

Application No.: A.05-11-

Exhibit No.: Utilities-1

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## ***Testimony On Nuclear Decommissioning Trust Fund Contribution Levels And Ratemaking***

Before the

**Public Utilities Commission of the State of California**

Rosemead, California

November 10, 2005

1 appropriate contingency. The cost to decommission SCE's share of SONGS 2&3 and Palo Verde used  
2 to develop the proposed contributions is currently estimated to be \$3.088 billion (2004 dollars).

3 **2. SDG&E**

4 The cost to decommission SDG&E's share of SONGS 2 & 3 is currently estimated to be  
5 \$626.2 million in \$2004. The cost to decommission SDG&E's share of SONGS 2 & 3 in future dollars  
6 is \$2.244 billion. The most recent liquidation value of SDG&E's nuclear decommissioning trust funds  
7 for SONGS 2 & 3 is \$461.4 million after adjusting the market value for estimated taxes that will be paid  
8 on the net investment, when the securities are sold in the future. The current balance must increase by  
9 about 5 times in order to meet the future liability in future dollars. This can only be done by making  
10 regular contributions and implementing prudent investment management.

11 **H. Financial Assumptions And Rate Of Return**

12 To estimate the contributions needed to fully fund decommissioning of the SONGS 2&3 and  
13 Palo Verde nuclear units, annual escalation rates or annual escalation indexes are used to convert the  
14 decommissioning cost estimates in base-year dollars to decommissioning cost estimates in future-year  
15 dollars. In this proceeding, the Utilities have calculated separate escalation rates for: (1) labor, (2) the  
16 combined category of material, equipment, and other, and (3) low-level radioactive waste (LLRW)  
17 burial. These escalation rates are described in more detail below.

18 The Utilities based their projections for labor escalation, and for material, equipment, and other  
19 escalation, upon projections provided by the Global Insight economic forecasting service. The Utilities  
20 subscribe to certain Global Insight products and have used Global Insight projections in numerous  
21 proceedings before the Commission. The particular Global Insight projection used to develop this  
22 application was the August 2005 TREND25YEAR0805 projection. This projection spans the period  
23 from 2005 through 2029.

1           **1. Escalation**

2                   a)     **Labor Escalation**

3                             To project labor escalation, the Utilities used the Global Insight projection of the  
4     Employment Cost Index for total compensation, private sector.<sup>12</sup> This index is a “fixed-employment-  
5     weighted index that tracks changes in labor costs (wages, salaries, and employer costs for employee  
6     benefits), free from the influence of employment shifts among occupations and industries.”<sup>13</sup>

7                             One important feature of the Employment Cost Index for this application is that it  
8     covers both direct compensation (wages and salaries) and the cost of employee benefits provided by  
9     employers. Other potential labor escalation indexes, such as the Consumer Price Index, do not share this  
10    important attribute. (The Consumer Price Index measures escalation of goods and services that  
11    consumers purchase directly, not the escalation in their compensation or income.)

12                   b)     **Material, Equipment, And Other Escalation**

13                             To escalate costs from base-year dollars to future-year dollars for the categories of  
14    material, equipment, and other, the Utilities constructed an index that is a weighted average of Producer  
15    Price Indexes for fuels and related products and power (PPI05), metals and metal products (PPI10),  
16    construction machinery and equipment (PPI112), general purpose machinery and equipment (PPI114),  
17    and the chain-weighted price index for the Gross Domestic Product (GDP; the acronym for the  
18    associated price index is JPGDP).<sup>14</sup> The Utilities directly used PPI05, PPI10, and JPGDP projections by  
19    Global Insight. To project values for PPI112 and PPI114, the Utilities constructed an econometric  
20    forecasting model that related the historical changes in PPI112 and PPI114 to JPGDP, the chain-  
21    weighted price index for the Gross Domestic Product. The Utilities then applied these historical

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<sup>12</sup> This index is published by the Bureau of Labor Statistics, U.S. Department of Labor. The Global Insight acronym for this index is JECIWSSP.

<sup>13</sup> Schwenk, Albert E., “Escalation in Employer Costs for Employee Compensation: A Guide to Contracting Parties,” *Compensation and Working Conditions*, U.S. Department of Labor, Bureau of Labor Statistics, Spring, 1997. (Obtained from the Bureau of Labor Statistics Internet web site.)

<sup>14</sup> Global Insight’s acronyms for these indexes begin with the letters “WPI”, not “PPI”. In the Bureau of Labor Statistics Internet web site, the historical values for these indexes begin with the letters “WPU.”

relationships (PPI112 to JPGDP and PPI114 to JPGDP) to the Global Insight projection of JPGDP to produce a projection of PPI112 and PPI114.

The Utilities calculated weighted averages of these indexes for SONGS 2&3 and the Palo Verde units. The weights were based upon an investigation of materials and equipment used by SCE in the decommissioning of SONGS 1. The following weights were used:

**Table I-3**  
***Weights For Indexes In Material, Equipment, And Other Escalation Rates***

Index	Description	Weight
PPI05	Producer price index, fuels and related products and power	0.5%
PPI10	Producer price index, metals and metal products	1.9%
PPI112	Producer price index, construction machinery and equipment	42.4%
PPI114	Producer price index, general purpose machinery and equipment	6.2%
JPGDP	Chain-weighted price index for Gross Domestic Product	49.1%

c) Burial Escalation

In D.03-10-015, the Commission adopted a burial cost escalation rate of 7.5%.<sup>15</sup> The Utilities have adopted this rate for use in this application.

In addition to the Commission's adoption of a 7.5% burial cost escalation rate in the Utilities' last NDCTP application, the 7.5% rate is supported by evidence on historical trends in burial cost escalation factors. The Utilities examined historical trends in burial cost escalation factors published by the Nuclear Regulatory Commission (NRC) to project LLRW burial cost escalation.<sup>16</sup> The NRC report is written to be an "appropriate source of information for obtaining ... waste burial/disposition costs"<sup>17</sup> for use by nuclear power reactor licensees in providing to the NRC "reasonable assurance . . . that funds will be available for decommissioning."<sup>18</sup> Various revisions of this

<sup>15</sup> D.03-10-015, *mimeo*, p. 27; Conclusion of Law 14, p. 36; 2002 Cal. PUC LEXIS 1031 \*37, \*49.

<sup>16</sup> Division of Regulatory Applications, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, "Report on Waste Burial Charges/Escalation of Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities", NUREG-1307, Revision 9, August 2000 (manuscript completion date); Revision 8, December 1998 (manuscript completion date); Revision 7, November 1997.

<sup>17</sup> *Id.*, Revision 9, Foreword.

<sup>18</sup> 10 C.F.R. 50.75(a).

report provide historical burial cost escalation factors from 1986 through 2000 for burial sites in the states of Nevada, South Carolina, and Washington.<sup>19</sup>

These burial escalation factors show rapidly increasing burial costs accompanied by large discrete jumps in burial costs. The Utilities used the burial cost escalation factors to statistically estimate the range of annual burial cost escalation rates that occurred over the period from 1986 to 2000 for the three burial sites. For the statistical estimation of burial escalation rates for the South Carolina site, three different rates were calculated: one for all years, including the large effect of the discrete jump in burial costs at the South Carolina site that occurred between 1991 and 1993, and two that exclude this discrete jump, one for 1986 through 1991 and one for 1993 through 2000.

Two similar statistical models were used,<sup>20</sup> so the analysis produced ten estimated annual burial escalation rates.<sup>21</sup> They ranged from 6.8 percent to 19.9 percent, with a mean estimate of 9.5 percent and a median estimate of 8.0 percent. The Utilities' proposed burial escalation rate is below both the mean and median estimates. Although the Utilities recognize that none of the disposal sites referenced in the NRC reports will be available when the SONGS 2&3 and Palo Verde units are assumed to be decommissioned, the escalation rates in the reports are the most representative of any burial escalation rate data available. These escalation rates provide additional support for the Utilities' use of a 7.5% burial escalation rate.

## **2. Trust Fund Rate Of Return Estimates**

### **a) SCE Trust Fund Rate of Return Estimates**

Each Utility has established two master trusts: (1) one (Qualified Master Trust) that holds the decommissioning funds that result from contributions that qualify for an income tax deduction under Section 468A of the Internal Revenue Code, and (2) one (Nonqualified Master Trust)

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<sup>19</sup> NUREG-1307, Table 2.1.

<sup>20</sup> One was a compound growth model; the other was an exponential growth model.

<sup>21</sup> Five site/time periods were used for each model to yield estimates. They were: Nevada, 1986-1991; South Carolina, 1986-2000, 1986-1991 and 1993-2000; and Washington, 1986-2000.

that holds the decommissioning funds that result from all other contributions (Nonqualified Trusts).<sup>22</sup> Each Utility has established unit accounts within each master trust, to maintain separate trust accounts for each of the SONGS units.<sup>23</sup> SCE has established unit accounts within each master trust, to maintain separate trust accounts for each of the Palo Verde units.

(1) Qualified Trust

Prior to January 1, 1993, the Qualified Trust investments were subject to certain restrictions, known as "Black Lung" restrictions. In October 1992, the Energy Policy Act of 1992 eliminated these restrictions and lowered the tax rate on trust earnings from the maximum corporate rate (then 34%) to 22% beginning in 1994, and to 20% beginning in 1996. Subsequent to the passage of the Energy Policy Act of 1992, Pacific Gas and Electric Company, SDG&E, and SCE all filed petitions for modification of D.87-05-062 in OII-86,<sup>24</sup> seeking relaxation of previous restrictions on the investments of the Qualified Trust.

In D.95-07-055, the Commission determined that up to 50% of the funds of a Qualified Trust may be invested in equities and that up to 20% of the funds of a Qualified Trust may be invested in international equities.<sup>25</sup> At least 50% of the equity portion of the funds of a Qualified Trust must be invested passively.<sup>26</sup> Up to 100% of the funds of a Qualified Trust may be invested in investment grade fixed-income securities.<sup>27</sup>

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<sup>22</sup> As discussed in Section I.J, the Energy Policy Act of 2005 included provisions that enable transfer of certain Nonqualified Trust assets to Qualified Trusts. The Nonqualified Master Trust may continue to be used for any asset not eligible for Qualified Trust treatment.

<sup>23</sup> The Master Trust Agreement requires that trust investments for each trust be overseen by a five-member Committee. Two of members may be affiliated with the Utility. The other three cannot be affiliated with the utility. Their appointments are confirmed by the Commission.

<sup>24</sup> These petitions were filed on May 18, 1993 (PG&E), May 21, 1993 (SCE), and August 18, 1993 (SDG&E).

<sup>25</sup> D.95-07-055, Findings of Fact 7 and 8.

<sup>26</sup> A passive investment strategy is one that seeks to match the return of a benchmark index, such as the Standard & Poor's 500 index, by replicating the composition of the index. D.95-07-055, Findings of Fact 12 and 13.

<sup>27</sup> Investment grade securities are those rated BBB- or higher by Standard & Poor's or equal to or higher than the equivalent rating by other rating agencies. D.95-07-055, Finding of Fact 9.

(2) Nonqualified Trust

D.95-07-055 also established investment restrictions for the Nonqualified Trust. These are identical to those of the Qualified Trust, with the exception that the Nonqualified Trust may invest up to 60% of its funds in equities.<sup>28</sup>

(3) Global Insight Projections Related To Trust Returns

As in the case of escalation, SCE based its projections of future trust returns upon projections provided by the Global Insight economic forecasting service (formerly DRI-WEFA) in the August 2005 TREND25YEAR0805 projection. The Global Insight projections are made on a pre-tax basis, and SCE adjusted them for applicable taxes. SCE has used this direct method historically in SCE's decommissioning contribution analysis.

(a) Equity Returns

SCE utilized Global Insight variables for the Standard & Poor's (S&P) 500 Stock Price Index (SP500), and the dividend yield for the Standard & Poor's 500 Stock Index (SP500YLD) to project future equity returns. From quarterly data, SCE calculated the annual price return based on the S&P price index values, then added the annual dividend yield to produce the total annual equity return for each year. Over the 25-year period from 2005 through 2029, the average annual pre-tax equity return equals 8.45%, composed of an average annual price change of 6.96% and an annual dividend yield of 1.49%.

(b) Fixed-Income Returns

Global Insight also provides projected returns on fixed income securities for three variables used in SCE's analysis: (1) the yield on three-month U.S. Treasury bills (RMTB3M), (2) the yield on ten-year constant maturity U.S. Treasury bonds (RMTCM10Y), and (3) Moody's average yield on AAA state and local government bonds (RMMUNIAAA). The projected return on three-month Treasury bills averages 4.82% per year over the period 2005-2029. The return for

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<sup>28</sup> D.95-07-055, Conclusion of Law 2.

1 ten-year Treasury bonds is calculated assuming a one-year holding period. Over the period 2005-2029,  
2 the projected return on ten-year Treasury bonds averages 5.85% per year.

3 Moody's average yield on AAA state and local government bonds  
4 projected by Global Insight is for bonds with a twenty year maturity. As with ten-year Treasury bonds,  
5 the projected return for AAA state and local government bonds is calculated assuming a one-year  
6 holding period. Over the period 2005-2029, the projected return on AAA state and local government  
7 bonds averages 5.78%. However, the actual municipal bond strategy used in managing SCE's  
8 Nonqualified Trust is closer to a 10-year average maturity. Therefore, SCE lowered the annual  
9 projected return by 0.70% to reflect a return difference between 10 and 20 year maturity municipal  
10 bonds.<sup>29</sup> Applying this adjustment results in a 5.08% return used for municipal bond investments.

11 (4) Projected After-Tax Trust Fund Returns

12 Projected after-tax returns for the Qualified Trust and the Nonqualified  
13 Trust depend on: (1) the pre-tax returns discussed immediately above, (2) the tax rates applicable to the  
14 different financial instruments held by each Trust, (3) Trust management fees and (4) the projected  
15 investment strategy chosen by the Decommissioning Trust Investment Committee that each Trust is  
16 projected to pursue within the restrictions set by the Commission. The tax rates and the Trust  
17 investment strategies are summarized in the following table:

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<sup>29</sup> SCE lowered the annual projected return by 0.70% following discussions with its Decommissioning Trust Fund managers concerning the municipal bonds.



**Table I-4**  
**Tax Rates and Trust Investment Strategies**

Characteristic	Qualified Trust	Nonqualified Trust
Federal tax rate	20.00%	35.00%
State tax rate	8.84%	8.261%(SCE)/8.83%(SDG&E)
Trust management fees (pre-tax)	0.20% annually	0.20% annually
Equity portfolio turnover	20% annually	20% annually
Federal dividend exclusion	0%	70%
Equity investment percentage (before liquidation)	50%	60%
Equity investment liquidation	Beginning 4 years before Unit shutdown	Beginning 4 years before Unit shutdown
Fixed income asset	Ten-year Treasury bonds	AAA municipal bonds

Based on the tax rates and Trust investment strategies shown in Table I-4, the following after-tax Trust fund returns were calculated:

**Table I-5**  
**After-Tax Trust Fund Returns Employed by SCE**

	Qualified Trust	Nonqualified Trust
SONGS 2&3 2007	5.55%	5.25%
SONGS 2&3 2018/2019/2020/2021	5.35%/5.14%/4.94%/4.73%	5.11%/4.97%/4.82%/4.68%
SONGS 2&3 2022 and after	4.53%	4.54%
Palo Verde 2007 to 5 years before shutdown	5.53%	5.25%
Palo Verde years 4/3/2/1 before shutdown	5.33%/5.13%/4.93%/4.73%	5.11%/4.97%/4.82%/4.68%
Palo Verde year of shutdown and after	4.53%	4.54%

b) Projected SDG&E's Trust Fund Rate of Return Estimate

SDG&E also used Global Insight projections for Pre-Tax Equity and Fixed Income Returns on the basis for computing expected after-tax returns in this filing. Global Insight's forecast of equity and fixed-income returns was used as the source of investment return data during our previous triennial cost review. Global Insight projects that the average annual pre-tax return for the S&P 500 and 10-year Treasury bond will average 8.45% and 5.85%, respectively, from 2005 through

2029 (Appendix C). While we accept this equity return assumption, we also wish to emphasize that this return may not be achievable and may actually be significantly lower.

Taking into consideration current market valuations and poor equity returns of the last five years (Appendix E), it is highly possible that the equity returns will be below the forecasted average annualized returns of 8.45%. Below we present the data that support our observations.

(1) Investment Professional Forecasts

In Table I-6, pension plan consultants and investment advisors have provided the U.S. equity forecasts in the following range: -1.2% to 8/9%. A 2005 survey of U.S. Chief Financial Officers<sup>30</sup> revealed an average annual return estimate of 7.1%.

**Table I-6**  
***U.S. Equity Return Projections***

<b>Consultants</b>			
Callan Associates	S&P 500	8.9%	5 years
Frank Russell	US Equity	8.0%	10 years
<b>Investment Advisors</b>			
JP Morgan	U.S. Large Cap	7.3%	10-15 years
UBS	S&P 500	8.2%	Long Term
GMO	U.S. Large Cap	-1.2%	7 years
SSGA	S&P 500	7.0%	10 years

Table I-7 shows that in the seven most recent decades, annual returns were as low as 0.8% and as high as 18.2%. Furthermore, there have been extended periods where investment returns in the equity market have been very poor. Appendix E shows that rolling 5-Year return of the S&P 500 as of June 30, 2005 is -2.4%. Other periods are also shown where equity market returns can be well below the current forecast of 8.45% for long periods of time.

<sup>30</sup> John R. Graham and Campbell R. Harvey, Fuqua School of Business, The Equity Risk Premium in June 2005; Evidence from the Global CFO Survey.

*Table I-7  
Annual Return for S&P 500 Index*

Time Period	Annual Return
1929-1939	-0.8%
1940-1949	9.2%
1950-1959	19.4%
1960-1969	7.8%
1970-1979	5.9%
1980-1989	17.5%
1990-1999	18.2%
2000-2005	-2.4%

*Periods of  
Lackluster Equity  
Performance*

(2) Current Equity Valuation and Return Forecasts

There is also evidence that the market valuation of equities impacts future stock market returns. Appendix F shows the average and worst-case equity investment returns on the S&P 500 for the 3-, 5-, and 10-year subsequent periods following various levels of market valuation, as measured by the price/earnings ratio. Price/Earnings ratios were divided into quintiles covering the period 1948 through September of 2005 and subsequent period investment returns were measured. The chart emphasizes that investment returns on the S&P 500 following periods of high valuation tend to generate poor relative equity returns in subsequent periods. Conversely, periods following low price/earnings ratios tend to be followed by high returns in subsequent periods. At today's S&P 500 price/earnings ratio of approximately 18.5%, history would indicate that the average annual 10-year compound return would be only 6.9%, and the worst-case (95th percentile) expectation would be 0.5%. Coupled with the low dividend yield of only 2.1%, we believe that there is a significant risk that investment returns over the next decade will be in low single digits. This data supports the conclusion of lower than historical equity risk premiums over the next decade and perhaps longer.

c) Effect of Energy Policy Act of 2005 on Trusts

As discussed below in Section I.J.1 below, the Energy Policy Act of 2005 allows the transfer of certain Nonqualified Trust assets to Qualified Trusts. To the extent such transfers are beneficial to funding the ultimate costs of decommissioning, SCE and SDG&E will propose to amend

**Appendix C**  
**Global Insight Forecast**

## Global Insight Forecast (former DRI WEFA)

SOURCE:	Global Insight Forecast						
	From MODTREND25YEAR, updated 8/31/05						
	S&P	S&P		S&P	AAA	3-month	10-year
	Index,	Price	S&P	Total	Muni	T-Bill	T-Bond
	Year End	Return	Yield	Return	Bonds	Yield	Rate
Date	SPINDEXF	SPCAPGN	SPYIELD	SPRTAVG	AAAMAVC	TB3MAVC	TB10AVG
Dec-05	1250.42	7.602	1.780	9.38	4.387	3.113	4.391
Dec-06	1269.18	1.500	1.783	3.28	4.985	4.316	5.025
Dec-07	1303.02	2.667	1.833	4.50	5.138	4.481	5.173
Dec-08	1417.08	8.753	1.802	10.56	5.399	4.659	5.406
Dec-09	1486.10	4.871	1.782	6.65	5.700	4.846	5.714
Dec-10	1609.43	8.298	1.747	10.05	5.926	4.967	5.978
Dec-11	1731.35	7.576	1.695	9.27	5.933	4.967	6.000
Dec-12	1857.69	7.297	1.656	8.95	5.933	4.969	6.000
Dec-13	2001.72	7.753	1.610	9.36	5.933	4.970	6.000
Dec-14	2132.27	6.522	1.581	8.10	5.933	4.970	6.000
Dec-15	2276.93	6.784	1.558	8.34	5.933	4.967	6.000
Dec-16	2428.96	6.677	1.532	8.21	5.938	4.953	6.026
Dec-17	2588.50	6.568	1.507	8.07	5.946	4.954	6.046
Dec-18	2770.60	7.035	1.478	8.51	5.942	4.956	6.033
Dec-19	2965.12	7.021	1.447	8.47	5.946	4.959	6.046
Dec-20	3189.08	7.553	1.412	8.97	5.952	4.959	6.045
Dec-21	3436.74	7.766	1.370	9.14	5.962	4.957	6.060
Dec-22	3699.09	7.634	1.333	8.97	5.961	4.957	6.051
Dec-23	3982.12	7.651	1.294	8.95	5.950	4.956	6.035
Dec-24	4283.05	7.557	1.258	8.81	5.979	4.957	6.064
Dec-25	4610.77	7.652	1.221	8.87	5.963	4.956	6.042
Dec-26	4972.77	7.851	1.184	9.03	5.942	4.957	6.010
Dec-27	5360.80	7.803	1.147	8.95	5.959	4.957	6.028
Dec-28	5770.16	7.636	1.110	8.75	5.951	4.957	6.008
Dec-29	6229.15	7.955	1.075	9.03	5.972	4.956	6.024
AVG. RETURN (2005-2029)		6.96	1.49	8.45	5.78	4.82	5.85

**Appendix D**  
**After-Tax Rates Of Return**

After-Tax Rates of Returns

QUALIFIED TRUST

	BEFORE TAX RETURN	TAX RATE	AFTER TAX RETURN	% Equities (Equities/10-Yr Bond)	Portfolio Combination ROR	ROR	Net of Fees**
S&P500 PRICE RETURN	6.96			0% 0:100	4.68	4.53	
S&P 500 DIV. YIELD	1.49			10% 10:90	4.88	4.73	
S&P 500 TOTAL RETURN-SONGS 2&3*	8.45	20.9%	6.69	20% 20:80	5.08	4.93	
				30% 30:70	5.28	5.13	
AAA MUNI YIELD	5.78	7.07%	5.37	40% 40:60	5.48	5.34	
3-MONTH T-BILLS	4.82	20.00%	3.86	50% 50:50	5.68	5.54	
10 YEAR TREASURY YIELD	5.85	20.00%	4.68	60% 60:40	5.88	5.74	
				70% 70:30	6.08	5.94	
				80% 80:20	6.28	6.14	
				90% 90:10	6.48	6.34	
				100% 100:0	6.68	6.54	

TAX RATES:

FEDERAL	20.00%
STATE	8.84%
COMBINED	27.07%
STATE	7.07%

(ADJUSTED FOR BENEFIT OF  
DEDUCTION FOR FEDERAL TAX LIABILITY)  
\*S&P 500 After Tax Return Calculated as Follows:

Dividends taxed at combined rate, capital gains tax on price return  
Assumed portfolio turnover of 20% per year  
Assumed liquidation of SONGS 2&3 equities 2021  
\*\* Fees are assumed at 20 bps before Taxes

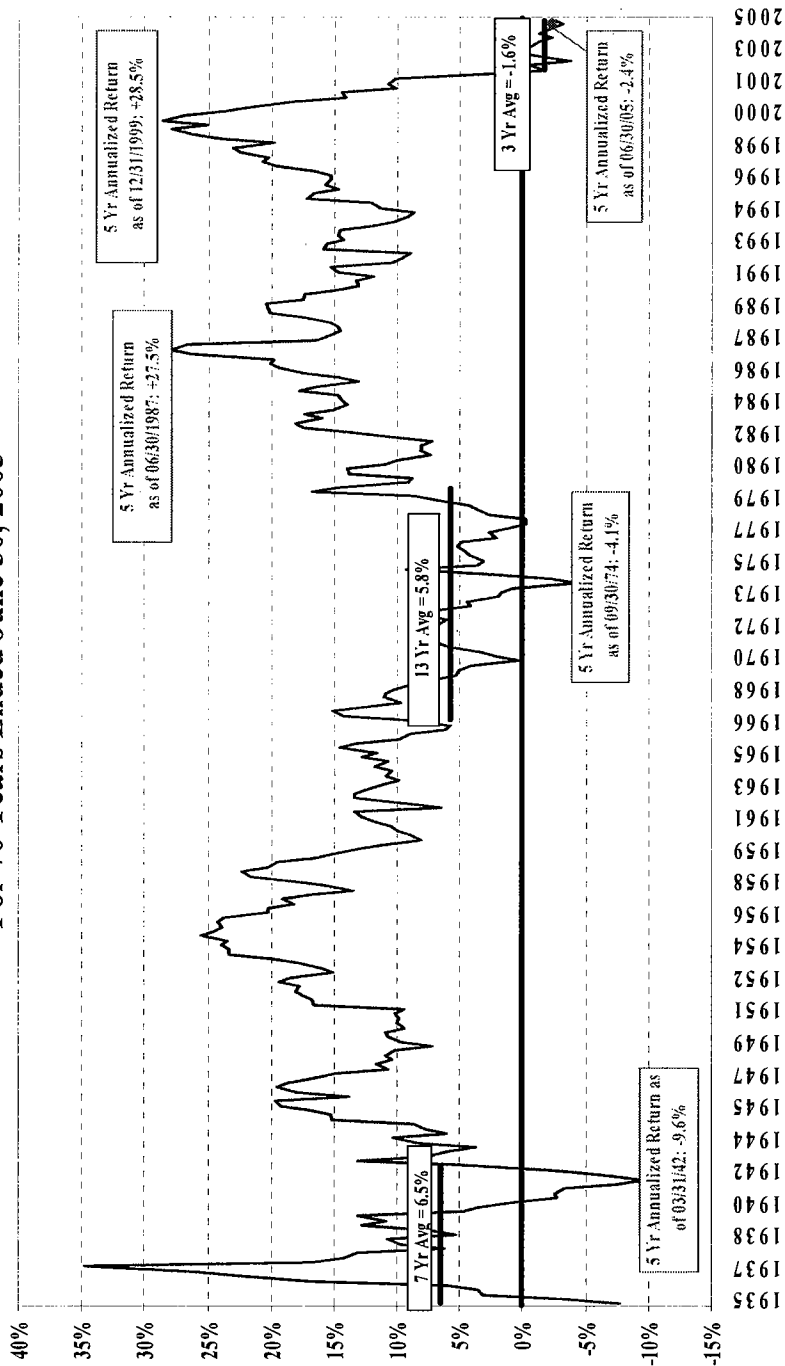
SAN ONOFRE 2&3:  
Pre-Retirement Use (2006-2021) : 5.54 - 4.74  
Post-Retirement Use (2022-2047): 4.53-3.71

**Appendix E**

**Rolling 5 Year S&P 500 Equity Returns For 70 Years Ended June 30, 2005**



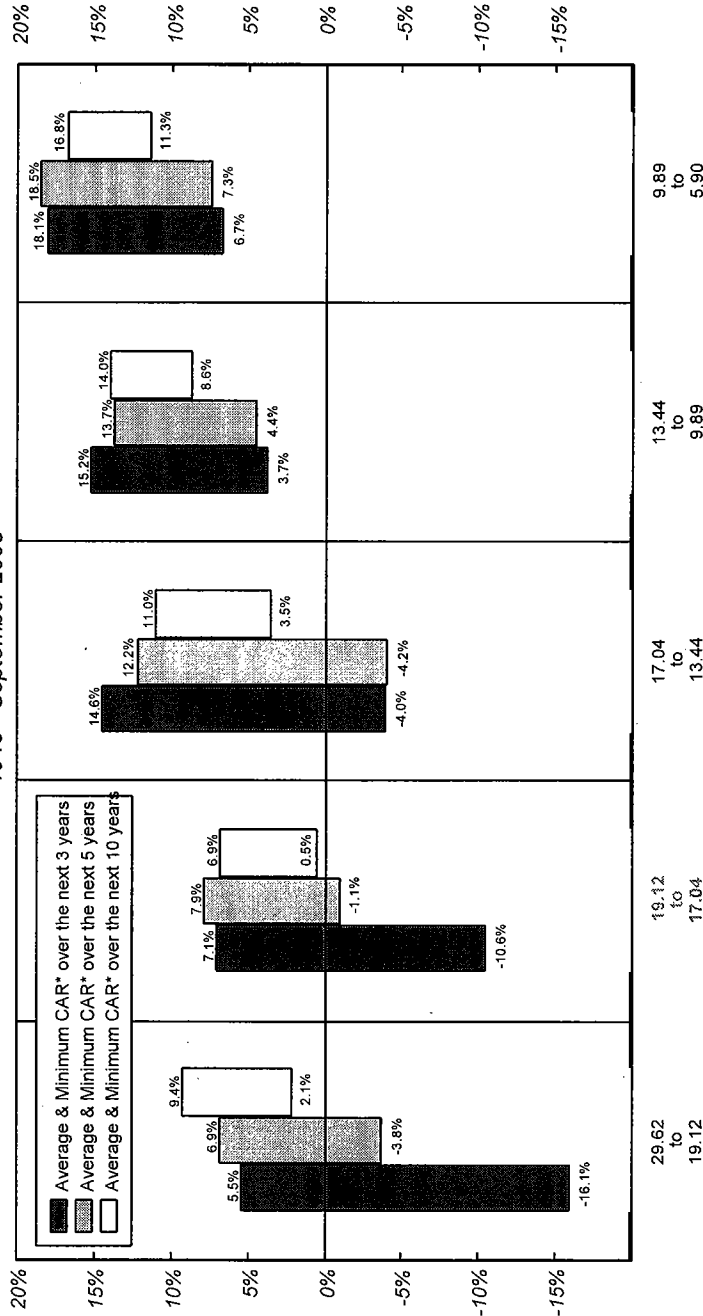
# Rolling 5 Year S&P 500 Equity Returns For 70 Years Ended June 30, 2005



**Appendix F**

**P/E Ratios And Return By P/E Quintile**

# P/E Ratios and Return by P/E Quintile Standard & Poor's 500 Stock Index 1948 - September 2005



Data: Rolling periods using monthly data • CAR - Compound Annual Rate  
The Price/Earnings Ratios are calculated using Reported Earnings prior to 1988 and Operating Earnings from 1988 to the present.  
Source: Standard & Poor's Corporation • Copyright © 2005 Crandall, Pierce & Company • All rights reserved.