

ECONOMIC ANALYSIS SUMMARY

Reid Gardner Unit 3

Boiler Design:

Foster Wheeler Wall-Fired PC

Parameter	Current Operation	NOx Control				
		LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
Case	1	2	3	4	5	6
NOx Emission Control System	LNB	LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
TOTAL INSTALLED CAPITAL COST (\$)	0	4,448,000	6,945,500	7,884,900	35,048,000	38,484,900
FIRST YEAR O&M COST (\$)						
Operating Labor (\$)	0	0	0	0	0	0
Maintenance Material (\$)	0	32,000	83,000	48,000	132,000	148,000
Maintenance Labor (\$)	0	48,000	124,500	72,000	198,000	222,000
Administrative Labor (\$)	0	0	0	0	0	0
TOTAL FIXED O&M COST	0	80,000	207,500	120,000	330,000	370,000
Makeup Water Cost	0	0	0	0	0	0
Reagent Cost	0	0	98,612	126,347	257,830	257,830
SCR Catalyst / FF Bag Cost	0	0	0	0	150,000	132,000
Electric Power Cost	0	0	39,858	297,221	263,063	560,284
TOTAL VARIABLE O&M COST	0	0	138,470	423,568	670,893	950,114
TOTAL FIRST YEAR O&M COST	0	80,000	345,970	543,568	1,000,893	1,320,114
FIRST YEAR DEBT SERVICE (\$)	0	471,737	736,612	836,241	3,717,051	4,081,555
TOTAL FIRST YEAR COST (\$)	0	551,737	1,082,582	1,379,809	4,717,944	5,401,669
Power Consumption (MW)	0.0	0.0	0.1	0.7	0.7	1.4
Annual Power Usage (Million kW-Hr/Yr)	0.0	0.0	0.8	5.9	5.3	11.2
CONTROL COST (\$/Ton Removed)						
NOx Removal Rate (%)	0.0%	6.5%	29.9%	38.3%	78.2%	78.2%
NOx Removed (Tons/Yr)	0	95	434	556	1,136	1,136
First Year Average Control Cost (\$/Ton NOx Rem.)	0	5,807	2,493	2,480	4,155	4,757
Incremental Control Cost (\$/Ton NOx Removed)	0	5,807	1,564	2,433	5,764	#DIV/0!

INPUT CALCULATIONS						
Reid Gardner Unit 3		Boiler Design: Foster Wheeler Wall-Fired PC				
Parameter	Current Operation	NOx Control				
		LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
Case	1	2	3	4	5	6
NOx Emission Control System	LNB	LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
Unit Design and Coal Characteristics						
Type of Unit	PC	PC	PC	PC	PC	PC
Net Power Output (kW)	100,000	100,000	100,000	100,000	100,000	100,000
Net Plant Heat Rate (Btu/kW-Hr)	11,351	11,351	11,351	11,351	11,351	11,351
Boiler Fuel	Bituminous Coal	Bituminous Coal	Bituminous Coal	Bituminous Coal	Bituminous Coal	Bituminous Coal
Coal Heating Value (Btu/Lb)	11,712	11,712	11,712	11,712	11,712	11,712
Coal Sulfur Content (wt.%)	0.570%	0.570%	0.570%	0.570%	0.570%	0.570%
Coal Ash Content (wt.%)	7.640%	7.640%	7.640%	7.640%	7.640%	7.640%
Boiler Heat Input, each (MMBtu/Hr)	1,135	1,135	1,135	1,135	1,135	1,135
Coal Flow Rate (Lb/Hr)	96,918	96,918	96,918	96,918	96,918	96,918
(Ton/Yr)	386,295	386,295	386,295	386,295	386,295	386,295
(MMBtu/Yr)	9,048,563	9,048,563	9,048,563	9,048,563	9,048,563	9,048,563
Emissions						
Uncontrolled NOx (Lb/Hr)	364	364	364	364	364	364
(Lb/MMBtu)	0.32	0.32	0.32	0.32	0.32	0.32
(Lb Moles/Hr)	12.14	12.14	12.14	12.14	12.14	12.14
(Tons/Yr)	1,452	1,452	1,452	1,452	1,452	1,452
NOx Removal Rate (%)	0.0%	6.5%	29.9%	38.3%	78.2%	78.2%
(Lb/Hr)	0	24	109	140	285	285
(Lb Moles/Hr)	0.00	0.79	3.63	4.65	9.49	9.49
(Ton/Yr)	0	95	434	556	1,136	1,136
NOx Emission Rate (Lb/Hr)	364	341	255	225	79	79
(Lb/MMBtu)	0.32	0.30	0.23	0.20	0.07	0.07
(Ton/Yr)	1,452	1,357	1,018	896	317	317
General Plant Data						
Annual Operation (Hours/Year)	7,972	7,972	7,972	7,972	7,972	7,972
Annual On-Site Power Plant Capacity Factor	91%	0.91	0.91	0.91	0.91	0.91
Economic Factors						
Interest Rate (%)	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%
Discount Rate (%)	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
Plant Economic Life (Years)	20	20	20	20	20	20
Installed Capital Costs						
NOx Emission Control System (\$2007)	0	4,448,000	6,945,500	7,884,900	35,048,000	38,484,900
Total Emission Control Systems (\$2007)	0	4,448,000	6,945,500	7,884,900	35,048,000	38,484,900
NOx Emission Control System (\$/kW)	0	44	69	79	350	385
Total Emission Control Systems (\$/kW)	0	44	69	79	350	385
Total Fixed Operating & Maintenance Costs						
Operating Labor (\$)	0	0	0	0	0	0
Maintenance Material (\$)	0	32,000	83,000	48,000	132,000	148,000
Maintenance Labor (\$)	0	48,000	124,500	72,000	198,000	222,000
Administrative Labor (\$)	0	0	0	0	0	0
Total Fixed O&M Cost (\$)	0	80,000	207,500	120,000	330,000	370,000
Annual Fixed O&M Cost Escalation Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Reagent Cost						
Unit Cost (\$/Ton)	None	None	Anhydrous NH3	Anhydrous NH3	Anhydrous NH3	Anhydrous NH3
(\$/Lb)	0.00	0.00	400	400	400	400
Molar Stoichiometry	0.00	0.00	0.200	0.200	0.200	0.200
Reagent Purity (Wt.%)	100%	100%	100%	100%	100%	100%
Reagent Usage (Lb/Hr)	0	0	62	79	162	162
First Year Reagent Cost (\$)	0	0	98,612	126,347	257,830	257,830
Annual Reagent Cost Escalation Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
SCR Catalyst / FF Bag Replacement Cost						
Annual SCR Catalyst (m3) / No. FF Bags	0	0	0	0	50	44
SCR Catalyst (\$/m3) / Bag Cost (\$/ea.)	3,000	3,000	3,000	3,000	3,000	3,000
First Year SCR Catalyst / Bag Replace. Cost (\$)	0	0	0	0	150,000	132,000
Annual SCR Catalyst / Bag Cost Esc. Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Auxiliary Power Cost						
Auxiliary Power Requirement (% of Plant Output)	0.00%	0.00%	0.10%	0.75%	0.66%	1.41%
(MW)	0.00	0.00	0.10	0.75	0.66	1.41
Unit Cost (\$2007/MW-Hr)	50.00	50.00	50.00	50.00	50.00	50.00
First Year Auxiliary Power Cost (\$)	0	0	39,858	297,221	263,063	560,284
Annual Power Cost Escalation Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

Economic factors as per Sierra Pacific 2008 planning guidelines

CAPITAL COST

Reid Gardner Unit 3

Parameter	NOx Control									
	LNB w/OFA		LNB w/OFA & SNCR		ROFA w/Rotamix		LNB w/OFA & SCR		ROFA w/SCR	
Case	2		3		4		5		6	
NOx Emission Control System	LNB w/OFA		LNB w/OFA & SNCR		ROFA w/Rotamix		LNB w/OFA & SCR		ROFA w/SCR	
SO2 Emission Control System	Soda Ash Wet FGD		Soda Ash Wet FGD		Soda Ash Wet FGD		Soda Ash Wet FGD		Soda Ash Wet FGD	
PM Emission Control System	Fabric Filter		Fabric Filter		Fabric Filter		Fabric Filter		Fabric Filter	
CAPITAL COST COMPONENT	Factor/Source	Cost	Factor/Source	Cost	Factor/Source	Cost	Factor/Source	Cost	Factor/Source	Cost
LNB w/OFA or ROFA	LNB w/OFA		LNB w/OFA		ROFA		LNB w/OFA		ROFA	
Major Materials Design and Supply	Vendor	\$1,600,000	Vendor	\$1,600,000	Vendor	\$2,880,000	Vendor	\$1,600,000	Vendor	\$2,880,000
Construction	70.0%	\$1,120,000	70.0%	\$1,120,000	Vendor	\$742,500	70.0%	\$1,120,000	Vendor	\$742,500
Balance of Plant	50.0%	\$800,000	50.0%	\$800,000	50.0%	\$1,440,000	50.0%	\$800,000	50.0%	\$1,440,000
Electrical (Allowance)	5.0%	\$80,000	5.0%	\$80,000	30.0%	\$864,000	5.0%	\$80,000	30.0%	\$864,000
Owner's Costs	10.0%	\$160,000	10.0%	\$160,000	10.0%	\$288,000	10.0%	\$160,000	10.0%	\$288,000
Surcharge	16.0%	\$256,000	16.0%	\$256,000	16.0%	\$460,800	16.0%	\$256,000	16.0%	\$460,800
AFUDC	12.0%	\$192,000	12.0%	\$192,000	12.0%	\$345,600	12.0%	\$192,000	12.0%	\$345,600
Subtotal		\$4,208,000		\$4,208,000		\$7,020,900		\$4,208,000		\$7,020,900
Contingency	15.0%	\$240,000	15.0%	\$240,000	30.0%	\$864,000	15.0%	\$240,000	30.0%	\$864,000
Total Capital Cost for LNB w/OFA, ROFA/Rotamix		\$4,448,000		\$4,448,000		\$7,884,900		\$4,448,000		\$7,884,900
SNCR or SCR or Rotamix	SNCR		SNCR		Rotamix		SCR		SCR	
Major Materials Design and Supply	Vendor	\$0	Vendor	\$1,350,000	Vendor	\$1,029,000	Vendor	\$20,000,000	Vendor	\$20,000,000
Construction	0.0%	\$0	15.0%	\$202,500	Vendor	\$247,500	0.0%	\$0	0.0%	\$0
Balance of Plant	0.0%	\$0	12.0%	\$162,000	12.0%	\$123,480	0.0%	\$0	0.0%	\$0
Electrical (Allowance)	0.0%	\$0	5.0%	\$67,500	0.0%	\$0	0.0%	\$0	0.0%	\$0
Owner's Costs	0.0%	\$0	10.0%	\$135,000	10.0%	\$102,900	10.0%	\$2,000,000	10.0%	\$2,000,000
Surcharge	0.0%	\$0	16.0%	\$216,000	16.0%	\$164,640	16.0%	\$3,200,000	16.0%	\$3,200,000
AFUDC	0.0%	\$0	12.0%	\$162,000	12.0%	\$123,480	12.0%	\$2,400,000	12.0%	\$2,400,000
Subtotal		\$0		\$2,295,000		\$1,791,000		\$27,600,000		\$27,600,000
Contingency	0.0%	\$0	15.0%	\$202,500	15.0%	\$154,350	15.0%	\$3,000,000	15.0%	\$3,000,000
Total Capital Cost for SNCR or SCR or Rotamix		\$0		\$2,497,500		\$1,945,350		\$30,600,000		\$30,600,000

Reid Gardner Unit 3		Current Operation								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	-	-	-	-	-	-	-	-	-
2	2015	-	-	-	-	-	-	-	-	-
3	2016	-	-	-	-	-	-	-	-	-
4	2017	-	-	-	-	-	-	-	-	-
5	2018	-	-	-	-	-	-	-	-	-
6	2019	-	-	-	-	-	-	-	-	-
7	2020	-	-	-	-	-	-	-	-	-
8	2021	-	-	-	-	-	-	-	-	-
9	2022	-	-	-	-	-	-	-	-	-
10	2023	-	-	-	-	-	-	-	-	-
11	2024	-	-	-	-	-	-	-	-	-
12	2025	-	-	-	-	-	-	-	-	-
13	2026	-	-	-	-	-	-	-	-	-
14	2027	-	-	-	-	-	-	-	-	-
15	2028	-	-	-	-	-	-	-	-	-
16	2029	-	-	-	-	-	-	-	-	-
17	2030	-	-	-	-	-	-	-	-	-
18	2031	-	-	-	-	-	-	-	-	-
19	2032	-	-	-	-	-	-	-	-	-
20	2033	-	-	-	-	-	-	-	-	-

Reid Gardner Unit 3		LNB w/OFA								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	80,000	-	-	-	-	-	471,737	551,737	5,807
2	2015	81,600	-	-	-	-	-	471,737	553,337	5,824
3	2016	83,232	-	-	-	-	-	471,737	554,969	5,841
4	2017	84,897	-	-	-	-	-	471,737	556,634	5,859
5	2018	86,595	-	-	-	-	-	471,737	558,332	5,877
6	2019	88,326	-	-	-	-	-	471,737	560,064	5,895
7	2020	90,093	-	-	-	-	-	471,737	561,830	5,913
8	2021	91,895	-	-	-	-	-	471,737	563,632	5,932
9	2022	93,733	-	-	-	-	-	471,737	565,470	5,952
10	2023	95,607	-	-	-	-	-	471,737	567,345	5,971
11	2024	97,520	-	-	-	-	-	471,737	569,257	5,992
12	2025	99,470	-	-	-	-	-	471,737	571,207	6,012
13	2026	101,459	-	-	-	-	-	471,737	573,196	6,033
14	2027	103,489	-	-	-	-	-	471,737	575,226	6,054
15	2028	105,558	-	-	-	-	-	471,737	577,295	6,076
16	2029	107,669	-	-	-	-	-	471,737	579,407	6,098
17	2030	109,823	-	-	-	-	-	471,737	581,560	6,121
18	2031	112,019	-	-	-	-	-	471,737	583,756	6,144
19	2032	114,260	-	-	-	-	-	471,737	585,997	6,168
20	2033	116,545	-	-	-	-	-	471,737	588,282	6,192

Reid Gardner Unit 3		ROFA w/Rotamix									
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)	
0	2013										
1	2014	120,000	-	126,347	-	297,221	423,568	836,241	1,379,809	2,480	
2	2015	122,400	-	128,874	-	303,166	432,040	836,241	1,390,681	2,499	
3	2016	124,848	-	131,452	-	309,229	440,680	836,241	1,401,769	2,519	
4	2017	127,345	-	134,081	-	315,413	449,494	836,241	1,413,080	2,539	
5	2018	129,892	-	136,762	-	321,722	458,484	836,241	1,424,617	2,560	
6	2019	132,490	-	139,497	-	328,156	467,654	836,241	1,436,384	2,581	
7	2020	135,139	-	142,287	-	334,719	477,007	836,241	1,448,387	2,603	
8	2021	137,842	-	145,133	-	341,414	486,547	836,241	1,460,630	2,625	
9	2022	140,599	-	148,036	-	348,242	496,278	836,241	1,473,118	2,647	
10	2023	143,411	-	150,997	-	355,207	506,203	836,241	1,485,855	2,670	
11	2024	146,279	-	154,016	-	362,311	516,327	836,241	1,498,848	2,693	
12	2025	149,205	-	157,097	-	369,557	526,654	836,241	1,512,100	2,717	
13	2026	152,189	-	160,239	-	376,948	537,187	836,241	1,525,617	2,742	
14	2027	155,233	-	163,443	-	384,487	547,931	836,241	1,539,404	2,766	
15	2028	158,337	-	166,712	-	392,177	558,889	836,241	1,553,468	2,792	
16	2029	161,504	-	170,047	-	400,020	570,067	836,241	1,567,812	2,817	
17	2030	164,734	-	173,448	-	408,021	581,468	836,241	1,582,444	2,844	
18	2031	168,029	-	176,916	-	416,181	593,098	836,241	1,597,368	2,870	
19	2032	171,390	-	180,455	-	424,505	604,960	836,241	1,612,590	2,898	
20	2033	174,817	-	184,064	-	432,995	617,059	836,241	1,628,117	2,926	

Reid Gardner Unit 3		ROFA w/SCR									
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)	
0	2013										
1	2014	370,000	-	257,830	132,000	560,284	950,114	4,081,555	5,401,669	4,757	
2	2015	377,400	-	262,987	134,640	571,490	969,117	4,081,555	5,428,071	4,780	
3	2016	384,948	-	268,247	137,333	582,919	988,499	4,081,555	5,455,002	4,804	
4	2017	392,647	-	273,612	140,079	594,578	1,008,269	4,081,555	5,482,471	4,828	
5	2018	400,500	-	279,084	142,881	606,469	1,028,434	4,081,555	5,510,489	4,853	
6	2019	408,510	-	284,666	145,739	618,599	1,049,003	4,081,555	5,539,068	4,878	
7	2020	416,680	-	290,359	148,653	630,971	1,069,983	4,081,555	5,568,218	4,903	
8	2021	425,014	-	296,166	151,627	643,590	1,091,383	4,081,555	5,597,951	4,930	
9	2022	433,514	-	302,089	154,659	656,462	1,113,210	4,081,555	5,628,279	4,956	
10	2023	442,184	-	308,131	157,752	669,591	1,135,474	4,081,555	5,659,213	4,983	
11	2024	451,028	-	314,294	160,907	682,983	1,158,184	4,081,555	5,690,767	5,011	
12	2025	460,048	-	320,580	164,125	696,643	1,181,348	4,081,555	5,722,951	5,040	
13	2026	469,249	-	326,991	167,408	710,575	1,204,975	4,081,555	5,755,779	5,069	
14	2027	478,634	-	333,531	170,756	724,787	1,229,074	4,081,555	5,789,263	5,098	
15	2028	488,207	-	340,202	174,171	739,283	1,253,656	4,081,555	5,823,417	5,128	
16	2029	497,971	-	347,006	177,655	754,068	1,278,729	4,081,555	5,858,255	5,159	
17	2030	507,931	-	353,946	181,208	769,150	1,304,303	4,081,555	5,893,789	5,190	
18	2031	518,089	-	361,025	184,832	784,533	1,330,389	4,081,555	5,930,033	5,222	
19	2032	528,451	-	368,245	188,529	800,223	1,356,997	4,081,555	5,967,003	5,255	
20	2033	539,020	-	375,610	192,299	816,228	1,384,137	4,081,555	6,004,712	5,288	

Reid Gardner Unit 3		LNB w/OFA & SNCR								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	207,500	-	98,612	-	39,858	138,470	736,612	1,082,582	2,493
2	2015	211,650	-	100,585	-	40,655	141,240	736,612	1,089,502	2,508
3	2016	215,883	-	102,596	-	41,468	144,065	736,612	1,096,560	2,525
4	2017	220,201	-	104,648	-	42,298	146,946	736,612	1,103,759	2,541
5	2018	224,605	-	106,741	-	43,144	149,885	736,612	1,111,101	2,558
6	2019	229,097	-	108,876	-	44,006	152,883	736,612	1,118,591	2,575
7	2020	233,679	-	111,054	-	44,887	155,940	736,612	1,126,231	2,593
8	2021	238,352	-	113,275	-	45,784	159,059	736,612	1,134,023	2,611
9	2022	243,119	-	115,540	-	46,700	162,240	736,612	1,141,971	2,629
10	2023	247,982	-	117,851	-	47,634	165,485	736,612	1,150,079	2,648
11	2024	252,941	-	120,208	-	48,587	168,795	736,612	1,158,348	2,667
12	2025	258,000	-	122,612	-	49,558	172,171	736,612	1,166,783	2,686
13	2026	263,160	-	125,064	-	50,550	175,614	736,612	1,175,386	2,706
14	2027	268,423	-	127,566	-	51,561	179,126	736,612	1,184,162	2,726
15	2028	273,792	-	130,117	-	52,592	182,709	736,612	1,193,113	2,747
16	2029	279,268	-	132,719	-	53,644	186,363	736,612	1,202,243	2,768
17	2030	284,853	-	135,374	-	54,716	190,090	736,612	1,211,555	2,789
18	2031	290,550	-	138,081	-	55,811	193,892	736,612	1,221,054	2,811
19	2032	296,361	-	140,843	-	56,927	197,770	736,612	1,230,743	2,834
20	2033	302,288	-	143,660	-	58,066	201,725	736,612	1,240,626	2,856

Reid Gardner Unit 3		LNB w/OFA & SCR								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	330,000	-	257,830	150,000	263,063	670,893	3,717,051	4,717,944	4,155
2	2015	336,600	-	262,987	153,000	268,324	684,311	3,717,051	4,737,962	4,172
3	2016	343,332	-	268,247	156,060	273,691	697,997	3,717,051	4,758,380	4,190
4	2017	350,199	-	273,612	159,181	279,164	711,957	3,717,051	4,779,207	4,209
5	2018	357,203	-	279,084	162,365	284,748	726,196	3,717,051	4,800,450	4,227
6	2019	364,347	-	284,666	165,612	290,443	740,720	3,717,051	4,822,118	4,246
7	2020	371,634	-	290,359	168,924	296,251	755,535	3,717,051	4,844,219	4,266
8	2021	379,066	-	296,166	172,303	302,176	770,645	3,717,051	4,866,762	4,286
9	2022	386,648	-	302,089	175,749	308,220	786,058	3,717,051	4,889,757	4,306
10	2023	394,381	-	308,131	179,264	314,384	801,779	3,717,051	4,913,211	4,327
11	2024	402,268	-	314,294	182,849	320,672	817,815	3,717,051	4,937,134	4,348
12	2025	410,314	-	320,580	186,506	327,086	834,171	3,717,051	4,961,536	4,369
13	2026	418,520	-	326,991	190,236	333,627	850,855	3,717,051	4,986,425	4,391
14	2027	426,890	-	333,531	194,041	340,300	867,872	3,717,051	5,011,813	4,413
15	2028	435,428	-	340,202	197,922	347,106	885,229	3,717,051	5,037,708	4,436
16	2029	444,137	-	347,006	201,880	354,048	902,934	3,717,051	5,064,121	4,459
17	2030	453,019	-	353,946	205,918	361,129	920,992	3,717,051	5,091,063	4,483
18	2031	462,080	-	361,025	210,036	368,351	939,412	3,717,051	5,118,543	4,507
19	2032	471,321	-	368,245	214,237	375,718	958,201	3,717,051	5,146,573	4,532
20	2033	480,748	-	375,610	218,522	383,233	977,365	3,717,051	5,175,163	4,557

Reid Gardner Unit 3			ROFA							
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	80,000	-	-	-	297,221	297,221	836,241	1,213,462	4,705
2	2015	81,600	-	-	-	303,166	303,166	836,241	1,221,007	4,735
3	2016	83,232	-	-	-	309,229	309,229	836,241	1,228,702	4,765
4	2017	84,897	-	-	-	315,413	315,413	836,241	1,236,551	4,795
5	2018	86,595	-	-	-	321,722	321,722	836,241	1,244,557	4,826
6	2019	88,326	-	-	-	328,156	328,156	836,241	1,252,724	4,858
7	2020	90,093	-	-	-	334,719	334,719	836,241	1,261,053	4,890
8	2021	91,895	-	-	-	341,414	341,414	836,241	1,269,549	4,923
9	2022	93,733	-	-	-	348,242	348,242	836,241	1,278,216	4,957
10	2023	95,607	-	-	-	355,207	355,207	836,241	1,287,055	4,991
11	2024	97,520	-	-	-	362,311	362,311	836,241	1,296,071	5,026
12	2025	99,470	-	-	-	369,557	369,557	836,241	1,305,268	5,061
13	2026	101,459	-	-	-	376,948	376,948	836,241	1,314,649	5,098
14	2027	103,489	-	-	-	384,487	384,487	836,241	1,324,217	5,135
15	2028	105,558	-	-	-	392,177	392,177	836,241	1,333,976	5,173
16	2029	107,669	-	-	-	400,020	400,020	836,241	1,343,931	5,211
17	2030	109,823	-	-	-	408,021	408,021	836,241	1,354,085	5,251
18	2031	112,019	-	-	-	416,181	416,181	836,241	1,364,442	5,291
19	2032	114,260	-	-	-	424,505	424,505	836,241	1,375,006	5,332
20	2033	116,545	-	-	-	432,995	432,995	836,241	1,385,781	5,374

ECONOMIC ANALYSIS SUMMARY

Reid Gardner Unit 3

Boiler Design:

Parameter	Current Operation	PM Control
		Fabric Filter
Case	1	7
PM Emission Control System	Fabric Filter	Fabric Filter
TOTAL INSTALLED CAPITAL COST (\$)	0	23,520,000
FIRST YEAR O&M COST (\$)		
Operating Labor (\$)	0	0
Maintenance Material (\$)	0	128,000
Maintenance Labor (\$)	0	216,000
Administrative Labor (\$)	0	0
TOTAL FIXED O&M COST	0	344,000
Makeup Water Cost	0	0
Reagent Cost	0	0
SCR Catalyst / FF Bag Cost	0	54,080
Electric Power Cost	0	159,432
TOTAL VARIABLE O&M COST	0	213,512
TOTAL FIRST YEAR O&M COST	0	557,512
FIRST YEAR DEBT SERVICE (\$)	0	2,494,437
TOTAL FIRST YEAR COST (\$)	0	3,051,949
Power Consumption (MW)	0.0	0.4
Annual Power Usage (Million kW-Hr/Yr)	0.0	3.2
CONTROL COST (\$/Ton Removed)		
PM Removal Rate (%)	0.00%	0.0%
PM Removed (Tons/Yr)	0	0
First Year Average Control Cost (\$/Ton PM Rem.)	0	#DIV/0!
Incremental Control Cost (\$/Ton PM Removed)	Base	#DIV/0!
		7-1

INPUT CALCULATIONS			
Reid Gardner Unit 3		Boiler Design:	
Parameter	Current Operation	PM Control	Comments
		Fabric Filter	
Case	1	7	
PM Emission Control System	Fabric Filter	Fabric Filter	
Unit Design and Coal Characteristics			
Type of Unit	PC	PC	
Net Power Output (kW)	100,000	100,000	
Net Plant Heat Rate (Btu/kW-Hr)	11,351	11,351	
Boiler Fuel	Bituminous	Bituminous Coal	
Coal Heating Value (Btu/Lb)	11,712	11,712	
Coal Sulfur Content (wt.%)	0.570%	0.570%	
Coal Ash Content (wt.%)	7.640%	7.640%	
Boiler Heat Input, each (MMBtu/Hr)	1,135	1,135	
Coal Flow Rate (Lb/Hr)	96,918	96,918	
(Ton/Yr)	386,295	386,295	
(MMBtu/Yr)	9,048,563	9,048,563	
Emissions			
Uncontrolled Fly Ash (Lb/Hr)	5,924	17	
(Lb/MMBtu)	5.219	0.015	
(Lb Moles/Hr)	197.4	0.6	
(Tons/Yr)	23,610	68	
Fly Ash Removal Rate (%)	99.71%	0.00%	
(Lb/Hr)	5,907	0	
(Ton/Yr)	23,542	0	
Fly Ash Emission Rate (Lb/Hr)	17	17	
(Lb/MMBtu)	0.015	0.015	
(Ton/Yr)	68	68	
General Plant Data			
Annual Operation (Hours/Year)	7,972	7,972	
Annual On-Site Power Plant Capacity Factor	91%	0.91	
Economic Factors			
Interest Rate (%)	8.55%	8.55%	
Discount Rate (%)	9.00%	9.00%	
Plant Economic Life (Years)	20	20	
Installed Capital Costs			
PM Emission Control System (\$2007)	0	23,520,000	
Total Emission Control Systems (\$2007)	0	23,520,000	
PM Emission Control System (\$/kW)	0	235	
Total Emission Control Systems (\$/kW)	0	235	
Total Fixed Operating & Maintenance Costs			
Operating Labor (\$)	0	0	
Maintenance Material (\$)	0	128,000	
Maintenance Labor (\$)	0	216,000	
Administrative Labor (\$)	0	0	
Total Fixed O&M Cost (\$)	0	344,000	
Annual Fixed O&M Cost Escalation Rate (%)	2.00%	2.00%	
Reagent Cost			
Unit Cost (\$/Ton)	None	None	
(\$/Lb)	0.00	0.00	
Molar Stoichiometry	0.00	0.00	
Reagent Purity (Wt.%)	100%	200%	
Reagent Usage (Lb/Hr)	0	0	
First Year Reagent Cost (\$)	0	0	
Annual Reagent Cost Escalation Rate (%)	2.00%	2.00%	
SCR Catalyst / FF Bag Replacement Cost			
Annual SCR Catalyst (m3) / No. FF Bags	0	520	
SCR Catalyst (\$/m3) / Bag Cost (\$/ea.)	3,000	104	
First Year SCR Catalyst / Bag Replace. Cost (\$)	0	54,080	
Annual SCR Catalyst / Bag Cost Esc. Rate (%)	2.00%	2.00%	
Auxiliary Power Cost			
Auxiliary Power Requirement (% of Plant Output)	0.00%	0.40%	
(MW)	0.00	0.40	
Unit Cost (\$2007/MW-Hr)	50.00	50.00	
First Year Auxiliary Power Cost (\$)	0	159,432	
Annual Power Cost Escalation Rate (%)	2.00%	2.00%	

Economic factors as per Sierra Pacific 2008 planning guidelines

CAPITAL COST

Reid Gardner Unit 3

Parameter	PM Control	
	Fabric Filter	
Case NOx Emission Control System SO2 Emission Control System PM Emission Control System	7 LNB Soda Ash Wet FGD Fabric Filter	
CAPITAL COST COMPONENT	Factor/Source	Cost
Fabric Filter		
Major Materials Design and Supply	Vendor	\$21,000,000
Construction	0.0%	\$0
Balance of Plant	0.0%	\$0
Electrical (Allowance)	0.0%	\$0
Owner's Costs	0.0%	\$0
Surcharge	0.0%	\$0
AFUDC	12.0%	\$2,520,000
Subtotal		\$23,520,000
Contingency	0.0%	\$0
Total Capital Cost for Fabric Filter		\$23,520,000

Reid Gardner Unit 3		Current Operation								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	-	-	-	-	-	-	-	-	-
2	2015	-	-	-	-	-	-	-	-	-
3	2016	-	-	-	-	-	-	-	-	-
4	2017	-	-	-	-	-	-	-	-	-
5	2018	-	-	-	-	-	-	-	-	-
6	2019	-	-	-	-	-	-	-	-	-
7	2020	-	-	-	-	-	-	-	-	-
8	2021	-	-	-	-	-	-	-	-	-
9	2022	-	-	-	-	-	-	-	-	-
10	2023	-	-	-	-	-	-	-	-	-
11	2024	-	-	-	-	-	-	-	-	-
12	2025	-	-	-	-	-	-	-	-	-
13	2026	-	-	-	-	-	-	-	-	-
14	2027	-	-	-	-	-	-	-	-	-
15	2028	-	-	-	-	-	-	-	-	-
16	2029	-	-	-	-	-	-	-	-	-
17	2030	-	-	-	-	-	-	-	-	-
18	2031	-	-	-	-	-	-	-	-	-
19	2032	-	-	-	-	-	-	-	-	-
20	2033	-	-	-	-	-	-	-	-	-

Reid Gardner Unit 3		Fabric Filter								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst / FF Bag Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton PM Removed)
0	2013									
1	2014	344,000	-	-	54,080	159,432	213,512	2,494,437	3,051,949	#DIV/0!
2	2015	350,880	-	-	55,162	162,621	217,782	2,494,437	3,063,099	#DIV/0!
3	2016	357,898	-	-	56,265	165,873	222,138	2,494,437	3,074,473	#DIV/0!
4	2017	365,056	-	-	57,390	169,191	226,581	2,494,437	3,086,073	#DIV/0!
5	2018	372,357	-	-	58,538	172,574	231,112	2,494,437	3,097,906	#DIV/0!
6	2019	379,804	-	-	59,709	176,026	235,735	2,494,437	3,109,976	#DIV/0!
7	2020	387,400	-	-	60,903	179,546	240,449	2,494,437	3,122,286	#DIV/0!
8	2021	395,148	-	-	62,121	183,137	245,258	2,494,437	3,134,843	#DIV/0!
9	2022	403,051	-	-	63,363	186,800	250,163	2,494,437	3,147,651	#DIV/0!
10	2023	411,112	-	-	64,631	190,536	255,167	2,494,437	3,160,716	#DIV/0!
11	2024	419,334	-	-	65,923	194,347	260,270	2,494,437	3,174,041	#DIV/0!
12	2025	427,721	-	-	67,242	198,234	265,475	2,494,437	3,187,633	#DIV/0!
13	2026	436,275	-	-	68,587	202,198	270,785	2,494,437	3,201,497	#DIV/0!
14	2027	445,001	-	-	69,958	206,242	276,201	2,494,437	3,215,638	#DIV/0!
15	2028	453,901	-	-	71,357	210,367	281,725	2,494,437	3,230,062	#DIV/0!
16	2029	462,979	-	-	72,785	214,574	287,359	2,494,437	3,244,775	#DIV/0!
17	2030	472,238	-	-	74,240	218,866	293,106	2,494,437	3,259,782	#DIV/0!
18	2031	481,683	-	-	75,725	223,243	298,968	2,494,437	3,275,089	#DIV/0!
19	2032	491,317	-	-	77,240	227,708	304,948	2,494,437	3,290,702	#DIV/0!
20	2033	501,143	-	-	78,784	232,262	311,047	2,494,437	3,306,627	#DIV/0!