Exhibit No.___(EHF-1)

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

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|---|---|---|
| Paiute Pipeline Company | ) | Docket No. RP09-____-000 |

Prepared Direct Testimony
of
EDWARD H. FEINSTEIN
on Behalf of
PAIUTE PIPELINE COMPANY

**Q. Please state your name and business address.**

A. My name is Edward H. Feinstein and my business address is 1155 15th Street, N.W., Suite 400, Washington, D.C. 20005.

**Q. Please state your occupation.**

A. I am a consulting petroleum engineer with the firm of Brown, Williams, Moorhead & Quinn, Inc.

**Q.** Please briefly describe your education, background, and training.

A. I received my Bachelor of Petroleum Engineering degree at the University of Tulsa in May 1963. From July 1963 to February 1998, I worked at the Federal Energy Regulatory Commission ("FERC") and its predecessor, the Federal Power Commission ("FPC"). From the time of my employment at the FPC until approximately 1970, I was engaged in work involving economic feasibility studies in certificate proceedings under the Natural Gas Act ("NGA"). This work was concerned primarily with market, engineering, and financial analyses for the purpose of determining the economic feasibility of pipeline projects proposed in certificate applications. From 1970 to the present, my efforts have been concentrated on determining the appropriate depreciation rates for oil and gas pipeline facilities, including the determination of potential supplies of oil and natural gas, and with other rate issues such as storage utilization, operations and cost allocation and gathering rates. During my nearly 35 years with the Commission, I earned positions of increasing responsibility, including Chief of the Depreciation Branch. In March 1998, I joined the firm of Brown, Williams, Scarbrough and Quinn, Inc., precursor to Brown, Williams, Moorhead & Quinn, Inc.

**Q. Are you a member of any professional societies?**

A. Yes, I am a member of the Society of Depreciation Professionals and the Society of Petroleum Engineers.

**Q. Have you testified in proceedings before the FPC and the FERC?**

A. Yes, I have presented testimony in many different areas, including gas supply and deliverability, depreciation, gathering issues and storage operations and cost allocation. A list of testimony which served is shown in Exhibit No. EHF-2.

**Q. On whose behalf are you presenting testimony in this proceeding?**

A. I am presenting testimony on behalf of Paiute Pipeline Company (Paiute). Paiute requested that I perform an analysis to see if their current depreciation and negative salvage rates are reasonable, realistic and practical at this time. My testimony addresses the determination of the justness and reasonableness of the depreciation and negative salvage rates that are currently applied to Paiute's depreciable transmission and storage plant. As part of the support for my determinations, I performed a detailed depreciation study.

**Q. Would you please summarize the results of your depreciation determination?**

A. As a result of my studies and determinations, I have determined that Paiute could support increased depreciation rates for many of its plant accounts, however, based upon discussions with Paiute personnel, it is my understanding that Paiute desires to retain its current depreciation and negative salvage rates for all of its accounts. The rates are, as a percentage of plant in service, as follows:

| **STORAGE PLANT** | **DEPRECIATION** | **NEG. SALVAGE.** |
|---|---|---|
| Account 361 Structures | 3.62 | 0.13 |
| Account 362 Gas Holders | 5.88 | 0.12 |
| Account 363.2 Vaporization Equip | 4.90 | 0.10 |
| Account 363.5 LNG Equipment | 4.90 | 0.12 |
| **TRANSMISSION PLANT** | | |
| Account 365.2 Rights of Way | 2.43 | 0.00 |
| Account 366.1 Structures – Compr | 3.00 | 1.29 |
| Account 366.2 Structures – Other | 1.43 | 0.30 |
| Account 367 Mains | 2.40 | 0.07 |
| Account 367 Mains-Lake Tahoe Expan | 2.65 | 0.36 |
| Account 367 Mains-Carson Lateral | 2.80 | 0.38 |
| Account 367 Mains-2003 Expansion | 2.97 | 0.39 |
| Account 368 Compr Sta Equip | 3.30 | 0.61 |
| Account 368 Compr Sta Equip-Elko Lat | 3.30 | 0.61 |

| | | |
|---|---|---|
| Account 369 Meas. & Reg. Equip | 2.49 | 0.54 |
| Account 369 Meas. & Reg. Equip-L Tahoe | 3.62 | -0.18 |
| Account 369 Meas. & Reg. Equip-Expan | 3.97 | 0.01 |
| Account 370 Communication Equipment | 3.48 | 0.30 |
| Account 371 Miscellaneous Equip | 3.87 | 0.00 |
| **GENERAL PLANT** | | |
| Account 390.1 Structures and Improv | 4.00 | 0.00 |
| Account 391.0 Office Furniture and Equip | 5.14 | 0.00 |
| Account 391.1 Comp Software and Hard | 20.00 | 0.00 |
| Account 392.1 Transp Equip-Lt Vehicles | 12.50 | 0.00 |
| Account 392.2 Transp Equip-Hv Vehicles | 8.00 | 0.00 |
| Account 393 Stores Equipment | 4.00 | 0.00 |
| Account 394 Tools, Shop and Gar Equip | 9.09 | 0.00 |
| Account 395 Laboratory Equipment | 16.67 | 0.00 |
| Account 396 Power Operated Equipment | 4.47 | 0.00 |
| Account 397.1 Communication Equip | 10.00 | 0.00 |
| Account 397.2 Telemetry Equipment | 12.50 | 0.00 |
| Account 398 Miscellaneous Equipment | 5.00 | 0.00 |

The above rates, were the result of a settlement agreement, and subsequently authorized by the Commission.

**Q. Would you please summarize how you performed your studies?**

A. I analyzed Paiute's system operations along with its markets and source of supply. I determined average service lives based on the physical lives of its facilities. For the storage and transmission facilities, I employed the straight- line method, average remaining life technique with a life span approach. The life span approach considered projected Rocky Mountain Area gas supplies and Canadian gas supply available for export. I also considered how competition in the natural gas industry affects the economic life of Paiute's facilities. I applied the average remaining life to each of its plant accounts to determine the applicable depreciation rate. With respect to general plant, I determined the appropriateness of Paiute's current depreciation rate for each account using the average service life approach. The methodology I employed for determining Paiute's just and reasonable depreciation rates is fully consistent with Commission precedent.

**DEPRECIATION**

**Q. Let us turn first to a definition of depreciation, would you please define and describe depreciation?**

A. Depreciation is the allocation of the original cost of tangible facilities in service over their useful lives. Stated another way, depreciation is the mechanism by which the plant investment is recouped in an orderly fashion over the useful life of the investment. For rate purposes it is treated as an operating expense. Depreciation is intended to systematically recover the invested capital over the useful life of the universe of relevant assets.

I used the Average Remaining Life approach and recommend that Paiute's depreciation rates in this case be based on this approach. This approach is the most widely used of all the methods to determine depreciation rates for major transmission pipeline and natural gas storage systems. The average service life approach was used to determine depreciation rates for the high turnover general plant accounts. This approach is commonly employed throughout the industry for such general plant accounts.

Depreciation rates depend on estimates of service life of plant investment. Because natural gas pipeline systems are made up of a host of different complex property units, it would be impractical to calculate and apply separate depreciation rates for each unit of facility. This calculation would place an undue burden on the accounting system for depreciation purposes requiring the maintenance of records for each unit of property. Consequently, the normal approach for developing depreciation rates is to calculate the rates for groups of plant based upon average service lives for those groups which are determined through studies of the forces affecting the lives of the pipeline's facilities. Under this method, individual facilities booked to each relevant FERC account are treated as a single group by those accounts.

## DETERMINATION OF DEPRECIATION - THE SERVICE LIFE FACTORS

**Q. Would you please discuss the relationship between useful life and depreciation?**

A. The measurement of depreciation recognizes that all plant will ultimately reach the end of its useful life. The end of the useful life and retirement from service may be caused by the following factors:

- wear and tear
- action of the elements
- deterioration
- inadequacy
- obsolescence

- requirements of public authorities
- adequacy of supply or market.

The physical causes, such as wear and tear and deterioration, are the most readily observed reasons for the retirements. Functional causes, such as inadequacy, obsolescence, requirements of public authorities and inadequacy of supplies or markets are probably the more prevalent causes of retirements in the pipeline industry.

For a pipeline system such as Paiute, all of the above causes of retirement, whether physical or functional, have one thing in common: they are ever-occurring and affect individual facilities. On the other hand, the adequacy of supply or market is unrelated to the physical characteristics of the property or the action of public authorities. Adequacy of supply or market is probably the single most important factor resulting in premature retirements because this factor may affect a large portion of a pipeline system; therefore, I will treat this subject in more detail.

In a depreciation study, the adequacy of supply and markets is referred to as the economic life.

**THE DEPRECIATION MODEL**

**Q. Would you please describe the depreciation model that you employed in your study.**

A. I employed the straight line average remaining life method as traditionally adopted by the Commission. It is described as follows:

$$DE = \frac{\mathbf{DB - (S - COR) - DR}}{\mathbf{ARL}}$$

Where,

**DB** = the depreciation base or original cost
**S** = the future gross salvage
**COR** = the cost of removal
**DR** = the accumulated depreciation reserve
**ARL** = the average remaining life

And, the gross salvage and cost of removal are related specifically to the **DB**.

The determination of depreciation using the above equations serves three purposes:

capital recovery - rateably allocates a known fixed cost,

cost of removal - rateably allocates a future obligation,

salvage - rateably reflects recognition of future value.

**Q. Would you describe the average remaining life approach?**

A. The concept of an average service life or remaining service life for a property group implies that the various units in the group have different lives. The average life of any group of plant items is a matter of estimate until all the items in that group have been finally retired. The issue then is to determine the average life before complete retirement of all units occurs. The average remaining service life method determines the average period of time the facilities will be in service. This is normally done by first determining the historical life of the plant group and then estimating the life expectancy for the items remaining in service. The life experienced plus the expected life comprises the average life for the group.

This analysis can be done by determining the separate lives for each of the property units or by constructing a survivor curve for the entire group. In this testimony, I employed the group method and I used a survivor curve for each group of facilities.

**Q. What is a survivor curve?**

A. A survivor curve, fitted to a particular type of plant, predicts the average remaining service life and normal retirement pattern of that plant. A survivor curve graphically reflects the percent of capital investment existing at each age throughout the entire physical life of an original group of property. From the survivor curve, the average service life or average remaining life can be calculated.

The survivor curves are referred to as Iowa type survivor curves (See Schedule No. 1 of Exhibit No. EHF-3). They were originally developed at the Iowa State College Engineering Experiment Station and refined through an extensive process of observation and classification of the ages at which industrial property had been retired. Iowa survivor curves are used to account for the normal retirements that occur over the life of a specific type of plant.

The determination and use of a survivor curve to determine the physical life of facilities requires a great deal of experience and knowledge in the interpretation of the results of such a study. The use of judgment must include investigation into whether future normal retirements can be predicted based on the past performance of those facilities. For example, research on my part along with discussions with Paiute's operating personnel indicate certain pipeline and appurtenant facilities may not be subject to precise interpretation of past retirement experience.

## ECONOMIC LIFE OF THE PAIUTE SYSTEM

**Q. Would you please describe your studies, analysis and determination of the economic life of the Paiute system?**

A. The economic life of the Paiute system is dependent primarily upon the productive capability of the supply areas from which it receives gas for transmission. On the other hand, Paiute's markets are made up of a combination of local distribution companies serving town border customers. Generally, the life of Paiute's markets, in and by themselves, is relatively long-term. However, any potential loss of markets may affect the useful life of a particular facility or some portion thereof.

Adequate supply of gas for shipment is crucial to the remaining life of a pipeline system. In the case of Paiute, essentially the sole source of gas for transportation in its pipeline facilities is the gas supplies of the Rocky Mountain Region and the Western Canada Sedimentary Basin. I analyzed Paiute's Rocky Mountain and Canadian gas supply as it would affect its system and performed studies concerning the supply life. The results of those studies, when directly related to Paiute's existing facilities, indicate an average remaining economic life of 30 years. The economic life of Paiute's facilities, which I will discuss further in my testimony, should be used to determine the life span and average remaining life for the calculation of depreciation for storage and transmission plant in this proceeding.

## GAS SUPPLY

**Q. Would you please describe your gas supply studies?**

A. I studied, analyzed and modeled the gas supply of the Rocky Mountain area. Further, I studied, analyzed and modeled Canada's gas supply in order to determine the future viability of exports to the United States, specifically in the west. The future of these exports may affect the life of the Paiute system.

With respect to the gas supply areas, I analyzed data available concerning proven reserves of natural gas as well as the various estimates of potential gas resources. I constructed a model, which forecast the availability of gas from supply sources in the future. The purpose of my gas supply analysis is to determine a realistic economic life of pipeline facilities that are dependent upon such supplies. The results of this analysis are found in Schedule Nos. 2 and 3 (Rocky Mountain Area) and Schedule Nos. 4 and 5 (Imports from Canada) of Exhibit No. EHF-3. The entire analysis is found in Exhibit No. EHF-5, *Assessment of the Availability of Natural Gas in the Rocky Mountain Area*, and Exhibit No. EHF-4, *Assessment of the Availability of Natural Gas in the Western Canada Sedimentary Basin.*

**Q. How did you go about determining the supplies of gas that are realistically accessible through Paiute's, existing facilities?**

A. Recognize that gas resources can be categorized as proven reserves and undiscovered resources. Natural gas resources occur in porous and permeable reservoir rock, which at a particular period in time can be technically and economically produced using normal production practices. However, production from area to area differs because the size, location, physical properties and depth of each reservoir varies widely.

**Q. Mr. Feinstein, would you please discuss the analysis, determination and results of your gas supply studies**?

A. Schedule No. 6 of Exhibit No. EHF-3 illustrates the concept of the gas supply model. Estimates of future annual gas discoveries were made employing an effectiveness of exploration discovery – process model. Productive capacity decline rates were applied to determine the availability of gas from new supply sources.

One measure of the discoverability of resources is the effectiveness of exploration. The effectiveness of exploration compares the drilling footage in a particular year with the related discoveries. This method depicts the normal stage of events that take place when a gas-bearing province graduates past its initial discovery stage and enters its more or less mature stage. The degree of maturity of the producing life of the supply areas can be determined by comparing the amount of gas resources already discovered with an estimate of the ultimate resources.

**Q. What can you conclude as to the economic life of Paiute's existing facilities from the results of your gas supply studies?**

A. The results of the gas supply model coupled with Paiute's position as a pipeline largely depending on specific domestic gas supplies and gas imports from Canada strongly indicate an average remaining economic life for Paiute's pipeline system of 30 years. The analysis of the economic life of a pipeline system, such as Paiute involves consideration of not only the related gas supply, but, the company's markets and competitive position. Thus, I employed an average remaining economic life of 30 years in order to determine Paiute's depreciation rate would certainly be just and reasonable.

This conclusion is based upon the potential for serious underutilization of pipeline facilities, making them candidates for major retirements due to depletion of its traditional gas supply sources and competition. This is supported by the analysis of the relationship between the amount of gas available in Paiute's traditional supply sources and the level of utilization of its facilities. This determination is shown in conception form in Schedule No. 7 of Exhibit No. EHF-3. The actual calculations are shown in Schedule Nos. 8 and 9 of Exhibit No. EHF-3.

**Q. What are major retirements and how do you conceptualize them with respect to economic life?**

A. Major retirements are comprised of severely underutilized facilities due to economic forces (rather than physical forces), such as gas supply depletion causing underutilization and changes in system operations. It is my experience, in analyzing retirements of pipeline properties, that major retirements in varying degrees take place. In supply areas, depletion of gas reserves and competition are typical causes of underutilization and eventual retirement.

**Q. Can you provide examples of major retirements, which have taken place in recent years in the pipeline industry?**

A. Yes I can. For example:

1) Offshore Gulf of Mexico facilities are constantly being retired as the depletion of gas reserves causes the aforementioned underutilization.

2) On March 9, 2000, Trunkline Gas Company, after exhibiting underutilization on its south Louisiana to Tuscola, Illinois mainline system, retired an entire 700-mile loop line. The reason that the pipeline loop was retired is because of the severe underutilization on Trunkline's mainline system.

3) Trans-Northern Pipelines Inc. sought, and was granted, abandonment authority by the NEB for its entire Don Valley Lateral to Toronto Harbour. That decision was made as the facility was in a "serious deficit position" due to reduced throughput.

4) Florida Gas Transmission Company (Florida Gas) has exhibited major retirements of pipeline and compressor facilities in its South Texas Gulf Coast production area due to decreasing gas availability. Specifically, Florida Gas has retired: (1) pipeline facilities located south of Florida Gas' Compressor Station No. 2 and (2) pipeline facilities and Compressor Station No. 2, both located south of Station No. 3 and its Matagorda Offshore Pipeline System interconnect. While the facilities were sold for $2.3 million, a fraction of their replacement cost or original cost, the fact remains that they were no longer useful to Florida Gas' operations.

5) CenterPoint Energy – Mississippi River Transmission Corporation (Docket No. CP04-334-000) recently abandoned 307 miles of its Main

Line No. 1, consisting of 22-inch diameter pipeline and other equipment such as compressor engines. While, in the case of this facility, the system was old and, in many places, in need of upgrading, other portions were not old. This facility was underutilized. An indication of its underutilization is that the facilities were not replaced.

**Q. Mr. Feinstein, in your economic life analysis of Paiute's facilities, are you estimating the precise year of retirement?**

A. No, the exact date when Paiute actually retires such facilities is not relevant. It is not necessary that an actual physical retirement take place in order to qualify a facility as underutilized in the determination of the economic life of the Paiute system. However, certain facilities, such as compressor station equipment as may actually be physically retired at points in time as underutilization continues. For example, when a compressor unit or a loop line is no longer used for its intended purpose, other than for repair or emergency purposes, it should be fully accrued (depreciated). However, such a facility may linger in service for a period of time as an emergency back-up; it may be put in mothball status waiting for the appropriate time to physically retire the facility when abandonment is formally approved; or it may simply not be used because it is a component of a larger facility, a portion of which is still used and useful. The illustration of this very concept of underutilization of facilities, sometimes referred to in this case as "major retirements," along with the economic life concept is found in the aforementioned Schedule No. 7 of Exhibit No. EHF-3.

**Q. Mr. Feinstein, with respect to your determinations of gas supply and supply life, are these the sole legitimate means of estimating the available resource base in the WCSB and the Rocky Mountain Area?**

A. No. The foregoing represents a reasonable method of estimating the size and characteristics of the resource base. Other methods may be reasonable, putting aside whether the calculations and assumptions behind the estimation are sound. Given the relative recent vintage of the latest Potential Gas Committee and NEB reports, the estimation of the available United States and Canadian resource basis will continue to be refined over time.

**Q. Please continue.**

A. For a study that ultimately determines the recovery of a pipeline's investment in facilities, it is important that projections of gas production take into consideration only that portion of the ultimate resource that can reasonably be expected to be delivered to markets. By applying various estimates without recognizing the constraints, such as surface location restrictions, not all pools below the surface will be discovered, and the economic realities for small pools, any production projections will surely overstate the future supply availability.

## THE DETERMINATION OF DEPRECIATION FOR PAIUTE'S GAS TRANSMISSION AND STORAGE SYSTEM

**Q. How did you apply the 30-year economic life to the depreciation model?**

A. The 30-year average remaining economic life plays a key role in the determination of the ARL (average remaining life). It represents the average year of the final investment recoupment. Actually, it reflects a point in time around which major retirements may occur. The best way to describe the relationship of the economic life to the ARL is to overlay it with the normal retirement survivor curve (physical life). This is illustrated for the compressor station equipment account 368 in Schedule No. 10 Page 1 of 2 of Exhibit No. EHF-3. The procedure of determining the ARL is diagramed on Schedule No. 10 Page 2 of 2 of Exhibit No. EHF-3.

**Q. Please describe how you determined the physical life normal retirement survivor curve.**

A. The survivor curve represents the pattern of annual normal retirements that will occur out into the future. I determined the normal retirement curve for each of Paiute's transmission and storage accounts. For example, I determined that Account 367 (Mains) has an average service life of 50 years, with an $R_2$ survival pattern. This is shown on Schedule No. 1 of Exhibit No. EHF-3. Mains make-up approximately 75 percent of Paiute's transmission system. This determination was made in part by employing the statistical assembling techniques of historical additions and retirements. In cases, where there is very limited historical data, I also relied upon an analysis of the type of equipment, its usage and condition, as well as its age and survivor curve retirement patterns that are typical in the industry of such facilities. I determined the survivor curve and resulting average service life which best applies for each of the other accounts as follows:

| Account No. | Description | Average Service Life | Survivor Pattern |
|---|---|---|---|
| ***Transmission Plant*** | | | |
| 365.2 | Rights-of-way | 55 | $R_4$ |

| | | | |
|---|---|---|---|
| 366.1 | Structures - Compressor | 24 | $R_4$ |
| 366.2 | Structures - Other | 30 | $R_2$ |
| 367 | Mains | 50 | $R_2$ |
| 368 | Compressor Sta. | 24 | $R_3$ |
| 369 | Meas. & Reg Sta. Eq. | 32 | $L_1$ |
| 370 | Communication Equip. | 15 | $R_3$ |
| 371 | Miscellaneous Equip. | 20 | $R_3$ |
| ***LNG Storage*** | | | |
| 361 | Structures | 27 | R2 |
| 362 | Gas Holders | 27 | R2 |
| 363 | LNG Equipment | 24 | R2 |

**Q. How did you calculate the average remaining life from the information described above?**

A. When the economic life is applied to the plant survivor pattern, future normal retirements beyond the 30-year period are truncated. Integrating or calculating the area under the truncated survivor curve determines the average remaining life. For the transmission compressor station equipment, the ARL was determined to be 9.8 years. This is shown in diagrammatic form in Schedule No. 10 Page 1 of 2 of Exhibit No. EHF-3. Similar determinations were made for the rest of the accounts in the transmission function and LNG storage function.

**Q. Would you please explain the mechanics of your calculation of the depreciation rate for the transmission plant and LNG storage plant?**

A. After determining the individual ARL's for each account, I then divided each ARL into the difference between the depreciable plant, appropriate positive and negative salvage and the accumulated reserve for depreciation, thus arriving at the indicated depreciation expense. I performed this operation for each account. This is shown on Schedule No. 11 of Exhibit No. EHF-3. This process is shown is diagrammatic form in Schedule No. 12 of Exhibit No. EHF-3.

Further, I usually reflect near-term plant additions and retirements for purposes of rate stability, however, operating personnel at Paiute informed me that insignificant amounts of additions and retirements are expected within the next two years. Thus, I did not find it necessary to reflect any future near-term plant additions and retirements in my depreciation calculations.

**Q. What is the source of the gross depreciable plant shown on that schedule?**

A. The gross depreciable plant as of November 30, 2008 was provided to me by the company as booked plant. With respect to actual and very near-term additions I estimated them based upon historical experience and discussions with company personnel.

**Q. What is the source of the accumulated reserve for depreciation used in your rate determination shown on Schedule No. 12 of Exhibit No. EHF-3?**

A. The November 30, 2008 reserve for depreciation for the storage and transmission function was provided to me by the company.

## GENERAL PLANT DEPRECIATION

**Q. Would you please discuss your determination of the depreciation rates for the general plant accounts? What accounts make up the general plant?**

A. The general plant is made up of the following accounts:

| Account No. | Description |
|---|---|
| 390.1 | Structures and Improvements |
| 391.0 | Office Furniture and Equipment |
| 391.1 | Computer Software and Hardware |
| 392.1 | Transportation Equipment |
| 393 | Stores Equipment |
| 394 | Tools, Shop and Garage Equip. |
| 395 | Laboratory Equipment |
| 396 | Power Operated Equipment |
| 397.1 | Communication Equipment |
| 397.2 | Telemetry Equipment |
| 398 | Miscellaneous Equipment |

**Q. Please explain how you determined the average service life and why you made a separate determination for each individual account.**

A. I determined the appropriate average service life that best applies to each type of the equipment in the individual accounts. These lives, along with their respective depreciation rates, are also shown on Schedule No. 11 of Exhibit No. EHF-3. These average service lives were developed based upon analysis of the properties in each account, along with historical retirement experience, where available. My analysis was also based on discussions with Paiute personnel, as well as the experience of similar properties of other pipeline companies. The determination of the above depreciation rates differs from the mechanics employed for the transmission plant. Because of the high turnover rate of the facilities in the general plant, the whole life method was used to determine depreciation instead of the remaining life method. The reason for this treatment is that the turnover rate for general plant facilities is so much higher than that of the transmission plant.

## NET SALVAGE

**Q. Would you please now turn to the salvage component of the depreciation formula . What is net salvage?**

Net salvage is the net amount of funds necessary to retire a specific facility or group of facilities. It is the difference between the gross salvage, if any, and the cost of removal. Gross salvage may be in the form of value of the facilities stored in a warehouse for reuse or the proceeds from a sale of such facilities. Net salvage may be positive or negative. Salvage was a factor in most of the storage and transmission accounts. Salvage for those accounts was determined to be net negative. In determining the future net salvage, I examined the historical activity, where available, the actual experience of other companies operating similar facilities and in-house knowledge.

For the storage plant, historical activity was not available. I therefore based the determination of future net salvage upon the experience of other pipeline companies who operate similar equipment. With respect to transmission plant, historical data was available, and was employed appropriately. Where historical retirement data was not extensive, information, such as typical values and judgment were employed.

My analysis of the historical retirements of the Mains Account 367 and their gross salvage and cost of removal are shown in Schedule No. 13 of Exhibit No. EHF-3. That analysis resulted in a net negative salvage of 17 percent of the gross depreciable plant in service. I believe that the future net negative salvage will be at least that amount. I, therefore, employed a net negative salvage increment to the undepreciated Mains Account 367 plant in order to accrue the proper amount through depreciation expense. Net salvage values of the other accounts are shown in Schedule No. 14 of Exhibit No. EHF-3.

**Q. Is it proper to provide for the cost of retirements through a net negative salvage component?**

A. The net negative salvage increment reflects the future obligation of removal when the plant is retired. Like depreciation, the cost of retiring facilities is a legitimate cost of doing business. It is both reasonable and necessary for the ratepayers who are receiving service from these facilities to fund the additional costs of retirements through a negative salvage increment in the depreciation rates. In order to insure that an adequate reserve will be on hand to decommission the facilities when they are retired, and to restore the land to its original condition, it is imperative that Paiute be able to collect such an amount in addition to depreciation rates over the estimated remaining useful life. Failing to include such an expense in current rates will force a subsequent generation of ratepayers to subsidize service provided to current ratepayers. Furthermore, a negative salvage allowance requires current ratepayers to pay the full cost of using these facilities by bearing their fair share of these costs.

**Q. Is there a clear statutory requirement for Paiute to provide financial assurance for decommissioning its pipeline facilities?**

A. Yes. Authorization under Section 7 of the Natural Gas Act for the abandonment of natural gas facilities provides for actions that require an environmental assessment by the FERC (See 18 C.F.R. § 380.5 (2001)). It is this assessment, which describes the manner in which the abandonment is to take place. This places a monetary burden on Paiute to correctly decommission its facilities and restore the land to its original condition.

**Q. Is there evidence that Paiute will have to retire its pipeline facilities?**

A. Yes. Paiute's pipeline facilities will have to be decommissioned. Pipeline facilities eventually wear out, become obsolete or uneconomic. This fact is demonstrated by my plant retirement and survivor curve analysis, which reflects retirements due to physical causes. Gas supply and facility utilization studies reflect retirements that occur due to specific pipeline facilities becoming obsolete, redundant or other wise unnecessary. At some point, each pipeline reaches the end of its economic life.

**Q. Is there any evidence that Paiute exhibited net negative salvage concerning historical retirements?**

A. Yes. I analyzed Paiute's historical retirements and found that the cost of removal out-paced any gross salvage received for such retirements. An example of the analysis is shown for the mains account in Schedule No. 13 of Exhibit No. EHF-3.

**Q. How should Paiute account for its annual negative salvage allowance?**

A. Paiute has established a sub-account to Account 108 called Accumulated Provision for Depreciation of Gas Utility Plant. Negative salvage accruals and net salvage (gross salvage and cost of removal) will be entered into this sub-account. This account will enable the negative salvage accruals and the actual net salvage costs resulting from retirements to be identified separately apart from the accumulated depreciation accruals.

**Q. Why do you recommend the establishment of a negative salvage reserve, which is separate and distinct from the reserve for depreciation?**

A. There are two reasons for this. First, the negative salvage reserve could be reviewed periodically with ease. This would allow the detection of deficiencies or excesses in the accumulated reserve. Second, when negative salvage accruals and net salvage costs from retirements are reflected in the depreciation reserve, such reserve is distorted by the negative salvage amounts. This obscures the data in the reserve when making capital recovery depreciation analyses.

**Q. Are there any factors, other than technological, that could affect the negative salvage allowance?**

A. Yes, there are. Inflation, environmental and political considerations may result in future negative salvage costs that may differ from today's estimates.

**Q. Would you please summarize the results of your depreciation rate determination?**

A. As a result of my studies, I found that Paiute's existing depreciation and negative salvage rates for transmission plant and LNG storage plant to be somewhat lower than those that I calculated. Schedule No. 11 and 14 of Exhibit No. EHF-3 shows the results of my updated determination of depreciation and negative salvage. While the depreciation and negative salvage rates under my present study are, in some instances higher than the existing rates, based upon my discussions with Paiute personnel, I support Paiute's recommendation to retain its existing rates as listed on Pages 3 and 4 of this Testimony (Exhibit No. EHF-1).

**Q.** Mr**. Feinstein, does this conclude your direct testimony?**

A. Yes, it does.

AFFIDAVIT OF EDWARD H. FEINSTEIN

IN THE DISTRICT )

OF COLUMBIA )

Edward H. Feinstein, being duly sworn, deposes and says: that he has read and is familiar with the contents of the foregoing "Prepared Direct Testimony of Edward H. Feinstein"; that if asked the questions contained in said prepared direct testimony, the answers and responses thereto would be as shown in said testimony; that the facts contained in said answers are true to the best of his knowledge, information and belief; and that he adopts these matters as his own.

Edward H. Feinstein

SUBSCRIBED AND SWORN TO BEFORE ME on this 19th day of February 2009.

Notary Public

STEPHANIE J. WILKERSON
Notary Public District of Columbia
Commission Expires June 14, 2009

**Exhibit No. EHF-2**

EXPERT WITNESS LIST
OF
EDWARD H. FEINSTEIN

| Company Name | Docket No. | *Subject | | |
|---|---|---|---|---|
| Columbia Gulf Transmission Company | RP76-91 | D | Settled | |
| Northern Natural Gas Company | RP77-56 | GS | Settled | |
| Texas Gas Transmission Corporation | RP78-94 | D | Litigated | |
| Trailblazer Pipe Line Company | RP79-80 | D | Settled | |
| Trans-Anadarko Pipe Line System | RP80-17 | GS | Litigated | |
| Midwestern Gas Transmission Company | RP81-17 & RP81-57 | D | Settled | |
| Tennessee Gas Pipe Line Company | RP81-54 | D | Litigated | x-exam |
| South Georgia Natural Gas Company | RP81-69 | D | Settled | |
| United Gas Pipe Line Company | RP81-81 | D | Settled | |
| Texas Eastern Transmission Corportation | RP81-109-000 | D | Settled | |
| Panhandle Eastern Pipe Line Company | RP82-58 | D | Settled | |
| Trunkline Gas Company | RP83-93-000 | D | Settled | |
| Stingray Pipeline Company | RP84-94-000 | GS | Settled | |
| Colorado Interstate Gas Company | RP85-122-000 | D | Settled | x-exam |
| Trunkline Gas Company | RP87-15 | D | Settled | x-exam |
| National Fuel Gas Supply Corporation | RP89-49 | S | Settled | |
| Sea Robin Pipeline Company | RP89-55 | GS | Settled | |
| Algonquin Gas Transmission Company | RP89-72 | GS | Settled | |
| United Gas Pipe Line Company | RP89-121 | D | Settled | |
| Colorado Interstate Gas Company | RP90-69 | S | Settled | |
| Penn-York Energy Corporation | RP91-68-000 | S | Litigated | x-exam |
| Columbia Gas Transmission Corporation | RP91-161-000 | S | Settled | |
| Natural Gas Pipeline Co. of America | RP93-36-000 | S | Settled | |
| Equitrans, Inc. | RP93-187 | G/MV | Settled | |
| CNG Transmission Corporation | RP94-96-000 | S, G/MV | Settled | |
| Tennessee Gas Pipe Line Company | RP95-112-000 | S | Settled | |
| Northern Natural Gas Company | RP95-185-000 | S | Settled | |
| Transcontinental Gas Pipe Line Corp. | RP95-197-000 | S&R | Settled | |
| Northwest Pipeline Corporation | RP95-409-000 | S&R | Litigated | |
| Columbia Gas Transmission Corporation | RP95-408-000 | S&G/MV | Settled | |
| Paiute Pipeline Company | RP95-306 | D&NS | Settled | |
| Trunkline Gas Company | RP96-129-000 | S | Litigated | x-exam |
| Equitrans, Inc. | RP97-346-000 | S | Settled | |
| Viking Gas Transmission Company | RP98-290-000 | D&NS | Settled | |
| Northern Natural Gas Company | RP98-203-000 | F | Settled | |
| Koch Gateway Pipeline Company | RP99-111-000 | D | Settled | |
| Kansas Pipeline Company | RP99-485-000 | D&NS | Litigated | x-exam |
| Northern Border Pipeline Company | RP99-322-000 | D | Settled | |
| Trailblazer Pipe Line Company | RP97-408-000 | D | Settled | |
| Wyoming Interstate Company, Ltd. | RP99-381-000 | D | Litigated | x-exam |
| Williams Field Services Group, Inc. v. El Paso Natural Gas Company | RP99-471-000 | O | Litigated | |
| Williston Basin Interstate Pipeline Company | RP00-107-000 | D | Litigated | x-exam |
| Mississippi River Transmission Company | RP01-292-000 | D&NS | Settled | |
| Viking Gas Transmission Company | RP02-132-000 | D&NS | Settled | |
| Portland Natural Gas Transmission | RP02-013 | O | Settled | |
| Arkansas Oklahoma Gas Corporation (APSC) | 02-024-U | O, L&D | Settled | |
| Arkansas Western Gas Company (APSC) | 02-227-U | L,F,S | Settled | |
| Northern Natural Gas Company | RP03-398-000 | GS, D&NS | Settled | |
| Florida Gas Transmission Company | RP04-12-000 | D | Settled | |
| Chandeleur Pipe Line Company | RP03-625-000 | D&NS | Settled | |
| Devon Power LLC, et al. | ER03-563-000 | D&NS | Settled | |
| Equitrans, Inc. | RP04-97-000 | D&NS | Settled | |
| Equitrans, Inc. | RP04-203-000 | D&NS | Settled | |
| Entergy Services, Inc. | ER03-753-000 | D | Settled | |
| Kern River Gas Transmission Company | RP04-274-000 | D&NS | Litigated | |
| City of Vernon | EL00-105-007 | D&NS | Litigated | |
| Virginia Natural Gas, Inc. | PUE-2004-00012 | D | Settled | |
| Maritimes & Northeast Pipelines, LLC | RP04-360-000 | D | Settled | |
| PSEG Connecticut Power, LLC | ER05-231-000 | D | Settled | |
| Equitrans, Inc. | RP05-164-000 | D | Settled | |
| Northern Natural Gas Company | RP04-155-000 | D&NS | Settled | |
| Paiute Pipeline Company | RP05-163-000 | D | Settled | |
| El Paso Natural Gas Company | RP06-369-000 | D | Settled | |
| Northern Border Pipeline Company | RP06-72-000 | D | Settled | |
| Pine Needle LNG, LLC | RP06-336-000 | D | Settled | |
| Orion Power Midwest, LP | ER06-__-000 | D | Settled | |
| Arkansas Oklahoma Gas Corporation | 05-006-U | L & F | Settled | |
| Northwest Pipeline Corp. | RP06-416-000 | D&NS | Settled | |
| Gas Transmission Northwest Corp | RP06-407-000 | D&NS | Settled | |
| Transcontinental Gas Pipe Line Corp. | RP06-569-000 | D&NS | Settled | |
| Dominion Cove Point LNG | RP06-417-000 | D&NS | Settled | |
| Mojave Pipeline Company | RP07-310-000 | D&NS | Settled | |
| Southwest Gas Storage Company | RP07-34-000 | D&NS | Settled | |
| Southern Star Central Gas Pipeline, Inc. | RP08-350-000 | D,NS & ARO | Pending | |

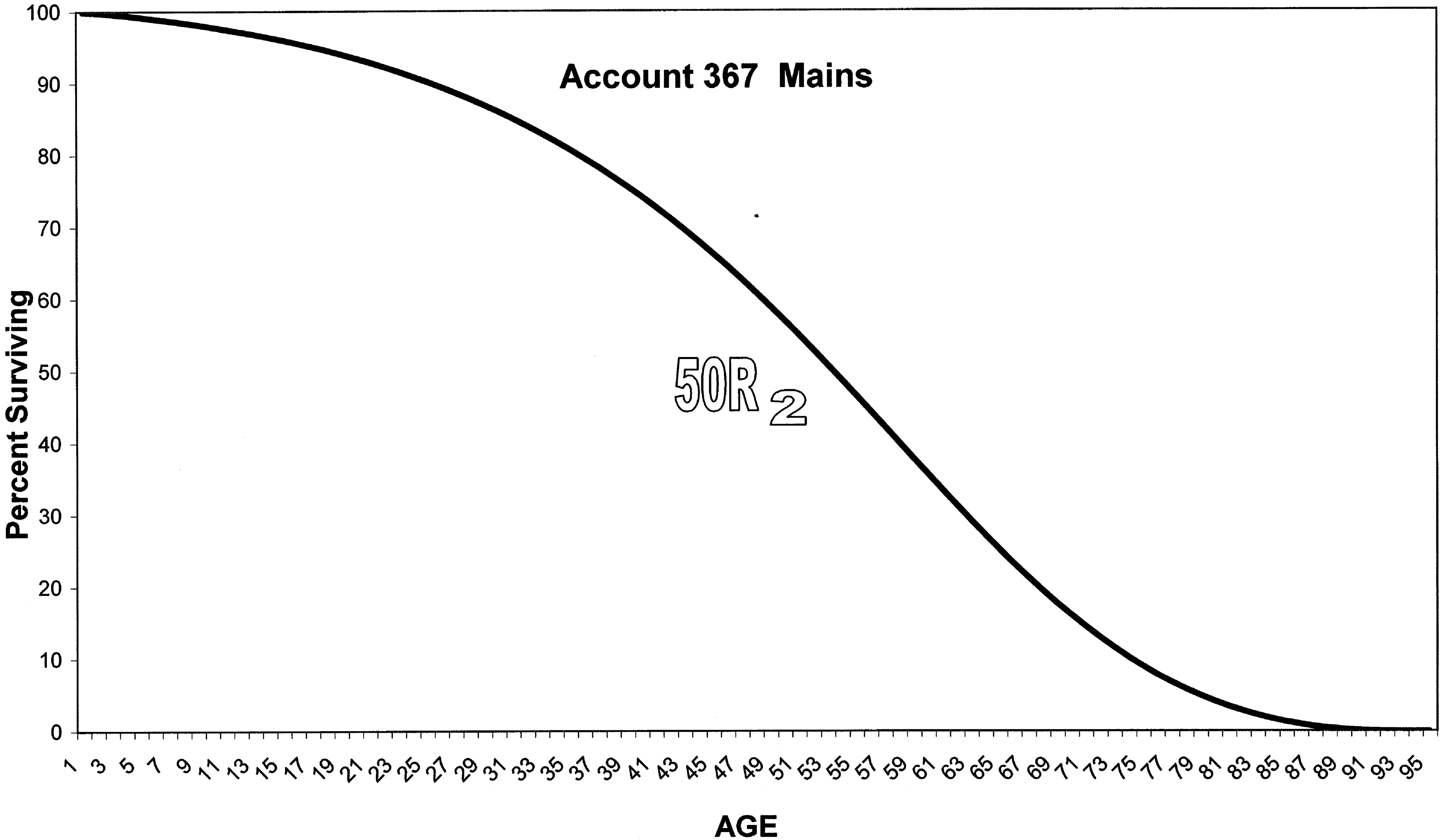
* Subject
R = Requirements
MV = Market Value
D = Depreciation
F = Fuel
GS = Gas Supply
S = Storage Requirements & Cost Allocation
O = Pipeline Operations
L = Lost and Unaccounted For
NS = Negative Salvage Rate

**Exhibit No. EHF-3**

# SCHEDULES
# TO THE
# TESTIMONY OF
# EDWARD FEINSTEIN

Schedule No 1
Exhibit No. EHF-3

# SURVIVOR CURVE



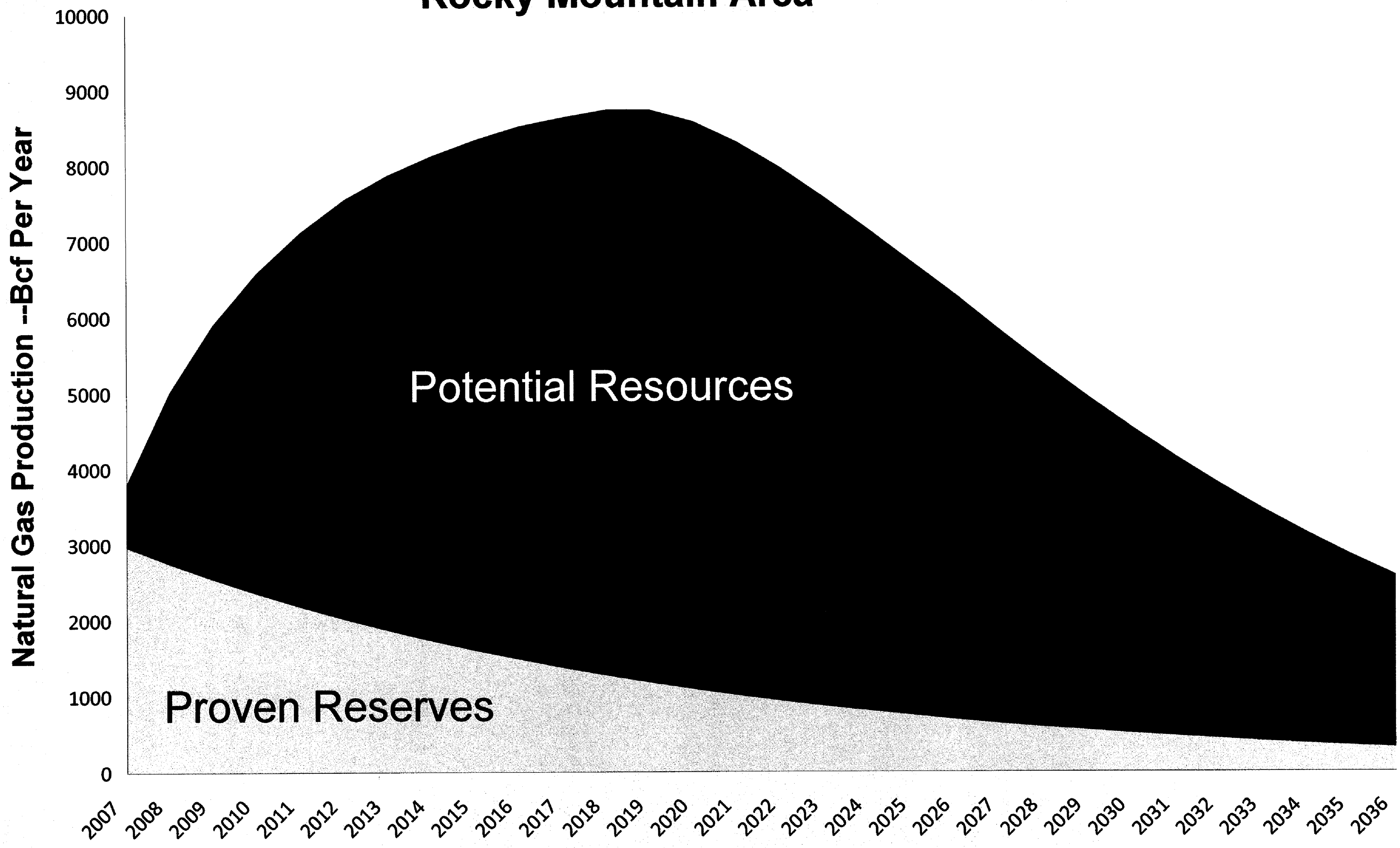
**Schedule No. 2**
**Exhibit No. EHF-3**

# PRODUCTIVE CAPACITY
# ROCKY MOUNTAIN AREA
**Colorado, Utah and Wyoming**

| Year | Productive Availability of 2006 Reserves 7.45% Bcf/Year | Productive Availability of Future Reserves Bcf/Year | Productive Availability Total Bcf/Year | Productive Availability Total Bcf / Day |
|---|---|---|---|---|
| 2006 | 3,218 | | | |
| 2007 | 2,978 | 828 | 4,046 | 11.085 |
| 2008 | 2,756 | 2,273 | 5,029 | 13.779 |
| 2009 | 2,551 | 3,369 | 5,920 | 16.219 |
| 2010 | 2,361 | 4,239 | 6,600 | 18.082 |
| 2011 | 2,185 | 4,944 | 7,129 | 19.531 |
| 2012 | 2,022 | 5,535 | 7,558 | 20.706 |
| 2013 | 1,872 | 6,007 | 7,878 | 21.584 |
| 2014 | 1,732 | 6,398 | 8,130 | 22.274 |
| 2015 | 1,603 | 6,739 | 8,343 | 22.856 |
| 2016 | 1,484 | 7,033 | 8,517 | 23.334 |
| 2017 | 1,373 | 7,262 | 8,635 | 23.658 |
| 2018 | 1,271 | 7,463 | 8,734 | 23.930 |
| 2019 | 1,176 | 7,557 | 8,733 | 23.927 |
| 2020 | 1,089 | 7,485 | 8,573 | 23.488 |
| 2021 | 1,007 | 7,294 | 8,302 | 22.745 |
| 2022 | 932 | 7,026 | 7,958 | 21.804 |
| 2023 | 863 | 6,702 | 7,565 | 20.726 |
| 2024 | 799 | 6,339 | 7,138 | 19.556 |
| 2025 | 739 | 5,965 | 6,704 | 18.368 |
| 2026 | 684 | 5,588 | 6,272 | 17.183 |
| 2027 | 633 | 5,176 | 5,809 | 15.916 |
| 2028 | 586 | 4,777 | 5,363 | 14.692 |
| 2029 | 542 | 4,394 | 4,937 | 13.525 |
| 2030 | 502 | 4,030 | 4,532 | 12.416 |
| 2031 | 465 | 3,684 | 4,149 | 11.367 |
| 2032 | 430 | 3,359 | 3,789 | 10.380 |
| 2033 | 398 | 3,054 | 3,452 | 9.457 |
| 2034 | 368 | 2,770 | 3,138 | 8.599 |
| 2035 | 341 | 2,508 | 2,848 | 7.804 |
| 2036 | 315 | 2,266 | 2,581 | 7.072 |
| 2037 | 292 | 1,985 | 2,277 | 6.238 |

Schedule No. 3
Exhibit No. EHF-3

# Forecast of the Availability of Natural Gas
## Rocky Mountain Area



## Surplus Canadian Gas for Export to The United States

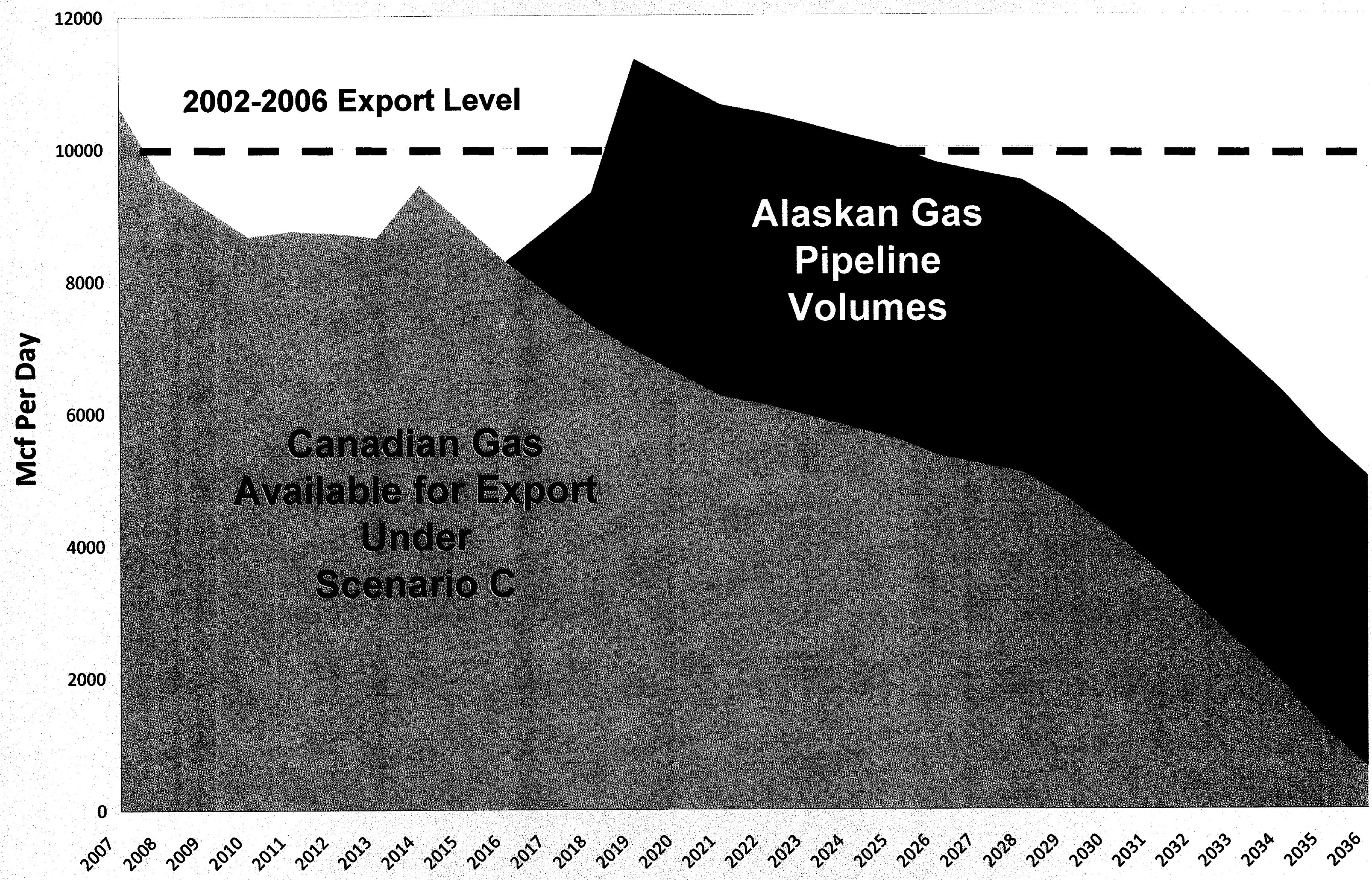
***With Alaskan Gas Pipeline and 6 LNG Projects***

**Volumes in MMcf Per Day**

| | Year | Canadian Gas Supply | Alaskan Gas Pipeline | Imports of Gas From US | Canadian Domestic Demand | Surplus WO Alaska For Export to US | Surplus W Alaska For Export to US |
|---|---|---|---|---|---|---|---|
| | 2007 | 17,563 | - | 1,017 | 8,408 | 10,172 | 10,172 |
| 1 | 2008 | 16,108 | - | 1,017 | 8,604 | 8,521 | 8,521 |
| 2 | 2009 | 15,771 | - | 1,017 | 8,861 | 7,927 | 7,927 |
| 3 | 2010 | 15,797 | - | 1,017 | 9,095 | 7,719 | 7,719 |
| 4 | 2011 | 15,616 | - | 1,017 | 9,352 | 7,280 | 7,280 |
| 5 | 2012 | 15,408 | - | 1,017 | 9,548 | 6,878 | 6,878 |
| 6 | 2013 | 15,791 | - | 1,017 | 9,731 | 7,077 | 7,077 |
| 7 | 2014 | 16,844 | - | 1,017 | 9,938 | 7,923 | 7,923 |
| 8 | 2015 | 16,462 | - | 1,017 | 9,952 | 7,527 | 7,527 |
| 9 | 2016 | 16,140 | - | 1,017 | 10,004 | 7,153 | 7,153 |
| 10 | 2017 | 15,880 | 1,000 | 1,017 | 10,077 | 6,820 | 7,820 |
| 11 | 2018 | 15,663 | 2,000 | 1,017 | 10,124 | 6,556 | 8,556 |
| 12 | 2019 | 15,473 | 4,400 | 1,017 | 10,250 | 6,240 | 10,640 |
| 13 | 2020 | 15,305 | 4,400 | 1,017 | 10,308 | 6,013 | 10,413 |
| 14 | 2021 | 15,170 | 4,400 | 1,017 | 10,346 | 5,841 | 10,241 |
| 15 | 2022 | 15,059 | 4,400 | 1,017 | 10,418 | 5,658 | 10,058 |
| 16 | 2023 | 14,946 | 4,400 | 1,017 | 10,491 | 5,472 | 9,872 |
| 17 | 2024 | 14,842 | 4,400 | 1,017 | 10,565 | 5,294 | 9,694 |
| 18 | 2025 | 14,723 | 4,400 | 1,017 | 10,639 | 5,101 | 9,501 |
| 19 | 2026 | 14,599 | 4,400 | 1,017 | 10,714 | 4,902 | 9,302 |
| 20 | 2027 | 14,516 | 4,400 | 1,017 | 10,789 | 4,744 | 9,144 |
| 21 | 2028 | 14,422 | 4,400 | 1,017 | 10,865 | 4,573 | 8,973 |
| 22 | 2029 | 14,116 | 4,400 | 1,017 | 10,941 | 4,191 | 8,591 |
| 23 | 2030 | 13,708 | 4,400 | 1,017 | 11,018 | 3,707 | 8,107 |
| 24 | 2031 | 13,230 | 4,400 | 1,017 | 11,096 | 3,152 | 7,552 |
| 25 | 2032 | 12,717 | 4,400 | 1,017 | 11,174 | 2,561 | 6,961 |
| 26 | 2033 | 12,212 | 4,400 | 1,017 | 11,252 | 1,977 | 6,377 |
| 27 | 2034 | 11,690 | 4,400 | 1,017 | 11,331 | 1,376 | 5,776 |
| 28 | 2035 | 11,059 | 4,400 | 1,017 | 11,411 | 666 | 5,066 |
| 29 | 2036 | 10,550 | 4,400 | 1,017 | 11,491 | 76 | 4,476 |
| 30 | 2037 | 10,080 | 4,400 | 1,017 | 11,492 | (395) | 4,005 |

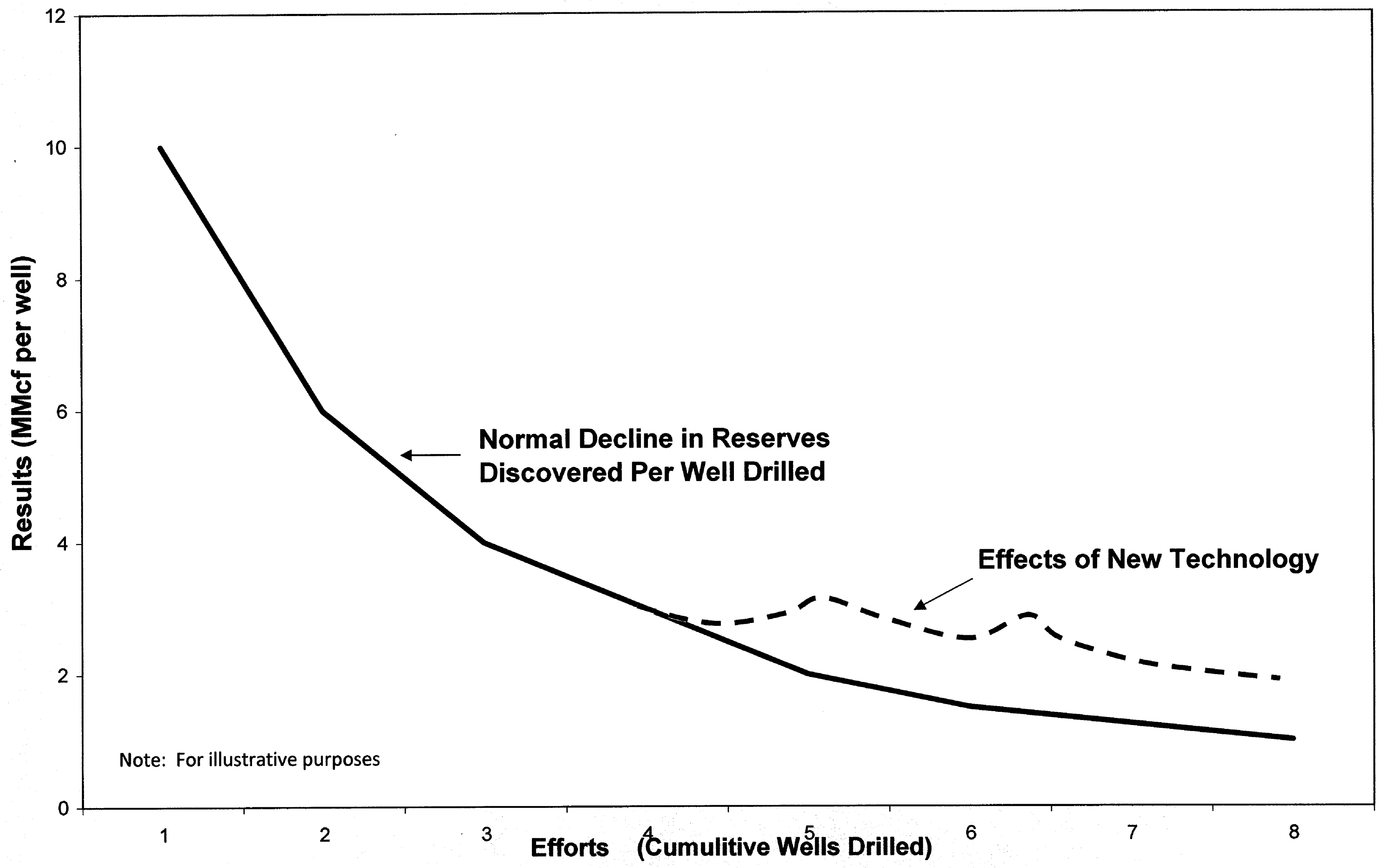
Schedule No. 5
Exhibit No. EHF-3

## Canadian Gas Available for Export With Alaskan Gas

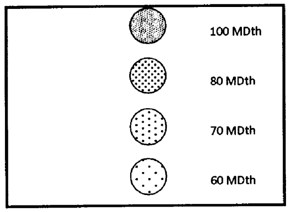


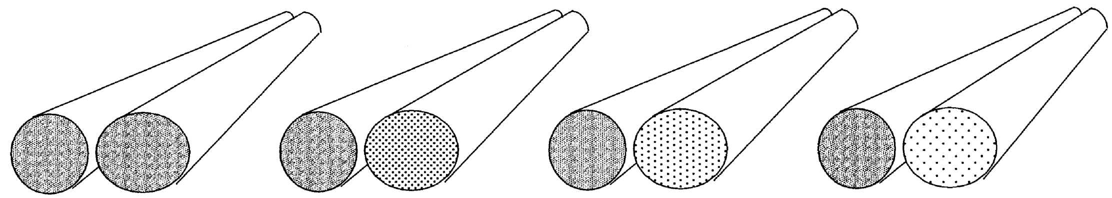
Schedule No. 6
Exhibit No. EHF-3

# TYPICAL DISCOVERY - PROCESS FINDING RATE



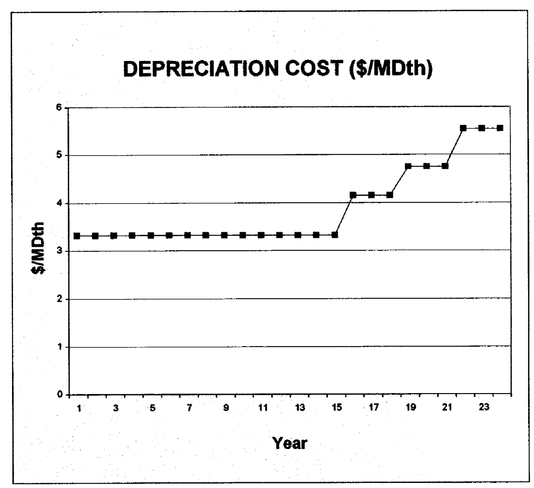
# ILLUSTRATIVE EXAMPLE OF THE EFFECTS OF UNDERUTILIZATION ON THE ECONOMIC LIFE OF A PIPELINE



| | | | | |
|---|---|---|---|---|
| Plant Investment ($) | 10,000 | 10,000 | 10,000 | 10,000 |
| Cost of Service ($) | 1,000 | 900 | 800 | 700 |
| Depreciation Rate - Not taking into account underutilization (%) | 3.33 | 3.33 | 3.33 | 3.33 |
| Depreciation Expense ($) | 333 | 333 | 333 | 333 |
| Time Period (Years) | 0 TO 15 | 16 to 18 | 19 to 21 | 22 to 24 |
| Throughput (MDth) | 100 | 80 | 70 | 60 |
| Depr Exp Per MDth | 3.33 $/MDth | 4.16 $/MDth | 4.76 $/MDth | 5.55 $/MDth |
| Cost of Serv Per MDth | 10 $/MDth | 11.25 $/MDth | 11.43 $/MDth | 11.67 $/MDth |

| Year | Depreciation Cost Per MDth |
|---|---|
| 1 | 3.33 |
| 2 | 3.33 |
| 3 | 3.33 |
| 4 | 3.33 |
| 5 | 3.33 |
| 6 | 3.33 |
| 7 | 3.33 |
| 8 | 3.33 |
| 9 | 3.33 |
| 10 | 3.33 |
| 11 | 3.33 |
| 12 | 3.33 |
| 13 | 3.33 |
| 14 | 3.33 |
| 15 | 3.33 |
| 16 | 4.16 |
| 17 | 4.16 |
| 18 | 4.16 |
| 19 | 4.76 |
| 20 | 4.76 |
| 21 | 4.76 |
| 22 | 5.55 |
| 23 | 5.55 |
| 24 | 5.55 |



# DETERMINATION OF THE AVERAGE ECONOMIC LIFE OF PAIUTE'S PIPELINE FACILITIES

## Rocky Mountain Gas Supplies

| Year | Gas Availabile For Export (Relative Throughput) Tcf Per Year | Adjusted for Paiute Share Tcf Per Day | Deficient Flow Capability as a % of Export Level 13.78 | Facility Redundancy of Current Plant Facilities $ 143,816,186 | Underutilization of Facilities | 3-Year Increments of Underutilization of Facilities | Years Remaining From 2007 | Weighted Years *Year-to-Year* *Direct Weighting* | Weighted Years *3-Year Increments* *Direct Weighting* |
|---|---|---|---|---|---|---|---|---|---|
| 2008 | 13.779 | 13.779 | 100% | 143,816,186 | | | 1 | | |
| 2009 | 16.219 | 13.779 | 100% | 143,816,186 | - | | 2 | - | |
| 2010 | 18.082 | 13.779 | 100% | 143,816,186 | - | | 3 | - | |
| 2011 | 19.531 | 13.779 | 100% | 143,816,186 | | - | 4 | - | - |
| 2012 | 20.706 | 13.779 | 100% | 143,816,186 | - | | 5 | - | |
| 2013 | 21.584 | 13.779 | 100% | 143,816,186 | - | | 6 | - | |
| 2014 | 22.274 | 13.779 | 100% | 143,816,186 | | - | 7 | - | - |
| 2015 | 22.856 | 13.779 | 100% | 143,816,186 | - | | 8 | - | |
| 2016 | 23.334 | 13.779 | 100% | 143,816,186 | - | | 9 | - | |
| 2017 | 23.658 | 13.779 | 100% | 143,816,186 | - | - | 10 | - | - |
| 2018 | 23.930 | 13.779 | 100% | 143,816,186 | - | | 11 | - | |
| 2019 | 23.927 | 13.779 | 100% | 143,816,186 | - | | 12 | - | |
| 2020 | 23.488 | 13.779 | 100% | 143,816,186 | - | - | 13 | - | - |
| 2021 | 22.745 | 13.779 | 100% | 143,816,186 | - | | 14 | - | |
| 2022 | 21.804 | 13.779 | 100% | 143,816,186 | - | | 15 | - | |
| 2023 | 20.726 | 13.098 | 95% | 136,707,645 | 7,108,541 | 7,108,541 | 16 | 113,736,648.13 | 113,736,648.13 |
| 2024 | 19.556 | 12.358 | 90% | 128,989,316 | 7,718,329 | | 17 | 131,211,600.12 | |
| 2025 | 18.368 | 11.608 | 84% | 121,152,081 | 7,837,235 | | 18 | 141,070,228.80 | |
| 2026 | 17.183 | 10.859 | 79% | 113,336,304 | 7,815,777 | 23,371,341 | 19 | 148,499,757.85 | 444,055,481 |
| 2027 | 15.916 | 10.058 | 73% | 104,983,043 | 8,353,262 | | 20 | 167,065,237.35 | |
| 2028 | 14.692 | 9.285 | 67% | 96,910,551 | 8,072,491 | | 21 | 169,522,320.32 | |
| 2029 | 13.525 | 8.547 | 62% | 89,210,237 | 7,700,314 | 24,126,068 | 22 | 169,406,915.42 | 530,773,488 |
| 2030 | 12.416 | 7.846 | 57% | 81,895,840 | 7,314,397 | | 23 | 168,231,129.15 | |
| 2031 | 11.367 | 7.183 | 52% | 74,975,117 | 6,920,723 | | 24 | 166,097,356.32 | |
| 2032 | 10.380 | 6.560 | 48% | 68,464,550 | 6,510,567 | 20,745,687 | 25 | 162,764,173.99 | 518,642,176 |
| 2033 | 9.457 | 5.976 | 43% | 62,378,865 | 6,085,685 | | 26 | 158,227,814.12 | |
| 2034 | 8.599 | 5.434 | 39% | 56,715,839 | 5,663,025 | | 27 | 152,901,678.58 | |
| 2035 | 7.804 | 4.932 | 36% | 51,472,947 | 5,242,892 | 16,991,603 | 28 | 146,800,985.02 | 475,764,873 |
| 2036 | 7.072 | 4.469 | 32% | 46,644,433 | 4,828,514 | | 29 | 140,026,898.70 | |
| 2037 | 6.522 | 4.122 | 30% | 43,018,652 | 46,644,433 | 51,472,947 | 30 | 1,399,333,000.25 | 1,544,188,413 |
| | | | | | 143,816,186 | 143,816,186 | $\boxed{24.58}$ | 3,534,895,744 | 3,627,161,079 |
| | | | | | | | | | $\boxed{25.22}$ |

Weighted Average Economic Life

*Direct Weighting*

*Direct Weighting 3- Year Increments*

Schedule No. 9
Exhibit No. EHF-3

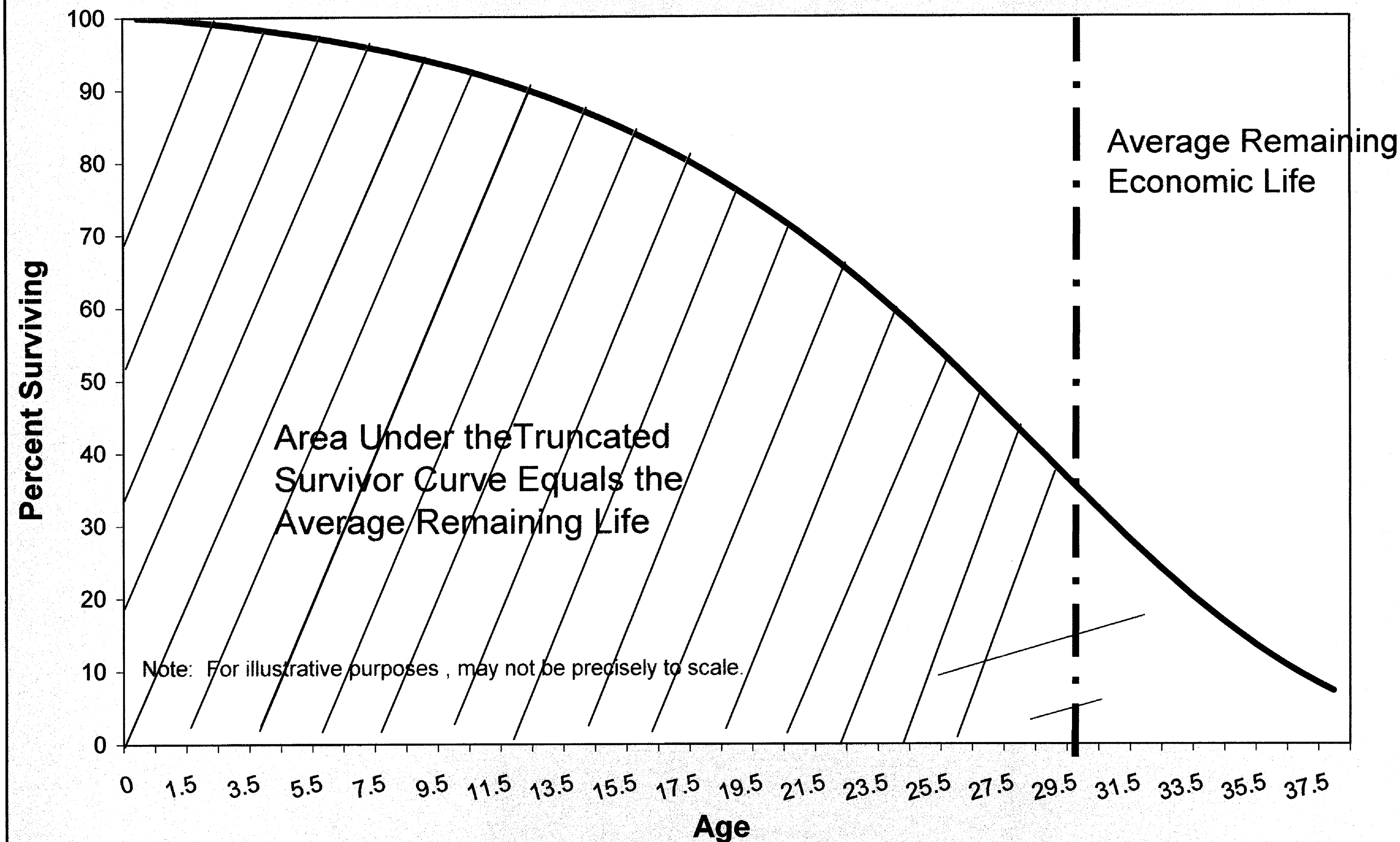
# DETERMINATION OF THE AVERAGE ECONOMIC LIFE OF PAIUTE'S PIPELINE FACILITIES

| Year | Gas Available For Export (Relative Throughput) MMcf Per Day | Adjusted for Paiute Share MMcf Per Day | Deficient Flow Capability as a % of Export Level 8,521 | Facility Redundancy of Current Plant Facilities $ 143,816,186 | Underutilization of Facilities | 3-Year Increments of Underutilization of Facilities | Years Remaining From 2007 | Weighted Years *Year-to-Year Direct Weighting* | Weighted Years *3-Year Increments Direct Weighting* |
|---|---|---|---|---|---|---|---|---|---|
| 2007 | 10,172 | 10,172 | | | | | | | |
| 2008 | 8,521 | 8,521 | | - | | | 1 | - | |
| 2009 | 7,927 | 7,927 | | - | | | 2 | - | |
| 2010 | 7,719 | 7,719 | | - | | - | 3 | - | - |
| 2011 | 7,280 | 7,280 | | - | | | 4 | - | |
| 2012 | 6,878 | 6,878 | | - | | | 5 | - | |
| 2013 | 7,077 | 7,077 | | - | | - | 6 | - | - |
| 2014 | 7,923 | 7,923 | | - | | | 7 | - | |
| 2015 | 7,527 | 7,527 | | - | | | 8 | - | |
| 2016 | 7,153 | 7,153 | | - | | - | 9 | - | - |
| 2017 | 7,820 | 7,820 | | - | | | 10 | - | |
| 2018 | 8,556 | 8,556 | | - | | | 11 | - | |
| 2019 | 10,640 | 10,640 | | - | | - | 12 | - | - |
| 2020 | 10,413 | 10,413 | | - | | | 13 | - | |
| 2021 | 10,241 | 10,241 | | - | | | 14 | - | |
| 2022 | 10,058 | 10,058 | | - | | - | 15 | - | - |
| 2023 | 9,872 | 9,872 | | - | | | 16 | - | |
| 2024 | 9,694 | 9,694 | | - | | | 17 | - | |
| 2025 | 9,501 | 9,501 | | - | | - | 18 | - | - |
| 2026 | 9,302 | 9,302 | | - | | | 19 | - | |
| 2027 | 9,144 | 9,144 | | - | - | | 20 | - | - |
| 2028 | 8,973 | 8,973 | | - | - | - | 21 | - | - |
| 2029 | 8,591 | 8,591 | | - | - | | 22 | - | |
| 2030 | 8,107 | 8,107 | 95% | 136,821,778 | 6,994,408 | | 23 | 160,871,377.68 | - |
| 2031 | 7,552 | 7,552 | 89% | 127,454,819 | 9,366,959 | | 24 | 224,807,013.72 | - |
| 2032 | 6,961 | 6,961 | 82% | 117,482,823 | 9,971,997 | 26,333,363 | 25 | 249,299,915.89 | 658,334,082 |
| 2033 | 6,377 | 6,377 | 75% | 107,632,890 | 9,849,932 | | 26 | 256,098,240.88 | - |
| 2034 | 5,776 | 5,776 | 68% | 97,480,562 | 10,152,329 | | 27 | 274,112,871.41 | - |
| 2035 | 5,066 | 5,066 | 59% | 85,496,341 | 11,984,221 | 31,986,482 | 28 | 335,558,194.30 | 895,621,500 |
| 2036 | 4,476 | 4,476 | 53% | 75,552,679 | 9,943,661 | | 29 | 288,366,177.39 | - |
| 2037 | 4,005 | 4,005 | 47% | 67,594,986 | 75,552,679 | 85,496,341 | 30 | 2,266,580,379.24 | 2,564,890,218 |
| | | | Weighted Average Economic Life | | 143,816,186 | 143,816,186 | $\boxed{28.20}$ | 4,055,694,170.50 | 4,118,845,799 |
| | | | | | | | | | $\boxed{28.64}$ |

Direct Weighting

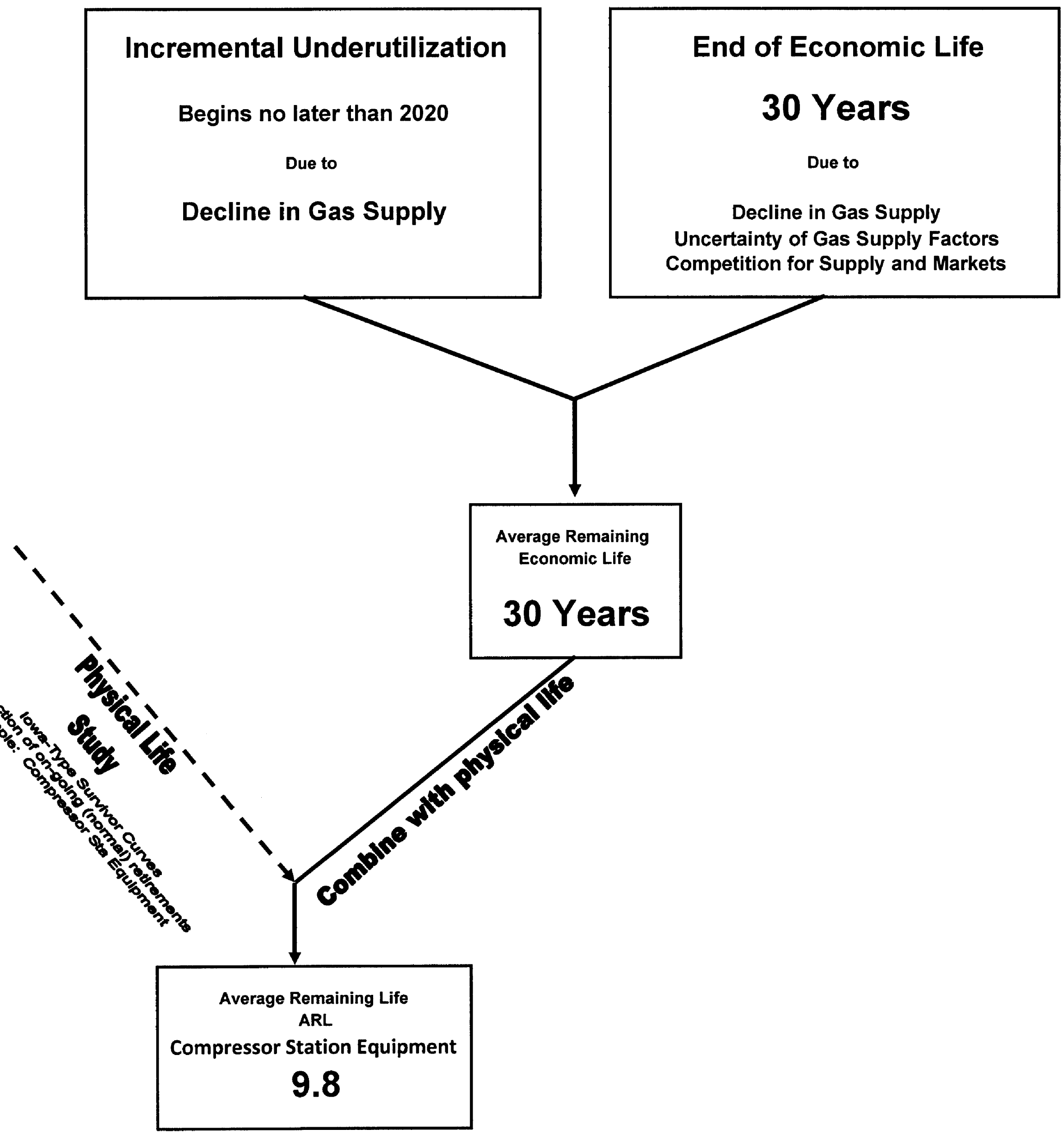
Direct Weighting 3- Year Increments

## Survivor Curve
## Account 368 Compressor Station Equipment



# Economic and Depreciable Life

## Economic Life



Schedule No. 11
Exhibit No. EHF-3

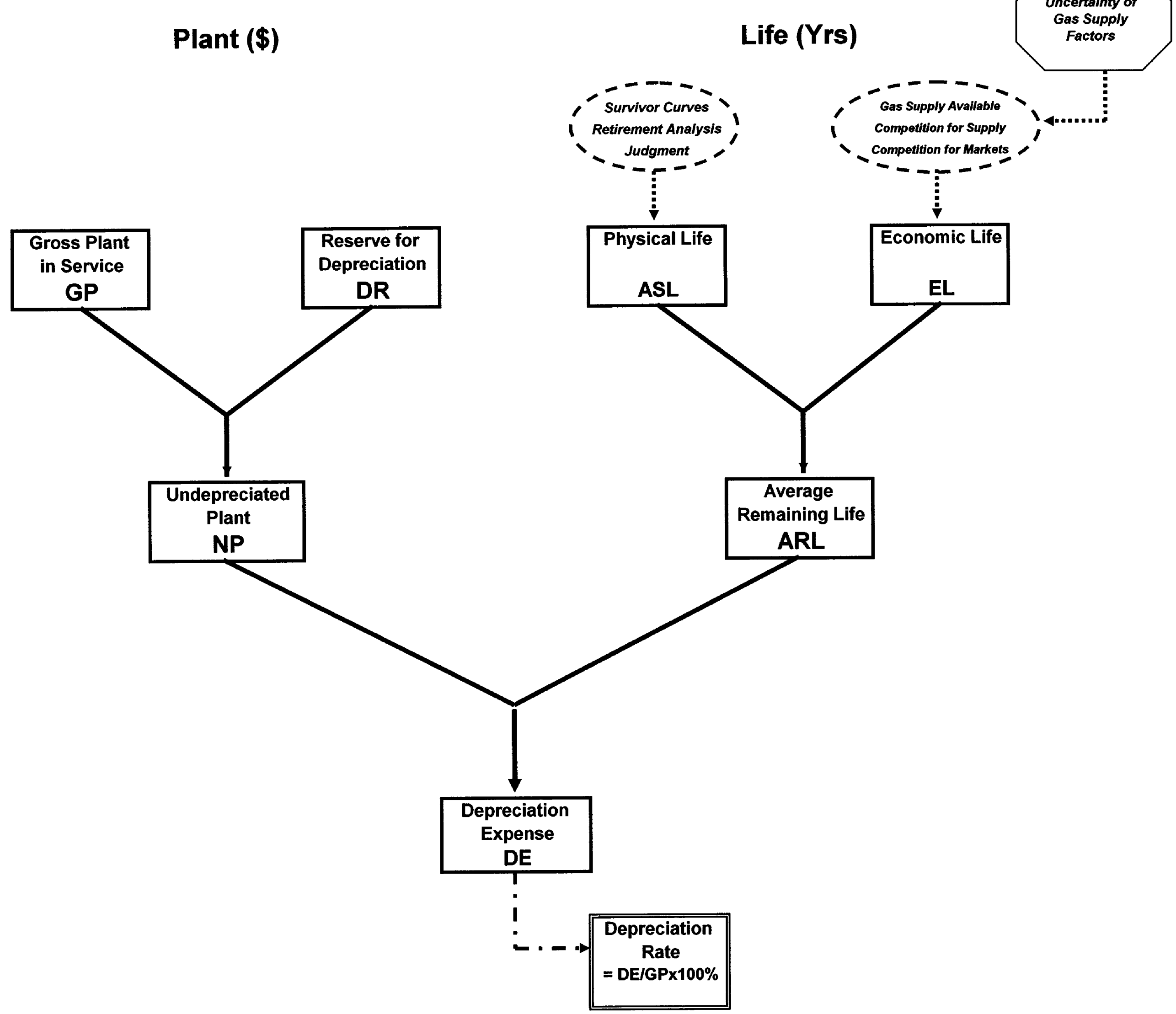
# Paiute Pipeline Company
## Determination of Depreciation

*Gas Plant and Reserve Balance as of November 30, 2008*

| Account No. | Description | Original Cost | Depr Reserve | Undepreciated Original Cost | Average Service Life | Average Remaining Life | Depreciation Accrual | Depreciation Rate |
|---|---|---|---|---|---|---|---|---|
| | | $ | $ | $ | Years | Years | $ | % |
| | DEPRECIABLE PLANT | | | | | | | |
| | Other Storage Plant | | | | | | | |
| 361 | Structures | 3,122,742 | 1,622,565 | 1,500,177 | 27 | 9.7 | 154,657 | 4.95 |
| 362 | Gas Holders | 4,506,639 | 1,059,060 | 3,447,579 | 27 | 7.7 | 447,738 | 9.94 |
| 363 | LNG Equipment | 11,386,609 | 2,954,392 | 8,432,217 | 24 | 9.5 | 887,602 | 7.80 |
| | Total Other Storage Plant | 19,015,990 | 5,636,017 | 13,379,973 | | | 1,489,997 | 7.84 |
| | Transmission Plant | | | | | | | |
| 365.2 | Rights of Way | 654,676 | 186,282 | 468,394 | 55 | 25.3 | 18,514 | 2.83 |
| 366.1 | Structures - Compressor Station | 705,418 | 562,833 | 142,585 | 28 | 2.8 | 50,923 | 7.22 |
| 366.2 | Structures - Other | 70,058 | 62,405 | 7,653 | 30 | 10.4 | 736 | 1.05 |
| 367 | Mains | 86,103,050 | 33,884,175 | 52,218,875 | 50 | 23.1 | 2,260,557 | 2.63 |
| | Mains-Lake Tahoe Area | 13,395,242 | 3,099,560 | 10,295,682 | 50 | 26.5 | 388,516 | 2.90 |
| | Mains-Carson Lateral Project | 2,861,763 | 519,226 | 2,342,537 | 50 | 26.9 | 87,083 | 3.04 |
| | Mains-2003 Expansion | 7,223,852 | 945,501 | 6,278,351 | 50 | 27.3 | 229,976 | 3.18 |
| 368 | Compressor Station Equipment | 18,326,368 | 11,174,939 | 7,151,429 | 24 | 9.8 | 729,738 | 3.98 |
| | Compressor Station Equipment-Battle Mountain | 2,179,024 | 1,136,545 | 1,042,479 | 24 | 12.5 | 83,398 | 3.83 |
| 369 | Measuring and Regulating Station Equipment | 8,107,281 | 3,984,125 | 4,123,156 | 32 | 18.3 | 225,309 | 2.78 |
| | Measuring and Regulating Station Equipment-Lake Tahoe | 361,501 | 142,737 | 218,764 | 32 | 19.2 | 11,394 | 3.15 |
| | Measuring and Regulating Station Equipment-Paiute Expan | 214,607 | 48,995 | 165,612 | 32 | 21.5 | 7,703 | 3.59 |
| 370 | Communication Equipment | 3,532,234 | 2,678,202 | 854,032 | 15 | 4.6 | 185,659 | 5.26 |
| 371 | Miscellaneous Equipment | 81,112 | 56,437 | 24,675 | 20 | 8.8 | 2,804 | 3.46 |
| | Total Transmission Plant | 143,816,186 | 58,481,962 | 85,334,224 | | | 4,282,311 | 2.98 |
| | General Plant | | | | | | | |
| 390.1 | Structures and Improvements | 3,123,092 | 295,189 | 2,827,903 | 25 | | 124,924 | 4.00 |
| 391 | Office Furniture and Equipment | 107,026 | 6,418 | 100,608 | 20 | | 5,351 | 5.00 |
| 391.1 | Computer Software and Hardware | 481,221 | 87,218 | 394,003 | 4 | | 120,305 | 25.00 |
| 392.1 | Transportation Equipment | 1,290,610 | 497,753 | 792,857 | 6 | | 193,592 | 15.00 |
| 392.2 | Transportation Equipment | 943,556 | 974,123 | (30,567) | 12.5 | | 75,484 | 8.00 |
| 393 | Stores Equipment | 40,580 | 2,429 | 38,151 | 20 | | 2,029 | 5.00 |
| 394 | Tools, Shop, and Garage Equipment | 585,173 | 146,576 | 438,597 | 10 | | 58,517 | 10.00 |
| 395 | Laboratory Equipment | 58,737 | 1,179 | 57,558 | 6 | | 9,790 | 16.67 |
| 396 | Power Operated Equipment | 1,430,389 | 254,021 | 1,176,368 | 15 | | 95,359 | 6.67 |
| 397 | Communication Equipment | 26,837 | (48,117) | 74,954 | 5 | | 5,367 | 20.00 |
| 397.2 | Telemetry Equipment | - | (5,748) | 5,748 | 8 | | - | 12.50 |
| 398 | Miscellaneous Equipment | 26,604 | 6,872 | 19,732 | 20 | | 1,330 | 5.00 |
| | Total General Plant | 8,113,825 | 2,217,913 | 5,895,912 | | | 692,049 | 8.53 |

Schedule No. 12
Exhibit No. EHF-3

# Depreciation Analysis



**Schedule No. 13**
**Exhibit No EHF-3**

# Paiute Pipeline Company

## Experienced Salvage

1966 through 2008

**Account 367 Mains**

| Year | Retirements Original Cost | Gross Salvage Amount | Gross Salvage Percent | Cost of Removal Amount | Cost of Removal Percent | Net Salvage Amount | Net Salvage Percent |
|---|---|---|---|---|---|---|---|
| 1966 | 1,225 | | - | | - | - | - |
| 1967 | 805 | 506 | 62.86 | 1,283 | 159.38 | (777) | (96.52) |
| 1968 | 4,707 | 13,057 | 277.40 | 112 | 2.38 | 12,945 | 275.02 |
| 1969 | 692 | | - | | - | - | - |
| 1970 | 10,786 | 393 | 3.64 | | - | 393 | 3.64 |
| 1971 | | | | | | | |
| 1972 | | | | | | | |
| 1973 | 2,020 | 200 | 9.90 | 732 | 36.24 | (532) | (26.34) |
| 1974 | 16,840 | 1,969 | 11.69 | 2,245 | 13.33 | (276) | (1.64) |
| 1975 | 6,478 | 3,030 | 46.77 | 506 | 7.81 | 2,524 | 38.96 |
| 1976 | 3,109 | 1,108 | 35.64 | 310 | 9.97 | 798 | 25.67 |
| 1977 | 1,889 | 1,648 | 87.24 | 305 | 16.15 | 1,343 | 71.10 |
| 1978 | 4,428 | | - | 1,311 | 29.61 | (1,311) | (29.61) |
| 1979 | | | | | | | |
| 1980 | 4,826 | 578 | 11.98 | 6,995 | 144.94 | (6,417) | (132.97) |
| 1981 | 10,494 | 2,067 | 19.70 | 12,874 | 122.68 | (10,807) | (102.98) |
| 1982 | 2,559 | | - | 146 | 5.71 | (146) | (5.71) |
| 1983 | 27,306 | | - | 2,043 | 7.48 | (2,043) | (7.48) |
| 1984 | 16,018 | | - | 338 | 2.11 | (338) | (2.11) |
| 1985 | 6,402 | | - | 1,384 | 21.62 | (1,384) | (21.62) |
| 1986 | 26,336 | | - | 33,578 | 127.50 | (33,578) | (127.50) |
| 1987 | 35,679 | | - | 15,823 | 44.35 | (15,823) | (44.35) |
| 1988 | 502,288 | 393,719 | 78.39 | 58,164 | 11.58 | 335,555 | 66.81 |
| 1989 | 4,150 | | - | | - | - | - |
| 1990 | 485,228 | | - | 1,102 | 0.23 | (1,102) | (0.23) |
| 1991 | 95,407 | | - | 95,239 | 99.82 | (95,239) | (99.82) |
| 1992 | 7,990 | | - | | - | - | - |
| 1993 | 4,888 | | - | | - | - | - |
| 1994 | 59,114 | | - | 5,128 | 8.67 | (5,128) | (8.67) |
| 1995 | 78,417 | - | - | 6,900 | 8.80 | (6,900) | (8.80) |
| 1996 | 57,809 | | - | 62,772 | 108.59 | (62,772) | (108.59) |
| 1997 | 82,751 | | - | 7,250 | 8.76 | (7,250) | (8.76) |
| 1998 | 84,112 | | - | 4,835 | 5.75 | (4,835) | (5.75) |
| 1999 | 42,317 | | - | 12,201 | 28.83 | (12,201) | (28.83) |
| 2000 | 351,191 | | - | 3,308 | 0.94 | (3,308) | (0.94) |
| 2001 | 93,218 | | - | 48,790 | 52.34 | (48,790) | (52.34) |
| 2002 | 16,229 | | - | 4,014 | 24.73 | (4,014) | (24.73) |
| 2003 | 30,909 | | - | | - | - | - |
| 2004 | 51,289 | | | 48,162.00 | 93.90 | (48,162) | (93.90) |
| 2005 | 61,327 | | | - | - | - | - |
| 2006 | 8,562 | | | - | - | - | - |
| 2007 | 29,522 | | | - | - | - | - |
| 2008 | 46,387 | | | 649 | 1.40 | (649) | (1.40) |
| 5-Year Avg | 533,864 | | | 68,313 | | (68,313) | (12.80) |
| 10-Year Avg | 896,067 | - | | 155,198 | | (155,198) | (17.32) |
| 15-Year Avg | 1,745,616 | | | 251,539 | | (251,539) | (14.41) |
| 20-Year Avg | 2,080,453 | 393,719 | | 360,826 | | 32,893 | 1.58 |

# Paiute Pipeline Company
## Determination of Negative Salvage Rate

| | | Depreciable Plant Balance | Future Net Salvage Rate | Future Net Salvage Amount | Accumulated Negative Salvage Accruals | Average Remaining Life | Annual Accrual | Negative Salvage Rate |
|---|---|---|---|---|---|---|---|---|
| | **Other Storage Plant** | $ | % | $ | $ | | | |
| 361 | Structures | 3,122,742 | -9 | 281,047 | 13,313 | 9.7 | 27,601 | 0.88 |
| 362 | Gas Holders | 4,506,639 | -12 | 540,797 | 18,026 | 7.7 | 67,892 | 1.51 |
| 363 | LNG Equipment | 11,386,609 | -9 | 1,024,795 | 31,967 | 9.5 | 104,508 | 0.92 |
| | Total Other Storage Plant | 19,015,990 | | | 63,306 | | | |
| | **Transmission Plant** | | | | | | | |
| 365.2 | Rights of Way | 654,676 | 0 | | | 25.3 | | |
| 366.1 | Structures - Compressor Station | 705,418 | -15 | 105,813 | 45,053 | 2.8 | 21,700 | 3.08 |
| 366.2 | Structures - Other | 70,058 | -5 | 3,503 | 3,709 | 10.4 | - | - |
| 367 | Mains - Original System | 86,103,050 | -17 | 14,637,519 | 1,081,553 | 23.1 | 586,838 | 0.68 |
| | Mains-Lake Tahoe Area | 13,395,242 | -17 | 2,277,191 | | 26.5 | 85,932 | 0.64 |
| | Mains-Carson Lateral Project | 2,861,763 | -17 | 486,500 | | 26.9 | 18,085 | 0.63 |
| | Mains-2003 Expansion | 7,223,852 | -17 | 1,228,055 | | 27.3 | 44,984 | 0.62 |
| 368 | Compressor Station Equipment | 18,326,368 | -10 | 1,832,637 | 823,100 | 9.8 | 103,014 | 0.56 |
| | Compressor Station Equipment-Battle Mountain | 2,179,024 | -10 | 217,902 | | 12.5 | 17,432 | 0.80 |
| 369 | Measuring and Regulating Station Equipment | 8,107,281 | -15 | 1,216,092 | 572,050 | 18.3 | 35,194 | 0.43 |
| | Measuring and Regulating Station Equipment-Lake Tahoe | 361,501 | -15 | 54,225 | | 19.2 | 2,824 | 0.78 |
| | Measuring and Regulating Station Equipment-Paiute Expan | 214,607 | -15 | 32,191 | | 21.5 | 1,497 | 0.70 |
| 370 | Communication Equipment | 3,532,234 | -2 | 70,645 | 37,505 | 4.6 | 7,204 | 0.20 |
| 371 | Miscellaneous Equipment | 81,112 | 0 | - | | 8.8 | - | - |
| | Total Transmission Plant | 143,816,186 | | 22,162,272 | 2,562,970 | | 924,705 | 0.64 |

Exhibit No
EHF - 4
cover thru 46

Exhibit No. EHF-5

# Assessment of the Availability Of Natural Gas in The Northern Rocky Mountain Area

Edward H. Feinstein

## I. INTRODUCTION

Edward H. Feinstein has prepared this report on conventional natural gas supplies of the Northern Rocky Mountain. In this report, specific reviews were made of the history, gas production, estimates of proven reserves and estimates of undiscovered resources.

The principal purpose of this report is to present estimates of the availability or productive capability of natural gas in certain regions of the Rocky Mountain Area. An assessment of the unconventional resource, coal-bed methane in the Rocky Mountain Area is also included in this report. Forecasts of the area-wide natural gas productive capability were based upon estimates of proven reserves, discovery process estimates of reserve additions, pipeline connection parameters and deliverability profiles. Discovery process is the relationship between the efforts (drilling) and the potential for natural gas discoveries.

## II. SUMMARY AND CONCLUSIONS

The gas supply regions of the Northern Rocky Mountain Area are in both an intermediate and mature stage of development. The assessment of gas supply herein is based on three ingredients: remaining reserves, reserves appreciation and undiscovered resources. Remaining reserves are the proved and economically producible gas discoveries. Reserves appreciation is resources believed to exist that are directly related to reserves already discovered. Undiscovered resources are estimated gas accumulations that are believed to exist, but have not yet been proven by drilling.

The productive capacities of proven gas reserves of each producing region of the Rocky Mountain area vary considerably. Reserves-to-production ratios in each area presently are at their lowest level, reflecting only modest surplus pipeline gas.

Estimates of future annual gas discoveries were made employing a discovery - process model as described below. Productive capacity decline rates were applied to determine the availability of gas from new supply sources.

The availability of supplies from future sources was added to the availability of current proven sources to arrive at the overall productive capability of natural gas supplies from the various areas.

These supply areas are currently reliable, active and viable in providing adequate throughput for the network of pipelines connected to them. In the long-term, however, the current grade of natural gas accumulations will be exhausted, giving way to the discovery of smaller deposits. The result will be a gradual decline in the productive capability from existing and future connected supply sources.

**III. BACKGROUND – NORTHERN ROCKY MOUNTAIN AREA**

The Northern Rocky Mountain area is made up of the states of Colorado, Utah, Wyoming, Montana and North Dakota. The Rocky Mountain area of Colorado, Utah and Wyoming is one of only two oil and gas provinces in North America that have been growing in gas production over the past 10 years. Although relatively small, productive areas of Montana and North Dakota, while not in a growth stage, presently remain in a constant state of gas discoveries and production. The Rocky Mountain region will continue to grow in gas production for at least 10 more years. The Rocky Mountain area is a large, gas prone, geologically heterogeneous area that contains numerous gas productive basins. Numerous oil and gas prone formations and prospective reservoirs are present. Productive reservoirs include carbonates (limestone) and sandstones with all types of porosity and permeability as well as naturally fractured reservoirs and coalbed methane reservoirs. The Potential Gas Committee (PGC) has estimated (2006) potential gas resources of 131 Tcf.

A challenge for certain gas resources in the region is to exploit technically available gas in locations where reserves are characterized by "tight" matrix porosity and permeability, naturally fractured reservoirs and coalbed methane and make them economically recoverable resources.

## IV. METHODOLOGY

Proven Reserves

An analysis of the producibility of proven gas reserves was made using information obtained from the Energy Information Administration (EIA) and the Potential Gas Committee (PGC). EIA's proven reserves are as of the end of 2006. The productive availability of those proven reserves was obtained from data assembled by the (PGC) and extrapolated employing a constant percentage decline until the reserves are exhausted. The proven gas reserves were obtained from EIA, which in turn collected the data from producers. The PGC provided the production rate of those reserves.

Future Reserve Additions

A characteristic observed in the petroleum producing areas of the North American gas supply areas is a rapid drop off in size from the largest known field to the fields and a seemingly unending amount of small fields. The Rocky Mountain Area, as well as the Midcontinent Area are no exception. An example of the distribution of gas reserves in the a portion of the Rocky Mountain Area, referred to as the Greater Green River Basin, is shown on Figure 1. This is typical of the exploratory events of an oil and gas province.

The basic concept of this Finding Rate Methodology is shown on Figure 2. At times, the declining rate of effectiveness is mitigated by: better technologies for discovery and resource recovery, greater understanding of the geophysics, and reservoir performance of the field in the province. This mitigation is also shown on Figure 2.

Advances in technology are, however, a double-edged sword with respect to extending the life of gas resources and ultimately the life of associated producing equipment and pipeline facilities. Exploration and production (E&P) technology varies throughout the industry, from increasing the success ratio in exploration to more efficient production techniques. While some advances in technology may allow the commercialization of heretofore unproduceable hydrocarbon deposits, most others relate to the profitability of technically discoverable oil and gas resources. For example, four causes for the accelerated production of a given gas resource in the Rocky Mountain area and the accelerating decline rates in the WCSB, relate to technology. They are:

- 3-D seismic
- Horizontal wells
- Efficient completion techniques

This can also be seen by analysis of the finding rate methodology in terms of exploratory effort. Most of the significant gas discoveries are actually associated with fields previously discovered. See the historical data shown on Tables 1 and 2, and Figure 3. The exploratory effect is the accumulation of wells drilled over time. The above finding rate data is a 5-year snapshot of a long trend from higher levels of how effective exploration and development was in prior years. I observed both exploratory wells and development wells. Development wells do not reflect the effort to find new discoveries. However, they contribute significantly to the reserve base. "Results" (in terms of annual gas discoveries) of the drilling effort are also shown on Tables 1 and 2 for all the areas.

When these "results" or annual gas discoveries are divided by the annual exploratory wells drilled, a more focused relationship develops as to the size of the discovery for the effort expended. This confirms that the large fields have already been discovered and that new discoveries are going to be generally confined to a considerably more moderate size. This concept of discoveries per well drilled is referred to by the EIA as the Finding Rate Methodology.

The Finding Rate Methodology began in the late 1950s and early 1960s and continues to be used today. The famous oil and gas forecaster, M. King Hubbert developed various aspects of it and used it in his presentations and forecasts. The renown petroleum engineer and recipient of the C. C. Uren Award from the Society of Petroleum Engineers, J.J Arps also developed the Finding Rate Methodology in the early 1960s, referring to it as the Effectiveness of Exploration. The methodology was and still is employed widely by those forecasting oil and gas resources. I employed the methodology in 1973 and continue to do so. The EIA exclusively uses the Finding Rate Methodology to forecast long range oil and gas discoveries in its state-of-the art Annual Energy Outlook publication.

The model used the relationship between annual reserve additions and both exploratory and development well drilling over time in years and cumulative feet drilled from a base of 1990. For the most likely case, I extrapolated the exploratory finding rate at a constant level using the 2000 - 2006 mean value developed in Tables 1 and 2 until a point is reached where 90 percent of the total endowment is reached. The total endowment is defined as all the gas that will eventually be discovered (past discoveries plus the PGC's estimates of potential resources). PGC's estimates of potential gas resources for the Northern Rocky Mountain area are shown on Table 1.

Table 1

**Estimate of Potential Gas Resources**
**Rocky Mountain Area**
**As of End of 2006**
**Volumes in Bcf**

| Producing Province | Resource Estimate | | | | Total Resource Estimate |
|---|---|---|---|---|---|
| | Growth in Reserves | | New Fields | | |
| | 0-15,000 Feet | CBM | 0-15,000 Feet | CBM | |
| Powder River Basin | 1,565 | 4,627 | 2,347 | 13,880 | 22,419 |
| Big Horn Basin | 827 | - | 1,131 | 25 | 1,983 |
| Wind River Basin | 4,984 | - | 9,581 | 50 | 14,615 |
| Greater Green River Basin | 10,946 | - | 9,873 | 375 | 21,194 |
| Denver Basin and Environs | 1,675 | - | 1,128 | - | 2,803 |
| Uinta/Piceance Basin and Environs | 34,154 | 133 | 27,883 | 4,115 | 66,285 |
| Thrust Belt | 800 | - | 1,000 | - | 1,800 |
| Total Colorado, Utah and Wyoming | 54,951 | 4,760 | 52,943 | 18,445 | 131,099 |

Source: Potential Gas Committee, 2007

*Note: CBM - Coalbed Methane*

Table 2 shows the total endowment as of 2006 for the gas provinces of Colorado, Utah and Wyoming.

Table 2

**ULTIMATE REMAINING GAS RESOURCES**
*Volumes in Trillion Cubic Feet*

| | | Rocky Mountain Area<br>Colo, Utah and Wyo |
|---|---|---|
| 1 | Cumulative Production to 12/31/1988 | 23.96 |
| 2 | Incremental Production 1989 to 12/31/2006 | 34.23 |
| 3 | Remaining Proved Reserves at 12/31/2006 | 45.84 |
| 4 | Potential Gas Resources Estimated at 12/31/2006 Wet | 131.10 |
| | Potential Gas Resources Estimated at 12/31/2006 Dry Marketable | 127.17 |
| 5 | Ultimate Estimated Resources (12/31/2006) | 231.20 |
| 6 | Gas Discoveries to 12/31/2006 | 104.04 |
| 7 | Percent Remaining to be Discovered | 55.00 |

I used the same procedure for the finding rate of development drilling.

The most likely level represents the mean value of the finding rate from 2000 through 2006.

I employed a constant level of effectiveness until 90 percent of the ultimate resources are discovered as I expect some occasional increases in the finding rate due to forces not directly indicated in the data. As mentioned earlier, any decline in the finding rate curve will be mitigated by technological increases in the exploration and drilling techniques along with an increased awareness of the geophysics and reservoir mechanics. Technological increases are included in the 1990-2006 data. I am assuming that future technological increases will occur at the same rate as in the historical statistics.

I determined the future discoveries from exploratory drilling by applying a representative constant level of drilling activity to the corresponding finding rate. For my determination of the discoveries from development drilling, I also applied a constant

Exploratory wells differ considerably from development wells in the Rocky Mountain area. Exploratory wells are relatively high risk. They are drilled relatively far from existing discoveries. They are high cost. Existing, in place, pipeline facilities may be lacking. They must rely upon financing much different from development wells, e.g., the expenditure of money for geological and geophysical studies. Many factors affect the decision to drill exploratory wells, including, but not exclusively, the prevailing wellhead price.

With respect to development wells and price, the annual relationship between them is not sufficient to forecast future drilling efforts. Instead, I employed high values of such efforts in my calculations. The Most Likely Case level of wells drilled and footage attained was based on the 2007 level.

The Future Discoveries resulting from the application of the drilling effort to the effectiveness of drilling in the Rocky Mountain area are shown on Table 3 for exploratory discoveries and Table 4 for development discoveries.

This results in the production capacity from new reserves beginning in 2007. I applied the same production rate profile to each future amount of gas discoveries. Actually, because of the progressively lower grade of gas deposits found in the future; and the new technology trending towards achieving faster revenue payouts, I expect the decline rate of the production rate profile to become steeper. This would tend towards faster depletion of the future resources and eventually shortening the life of the endowment of gas in those areas. By employing the current production profile decline rate to each increment of future discoveries, the results are somewhat conservative.

To the production profile of future reserves, I added the production profile for the beginning of year 2007 proven ( already discovered) gas reserves.

## V. DETERMINATION AND RESULTS -- NORTHERN ROCKY MOUNTAIN AREA

The Northern Rocky Mountain area that I analyzed occupies the states of Wyoming, Utah and Colorado. This is one of the major oil and gas producing regions of the United States. Gas production will come from mostly non-associated gas reservoirs and coal-bed methane deposits. New field discoveries are expected to be found in deposits ranging from 1 to 200 Bcf, with most in the 2 to 20 Bcf range. The profile of the future productive capacity from this area is graphically illustrated on Figure 7, shown below.