plant Equipment	32.00		32.00				2012	200-SC	19.26	10.36	-22.4	-13.5
353000 Station Equipment												
391001 Office Furniture and Equipment							18.00	L0	18.64	14.65		
391003 Computer Hardware							12.00	SC	12.82	8.99		
391004 Computer Software							12.00	SC	12.37	10.02		
392000 Transportation Equipment							12.00	L1.5	15.04	5.24	19.4	20.0
393000 Stores Equipment							30.00	S1.5	30.00	26.53		
394000 Tools, Shop and Garage Equipment							25.00	L2	25.21	17.84		
395000 Laboratory Equipment							25.00	S1	25.74	15.37		
396002 Power Operated Equipment							17.00	R1	18.40	9.95	25.0	25.0
397000 Communication Equipment												
398000 Miscellaneous Equipment							25.00	L1	25.49	18.05	-3.1	-5.0
Total Lake Road									20.95	10.39	-14.4	-12.7
Iatan												
311000 Structures and Improvements	30.50		30.50		-1.0	-1.0	2015	200-SC	29.64	13.26	-11.4	-12.7
312001 Boiler Plant Equipment	28.60		28.60		-4.0	-4.0	2015	200-SC	32.14	13.26	-8.8	-12.7
314000 Turbogenerator Units	32.30		32.30		-1.0	-1.0	2015	200-SC	32.62	13.26	-13.0	-12.7
315000 Accessory Electric Equipment	31.30		31.30		-1.0	-1.0	2015	200-SC	31.72	13.26	-12.2	-12.7
316000 Miscellaneous Power Plant Equipment	28.00		28.00		2.0	2.0	2015	200-SC	25.41	13.26	-10.1	-12.7
353000 Station Equipment	42.00		42.00		6.0	6.0	30.00	L2	31.43	14.89	-10.0	-10.0
391001 Office Furniture and Equipment	18.40		18.40		1.0	1.0	18.00	L0	21.26	11.30		
391003 Computer Hardware												
391004 Computer Software							12.00	SC	12.38	9.91		
392000 Transportation Equipment												
393000 Stores Equipment												
394000 Tools, Shop and Garage Equipment												
395000 Laboratory Equipment												
396002 Power Operated Equipment												
397000 Communication Equipment	38.80		38.80		3.0	3.0	25.00	L1.5	25.03	19.40	-5.1	-5.0
398000 Miscellaneous Equipment												
Total Iatan									31.73	13.29	-10.0	-12.6

ANALYSIS

INTRODUCTION

This section provides an explanation of the supporting schedules developed in the SJLP electric and common depreciation study to estimate appropriate projection curves, projection lives and statistics for each rate category. The form and content of the schedules developed for an account depend upon the method of analysis adopted for the category.

This section also includes an example of the supporting schedules developed for Account 365000 – Overhead Conductors and Devices as an illustration. Documentation for all other plant accounts is contained in the study work papers. The supporting schedules developed in the SJLP study include:

Schedule A – Generation Arrangement;

Schedule B – Age Distribution;

Schedule C – Unadjusted Plant History;

Schedule D – Adjusted Plant History;

Schedule E – Actuarial Life Analysis;

Schedule F – Graphics Analysis;

Schedule G – Historical Net Salvage Analysis; and

Schedule H – Average Year of Final Retirement.

The format and content of these schedules are briefly described below.

SCHEDULE A – GENERATION ARRANGEMENT

The purpose of this schedule is to obtain appropriate weighted-average life statistics for a rate category. The weighted-average remaining-life is the sum of Column H divided by the sum of Column I. The weighted average life is the sum of Column C divided by the sum of Column I.

It should be noted that the generation arrangement does not include parameters for net salvage. Computed Net Plant (Column H) and Accruals (Column I) must be adjusted for net salvage to obtain a correct measurement of theoretical reserves and annualized depreciation accruals.

The following table provides a description of each column in the generation arrangement.

Generation Arrangement

Column	Title	Description
A	Vintage	Vintage or placement year of surviving plant.
B	Age	Age of surviving plant at beginning of study year.
C	Surviving Plant	Actual dollar amount of surviving plant.
D	Average Life	Estimated average life of each vintage. This statistic is the sum of the realized life and the unrealized life, which is the product of the remaining life (Column E) and the theoretical proportion surviving.
E	Remaining Life	Estimated remaining life of each vintage.
F	Net Plant Ratio	Theoretical net plant ratio of each vintage.
G	Allocation Factor	A pivotal ratio which determines the amortization period of the difference between the recorded and computed reserve.
H	Computed Net Plant	Plant in service less theoretical reserve for each vintage.
I	Accrual	Ratio of computed net plant (Column H) and remaining life (Column E).

TABLE 3. GENERATION ARRANGEMENT

SCHEDULE B – AGE DISTRIBUTION

This schedule provides the age distribution and realized life of surviving plant shown in Column C of the Generation Arrangement (Schedule A). The format of the schedule depends upon the availability of either aged or unaged data. Derived additions for vintage years older than the earliest activity year in an account for unaged data are obtained from the age distribution of surviving plant at the beginning of the earliest activity year. The amount surviving from these vintages is shown in Column D. The realized life (Column G) is derived from the dollar years of service provided by a vintage over the period of years the vintage has been in service. Plant additions for vintages older than the earliest activity year in an account are represented by the opening balances shown in Column D.

The computed proportion surviving (Column D) for unaged is derived from a computed mortality analysis. The average service life displayed in the title block is the life statistic derived for the most recent activity year, given the derived age distribution at the start of the year and the specified retirement dispersion. The realized life (Column F) is obtained by finding the slope of an SC retirement dispersion, which connects the computed survivors of a vintage (Column E) to the recorded vintage addition (Column B). The realized life is the area bounded by the SC dispersion, the computed proportion surviving and the age of the vintage.

SCHEDULE C – UNADJUSTED PLANT HISTORY

This schedule provides a summary of recorded plant data extracted from the continuing property records maintained by the Company. Activity year total amounts shown on this schedule for aged data are obtained from a historical arrangement of the data base in which all plant accounting transactions are identified by vintage and activity year. Activity year totals for unaged data are obtained from a transaction file without vintage identification. Information displayed in the unadjusted plant history is consistent with regulated investments reported internally by the Company.

SCHEDULE D – ADJUSTED PLANT HISTORY

This schedule provides a summary of recorded plant data extracted from the continuing property records maintained by the Company with sales, transfers, and adjustments appropriately aged for depreciation study purposes. Activity year total amounts shown on this schedule for aged data are obtained from a historical arrangement of the data base in which all plant accounting transactions are identified by vintage and activity year. Ageing of adjusting transactions is achieved using transaction codes that identify an adjusting year associated with the dollar amount of a transaction. Adjusting transactions processed in the adjusted plant history are not aged in the Company's records nor in the unadjusted plant history.

SCHEDULE E – ACTUARIAL LIFE ANALYSIS

These schedules provide a summary of the dispersion and life indications obtained from an actuarial life analysis for a specified placement band. The observation band (Column A) is specified to produce either a rolling-band or a shrinking-band analysis depending upon the movement of the end points of the band. The degree of censoring (or point of truncation) of the observed life table is shown in Column B for each observation band. The estimated average service life, best fitting Iowa dispersion, and a statistical measure of the goodness of fit are shown for each degree polynomial (First, Second, and Third) fitted to the estimated hazard rates. Options available in the analysis include the width and location of both the placement and observation bands; the interval of years included in a selected rolling or shrinking band analysis; the estimator of the hazard rate (actuarial, conditional proportion retired, or maximum likelihood); the elements to include on the diagonal of a weight matrix (exposures, inverse of age, inverse of variance, or unweighted); and the age at which an observed life table is truncated.

The estimated average service lives (Columns C, F, and I) are flagged with an asterisk if negative hazard rates are indicated by the fitted polynomial. All negative hazard rates are set equal to zero in the calculation of the graduated survivor curve. The Conformance Index (Columns E, H, and K) is the square root of the mean sum-of-squared differences between the graduated survivor curve and

the best fitting Iowa curve. A Conformance Index of zero would indicate a perfect fit.

SCHEDULE F – GRAPHICS ANALYSIS

This schedule provides a graphics plot of a) the observed proportion surviving for a selected placement and observation band; b) the statistically best fitting Iowa dispersion and derived average service life; and c) the projection curve and projection life selected to describe future forces of mortality.

SCHEDULE G – HISTORICAL NET SALVAGE ANALYSIS

This schedule provides a moving average analysis of the ratio of realized net salvage (Column I) to the associated retirements (Column B). The schedule also provides a moving average analysis of the components of net salvage related to retirements. The ratio of gross salvage to retirements is shown in Column D and the ratio of cost of removal to retirements is shown in Column G.

SCHEDULE H – AVERAGE YEAR OF FINAL RETIREMENT

This schedule provides a computation of the weighted average year of final retirement for major structure categories. Direct dollar weighting is used to obtain a composite year of final retirement for plant investments classified in service at the beginning of the study year.

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant
Account: 365000 Overhead Conductors and Devices

Dispersion: 55 - R2
Procedure: Vintage Group

Generation Arrangement

Vintage	Age (December 31, 2001)	Surviving Plant	Avg. Life	Rem. Life	Net Plant Ratio	Alloc. Factor	Computed Net Plant	Accrual
A	B	C	D	E	F	G	H=C*F*G	I=H/E
2001	0.5	267,611	55.00	54.55	0.9918	1.0000	265,407	4,866
2000	1.5	889,165	55.00	53.65	0.9753	1.0000	867,227	16,166
1999	2.5	426,372	54.99	52.75	0.9593	1.0000	409,003	7,754
1998	3.5	704,846	55.01	51.85	0.9427	1.0000	664,435	12,813
1997	4.5	616,505	55.02	50.97	0.9263	1.0000	571,093	11,205
1996	5.5	577,373	55.02	50.08	0.9103	1.0000	525,570	10,494
1995	6.5	595,526	55.00	49.21	0.8947	1.0000	532,802	10,828
1994	7.5	526,959	55.05	48.33	0.8780	1.0000	462,673	9,573
1993	8.5	515,089	55.07	47.46	0.8619	1.0000	443,941	9,353
1992	9.5	695,436	55.09	46.60	0.8460	1.0000	588,322	12,624
1991	10.5	632,766	55.11	45.75	0.8301	1.0000	525,286	11,483
1990	11.5	1,509,260	55.12	44.90	0.8145	1.0000	1,229,307	27,382
1989	12.5	794,278	55.16	44.05	0.7985	1.0000	634,254	14,398
1988	13.5	445,113	55.03	43.21	0.7853	1.0000	349,531	8,089
1987	14.5	514,616	54.84	42.38	0.7728	1.0000	397,676	9,384
1986	15.5	542,376	54.88	41.55	0.7571	1.0000	410,643	9,883
1985	16.5	541,305	54.86	40.73	0.7425	1.0000	401,902	9,867
1984	17.5	326,116	54.66	39.92	0.7302	1.0000	238,129	5,966
1983	18.5	384,369	54.29	39.11	0.7203	1.0000	276,867	7,080
1982	19.5	479,912	54.33	38.31	0.7051	1.0000	338,394	8,834
1981	20.5	532,920	54.86	37.51	0.6838	1.0000	364,423	9,715
1980	21.5	311,792	53.68	36.72	0.6841	1.0000	213,311	5,808
1979	22.5	326,440	52.85	35.94	0.6801	1.0000	222,016	6,177
1978	23.5	227,918	52.40	35.17	0.6712	1.0000	152,970	4,349
1977	24.5	510,266	54.46	34.40	0.6318	1.0000	322,365	9,370
1976	25.5	417,002	55.07	33.65	0.6109	1.0000	254,751	7,572
1975	26.5	344,473	53.81	32.89	0.6113	1.0000	210,566	6,401
1974	27.5	289,911	53.80	32.15	0.5976	1.0000	173,250	5,389
1973	28.5	234,953	55.11	31.41	0.5701	1.0000	133,937	4,264
1972	29.5	165,783	54.51	30.68	0.5629	1.0000	93,320	3,041
1971	30.5	290,166	54.62	29.96	0.5486	1.0000	159,173	5,312
1970	31.5	438,823	56.24	29.25	0.5201	1.0000	228,254	7,803
1969	32.5	202,976	55.44	28.55	0.5150	1.0000	104,527	3,661
1968	33.5	190,794	55.70	27.85	0.5000	1.0000	95,405	3,425
1967	34.5	128,538	56.18	27.17	0.4836	1.0000	62,160	2,288
1966	35.5	227,755	56.51	26.49	0.4688	1.0000	106,764	4,031
1965	36.5	289,299	56.76	25.82	0.4549	1.0000	131,604	5,097
1964	37.5	138,028	56.33	25.16	0.4467	1.0000	61,653	2,451

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant
Account: 365000 Overhead Conductors and Devices

Dispersion: 55 - R2
Procedure: Vintage Group

Generation Arrangement

Vintage	December 31, 2001 Age	Surviving Plant	Avg. Life	Rem. Life	Net Plant Ratio	Alloc. Factor	Computed Net Plant	Accrual
A	B	C	D	E	F	G	H=C*F*G	I=H/E
1963	38.5	123,964	57.04	24.51	0.4297	1.0000	53,264	2,173
1962	39.5	139,611	56.19	23.87	0.4248	1.0000	59,301	2,485
1961	40.5	99,603	56.52	23.24	0.4111	1.0000	40,945	1,762
1960	41.5	119,526	56.90	22.61	0.3974	1.0000	47,497	2,100
1959	42.5	125,118	57.32	22.00	0.3838	1.0000	48,021	2,183
1958	43.5	126,451	55.94	21.40	0.3825	1.0000	48,364	2,260
1957	44.5	140,743	56.76	20.80	0.3665	1.0000	51,587	2,480
1956	45.5	95,898	56.19	20.22	0.3599	1.0000	34,513	1,707
1955	46.5	108,475	55.26	19.65	0.3556	1.0000	38,575	1,963
1954	47.5	61,502	58.78	19.09	0.3248	1.0000	19,974	1,046
1953	48.5	57,927	58.55	18.54	0.3166	1.0000	18,342	989
1952	49.5	56,446	58.39	18.00	0.3082	1.0000	17,398	967
1951	50.5	46,703	60.33	17.47	0.2895	1.0000	13,522	774
1950	51.5	63,529	60.45	16.95	0.2804	1.0000	17,812	1,051
1949	52.5	94,977	60.68	16.44	0.2710	1.0000	25,735	1,565
1948	53.5	117,321	61.99	15.94	0.2572	1.0000	30,177	1,893
1947	54.5	58,355	60.29	15.46	0.2564	1.0000	14,961	968
1946	55.5	22,392	59.63	14.98	0.2512	1.0000	5,626	375
1945	56.5	9,779	60.07	14.52	0.2417	1.0000	2,363	163
1944	57.5	11,217	59.98	14.06	0.2345	1.0000	2,630	187
1943	58.5	5,475	56.37	13.62	0.2416	1.0000	1,323	97
1942	59.5	10,998	61.41	13.19	0.2147	1.0000	2,362	179
1941	60.5	14,345	65.88	12.77	0.1938	1.0000	2,780	218
1940	61.5	13,321	66.44	12.35	0.1859	1.0000	2,477	200
1939	62.5	14,998	67.21	11.95	0.1778	1.0000	2,667	223
1938	63.5	7,258	67.03	11.56	0.1724	1.0000	1,252	108
1937	64.5	130,350	67.43	11.18	0.1658	1.0000	21,606	1,933
1936	65.5	13,010	69.06	10.80	0.1564	1.0000	2,035	188
1935	66.5	1,292	67.89	10.44	0.1538	1.0000	199	19
1934	67.5	493	65.95	10.08	0.1529	1.0000	75	7
1933	68.5	1,558	70.71	9.74	0.1377	1.0000	215	22
1932	69.5	8,531	71.81	9.40	0.1308	1.0000	1,116	119
1931	70.5	3,463	67.97	9.06	0.1333	1.0000	462	51
1930	71.5	15,175	68.21	8.74	0.1281	1.0000	1,944	222
1929	72.5	25,520	68.81	8.42	0.1223	1.0000	3,122	371
1928	73.5	28,732	64.73	8.10	0.1252	1.0000	3,597	444
Total	18.7	$19,226,885	55.30	39.87	0.7209	1.0000	$13,860,748	$347,690

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Age Distribution

Vintage	Age as of 12/31/2001	Derived Additions	1980 Opening Balance	Experience to 12/31/2001		
				Amount Surviving	Proportion Surviving	Realized Life
A	B	C	D	E	F=E/(C+D)	G
2001	0.5	267,611		267,611	1.0000	0.5000
2000	1.5	889,223		889,165	0.9999	1.5000
1999	2.5	431,603		426,372	0.9879	2.4818
1998	3.5	705,857		704,846	0.9986	3.4971
1997	4.5	616,558		616,505	0.9999	4.5000
1996	5.5	579,151		577,373	0.9969	5.4904
1995	6.5	604,090		595,526	0.9858	6.4566
1994	7.5	528,355		526,959	0.9974	7.4918
1993	8.5	515,416		515,089	0.9994	8.4983
1992	9.5	697,766		695,436	0.9967	9.4940
1991	10.5	636,118		632,766	0.9947	10.4896
1990	11.5	1,526,177		1,509,260	0.9889	11.4761
1989	12.5	796,409		794,278	0.9973	12.4916
1988	13.5	474,245		445,113	0.9386	13.3217
1987	14.5	574,266		514,616	0.8961	14.0971
1986	15.5	596,994		542,376	0.9085	15.0974
1985	16.5	612,607		541,305	0.8836	16.0301
1984	17.5	367,293		326,116	0.8879	16.7882
1983	18.5	460,065		384,369	0.8355	17.3632
1982	19.5	550,766		479,912	0.8714	18.3390
1981	20.5	574,016		532,920	0.9284	19.8059
1980	21.5	362,872		311,792	0.8592	19.5600
1979	22.5		414,203	326,440	0.7881	19.6566
1978	23.5		290,616	227,918	0.7843	20.1299
1977	24.5		561,088	510,266	0.9094	23.0995
1976	25.5		446,998	417,002	0.9329	24.6238
1975	26.5		480,367	344,473	0.7171	24.2636
1974	27.5		344,147	289,911	0.8424	25.1443
1973	28.5		258,510	234,953	0.9089	27.3396
1972	29.5		191,743	165,783	0.8646	27.6265
1971	30.5		333,458	290,166	0.8702	28.6111
1970	31.5		455,149	438,823	0.9641	31.0889
1969	32.5		224,005	202,976	0.9061	31.1425
1968	33.5		209,873	190,794	0.9091	32.2535
1967	34.5		138,675	128,538	0.9269	33.5658
1966	35.5		241,918	227,755	0.9415	34.7234
1965	36.5		304,230	289,299	0.9509	35.7915
1964	37.5		153,831	138,028	0.8973	36.1666

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Age Distribution

Vintage	Age as of 12/31/2001	Derived Additions	1980 Opening Balance	Experience to 12/31/2001 Amount Surviving	Proportion Surviving	Realized Life
A	B	C	D	E	F=E/(C+D)	G
1963	38.5		137,878	123,964	0.8991	37.6742
1962	39.5		182,932	139,611	0.7632	37.6095
1961	40.5		123,025	99,603	0.8096	38.7144
1960	41.5		143,449	119,526	0.8332	39.8576
1959	42.5		147,526	125,118	0.8481	41.0218
1958	43.5		166,803	126,451	0.7581	40.3789
1957	44.5		177,630	140,743	0.7923	41.9153
1956	45.5		140,311	95,898	0.6835	42.0513
1955	46.5		199,923	108,475	0.5426	41.8119
1954	47.5		82,038	61,502	0.7497	46.0080
1953	48.5		86,862	57,927	0.6669	46.4371
1952	49.5		85,191	56,446	0.6626	46.9242
1951	50.5		54,526	46,703	0.8565	49.4967
1950	51.5		69,442	63,529	0.9149	50.2288
1949	52.5		105,632	94,977	0.8991	51.0480
1948	53.5		123,231	117,321	0.9520	52.9330
1947	54.5		78,072	58,355	0.7475	51.7974
1946	55.5		30,982	22,392	0.7227	51.6782
1945	56.5		14,579	9,779	0.6708	52.6412
1944	57.5		16,058	11,217	0.6985	53.0499
1943	58.5		11,376	5,475	0.4813	49.9269
1942	59.5		13,743	10,998	0.8003	55.4314
1941	60.5		15,058	14,345	0.9526	60.3401
1940	61.5		13,502	13,321	0.9866	61.3243
1939	62.5		15,019	14,998	0.9986	62.4950
1938	63.5		7,818	7,258	0.9284	62.7058
1937	64.5		139,916	130,350	0.9316	63.4689
1936	65.5		13,134	13,010	0.9906	65.4411
1935	66.5		1,538	1,292	0.8403	64.5995
1934	67.5		709	493	0.6957	62.9676
1933	68.5		1,695	1,558	0.9196	68.0084
1932	69.5		8,604	8,531	0.9916	69.3825
1931	70.5		9,062	3,463	0.3821	65.7898
1930	71.5		24,779	15,175	0.6124	66.2561
1929	72.5		35,904	25,520	0.7108	67.0767
1928	73.5		89,040	28,732	0.3227	63.1937
1922	79.5		213		0.0000	63.0000
1913	88.5		224		0.0000	68.1250

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Age Distribution

Vintage	Age as of 12/31/2001	Derived Additions	1980 Opening Balance	Experience to 12/31/2001 Amount Surviving	Proportion Surviving	Realized Life
A	B	C	D	E	F=E/(C+D)	G
1910	91.5		34		0.0000	71.0000
Total		$13,367,460	$7,616,268	$19,226,885	0.9163	

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Unadjusted Plant History

Year	Beginning Balance	Additions	Retirements	Sales, Transfers & Adjustments	Ending Balance
A	B	C	D	E	F=B+C-D+E
1980	6,458,141	363,030	69,101		6,752,070
1981	6,752,070	589,402	49,730		7,291,742
1982	7,291,742	571,281	76,653		7,786,370
1983	7,786,370	543,797	73,303		8,256,864
1984	8,256,864	393,329	37,858		8,612,335
1985	8,612,335	732,358	125,049		9,219,644
1986	9,219,644	630,757	94,166		9,756,235
1987	9,756,235	547,012	104,256		10,198,991
1988	10,198,991	426,456	46,914		10,578,533
1989	10,578,533	749,195	74,772		11,252,956
1990	11,252,956	773,356	59,596		11,966,716
1991	11,966,716	562,808	54,398		12,475,126
1992	12,475,126	664,640	87,009		13,052,757
1993	13,052,757	398,079	65,571		13,385,265
1994	13,385,265	493,109	71,984		13,806,390
1995	13,806,390	437,194	52,733		14,190,851
1996	14,190,851	551,653	109,279		14,633,225
1997	14,633,225	4,168,440	93,006		18,708,659
1998	18,708,659	874,555	64,844		19,518,370
1999	19,518,370	441,364	95,929		19,863,805
2000	19,863,805	867,031	204,668		20,526,168
2001	20,526,168	306,076	46,023	(1,559,335)	19,226,885

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Adjusted Plant History

Year	Beginning Balance	Additions	Retirements	Sales, Transfers & Adjustments	Ending Balance
A	B	C	D	E	F=B+C-D+E
1980	7,699,576	371,362	69,101		8,001,837
1981	8,001,837	637,402	49,730		8,589,509
1982	8,589,509	599,964	76,653		9,112,820
1983	9,112,820	575,285	73,303		9,614,802
1984	9,614,802	473,628	37,858		10,050,572
1985	10,050,572	904,954	125,049		10,830,477
1986	10,830,477	745,251	94,166		11,481,562
1987	11,481,562	748,391	104,256		12,125,697
1988	12,125,697	521,741	46,914		12,600,524
1989	12,600,524	910,967	74,772		13,436,719
1990	13,436,719	1,531,697	59,596		14,908,820
1991	14,908,820	658,851	54,398		15,513,273
1992	15,513,273	712,318	87,009		16,138,582
1993	16,138,582	550,206	65,571		16,623,217
1994	16,623,217	547,608	71,984		17,098,841
1995	17,098,841	626,805	52,733		17,672,913
1996	17,672,913	609,983	109,279		18,173,617
1997	18,173,617	645,518	93,006		18,726,129
1998	18,726,129	857,085	64,844		19,518,370
1999	19,518,370	441,364	95,929		19,863,805
2000	19,863,805	905,496	204,668		20,564,633
2001	20,564,633	267,611	46,023	(1,559,335)	19,226,885

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

T-Cut: None

Placement Band: 1910-2001

Hazard Function: Proportion Retired

Weighting: Exposures

Rolling Band Life Analysis

Observation Band	Censoring	First Degree			Second Degree			Third Degree		
		Average Life	Dispersion	Conf. Index	Average Life	Dispersion	Conf. Index	Average Life	Dispersion	Conf. Index
A	B	C	D	E	F	G	H	I	J	K
1980-1984	0.3	64.6	L0.5	0.42	52.0	R1.5	1.16	50.4	R2	3.08
1981-1985	0.0	59.0	L0.5	0.40	50.3	R1.5	0.90	48.6	R2	4.00
1982-1986	0.0	58.3	L0.5	0.43	50.7	R1	1.04	48.4	R1.5	4.44
1983-1987	0.0	58.0	L0.5	0.38	52.8	S0	1.15	48.9	R1.5 *	4.17
1984-1988	0.0	60.6	L0.5	0.53	55.3	S0	1.10	50.5	R1.5 *	4.63
1985-1989	0.0	61.5	L0.5	0.40	57.7	L1	1.42	51.1	R1.5 *	4.20
1986-1990	51.0	69.2	L0.5	0.43	74.5	L0	1.64	56.4	R1.5 *	3.34
1987-1991	58.9	74.0	L0.5	0.80	102.4	O3 *	8.35	61.4	R1.5 *	2.40
1988-1992	64.7	81.0	L0.5	0.57	127.1	SC *	13.19	67.3	R1.5	2.24
1989-1993	70.3	88.4	L0.5	0.96	148.9	SC *	16.43	82.8	R1	3.95
1990-1994	69.5	88.2	L0.5	0.61	148.8	SC *	16.22	96.3	R1	4.96
1991-1995	71.0	93.8	L0.5	0.91	152.1	SC *	16.54	85.4	R1	3.89
1992-1996	68.2	90.2	L0.5	0.99	145.9	SC *	15.65	81.5	R1	3.03
1993-1997	68.5	91.9	L0.5	1.06	143.4	SC *	14.94	80.5	R1	2.58
1994-1998	63.3	88.1	L0.5	0.61	113.5	SC *	9.36	81.0	R1	0.95
1995-1999	60.9	91.6	L0.5	0.86	103.3	L0	3.88	73.2	R1.5	2.00
1996-2000	45.9	74.3	L0.5	0.48	78.8	L0	1.46	65.8	R1	0.93
1997-2001	49.1	77.0	L1	0.93	76.2	L1	0.75	70.6	S0	0.88

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

T-Cut: None

Placement Band: 1910-2001

Hazard Function: Proportion Retired

Weighting: Exposures

Shrinking Band Life Analysis

		First Degree			Second Degree			Third Degree		
Observation Band	Censoring	Average Life	Dispersion	Conf. Index	Average Life	Dispersion	Conf. Index	Average Life	Dispersion	Conf. Index
A	B	C	D	E	F	G	H	I	J	K
1980-2001	45.2	75.3	L0.5	0.42	74.2	L0.5	0.76	64.7	R1	1.16
1982-2001	46.1	75.8	L0.5	0.45	78.3	L0.5	0.88	65.0	R1	1.51
1984-2001	48.2	77.2	L0.5	0.48	90.8	O2 *	4.03	66.3	R1	1.87
1986-2001	50.5	78.9	L0.5	0.53	101.6	O3 *	7.44	68.5	R1	1.62
1988-2001	53.1	81.4	L0.5	0.67	103.6	O3 *	7.71	71.4	R1	1.35
1990-2001	54.4	81.8	L0.5	0.67	111.3	O3 *	10.34	73.9	R1	0.83
1992-2001	54.3	81.6	L0.5	0.59	102.3	O2 *	7.30	72.8	R1	0.79
1994-2001	53.6	80.0	L0.5	0.86	88.6	L0	2.32	73.0	R1	0.82
1996-2001	50.2	76.9	L0.5	0.91	78.9	L0.5	0.61	71.2	S0	0.57
1998-2001	47.8	74.9	L1	0.59	73.5	L1	0.69	69.7	S0	0.88
2000-2001	38.2	65.9	L1 *	0.71	68.3	L1 *	1.19	92.9	O3 *	8.43

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

T-Cut: None

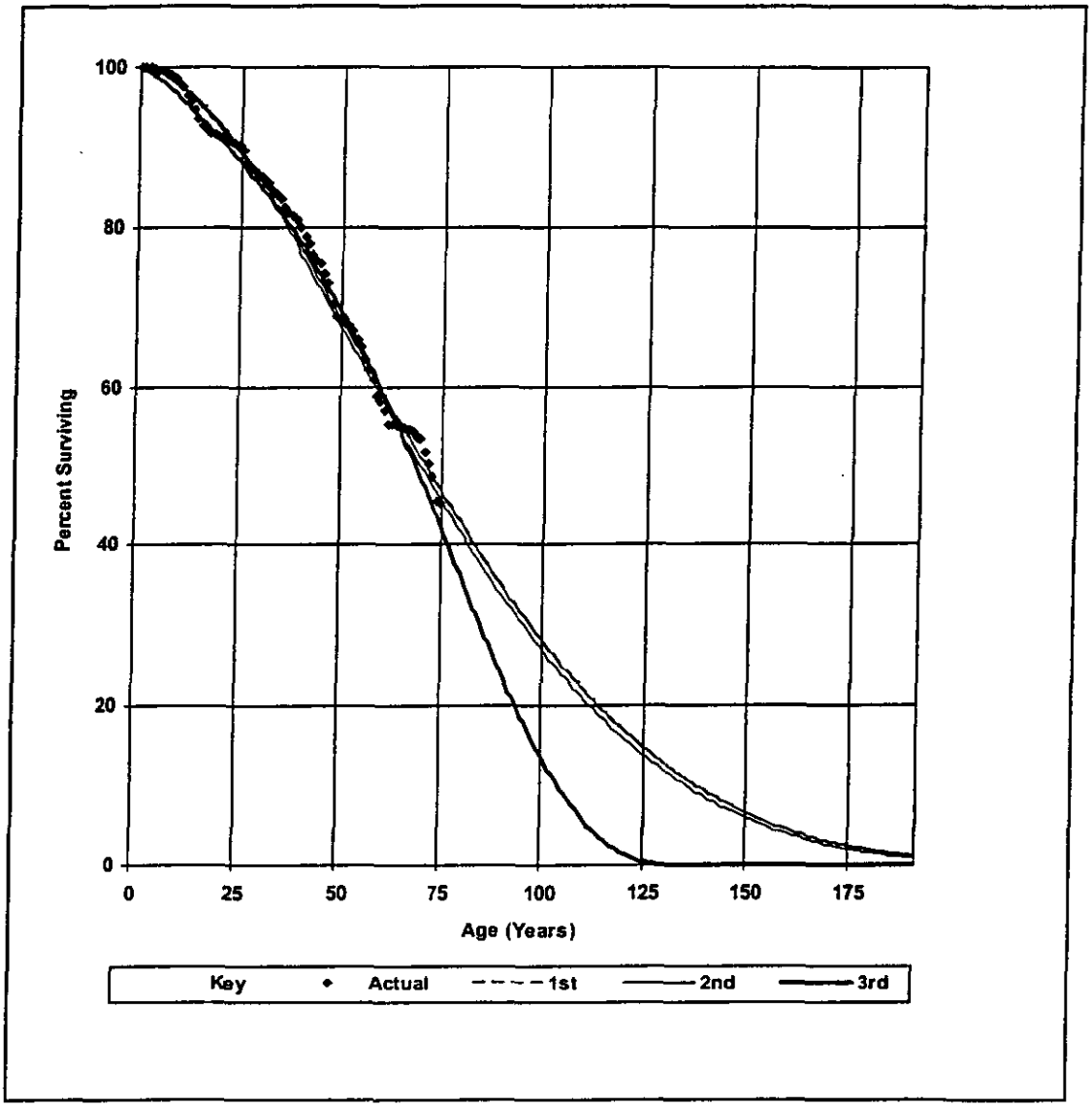
Placement Band: 1910-2001 Observation Band: 1980-2001

Hazard Function: Proportion Retired

Weighting: Exposures

Graphics Analysis

1st: 75.3-L0.5 2nd: 74.2-L0.5 3rd: 64.7-R1



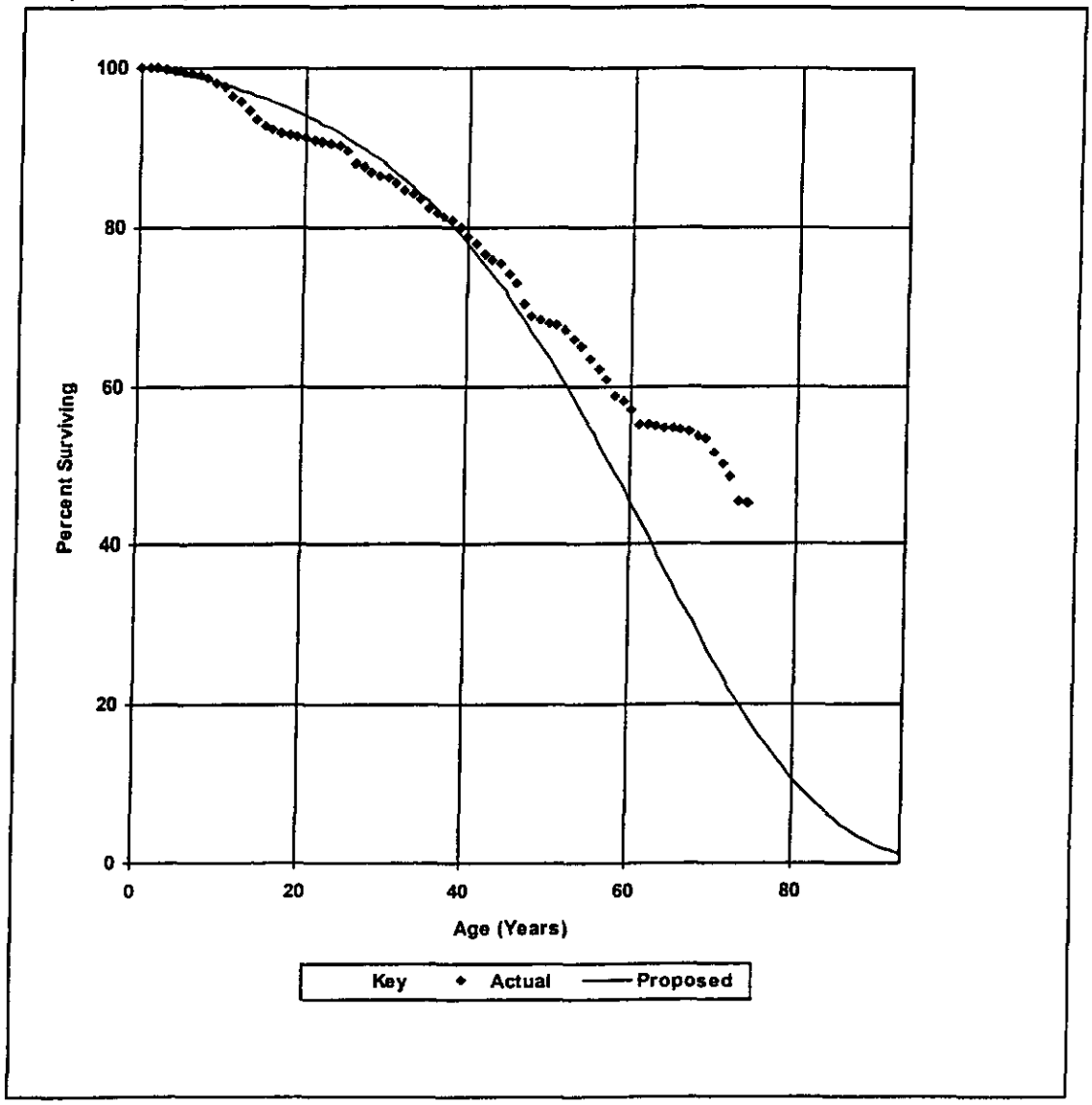
AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

T-Cut: 75
Placement Band: 1910-2001
Observation Band: 1980-2001
55.0-R2

Proposed Projection Life Curve



AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Unadjusted Net Salvage History

		Gross Salvage			Cost of Retiring			Net Salvage		
Year	Retirements	Amount	Pct.	5-Yr Avg.	Amount	Pct.	5-Yr Avg.	Amount	Pct.	5-Yr Avg.
A	B	C	D=C/B	E	F	G=F/B	H	I=C-F	J=I/B	K
1980	69,101	88,306	127.8		48,838	70.7		39,468	57.1	
1981	49,730	59,785	120.2		69,332	139.4		(9,547)	-19.2	
1982	76,653	48,006	62.6		84,365	110.1		(36,359)	-47.4	
1983	73,303	84,891	115.8		67,419	92.0		17,472	23.8	
1984	37,858	142,291	375.9	138.0	54,116	142.9	105.7	88,175	232.9	32.4
1985	125,049	154,899	123.9	135.1	76,650	61.3	97.0	78,249	62.6	38.1
1986	94,166	146,649	155.7	141.7	72,446	76.9	87.2	74,203	78.8	54.5
1987	104,256	141,081	135.3	154.1	117,917	113.1	89.4	23,164	22.2	64.7
1988	46,914	85,476	182.2	164.2	78,689	167.7	97.9	6,787	14.5	66.3
1989	74,772	117,622	157.3	145.1	90,614	121.2	98.0	27,008	36.1	47.0
1990	59,596	119,739	200.9	160.8	97,116	163.0	120.3	22,623	38.0	40.5
1991	54,398	61,279	112.6	154.5	95,555	175.7	141.2	(34,276)	-63.0	13.3
1992	87,009	61,500	70.7	138.1	100,005	114.9	143.2	(38,505)	-44.3	-5.1
1993	65,571	48,644	74.2	119.8	79,460	121.2	135.6	(30,816)	-47.0	-15.8
1994	71,984	43,614	60.6	98.9	81,398	113.1	134.0	(37,784)	-52.5	-35.1
1995	52,733	41,278	78.3	77.3	68,598	130.1	128.1	(27,320)	-51.8	-50.9
1996	109,279	64,455	59.0	67.1	96,449	88.3	110.2	(31,994)	-29.3	-43.0
1997	93,006	52,437	56.4	63.8	75,156	80.8	102.2	(22,719)	-24.4	-38.4
1998	64,844	35,489	54.7	60.6	85,511	131.9	103.9	(50,022)	-77.1	-43.3
1999	95,929	22,557	23.5	52.0	72,079	75.1	95.7	(49,522)	-51.6	-43.7
2000	204,668	24,231	11.8	35.1	101,995	49.8	76.0	(77,764)	-38.0	-40.9
2001	46,023	865	1.9	26.9	20,193	43.9	70.4	(19,328)	-42.0	-43.5
Total	1,756,842	1,645,094	93.6		1,733,901	98.7		(88,807)	-5.1	

AQUILA NETWORKS - SJLP (ELECTRIC and COMMON)

Distribution Plant

Account: 365000 Overhead Conductors and Devices

Adjusted Net Salvage History

		Gross Salvage			Cost of Retiring			Net Salvage		
Year	Retirements	Amount	Pct.	5-Yr Avg.	Amount	Pct.	5-Yr Avg.	Amount	Pct.	5-Yr Avg.
A	B	C	D=C/B	E	F	G=F/B	H	I=C-F	J=I/B	K
1980	69,101	88,306	127.8		48,838	70.7		39,468	57.1	
1981	49,730	59,785	120.2		69,332	139.4		(9,547)	-19.2	
1982	76,653	48,006	62.6		84,365	110.1		(36,359)	-47.4	
1983	73,303	84,891	115.8		67,419	92.0		17,472	23.8	
1984	37,858	142,291	375.9	138.0	54,116	142.9	105.7	88,175	232.9	32.4
1985	125,049	154,899	123.9	135.1	76,650	61.3	97.0	78,249	62.6	38.1
1986	94,166	146,649	155.7	141.7	72,446	76.9	87.2	74,203	78.8	54.5
1987	104,256	141,081	135.3	154.1	117,917	113.1	89.4	23,164	22.2	64.7
1988	46,914	85,476	182.2	164.2	78,689	167.7	97.9	6,787	14.5	66.3
1989	74,772	117,622	157.3	145.1	90,614	121.2	98.0	27,008	36.1	47.0
1990	59,596	119,739	200.9	160.8	97,116	163.0	120.3	22,623	38.0	40.5
1991	54,398	61,279	112.6	154.5	95,555	175.7	141.2	(34,276)	-63.0	13.3
1992	87,009	61,500	70.7	138.1	100,005	114.9	143.2	(38,505)	-44.3	-5.1
1993	65,571	48,644	74.2	119.8	79,460	121.2	135.6	(30,816)	-47.0	-15.8
1994	71,984	43,614	60.6	98.9	81,398	113.1	134.0	(37,784)	-52.5	-35.1
1995	52,733	41,278	78.3	77.3	68,598	130.1	128.1	(27,320)	-51.8	-50.9
1996	109,279	64,455	59.0	67.1	96,449	88.3	110.2	(31,994)	-29.3	-43.0
1997	93,006	52,437	56.4	63.8	75,156	80.8	102.2	(22,719)	-24.4	-38.4
1998	64,844	35,489	54.7	60.6	85,511	131.9	103.9	(50,022)	-77.1	-43.3
1999	95,929	22,557	23.5	52.0	72,079	75.1	95.7	(49,522)	-51.6	-43.7
2000	204,668	24,231	11.8	35.1	101,995	49.8	76.0	(77,764)	-38.0	-40.9
2001	46,023	865	1.9	26.9	20,193	43.9	70.4	(19,328)	-42.0	-43.5
Total	1,756,842	1,645,094	93.6		1,733,901	98.7		(88,807)	-5.1	

Schedule REW–3

2003 Depreciation Rate Study

Aquila Corporate Assets
(Missouri Operations)

Prepared by
Foster Associates, Inc.

FOSTER ASSOCIATES INCORPORATED
ECONOMIC CONSULTANTS

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INTRODUCTION

This report presents the findings and recommendations developed in a 2003 Depreciation Rate Study for Aquila Corporate Assets (Corporate). The 2003 study provides depreciation rates and annualized depreciation accruals for calendar year 2003, based on forecasted December 31, 2002 investments and depreciation reserves. The forecast period (*i.e.*, calendar year 2002) includes actual plant and reserve activity through September 30, 2002 and forecasted plant additions and depreciation accruals over the period October 1 through December 31, 2002. Work on the study, conducted by Foster Associates, Inc., commenced in August 2002 and progressed through mid-December 2002, at which time the project was completed.

Foster Associates, Inc. is a public utility economics consulting firm headquartered in Bethesda, Maryland offering economic research and consulting services on issues and problems arising from governmental regulation of business. Areas of specialization supported by our Fort Myers office include property life forecasting, technological forecasting, depreciation estimation, and valuation of industrial property.

Foster Associates has undertaken numerous depreciation engagements for both public and privately owned corporations including detailed statistical life studies, analyses of required net salvage rates, and the selection of depreciation systems that will most nearly achieve the goals of depreciation accounting under the constraints of either government regulation or competitive market pricing. Foster Associates is widely recognized for industry leadership in the development of depreciation systems, life analysis techniques and computer software for conducting depreciation and valuation studies.

Depreciation rates currently used for Corporate Assets allocated to jurisdictions other than Missouri were approved by the Missouri Public Service Commission (Commission) in Case No. ER-97-394 (Order dated August 14, 1998). The approved rates were developed for Aquila – MPS (formerly Missouri Public Service) electric and common operations. Recognizing that a significant portion of Corporate Assets property is located in the state of Missouri and the Missouri order represented the most recent Commission review of parameters for general plant assets, Aquila elected to adopt the MPS depreciation rates for all Corporate Assets. Service life and net salvage statistics (*e.g.*, projection life, projection curve, remaining life and future net salvage rates) used to derive the approved MPS depreciation rates were not identified in either the Order or other documents related to the case.

Depreciation rates currently used for Corporate Assets allocated to Missouri were approved by the Missouri Public Service Commission pursuant to a Stipulation and Agreement in consolidated Case Nos. ER-2001-672 and EC-2002-265

(Agreement dated February 5, 2002). The approved General Common Plant rates were developed for Aquila Networks – MPS electric and common operations and adopted by Aquila for Corporate Assets allocated to Missouri. Depreciable rate categories for Corporate Assets in which no corresponding depreciation rate was approved for General Common Plant have been assigned a zero percent rate. Average service lives used to derive the settled General Common Plant depreciation rates were included in an appendix attached to the Stipulation and Agreement.

Depreciation reserves allocated to Missouri are adjusted for differences in the accrual rates prescribed in Missouri and those currently used for all other jurisdictions and non-regulated business units. The reserve adjustment is the cumulative difference in accruals resulting from the application of unique depreciation rates in Missouri. Reserve adjustments are shown on Statement C of this report.

The principal findings and recommendations of the Corporate Assets Depreciation Rate Study for Missouri are summarized in the Statements section of this report. Statement A provides a comparative summary of present and proposed annual depreciation rates for each rate category. Statement B provides a comparison of present and proposed annual depreciation accruals. Statement C provides a comparison of the computed, recorded and redistributed depreciation reserves for each rate category. Statement D provides a summary of the components used to obtain a weighted-average net salvage rate for each account. Statement E provides a comparative summary of present and proposed parameters and statistics including projection life, projection curve, average service life, average remaining life, and average and future net salvage rates. Statement F provides plant and reserve allocation factors and the derivation of plant and reserves allocated to Missouri operations. A set of statements is included in this report for a) Corporate Assets allocated to MPS operations; and b) Corporate Assets allocated to SJLP operations.

SCOPE OF STUDY

The principal activities undertaken in the course of the current study included:

- Collection of plant data;
- Reconciliation of data to the official records of the Company;
- Discussions with Corporate plant accounting personnel;
- Estimation of projection lives and retirement dispersion patterns;
- Analysis of gross salvage and removal expense;
- Analysis and redistribution of recorded depreciation reserves; and
- Development of recommended accrual rates for each rate category.

DEPRECIATION SYSTEM

A depreciation rate is formed by combining the elements of a depreciation system. A depreciation system is composed of a method, a procedure and a technique. A depreciation method (*e.g.*, straight-line) describes the component of the system that determines the acceleration or deceleration of depreciation accruals in relation to either time or use. A depreciation procedure (*e.g.*, vintage group) identifies the level of grouping or sub-grouping of assets within a plant category. The level of grouping specifies the weighting used to obtain composite life statistics for an account. A depreciation technique (*e.g.*, remaining-life) describes the life statistic used in the system.

The depreciation system presently used for Corporate Assets is composed of the straight-line method, broad group procedure, whole-life technique for all plant categories. The rates proposed in this study are derived from a system composed of the straight-line method, vintage group procedure, whole-life technique with amortization of reserve imbalances over the estimated remaining life of each rate category. This formulation of the accrual rate is equivalent to a straight-line method, vintage group procedure, remaining-life technique.

The matching and expense recognition principles of accounting provide that the cost of an asset (or group of assets) should be allocated to operations over an estimate of the economic life of the asset in proportion to the consumption of service potential. It is the opinion of Foster Associates that the objectives of depreciation accounting can be more nearly achieved using the vintage-group procedure combined with the remaining-life technique. Unlike the broad group procedure in which each vintage is estimated to have the same average service life, the vintage group procedure distinguishes average service lives among vintages and provides cost apportionment over the estimated weighted-average remaining life or average life of a rate category.

The level of asset grouping identified in the broad group procedure is the total plant in service from all vintages in an account. Each vintage is estimated to have the same average service life. It is highly unlikely, therefore, that compensating deviations (*i.e.*, over and underestimates of average service life) will be created among vintages to achieve cost allocation over the average service life of each vintage. The level of asset grouping identified in the vintage group procedure is the plant in service from each vintage. The average service life (or remaining life) is estimated independently for each vintage and composite life statistics are computed for each plant account. It is more likely, therefore, that compensating deviations will be created with a vintage group procedure than with a broad group procedure.

The dependency of both the broad group procedure and the vintage group procedure on compensating deviations in the estimate of service lives is attribut-

able to the use of the whole-life technique. A permanent excess or deficiency will be created in the depreciation reserve by a continued application of the whole-life technique if these deviations are not exactly offsetting. The potential for a permanent reserve imbalance can be eliminated, however, by an application of the remaining-life technique.

The principal distinction between a whole-life rate and a remaining-life rate is the treatment of depreciation reserve imbalances. A reserve imbalance is the difference between a theoretical or computed reserve and the corresponding recorded reserve for a rate category. The remaining-life technique provides a systematic amortization of these differences over the composite weighted average remaining life of a rate category.

Although the emergence of economic factors such as bypass and incentive forms of regulation may ultimately encourage abandonment of the straight-line method, no attempt was made in the current study to address these concerns.

PROPOSED DEPRECIATION RATES

Table 1 provides a summary of the changes in annual depreciation rates and accruals applicable to Corporate Assets devoted to MPS operations.

Rates and Accruals

Function	Accrual Rate			2003 Annualized Accrual		
	Present	Proposed	Difference	Present	Proposed	Difference
General Plant	1.39%	11.86%	10.47%	$732,797	$6,256,676	$5,523,879

TABLE 1. CORPORATE ASSETS – MPS RATES AND ACCRUALS

The composite accrual rate recommended for MPS operations is 11.86 percent. The current equivalent rate is 1.39 percent. The recommended change in the composite rate is an increase of 10.47 percentage points.

A continued application of rates currently adopted for MPS would provide annualized depreciation expense of $732,797 compared to an annualized expense of $6,256,676 using the rates developed in this study. The proposed expense increase is $5,523,879. Of this increase, $1,985,795 represents amortization of a $12,229,229 reserve imbalance. The remaining portion of the increase is attributable to recommended changes in service life parameters.

Of the 10 primary accounts included in the 2003 study, a rate reduction is recommended for one account and rate increases for nine accounts.

Table 2 provides a summary of the changes in annual depreciation rates and accruals applicable to Corporate Assets devoted to SJLP operations.

Function	Accrual Rate			2003 Annualized Accrual		
	Present	Proposed	Difference	Present	Proposed	Difference
General Plant	1.41%	11.97%	10.56%	$241,203	$2,046,124	$1,804,921

TABLE 2. CORPORATE ASSETS – SJLP RATES AND ACCRUALS

The composite accrual rate recommended for SJLP operations is 11.97 percent. The current equivalent rate is 1.41 percent. The recommended change in the composite rate is an increase of 10.56 percentage points.

A continued application of rates currently adopted for SJLP would provide annualized depreciation expense of $241,203 compared to an annualized expense of $2,046,124 using the rates developed in this study. The proposed expense increase is $1,804,921. Of this increase, $663,511 represents amortization of a $4,020,601 reserve imbalance. The remaining portion of the increase is attributable to recommended changes in service life parameters.

Of the 10 primary accounts included in the 2003 study, a rate reduction is recommended for one account and rate increases for nine accounts.

COMPANY PROFILE

GENERAL

Aquila began as Green Light and Power Company in 1917. In 1922 the name was changed to West Missouri Power Company and in 1927 was merged with Missouri Public Service Company, adopting the Missouri Public Service Company name. Over the ensuing years, the Company continued to grow and acquire other utilities. In 1985, the Company name was changed to UtiliCorp United to better describe the numerous areas of the country being served by the Company. In 2002, the Company changed its name to Aquila.

Based in Kansas City, Missouri, Aquila operates electric and natural gas distribution networks serving customers in seven states, Canada, the United Kingdom, and Australia. The Company also owns and operates power generation assets.

At June 30, 2002, Aquila had total assets of $11.9 billion. Aquila Corporate Assets included in this study are used to provide corporate support to the networks and power generation asset groups. Corporate Assets and associated costs are distributed to other business units based on annually adjusted allocation factors.

STUDY PROCEDURE

INTRODUCTION

The purpose of a depreciation study is to analyze the mortality characteristics, net salvage rates and adequacy of the depreciation accrual and recorded depreciation reserve for each rate category. This study provides the foundation and documentation for recommended changes in the depreciation accrual rates used for Aquila Corporate Assets – MPS and Aquila Corporate Assets - SJLP.

SCOPE

The steps involved in conducting a depreciation study can be grouped into five major tasks:

- Data Collection;
- Life Analysis and Estimation;
- Net Salvage Analysis;
- Depreciation Reserve Analysis; and
- Development of Accrual Rates.

The scope of the 2003 study of Corporate Assets included a consideration of each of these tasks as described below.

DATA COLLECTION

The minimum database required to conduct a statistical life study consists of a history of vintage year additions and unaged activity year retirements, transfers and adjustments. These data must be appropriately adjusted for transfers, sales and other plant activity that would otherwise bias the measured service life of normal retirements. The age distribution of surviving plant for unaged data can be estimated by distributing the plant in service at the beginning of the study year to prior vintages in proportion to the theoretical amount surviving from a projection or survivor curve identified in the life study. The statistical methods of life analysis used to examine unaged plant data are known as *semi-actuarial techniques*.

A far more extensive database is required to apply the statistical methods of life analysis known as *actuarial techniques*. Plant data used in an actuarial life study most often include the age distribution of surviving plant at the beginning of the study year and the vintage year, activity year, and dollar amounts associated with normal retirements, reimbursed retirements, sales, abnormal retirements, transfers, corrections, and extraordinary adjustments over a series of prior activity years. An actuarial database may include the age distribution of surviving plant at the beginning of the earliest activity year, rather than at the beginning of the study year. Plant additions, however, must be included in a database containing an opening age distribution to derive aged survivors at the beginning of the study year. All activity year transactions with vintage year identification are

coded and stored in a data file. The data are processed by a computer program and transaction summary reports are created in a format reconcilable to the Company's official plant records. The availability of such detailed information is dependent upon an accounting system that supports aged property records. The Continuing Property Record (CPR) system used by Aquila for Corporate Assets provides aged transactions for all plant accounts.

The database used in the 2003 study was compiled from the current CPR system installed by Aquila in October 1998. The database was provided to Foster Associates in an electronic format containing activity year transactions over the period 1999 through September 30, 2002. Forecasted plant additions and depreciation accruals were provided over the period October 1 through December 31, 2002.

Transaction codes are used to describe the nature of the detailed accounting activity extracted from the CPR. Transaction codes for plant additions, for example, are used to distinguish normal additions from acquisitions, purchases, reimbursements and adjustments. Similar transaction codes are used to distinguish normal retirements from sales, reimbursements, abnormal retirements and adjustments. Transaction codes are also assigned to transfers, capital leases and other accounting activity which should be considered in a depreciation study.

The database was initially constructed to provide a reverse calculation of the historical arrangement over the period 1998–2002 for each account. Age distributions of plant exposed to retirement at the beginning of each activity year were obtained by adding (or subtracting) transaction amounts to the coded age distribution of surviving plant at the end of 2002. Plant additions for each activity year and age distributions of surviving plant at the beginning of 1999 derived from these transactions were subsequently coded and added to the database. The age distribution of surviving plant at the end of 2002 was then removed from the database. This conversion of the database from a reverse construction to a forward construction of the historical arrangement was made to facilitate maintaining the database for future depreciation studies. Future activity-year transactions (including plant additions) can now be appended to the database without removing or adjusting prior coded transactions.

The accuracy and completeness of the assembled data base was verified by Foster Associates for activity years 1999 through September 30, 2002 by comparing the beginning plant balance, additions, retirements, transfers and adjustments, and the ending plant balance derived for each activity year to the official plant records of the Company. Forecasted plant and reserve activity could not be reconciled to any official plant records of the Company.

LIFE ANALYSIS AND ESTIMATION

Life analysis and life estimation are terms used to describe a two-step procedure for estimating the mortality characteristics of a plant category. The first step (*i.e.*, life analysis) is largely mechanical and primarily concerned with history. Statistical techniques are used in this step to obtain a mathematical description of the forces of retirement acting upon a plant category and an estimate of service life known as the *projection life* of the account. The mathematical expressions used to describe these life characteristics are known as *survival functions* or *survivor curves*.

The second step (*i.e.*, life estimation) is concerned with predicting the expected remaining life of property units still exposed to the forces of retirement. It is a process of blending the results of a life analysis with informed judgment (including expectations about the future) to obtain an appropriate projection life and curve. The amount of weight given to the life analysis will depend upon the extent to which past retirement experience is considered descriptive of the future.

The analytical methods used in a life analysis are broadly classified as actuarial and semi-actuarial techniques. Actuarial techniques can be applied to plant accounting records that reveal the age of a plant asset at the time of its retirement from service. Stated differently, each property unit must be identifiable by date of installation and age at retirement. Semi-actuarial techniques can be used to derive service life and dispersion estimates when age identification of retirements is not maintained or readily available.

An actuarial life analysis program designed and developed by Foster Associates was used in this study. The first step in an actuarial analysis involves a systematic treatment of the available data for the purpose of constructing an observed life table. A complete life table contains the life history of a group of property units installed during the same accounting period and various probability relationships derived from the data. A life table is arranged by age-intervals (usually defined as one year) and shows the number of units (or dollars) entering and leaving each age-interval and probability relationships associated with this activity. A life table minimally shows the age of each survivor and the age of each retirement from a group of units installed in a given accounting year.

A life table can be constructed in any one of at least five alternative methods. The annual-rate or retirement-rate method was used in this study. The mechanics of the annual-rate method require the calculation of a series of ratios obtained by dividing the number of units (or dollars) surviving at the beginning of an age interval into the number of units (or dollars) retired during the same interval. This ratio (or set of ratios) is commonly referred to as retirement ratios. The cumulative proportion surviving is obtained by multiplying the retirement ratio for each age interval by the proportion of the original group surviving at the beginning of

that age interval and subtracting this product from the proportion surviving at the beginning of the same interval. The annual-rate method is applied to multiple groups or vintages by combining the retirements and/or survivors of like ages for each vintage included in the analysis.

The second step in an actuarial analysis involves graduating or smoothing the observed life table and fitting the smoothed series to a family of survival functions. The functions used in this study are the Iowa-type curves which were mathematically derived from the Pearson frequency curve family. The observed life table was smoothed by a weighted least-squares procedure in which first, second and third degree polynomials were fitted to the observed retirement ratios. The resulting function can be expressed as a survivorship function which is numerically integrated to obtain an estimate of the average service life. The smoothed survivorship function is then fitted by a weighted least-squares procedure to the Iowa-curve family to obtain a mathematical description or classification of the dispersion characteristics of the data.

The set of computer programs used in this analysis provides multiple rolling-band and shrinking-band analyses of an account. Observation bands are defined for a "retirement era" which restricts the analysis to the retirement activity of all vintages represented by survivors at the beginning of a selected era. In a rolling-band analysis, a year of retirement experience is added to each successive retirement band and the earliest year from the preceding band is dropped. A shrinking-band analysis begins with the total retirement experience available and the earliest year from the preceding band is dropped for each successive band. Rolling and shrinking band analyses are used to detect the emergence of trends in the behavior of the dispersion and average service life.

Options available in the actuarial life analysis program developed by Foster Associates include the width and location of both placement and observation bands; the interval of years included in a selected rolling or shrinking band analysis; the estimator of the hazard rate (actuarial, conditional proportion retired, or maximum likelihood); the elements to include on the diagonal of a weight matrix (exposures, inverse of age, inverse of variance, or unweighted); and the age at which an observed life table is truncated. The program also provides tabular and graphics output as an aid in the analysis and optionally produces data output files used in the calculation of depreciation accruals.

While actuarial and semi-actuarial statistical methods are well suited to an analysis of plant categories containing a large number of homogeneous units (*e.g.*, mains and services), the concept of retirement dispersion is inappropriate for plant categories composed of major items of plant that will most likely be retired as a single unit. Plant retirements from an integrated system prior to the retirement of the entire facility are more properly viewed as interim retirements that will be re-

placed in order to maintain the integrity of the system. Additionally, plant facilities may be added to the existing system (*i.e.*, interim additions) in order to expand or enhance its productive capacity without extending the service life of the present system. A proper depreciation rate can be developed for an integrated system using a life-span method. All plant accounts were treated as full mortality categories in this study.

Without exception, service life indications were indeterminate from a statistical analysis of the available activity years. Much of the plant activity over the period 1999–2002 consisted of transfers, adjustments, and several large retirements associated with the formation of the Corporate Assets business unit. Service life indications were generally much shorter than either experience or the anticipated future use of the assets would suggest. Absent meaningful indications from the analysis of historical retirement activity, the service-life statistics recommended in this study were based largely on judgment and a consideration of the parameters approved for similar assets managed by other Aquila business units.

NET SALVAGE ANALYSIS

Depreciation rates designed to achieve the goals and objectives of depreciation accounting will include a parameter for future net salvage and a variable for average net salvage which reflects both realized and future net salvage rates.

An estimate of the net salvage rate applicable to future retirements is most often obtained from an analysis of gross salvage and removal expense realized in the past. An analysis of past experience (including an examination of trends over time) provides an appropriate basis for estimating future salvage and cost of removal. Consideration should also be given, however, to events that may cause deviations from net salvage realized in the past.

Special consideration should also be given to the treatment of insurance proceeds and other forms of third-party reimbursements credited to the depreciation reserve. A properly conducted net salvage study will exclude such activity from the estimate of future parameters and include the activity in the computation of realized and average net salvage rates.

A traditional, historical analysis using a one-year moving average of the ratio of realized salvage and removal expense to the associated retirements was used in this study to a) estimate realized net salvage rates; b) detect the emergence of historical trends; and c) provide a basis for estimating future net salvage rates. Cost of removal and salvage opinions obtained from the Company were blended with judgment and historical indications in developing estimates of the future.

Account 390001 (Structures and Improvements) is the only account for which net salvage has been recorded. Salvage proceeds resulted from the sale infrastructure improvements on developable land. Foster Associates was advised by

Aquila that any future interim salvage from Corporate Assets will, most likely, be offset by removal expense. Accordingly, a future net salvage rate of zero percent is recommended for all Corporate Asset accounts.

The average net salvage rate for Account 390001 was estimated using direct dollar weighting of historical retirements with the historical net salvage rate, and future retirements (*i.e.*, surviving plant) with the estimated future net salvage rate. The computation of the estimated average net salvage rate for this account is shown in Statement D.

DEPRECIATION RESERVE ANALYSIS

The purpose of a depreciation reserve analysis is to compare the current level of the recorded reserve with the level required to achieve the goals or objectives of depreciation accounting if the amount and timing of future retirements and net salvage are realized as predicted. The difference between the required depreciation reserve and the recorded reserve provides a measurement of the expected excess or shortfall that will remain in the depreciation reserve if corrective action is not taken to eliminate the reserve imbalance.

Unlike a recorded reserve which represents the net amount of depreciation expense charged to previous periods of operations, a theoretical reserve is a measure of the implied reserve requirement at the beginning of a study year if the timing of future retirements and net salvage is in exact conformance with a survivor curve chosen to predict the probable life of plant units still exposed to the forces of retirement. Stated differently, a theoretical depreciation reserve is the difference between the recorded cost of plant presently in service and the sum of the depreciation expense and net salvage that will be charged in the future if plant retirements are distributed over time according to a specified retirement frequency distribution.

The survivor curve used in the calculation of a theoretical depreciation reserve is intended to describe forces of retirement that will be operative in the future. However, retirements caused by forces such as accidents, physical deterioration and changing technology seldom, if ever, remain stable over time. It is unlikely, therefore, that a probability or retirement frequency distribution can be identified that will accurately describe the age of plant retirements over the complete life cycle of a vintage. It is for this reason that depreciation rates should be reviewed periodically and adjusted for observed or expected changes in the parameters chosen to describe the underlying forces of mortality.

Although reserve records are commonly maintained by various account classifications, the total reserve for a company is the most important measure of the status of the company's depreciation practices and procedures. If a company has not previously conducted statistical life studies or considered retirement disper-

sion in setting depreciation rates, it is likely that some accounts will be over-depreciated and other accounts will be under-depreciated relative to a calculated theoretical reserve. Differences between the theoretical reserve and the recorded reserve also will arise as a normal occurrence when service lives, dispersion patterns and net salvage estimates are adjusted in the course of depreciation reviews. It is appropriate, therefore, and consistent with group depreciation theory to periodically redistribute or rebalance the total recorded reserve among the various primary accounts based upon the most recent estimates of retirement dispersion and net salvage rates.

A redistribution of recorded reserves is considered appropriate for Corporate Assets at this time. Although recorded reserves have been maintained by primary account, these reserves were largely ignored in the development of the currently used whole-life accrual rates. The MPS rates adopted for Corporate Assets were established by negotiations and compromise without specifying the projection curve and reserve ratios contemplated in the settled rates. The failure to address prior reserve imbalances produces an added dimension of instability in accrual rates beyond the variability attributable to the parameters estimated in the current study. A redistribution of the recorded reserve is necessary, therefore, to develop an initial reserve balance for each primary account consistent with the age distributions and estimates of retirement dispersion developed in this study. Reserves should also be realigned in this study to reflect implementation of the vintage group procedure.

A redistribution of the recorded reserve was achieved for Corporate Assets by multiplying the calculated reserve for each primary account within the general function by the ratio of the function total recorded reserve to the function total calculated reserve. The sum of the redistributed reserves within the general function is, therefore, equal to the function total recorded depreciation reserve before the redistribution.

Statement C (page 19) provides a comparison of the computed and recorded reserves forecasted for Corporate Assets – MPS on December 31, 2002. The recorded reserve is $2,051,206, or 3.9 percent of the depreciable plant investment. The corresponding computed reserve is $14,280,435 or 27.1 percent of the depreciable plant investment. A proportionate amount of the measured reserve imbalance of $12,229,229 will be amortized over the composite weighted-average remaining life of each rate category.

Statement C (page 26) provides a comparison of the computed and recorded reserves forecasted for Corporate Assets – SJLP on December 31, 2002. The recorded reserve is $697,985, or 4.1 percent of the depreciable plant investment. The corresponding computed reserve is $4,718,586 or 27.6 percent of the depreciable plant investment. A proportionate amount of the measured reserve imbal-

ance of $4,020,601 will be amortized over the composite weighted-average remaining life of each rate category.

DEVELOPMENT OF ACCRUAL RATES

The goal or objective of depreciation accounting is cost allocation over the economic life of an asset in proportion to the consumption of service potential. Ideally, the cost of an asset—which represents the cost of obtaining a bundle of service units—should be allocated to future periods of operation in proportion to the amount of service potential expended during an accounting interval. The service potential of an asset is the present value of future net revenue (*i.e.*, revenue less expenses exclusive of depreciation and other non-cash expenses) or cash inflows attributable to the use of that asset alone.

Cost allocation in proportion to the consumption of service potential is often approximated by the use of depreciation methods employing time rather than net revenue as the apportionment base. Examples of time-based methods include sinking-fund, straight-line, declining balance, and sum-of-the-years' digits. The advantage of using a time-based method is that it does not require an estimate of *the remaining amount of service capacity an asset will provide or the amount of* capacity actually consumed during an accounting interval. Using a time-based allocation method, however, does not change the goal of depreciation accounting. If it is predictable that the net revenue pattern of an asset will either decrease or increase over time, then an accelerated or decelerated time-based method should be used to approximate the rate at which service potential is actually consumed.

The time period over which the cost of an asset will be allocated to operations is determined by the combination of a procedure and a technique. A depreciation procedure describes the level of grouping or sub-grouping of assets within a plant category. The broad group, vintage group, equal-life group, and item or unit are a few of the more widely used procedures. A depreciation technique describes the life statistic used in a depreciation system. The whole life and remaining life (or expectancy) are the most common techniques.

Depreciation rates recommended in this study were developed using a system composed of the straight-line method, vintage group procedure, whole-life technique with amortization of reserve imbalances over the estimated remaining life of each rate category. This formulation of the accrual rate is equivalent to a straight-line method, vintage group procedure, remaining-life technique. It is the opinion of Foster Associates that this system will remain appropriate for Corporate Assets, provided depreciation studies are conducted periodically and parameters are routinely adjusted to reflect changing operating conditions.