

Amatitlan Geothermal Power Project

Fig. 3-2-10 CONSTRUCTION SCHEDULE (CASE 1) 建設計画 (CASE 1)

Commercial operation Power Plant Design, Maufacturing, Transportation Construction and comissioning Fluid Collection and Reinjection System Reservoir Response Monitoring Transmission Line Drilling of Wells

Amatitlan Geothermal Power Project

Fig. 3-2-11 CONSTRUCTION SCHEDULE (CASE 2) 建設計画 (CASE 2)

Commercial operation Steam admission UNIT 2 Commercial operation Steam admission FIND Design, Maufacturing, Transportation Construction and comissioning Fluid Collection and Reinjection System Reservoir Response Monitoring Transmission Line Drilling of Wells Power Plant

Amatitlan Geothermal Power Project

Fig. 3-2-12 CONSTRUCTION SCHEDULE (CASE 3) 建設計画 (CASE 3)

	Months
	1 2 3 4 5 6 7 8 9 10 1112 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 14 42 43 44 45 46 48 30 5 25 55 57 59 59 59 59 50 50 50 50 50 50 50 50 50 50 50 50 50
)
Reservoir Response Monitoring	
-	
Drilling of Wells	
Fluid Collection and Keinjection System	
Transmission Line	
	Commemcement of
Power Plant (Units No.1 and 2)	Gentle CO Co
1	OTHER CONTRACTOR OF THE PROPERTY OF THE PROPER
Design, Maufacturing, Transportation	Constant to the second
Construction and comissioning	Cham and head

Table 3-2-1 Selection of Generating Technology 発電方式の候補

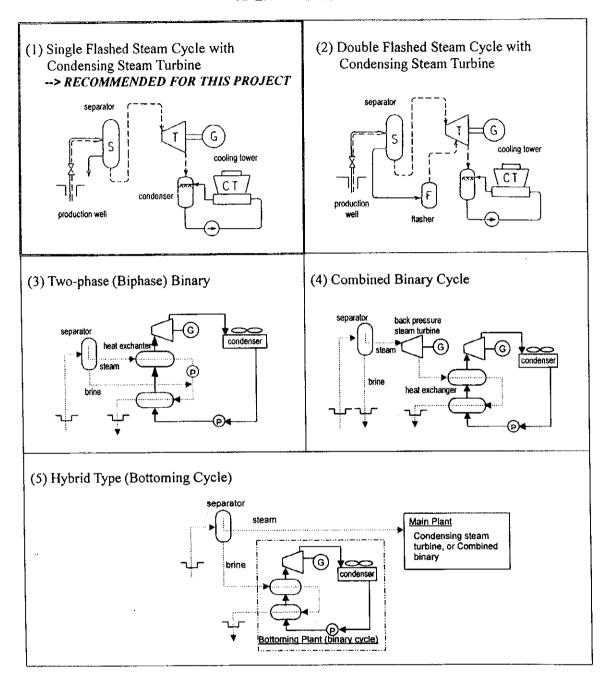


Table 3-2-2 Estimated Project Cost (Plant Site I, Outside Caldera) 工事費見積(発電所建設地点 I : カルデラ外)

	Scenario 1	Scenario 2	Scenario 3
l. Well Drilling			
Base cost	3.20	9.60	8.00
Price contingency	0.09	0.68	0.25
Physical contingency	0.16	0.51	0.41
2. Fluid Collection and Reinjection System		,	
Base cost	10.10	11.00	11.00
Price contingency	0.30	0.39	0.33
Physical contingency	0.52	0.57	0.57
3. Power Plant	· ·		
Base cost	29.15	55.65	53.00
Price contingency	0.88	3.35	1.76
Physical contingency	0.90	1.77	1.64
4. Transmission Line and Substation			
Base cost	2.90	3.50	3.50
Price contingency	0.09	0.14	0.11
Physical contingency	0.09	0.11	0.10
			6.
5. Geoscientific, General and Administrative Cost			
Base cost	5.46	10.92	7.55
Price contingency	0.16	0.67	0.26
Physical contingency	0.28	0.58	0.39
6. Land Acquisition and Compensation	1.84.50		
Base cost	0.75	1.50	1.50
Price contingency	0.02	0.08	0.05
Physical contingency	0.04	0.08	0.08
Project Cost Total	1.0		
Base cost	51.56	92.17	84.55
Price contingency	1.54	5.31	2.76
Physical contingency	1.99	3.62	3.19
TOTAL	55.09	101.10	90.50

Table 3-2-3 Estimated Project Cost (Plant Site II, Outside Caldera) 工事費見積(発電所建設地点 II: カルデラ内)

	Scenario 1	Scenario 2	Scenario 3
. Well Drilling			
Base cost	3.20	9.60	8.00
Price contingency	0.09	0.68	0.25
Physical contingency	0.16	0.51	0.41
2. Fluid Collection and Reinjection System			
Base cost	7.30	8.20	8.20
Price contingency	0.22	0.31	0.25
Physical contingency	0.38	0.43	0.42
3. Power Plant			
Base cost	29.15	55.65	53.00
Price contingency	0.88	3.35	1.76
Physical contingency	0.90	1.77	1.64
4. Transmission Line and Substation			
Base cost	3.10	3.70	3.70
Price contingency	0.09	0.14	0.11
Physical contingency	0.10	0.12	0.12
5. Geoscientific, General and Administrative Cost			
Base cost	5.46	10.92	7.55
Price contingency	0.16	0.67	0.26
Physical contingency	0.28	0.58	0.39
6. Land Acquisition and Compensation			
Base cost	1.20	2.40	2.40
Price contingency	0.02	0.12	0.07
Physical contingency	0.06	0.13	0.12
Project Cost Total			1.37 2
Base cost	49.41	90.47	82.85
Price contingency	1.46	5.27	2.70
Physical contingency	1.88	3.54	3.10
TOTAL	52.75	99.28	88.65

3.3 Envionmental Impact Assessment

- 3.3.1 Object of the Exaination
- 3.3.2 Environmental Regulation and Guidelines in Guatemala
- 3.3.3 Outline of the Field Survey Results
- 3.3.4 Environmental Monitoring during the Wells
 Drilling & Well Tests
- 3.3.5 Environmental Impact Assessment
- 3.3.6 General Recommendation for Next Project

3.3 ENVIRONMENTAL IMPACT ASSESSMENT

3.3.1 Object of the Examination

The environmental impact survey and analysis were performed to identify and evaluate the environmental sensitive aspects, and to provide the mitigation methods for these impacts during the drilling preparation works, drilling and production test base on "Environmental monitoring schedule". The initial environmental examination (IEE) was carried out in October 1998 before in position to start preparation of drilling of AMJ-1&2 base on the JICA's investigation program. Then, the environmental impact assessment and analysis were carried out in November – December 2000 in the area during wells drilling and well tests period.

The object of this examination is to support to make the "Environmental impact assessment" regarding construction plan of geothermal power plant that must be identified by results of the field survey.

3.3.2 Environmental regulation and guidelines in Guatemala

1. Correspondence for Environmental Survey

Environmental regulations in Guatemala have changed in recent years, so in order to execute any kind of works relate to well drilling in connection with geothermal survey that is required to have an authorization extended by Ministry of Environment (MOE). Besides of MOE, The CONAP (The National Protected Areas Commission) and INAB (The National Forestry Institute, in charge of the Volcan de Pacaya National Park) that are belong to governmental organization exist in conjunction with environmental affairs. However, to drill even within a National Park, once the permit from MOE is obtained, there is no need to obtain permits from other Organization.

Therefore, before in position to start preparation of drilling operation by this project, a report on the Environmental Impact Assessment (EIA) addressed to describe the possible impact on the environment caused by the construction of drilling pads, access roads, drilling operations and production test was required. A scheme of monitoring plan, outline of contents of the EIA and related reference data were already presented to INDE at the end of December of 1998. INDE prepared the EIA report on this project and have got the authorization from MOE.

INDE also made the schedule on a) monitoring plan, b) environmental mitigation plan and c) security / contingency plans for drilling operation that was required by MOE, and presented its. Then, the environmental impact survey has been carrying out along these schedules.

2. Standard of Environmental Assessment Index

a. MOE's Standards for Environmental Assessment

In the standards book published by MOE, no definite description regarding the environmental regulation and on the standard value was found. Up to day, EIA applications submitted to MOE standard value set

forth by the WHO or IDB have been adopted.

b. Related Standard of Environmental Assessment Index

1) Water effluent

a) Limit of waste water

The limits of wastewater to discharge to the public areas are regulated on IEE of the progress report (March,1999). It is mentioned that pH:6-9, COD(Chemical oxygen Demand): below 250mg/l, TSS(Total Suspended Solid): below 50mg/l, As:0.1mg/l etc. And, the limits of sewage from the geothermal power plant are basically also as same as those limits.

b) Limit of drinking water

The limits of items related to geothermal fluids set forth by the standard of drinking water regulated by WHO (World Health Organization; 1993) are shown in IEE of the progress report. It is mentioned that As limit is below 0.01 ppm. But, the limits of Cl (below 250 ppm), H₂S (below 0.05 ppm) and NH₃(below 1.5 ppm) are standardized according to smell and taste. Although, the limit of B is 0.3 ppm in WHO standard, that of CCREM (Canadian Council of Resource and Environment Minister's water Quality Guidelines; 1991) is 5 ppm.

2) Air emission

a) Limit for industrial estates

The standard values set forth on the environmental guideline of WB in industrial production are shown in IEE of the progress report. It is mentioned that the limit of H₂S is below 10ppm (15mg/Nm³).

b) Limit of property boundary

The standard value of air conditions at property boundary set forth on the environmental guidelines of WB in all industries is also shown in IEE of the progress report.

c) Limit of exposure

Several standard of exposure limit of H₂S, CO₂, Hg and SiO₂ (amorphous silica) in the air are shown in IEE of the progress report (by Kevin Blown,1995). The limits of H₂S of TLV ACGIH(Threshold Limit Values of American Conference of Governmental and Industrial Hygienists) and MAK(Maximum Concentrations at the Workplace) are defined as 10ppm.

3) Noise

a) Limit of duration at the noise level

The limit of noise on the workplace set forth by OSHA (Occupational

Safety and Health Administration that is one of the American Organization) is shown in IEE of the progress report. The duration of noise level of 85 dB(A) is allowed within 8 hours a day.

b) Limit for the surrounding circumstances

The limit of noise for the surrounding circumstances set forth on the environmental guidelines of WB in industrial production is shown in IEE of the progress report. It describe that the ambient noise level around residential area at the day time (7:00-22:00) is allowed within 55dB(A).

c) Others

The items of Environmental Impact Assessment (EIA) to proceed the geothermal exploitation are the effect for plant and animals, vibration, fluctuation of underground water level, sinking, etc. other than the above mentioned water effluent, air emission and noise. However, these items are not regulated definitely.

3.3.3 Outline of the Field Survey Results

The target area for geothermal exploitation is located between Laguna de Calderas and active volcano, Mt. Pacaya. The altitude of this area ranges from 1,500 to 2,000 m.a.s.l.. Most of the area lies within a National Park. La Lagunilla as the famous heritage is slightly apart from the area. San Vincente Pacaya and San Jose Calderas are medium size residential zones (the most important within the Amatitlan geothermal prospect) close to the targeted area while small villages such as Concepcion, El Cedro, San Francisco de Sales, etc. lies within the area. Due to the lack of rivers or streams with continuous water current, the inhabitants use the water of Laguna de Calderas as their main potable water supply.

In this area, two geothermal wells such as AMF-1 and AMF-2 have been drilled at the west edge of Laguna de Calderas. During the field survey it was found that the background concentration of gases like H₂S and SOx were though to be higher than it should be predicted. The reason might be several fumaroles around wells site and the Pacaya volcano which is still active.

3.3.4 Results of Environmental Monitoring during the Wells drilling & Well Tests

The utmost care about environmental issue on the surrounding geothermal developing area must be taken with respect to the following items.

- · Monitoring for water effluent
- · Monitoring for hydrogen sulfide emission
- · Monitoring for noise impact on the surrounding residential area

1. Impact on Water Quality

The monitoring points such as water streams, shallow drill hole of 50m depth and lake water in Calderas that is 12 in all for measurement on water fluids were selected around the geothermal developing area.

According to the monitoring results, there were no evidence that can be affected by well drilling and well test of AMJ-1&2. The concentration of Cl

and B in the monitored water samples was lower than limit in the standard of CCREM. But, the judgments for toxic elements like As and Hg in monitored points ware cancelled because of lack of data.

2. Impact on Air Quality (H2S Emission)

The H₂S concentration around the area where AMJ-2 was drilled and its blowout test was carried out, shown in IEE of the interim report (March,2001).

The whole of H₂S concentration during blowout test (Nov.27, 2000) were below 0.010ppm. The standard value set forth on the environmental guideline of WB (World Bank) for industrial production shows 10ppm.

In the developing area, 2 of geothermal production wells ware existing close to the site where 2 of new observation wells named AMJ-1&2 were drilled in Amatitlan. The backpressure turbine using steam produced from AMF-1&2 wells has been generating with 5MW. H₂S monitoring related with power plant operation was carried out every week around area. It was shown in IEE of the interim report. The maximum concentration of H₂S (after April of 2000) was 0.012ppm. Other measured concentrations were around 0.00Xppm that is fairly low concentration.

3. Noise Impact

The noise level comparison with noise level of background (after blowout) around the area where AMJ-1&2 were drilled during drilling works and blowout test was shown in IEE of the interim report.

Maximum noise level when blowout (fully open) of AMJ-1 was 116dB beside of the well, also measured 88 – 116dB at the pad. Noise levels of background were 74 – 95dB at the same points. The point No.5 an entrance way to the pad (100m a way from the pad) shown 76 – 88dB. This level is exceeding the background noise level, but almost same level of background / typical noise level in major city (1993, A.Freeston). The point No.9 San Francisco church atrium in the center of the village where close to the drilling pad, shown 58 – 66dB. Background level was 57dB at the same point.

Other hand, maximum noise levels of AMJ-2 during blowout operation were 75 – 99dB around pad, it was relatively low level compared with AMJ-1. In case of AMJ-2's blowout test, an entrance gate to pad point No.5 was 63dB, and the San Francisco church atrium point No.9 shown 58dB. Those levels are as same as background level.

4. Conclusions

The study on the Environmental Impact Evaluation regarding wells drilling and blowout test of AMJ-1&2 in the Amatitlan geothermal area, it will be concluded following.

- 1) Regarding water samples such as water streams, shallow drill hole of 50m depth and lake water in Calderas, there were no evidence that can be affected by well drilling of AMJ-1&2.
- 2) The whole of H₂S concentration around drilling pad were relatively low

and it's concentration during blowout test of AMJ-2 were below 0.010ppm.

- 3) Maximum concentration of H₂S related with power plant (5MW) operation was 0.010ppm, and another measured concentrations around power plant were extremely low.
- 4) Whole of monitoring points without drilling pad, the noise levels were almost same as background level, even in near by residential area.
- 5) The drilling mud and cuttings were buried. Whole of geothermal hot water was disposed into reinjection well, and drainage was dumped to waste water pit.

3.3.5 Environmental Impact Assessment

1. Conditions for Case Study

· Install capacity of newly power plant : 20,000kW

• Utilizing rate of power plant : 90%

· Type of power generation: Single flash & Steam turbine / Steam

condensate

• Steam consumption for generation : 141t/h

· Non-condensable gas content in steam : 1.78wt%

• CO₂ concentration in N.C gas : 93.0%

• H₂S concentration in N.C gas : 5.5%

• Volume of hot water : 320t/h

• Exhausted air volume from cooling tower: $4.6 \times 10^6 \, \text{Nm}^3 / \text{h}$

• Place of the power plant : out of the caldera rim

2. Environmental Impact Assessment

a. Water Effluent

Any of water effluents on the environmental issues related to the wells drilling in this area couldn't be recognized above mentioned by the environmental monitoring. Even so, some influence might be affected from wasted water or drainage from working places regarding power plant construction because the topography of this area shows with in a basin structure where is occupied the lowest elevation of Calderas lake, even if the power plant will be constructed within the Caldera. Therefore, it is recommended by this point of view.

1) Disposal of geothermal hot water

Whole amount of geothermal hot water discharged from 4 wells (AMF-1&2 and AMJ-1&2) will reach around 165t/h (at 20MW operation:320t/h)

showing Table 3-3-1. And major chemical components of hot water are shown in Table 3-3-2. The toxic elements like As (7-8ppm), B (40-50ppm) in geothermal hot water are extremely high, then whole of geothermal hot water should be disposed into the reinjection wells to under ground. On the other side, reninjection of hot water is necessary to help recharge the reservoir to maintain pressures in the reservoir.

2) Disposal of over flow water from cooling water system

The presence of water quality of over flowed cooling water at power plant operation stage cannot infer at the moment. The quality of the water is depending on the characteristic of condensate in general. The chemical components of steam condensate from 2 geothermal wells (AMJ-1&2) are shown in Table 3-3-3. Both As and Hg concentration in the condensate are lower than the limit (As:0.1mg/l, Hg:0.05mg/l) for process wastewater on the environmental guideline of WB, but the concentration of these are slight higher than the limit (As:0.001ppm, Hg:0.001ppm) on standards and guidelines for drinking water of WHO. Concentration of As,Hg and B in steam condensate in a world average selected geothermal fluids are also slight high compared with limit on WHO standards for drinking water. The contaminant concentration in selected geothermal fluids in a world average is showing Table 3-3-4 (by Jenny G.WEBSTER,1995).

As an operation stage of power plant, it seems to be used a kind of chemicals like "Biocide" to be added into the cooling water system due to prevent occurring of oxidizing bacteria and algae. From this point, an over flow water from cooling water system shall be injected into another reinjection well.

3) Disposal of waste water and drainage from working area

Whole of wasted water and drainage discharged from working area should be disposed to the pond and neutralized as same as a way of treatment at the wells drilling.

4) Disposal of drilling mud and other waste

The drilling mud and drilling fluids like cuttings shale be exhausted to drainage pit at first, after the evaporation, waste dumps shall be buried as same as a way of treatment at the wells drilling.

b. Hydrogen sulfide emission

1) H₂S concentration at the wells drilling stages

The whole of H₂S concentration during blowout test (Nov.27, 2000) were below 0.010ppm. These concentrations were extremely low compared with a standard value which is set forth on the environmental guideline of WB (World Bank) for industrial production shows 10ppm. Even so, it will be needed about consideration how to release H₂S safely into the atmosphere, because H₂S smell is well detectable at very low concentration under 0.3ppm. Incidentally, 5 MW power plant using steam produced from AMF-1&2 has been generating, but H₂S

concentration around area was 0.012ppm (Max) fairly low concentration.

2) Properties of H₂S

In general, hydrogen sulfide gas (H2S) exist in common geothermal fields and it has a characteristic like rotten eggs odor which is well detectable at very low concentration under 0.3ppm. H₂S is a heavy gas compared with air, and extremely flammable gas and highly toxic. Due to funny odor and toxic gas, it is kept out of working places or residential area. The standard value set forth on the environmental guideline of WB (World Bank) for industrial production and TLVACGIH (Threshold Limit Value of American Conference of Government and Industrial Hygienists) shows 10ppm. As the concentration increase, the odor becomes sweeter and finally disappears above 105ppm. Consequently a human may die within one hour if concentration of H2S exceed 600 ppm. H2S is a kind of heavy gas and will accumulate in low lying area, then it may travel some distance in gullies, drain or pipe pits without significant diluting or mixing with air. Therefore, it can say that the concentration of H₂S in environmental circumstances is affected by atmospheric conditions. The concentration will reach high enough with weak wind, decrease in atmospheric temperature and increase in humidity. Consequently, the concentration of H2S in circumstances at geothermal developing site can be controlled by atmospheric condition with winds, temperature and humidity.

The effects of H₂S on the wider environment are likely to be limited mainly to the secondary effects of any unoxidised gas remaining as hydrogen sulfide in the rainwater, and potential contamination of surface waters. Although, a part of H2S will converted to sulfuric acid, and have been identified as components of acid-rain, but no direct link between H2S emission and acidification of rainwater has been established.

3) Examination on H₂S emission

a) Conditions as a case study

• Install capacity of newly power plant : 20,000kW

· Steam consumption for generation : 141t/h

· Non-condensable gas content in steam: 1.78wt%

• H₂S concentration in NC.Gas 5.5%

• Exhausted air volume from cooling tower : $4.6 \times 10^6 \text{ Nm}^3/\text{h}$

b) Estimation of H₂S emission

 $: 141 \times 1.78/100 = 2.51 t/h$ · Gas flow

• H₂S emission : $2.51 \times 5.5/100 \times 10^{-3} = 138g/h$

• Total H₂S emission : $138 \times 22.4/34 = 91 \text{Nm}^3/\text{h}$

c) Estimation of H₂S emission from cooling water

• H₂S concentration at cooling tower exhaust : $91/4.6 \times 10^6 \times 10^6 = 20$ ppm

d) Comparison on H₂S emission

Total H₂S emission (91Nm³/h) and H₂S concentration (20ppm) at cooling tower exhaust were examined in case of 20 MW out put. Then, estimated values were evaluated compared with other existing geothermal power plants. Table 3-3-5 shows comparison results. From this, estimated H₂S concentration around power plant won't high comparatively.

4) Planning for Mitigation of H₂S Emission

It was assumed that H₂S concentration exhausted from cooling tower is fairly low in comparison with other existing power plants above mention. An ambient H₂S concentration around developing area won't exceed the limit of 10ppm which is set forth on the environmental guideline of WB and TLVACGIH. Although, the concentration of H₂S in circumstances at the site can be controlled by atmospheric conditions with winds, temperature and humidity, and affected by land scope. Therefore, it is better choice that the power plant shall be constructed out of the caldera rim.

General options on planning for mitigation of H₂S emission for electric power generation are summarized on following subjects;

- · An enlargement of forced draft due to dilution and dissemination.
- · An adoption of gathering cooling tower system for well dilution.
- · An adoption of completely closed system like Binary plants.
- An adoption of H₂S abatement apparatus, there are various process shown in Fig. 3-3-1.

c. Noise

When the blow out operation (fully open) of AMJ-1, maximum noise level was 116dB beside of the well, also measured 76 – 88dB at the point No.5 an entrance way to the pad (100m a part from the wells pad). This level is exceeding the background noise level, but almost same level of background / typical noise level in major city (1993, A.Freeston). Noise impacts in regard to the environmental issue depend on the relation between noise level and distance to the residential area. Noise level around residential area at the blow out test of AMJ-2 was 58dB as same level as background noise level.

Noise levels when the power plant is completed and operated on normal condition won't exceed the noise levels at the blow out operation of wells.

When the power plant will be installed at the site adjacent to the wells pad for AMJ-1&2 (out of the caldera rim), noise level around residential area won't exceed the standard value set forth on the environmental guideline

of WB for industrial production, from the relation between noise levels and actual distance to the residential area.

3.3.6 General Recommendation for Next project

- 1) The educative activities related with geothermal development should be implemented to the local communities in case of continued project.
- 2) Special attention must be paid to recover or repair the circumstances related to the project.
- 3) In case of further development program, through the construction of the power plant and operation, the Environmental Impact Evaluation plan must be implemented continuously.
- 4) In case of newly evaluation on further Environmental Impact Assessment, a) Plan for environmental impact monitoring (air, water, noise) b) Plan for environmental impact mitigation during drilling preparation, well drilling and blow out test c) Plan for human health protection and security on drilling preparation, drilling and blow out test shall be implemented with enrich the contents. For the monitoring of air, water and noise, measurement skill, measurement detector/devices and staffs shall be built up.

H2S 除去技術の地熱への適用例 Claus Sulfur Recovery Process H₂S Removal from Dry Treating Method Exhausted Gas with Al/Si Catalyser Wet Treating Method with Alumina Cat. Locat Process H₂S Recovery Methods with Iron-chelates Stretford Process with Na₂ADA H₂S Combustion H₂S into H₂SO₄ PSA and H₂S Combustio Hydrogen Peroxide H₂S Removal from Injection Cooling Water Iron Chelates Injection H₂S Removal from React with Copper Steam before into Cu-Sulphide Turbine Inlet Hydrogen Peroxide H₂S Removal before with use of Alkaline Kick-off Test of Well Adoption of Turbine By-pass Some Devices on the Power Plant Others, H₂S Adoption of Sufface Treatments Coatact Type Condense Direct Gas Injection Bioreactor (Sulfur Oxidiging Bacteria) Absorb into

Fig. 3-3-1 H₂S Abatement Process/Technology for Geothermal Application

Magnesium Hydrooxide

Table 3-3-1 Hot water volume of each wells.

坑井からの熱水量

	AMF-1	AMF-2	AMJ-1	AMJ-2	Total
Hot Water (t/h)	125	25	1.2	12.9	164.1

Table 3-3-2 Chemical components of hot water.

熱水の化学組成

	AMF-1	AMF-2	AMJ-1	AMJ·2
Data	before	Oct./22/1998	Nov./25/2000	Nov./28/2000
pН	7.01	5.25	7.95	7.56
TSM (mg/l)	7610	6150	3230	9500
Na (")	2298	1630	760	2520
K (")	495	345	132	524
Ca (")	79.2	39.1	10.3	72.5
Mg (")	0.16	0.02	0.07	0.09
T-SiO ₂ (")	567	745	765	1100
Cl (")	4049	2970	1220	4500
SO ₄ (")	28	11.7	28.2	36.7
HCO ₃ (")	38	37	137	54
B (")	43.3	45.9	42.0	77.1
As (")	7.59	5.39	3.56	8.64
Hg (")	<u> </u>	0.0009	-	4500

Table 3-3-3 Chemical components of condensed water.

凝縮水の化学組成

		AMJ-1	AMJ-2
PH		5.85	5.03
Cl (mg	/ •)	0.54	0.12
As (n)	0.013	0.031
Hg (<i>n</i>)	0.0011	< 0.0005

Table 3-3-4 Contamination Concentrations in selected Geothermal Fluids and Gases* and in a World Average Freshwater 地熱熱水・ガスの汚染物質濃度と清水の化学成分濃度

(mdd)

		Ţ			Γ-		1	- 1	Τ-			T	—	T		T	_	er, 1995)
NH3	0.04			386	t C F	127	00 0	0.20		700	52			190	4	1	c./	(Jenny Gr. Webster, 1995)
H2S	<d]< td=""><td>In/</td><td></td><td>16</td><td>,,,</td><td>0.16</td><td></td><td>1.7</td><td></td><td>540</td><td>666</td><td>1111</td><td>•</td><td>350</td><td>5.5</td><td></td><td>400</td><td>•</td></d]<>	In/		16	,,,	0.16		1.7		540	666	1111	•	350	5.5		400	•
Hg	70000	0.0004		9000	2000	0.00005		0.0002		0.005			0.04	•	6000	0.002		
As	0000	0.002		10	71	2.3		4.7		0.019		•	•	•			•	
ď	ď	0.01		000	390	19		30	(g)	16	01		•			0.23	0.052	
	וח	0.003			215	•		14	densable Gases(n				s				•	
		Freshwater	Deen mall Wotors	Deep well waters	Salton Sea (US)	Cerro Prieto	(Mex)	Wairakei (NZ)	Steam(s) or Non-condensable Gases(ncg)	() (OII)	Geysers (US) (s)	Geysers(US) (ncg)	Cerro Prieto (s)	(Cerro Frieto (ncg/	Wairakei (s)	Woiselvei (neg)	Wailanci (1108)

* Gas concentrations units here are ppm by weight, or mg/kg.

Table 3·3·5 Comparison on Total H₂S Emission and H₂S Concentration with Other Existing P/P 総 H2S 排出量と H2S 濃度の他の地熱発電所との比較

Predicted H2S around P/P (ppm)		0.03~0.06	0.006~0.008	$0.141 \sim 0.193$	0.006~0.007	
H2S Emission (Nm3/h)	117	58	140	~730	128	
H2S Concentration at cooling tower (ppm)	45	62~120	14~120	49~110	6~10	
Out Put (MW)	(20)	27.5	50	65	55×2	
Name of Power plant	Amatitlan	A	В	S	D	

3.4 Economical and Financial Evaluation

- 3.4.1 Necessity of Project
- 3.4.2 Least Cost Solution
- 3.4.3 Financial Evaluation

	4.00	
医侧侧 医侧侧线 医直动性连续炎		
	그 그 이 공항 없는 이상의 본다.	실어 살아갔다 것 뭐 하늘의
	문항은 그들의 문화적인 경치 환경인	
그리다면 되고 그림을 만하다고 하		
	하는 것이 되었다. 이 경기에 있는 것이 되었다. 그런	왕이 하면 있다. 그는 이 나를 사용하고 있다. 스타이스 이 보고 하는 사용이 들어가 있다면 보기를 받는다.
		경기들이 하는 것은 이 경기를 하는 것이 되는 것이 되었다. 그 말을 하는 것이 없는 것이 없다. 그런 그들은 경기를 하면 하는 것이 말씀하는 것은 것이 되었다. 그는 것은 것이
인데 하다가 살아가 살아지다고 말했다.	[일 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 :	리 유현하는 등 그는 요로 배운한다.
	그 발생으로 받았는데 하네요?	에 다양하다 및 하고 개발경기를 보았습니다 수있을 (100mm) 기계
이번 살아가 하는 것 같은 것이 없었다.		
	그 그리고 하다 오래 하다 하는 가장 모양	
일이 생각하게 되었는데 아이를 통하고 못		
당일 보일 전 경찰 보인 경찰 네 경찰		
는 경험에 되었다. 그리는 이 등을 받는 하다. 그리고 말이 말하지만 하고 있다. 나 있다.		
에는, 성프릴리하는 얼굴된다는 경찰의		
	[발발] 내용학생님의 젊은 그 가장은 그리고 하는 가장 하게 하지 않는	and the contract of the contra

3.4 ECONOMIC AND FINANCIAL EVALUATION

Among 3 each project implementation case inside and outside Caldera for Amatitlan Geothermal Power Development, the least generating cost case at the present value will be sought for at the economic evaluation. At the financial evaluation, financial soundness of each case will be evaluated with the financial internal rate of return method as well as cash flow based on the most plausible assumptions. The calculation process of each case will be presented in a form of electric files to INDE for further detailed study or review of some assumptions when the project will actually be implemented.

3.4.1 Necessity of Project

1. Power Demand

Since 1990, the power demand in Guatemala has been increasing supported by an average increase of GNP at 4% and active and robust trade with Central American countries. Although the rate has shown a slight decline recently, the demand increase rate still shows about 10%. After new Electric Enterprise Bill has been promulgated in 1996, the electrification rate in the country at 46.4% in 1990 increased to 73.4% in 1999. According to the Ministry of Energy and Mine, the total electrification is forecast to be attained by 2003.

As shown in Table 3.4-1, the country's dependable installed capacity was about 1,380 MW at the end of 1999 while the electric energy consumption reached 5,348 GWh at the peak demand of 1,049 MW. INDE forecast the demand increase at an average of 7.7% to 8.0% for coming 10 years in its medium scenario. When this project would be completed in 2005 or 2006, the forecast noted that total install capacity of about 1,600 MW, additional 200 MW or so capacity, would be necessary. So, taking into account the existing aged power generating facilities soon to be retired, the introduction of geothermal power units with a capacity of 20 MW x 2 units will be very significant for stable power supply and power system diversification because the geothermal power can generate at a higher capacity factor using indigenous energy source.

Table 3.4-1 Existing Power Facilities, MW (1999)

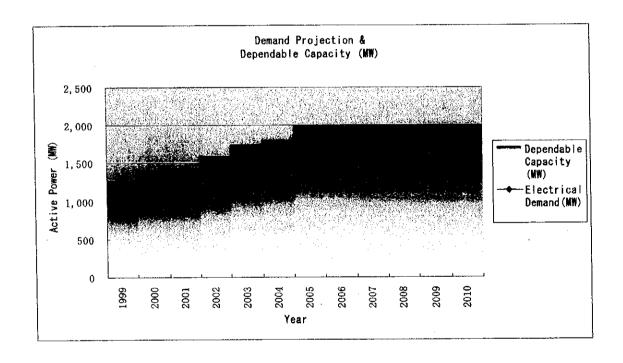
Facilties	Type	Installed Capacity	Dependable Capacity
Public Corporation	n		
INDE	Hydro	498.6	429.0
2.1	Thermal	219.9	125.8
Private Company			
EEGSA	Hydro	123.0	92.0
Others	Thermal	661.4	612.1
	Geothermal	29.0	29.0
	Coal	120.0	120.0
Total		1,651.9	1,379.2

(Source, INDE, 2000)

Table 3.4-2 Demand Forecast

Year	Peak Load (MW)	Growth Rate (%)	Generated Energy (GW h)	Growth Rate (%)
2000	1,049	-	5,348	-
2001	1,137	8.4	5,819	8.8
2002	1,231	8.3	6,319	8.6
2003	1,322	7.4	6,812	7.8
2004	1,414	7.0	7,309	7.3
2005	1,505	6.4	7,806	6.8
2006	1,595	6.1	8,306	6.4
2007	1,689	5.8	8,821	6.2
2008	1,779	5.3	9,350	6.0
2009	1,874	5.3	9.883	5.7
2010_	1,967	5.0	10,407	5.3

(Source: MEM Medium Scenario)



2. Effective Use of Renewable Energy

As Table 3.4-1 shows of the power plant type organization in Guatemala, thermal power by fossil fuel (mainly heavy oil) occupies more than 50%. The country is a sole oil producing country in Central America. Of the potential 2,900 million barrels of oil reserve, 625 million barrel reserve is confirmed for production. Guatemala's current refinery capacity, however, stands at 20,000 barrels per day and majority of the country's production at nearly 30,000 barrels are shipped to the US for processing. On the other hand, the consumption has been increasing year by year and exceeded the country's production capacity from 1998. Physically, the country becomes an oil importing country.

Under the circumstances, the geothermal power utilizes its own indigenous renewable energy resource. Once 40 MW geothermal power should be implemented, it can avoid power generation by diesel power with the equivalent annual power generation at 308 GWh and the fuel saving and therefore foreign exchange saving would amount to 30.2 million US\$ annually.

In addition, the geothermal power scarcely emissions CO₂ hugely produced by combustion of fossil fuel fired thermal power, and so favorable attention has been paid to geothermal power which may greatly contribute to global environmental preservation. Thus, once CO₂ transaction among developed countries according to the Kyoto Protocol would have been realized, the country could transact CO₂ reduction with this geothermal power project.

In this connection, the government of Guatemala took positive measures for promotion of effective use of renewable energy sources including geothermal power, and gives incentive to foreign investors by exemption of import and income taxes.

3.4.2 Least Cost Solution

1. Project

INDE intends to carry out the development of geothermal power project by inviting the private investors for BOO. The plausible project implementation configurations are:

- Case 1: To develop 20 MW x 1 unit using existing available 4 production wells as well as drill one each supplementary production and reinjection well. The transmission line, however, will have a capacity suitable for future geothermal power development. The project period is 2 years.
- Case 2: To develop additional 20 MW x 1 unit with an interval of one year for geothermal reservoir monitoring after Case 1. For this purpose, 3 supplementary production wells and one reinjection wells will be drilled. The project period is 5 years.

Case 3: To develop additional 20 MW x 1 in parallel with Case 1 with a time lag of 6 months. Six supplementary production wells and 3 reinjection wells will be drilled. The project period is 2.5 years.

In addition, two project site options are technically and environmentally considered, i.e., inside and outside Caldera. The following economic considerations are made.

- Transmission line length
- Proximity to steam gathering and disposal system from Power Plant
- Land acquisition, compensation to agricultural products and house removal

1. Base Cost

With respect to a total of 6 cases, the base costs as of the year 2001 were estimated. This base cost does not consider physical and price contingencies.

Table 3.4-3 Project Base Cost

(Unit: Million US\$)

	Case 1 20 MW x 1	Case 2 20 MW x 2	Case 3 20 MW x 2
Inside Caldera	49.41	90.47	82.85
Outside Caldera	51.56	92.17	84.55

2. kW Unit Construction Cost and Generating Cost Comparison

Based on the above estimate, the unit construction costs per kW were calculated and the generating costs at substation end with an annualized capital cost for 25 years operation were calculated and compared.

a. Exchange Rate

Economic and financial evaluation here use the following exchange rates and the currency used here is unified to US\$.

$$1 \text{ US}$$
 = 120 Yen = 7.850 Quezal

b. Operating Conditions

The operating conditions of this project are assumed as follows taking into consideration of the existing geothermal power plant in the world. The O&M costs include annual reservoir monitoring cost and plant overhaul cost to be carried out every 2 years.

Table 3.4-4 Geothermal Plant Operating Conditions

Installed Capacity	MW	20	40
Life	Years	25	25
Capacity Factor	%	88%	88%
Annual Power Generation	GWh	154.18	308.35
House Service Power	k W	1,136	2,272
Transmission Losses	k W	27	108
Salable Energy (S/S end)	GWh	145.21	290.01
Annual O&M (Steam Production)	MM\$	1.13	1.35
Annual O&M (Power Plant)	MM\$	0.30	0.60
Total O&M	MM\$	1.43	1.95

c. kW Unit Construction Cost and Generating Cost

For each case, the construction unit cost per kW of the total output was calculated. Then, the generating cost at substation end, using the operation conditions above and annualized capital cost at the discount rate of 10% for 25 years, was calculated. As for the generating cost, a case that INDE's investment for existing wells (4 productions well and 1 reinjection well) was calculated to obtain the least economic solution. The calculation results are tabulated below:

Table 3.4-5 kW Unit Construction Cost and Generating Cost

Ο.	Inside Caldera		Outside Caldera			
Case	Case 1	Case 2	Case 3	Case 1	Case 2	Case 3
Total Output, MW	20	40	40	20	40	40
Unit Construction Cost, \$/kW	2,471	2,262	2,071	2,578	2,304	2.114
Generating Cost, USCent/kWh	4.73	4.11	3.82	4.89	4.17	3.88
Where the investment of exist. wells is considered. USCent/kWh	5.33	4.41	4.12	5.50	4.48	4.19

3. Conclusion

As the table above shows, the Case 3 Inside Caldera, construction of 20 MW x 2 Units in parallel, can provide the least cost both for unit construction cost per kW and generating cost. On the contrary, the Case 1 Outside Caldera, 20 MW x 1 Unit, shows the highest cost. The construction of 1 unit becomes higher in

generating cost, and the development of 20 MW only is wasteful in view of effective use of energy resources, because owing to the detailed geoscientific investigation and existing well prove that the area has a potential for 40 MW geothermal power generating capacity.

Nonetheless, even this highest generating cost case of 20 MW development is still competitive with the other thermal power under operation as its total generating cost including the conceivable steam cost of 1.1 cent/kWh becomes 5.99 cent/kWh. Meanwhile, there are not so big differences between development of inside and outside caldera, 0.16 cent/kWh for Case 1 and 0.06 cent/kWh for Case 2 and 3. Thus, the selection between inside and outside will be made at the practical stage taking into detailed investigation on land acquisition, compensation, etc.

In case that 40 MW geothermal power should avoid the diesel power generation with an equivalent annual power generation of 308 GWh, the fuel saving amounts to 29,000 gallon of diesel oil at the cost of 31.22 million US\$. The geothermal power could save a large amount of precious foreign exchange.

So, it is concluded that the geothermal power development in the country is a highly economic solution and worth to pursue.

3.4.3 Financial Evaluation

1. Evaluation Methodology

Financial internal rate of return (FIRR, a discount rate which equalizes the financial costs and profit of the project in a stream of the project life) for each case of assumed development plan will be obtained, and the financial viability of each case will be evaluated by comparison between the obtained FIRR and opportunity cost of capital. In addition, the cash flow of each case will be prepared to check for financial soundness of the project. Further, the sensitivity analysis on several factors that are considered to affect greatly the profitability of the project, i.e., a plant capacity factor, steam and power rates, etc. The calculation results will be presented, with electric files, to INDE for its financial review when the project will be actually taken place in the very near future.

2. Evaluation Conditions

a. Plant Operating Conditions

The plant operating conditions are the same used for economic evaluation.

b. Project Cost and Contingencies

The project cost is estimated adding the price and physical contingencies to the base cost estimated in Chapter 3.2.6 and given in Table 3.4-3 above. The price contingency considers 2% of annual escalation and the physical contingency 3% for plant facilities and 5% for geothermal field development. Usually, about 10% of physical contingency is considered for the geothermal field development, but for this project the half the rate is considered sufficient because 5 geothermal wells were successfully drilled at the Amatitlan

geothermal field.

Table 3.4-6 Project Cost

Unit: Million US\$

~	Inside Cald	era		Outside Ca	aldera	
Case	Case 1	Case 2	Case 3	Case 1	Case 2	Case 3
Base Cost	49.41	90.47	82.85	51.56	92.17	84.55
Price Contingency	1.46	5.27	2.70	1.54	5.31	2.76
Physical	1.88	3.54	3.10	1.99	3.62	3.19
Contingency						
Project Cost	52.75	99.28	88.65	55.09	101.10	90.50

c. Financial Terms and Opportunity Cost of Capital

As a result of study on the most probable financial source for this project, loans from a Bank in Japan and the International Development Bank, which INDE has experience in getting the finance for power projects are considered. The project is assumed to be carried out with loans from these two international banking institutes. The terms of the Loan are summarized in the following table.

Table 3 4-7 Loan Term

	Tuble 3.1 / Down re	
	Japanese Bank	Int'l Develop. Bank
Currency	US\$	US\$
Share	40%	60%
Interest Rate	6.03% +3.08%	8.0%
Repayment	12 years	20 years
Grace Period	2 years (3 years) *	2 years (3 years)

Note to *: The grace period of Case 3 is considered 3 years as the construction period is scheduled for 2. 5 years.

From the table above, the WACC (weighted average cost of capital) becomes 8.44% and the value is an opportunity cost of capital for comparison with FIRR.

d. Steam and Power Rate

The steam cost is set in consideration of capital recovery from the investment to the existing geothermal wells and the power rate considers the current average power selling rate in Guatemala as follows:

Steam Rate:

1.1 US Cent/kWh

Power Rate:

8,0 US Cent/kWh

e. Depreciation

The geothermal wells and steam supply facilities are depreciated for 10 years and the power plant facilities for 20 years. The both are calculated with a straight line method without residual value.

f. Tax

A tax rate of 31% as against sales profit is considered.

3. Financial Internal Rate of Return

As a result of calculations with the conditions mentioned above, the obtained financial internal rate of returns are tabulated below and the calculation process of each case is shown in Appendix.

Table 3.4-8 FIRR

	Financial Internal Rate of Return		
	Inside Caldera	Outside Caldera	
Case 1	11.14%	10.57%	
Case 2	11.15%	10.87%	
Case 3	13.75%	13.40%	

As shown above, all the cases exceeds the opportunity cost of capital at 8.44% and are concluded as financially feasible. Because FIRRs of Case 1 and Case 2 are close to the opportunity cost of capital and subject to further study by cash flow, the Case 3, constructed and attained commissioning in a shorter period, is the most suitable to pursue.

4. Cash Flow

Table 3.4-9 Accumulated Profit

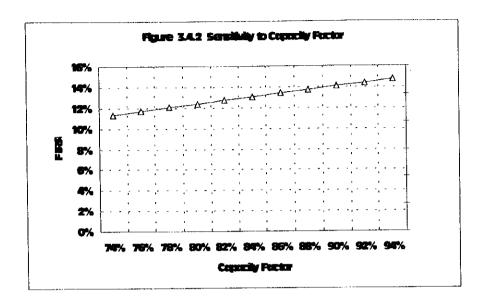
	Accumulated Profit (Million US\$)		
	Inside Caldera	Outside Caldera	
Case 1	47.22	35.79	
Case 2	76.81	73.44	
Case 3	111.33	106.56	

From the point of cash flow, the Case 1 and Case 2 will fall into short working fund for several years after commissioning, mainly due to repayment burden. On the other hand, the Case 3 could appropriate the profit soon after commissioning and will only fall in short fund in the year when the supplementary well will become necessary. Such a shortfall could be sufficiently recovered with the accumulated profit. In view of the debt service ratio, the Case 1 and Case 2 can not be said financially feasible. As a conclusion, only Case 3 is financially feasible. (Refer to the calculation processes in Appendix)

5. Sensitivity Analysis

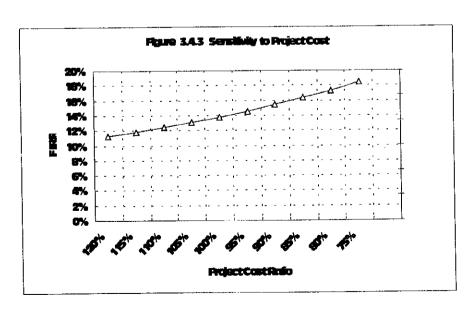
Using the Case 3 which is regarded financially feasible, the sensitivity of FIRR to the power plant capacity factor, project cost, power rate and steam rate are tested. Detailed figures are given in Appendix.

a. Plant Capacity Factor



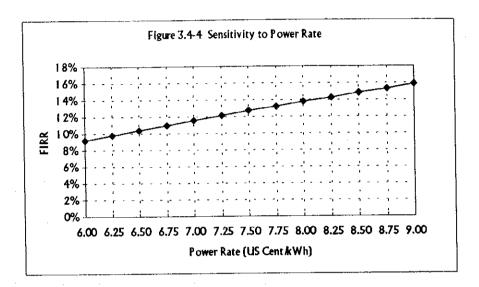
Because geothermal power does not consume the variable cost during operation, it is usually used as a base load carrying power unit. In Japan, most of the geothermal power renders the services at the plant factor of more than 90%. The assumed 88% in this project is supposed to be attained without difficulty, as the power units will be dispatched in the order of less variable cost plant in the case of the electricity sales free market in Guatemala. It should be noted, however, that once the capacity factor should fall less than 77%, the financial soundness will be jeopardized. Thus, it is important to maintain the factor at least more than 80%.

b. Project Cost



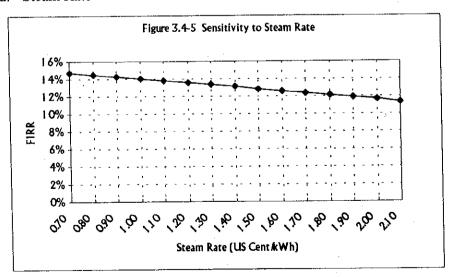
As Fig.3.4-3 shows, 5% cost reduction is effective to increase the FIRR by 1% approximately. So, introduction of effective and efficient engineering expertise and management may result in reduction of construction cost, and attaining the financial profitability.

c. Power Rate



As the electricity free market progresses, there is a possibility that the power rate will become lower. According to the figure above, the project could maintain the FIRR above 12% even if the power rate should fall less than 7.25 cent/kWh.

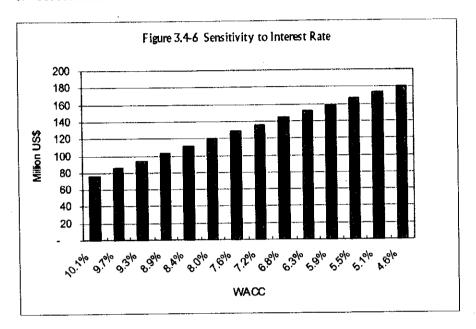
d. Steam Rate



The steam rate, at which project developer to be selected through bid by INDE will pay to INDE or the government, has not yet decided. For INDE, it is necessary to recover the cost so far INDE invested for geothermal development at Amatitlan area. The higher it is set for, the less incentive and

attractive for the developer to invest to the project. Then, the development of geothermal power will be delayed. So, the most appropriate steam rate should be set forth. If the lowest possible FIRR value should be 12%, the steam rate could be raised to 1.8 cent/kWh.

e. Accumulated Profit to WACC



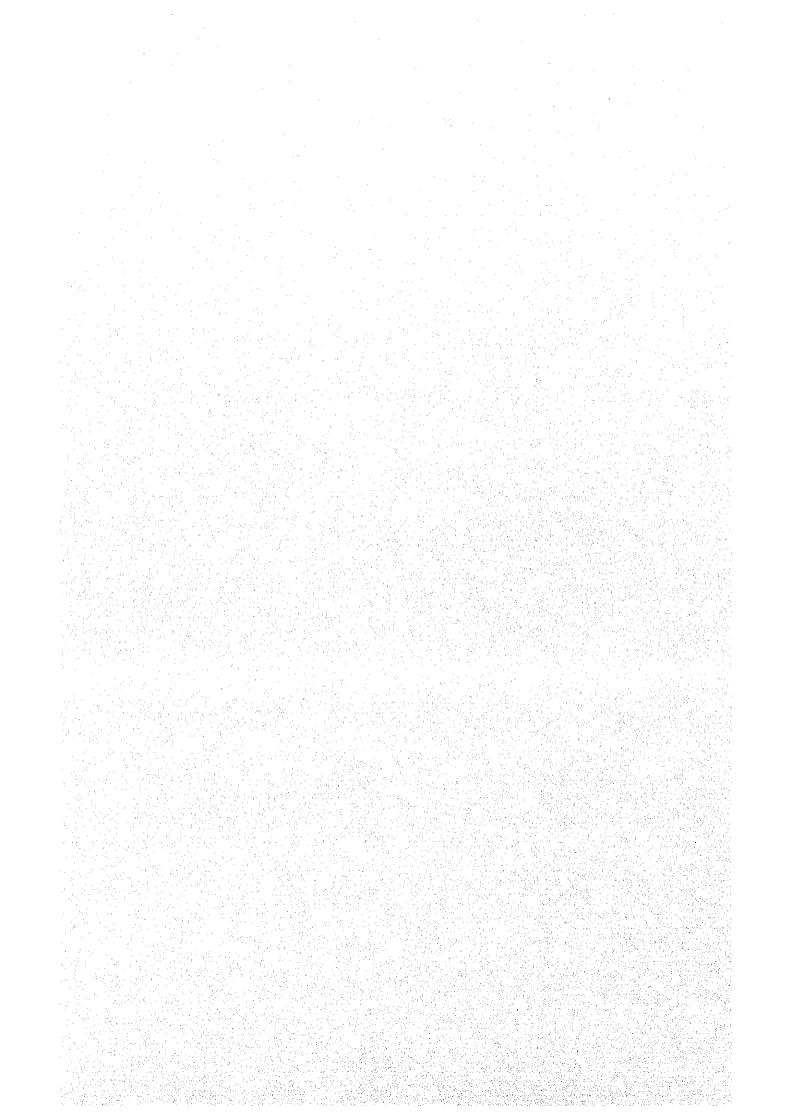
The table above shows the change of accumulated profit with a variable of WACC (Weighted Average Cost of Capital). With the WACC at 8.4% in this project, only initial investment value could be recovered after operation of 25 years, and such value will not so attractive for the investors. So, the loan with the more favorable loan conditions should be studied and selected.

6. Conclusion

As a result of financial evaluation, it is concluded that Case 3 is financially feasible. In view of cash flow, however, it is necessary to investigate the financial procurement in term of interest rate, grace period and repayment period. It is recommended that INDE seek for the more favorable loan than the assumed ones.

4 INTEGRATION AND RECOMMENDATION

- 4.1 Integration
- 4.2 Recommendation



4. INTEGRATION AND RECOMMENDATIONS

4.1 INTEGRATION

The exploitation of electric power in Guatemala is the urgent matter due to the increase of electric demand in recent years. Guatemala has abundant geothermal resources, which are scarcely negative environmental impact and renewable. Therefore, geothermal power generation is placed on the very important project for Guatemala.

Since the high temperature geothermal reservoir had been recognized to exist in Amatitlan area prior to the beginning of the Amatitlan Geothermal Development Project, it was desired to undertake the detailed exploration and feasibility study for confirmation of the extent and volume of the exploitable reservoir.

The present project was commenced at 1998 and had done two exploratory well so far. As a result of successful production test, we could identify the extent of geothermal reservoir and calculate the exploitable resources and the optimum generating scale.

The outline of the result is shown in the following.

4.1.1 Geothermal Conceptual Model

From geo-scientific surveys such as geological reconnaissance, geochemical and geophysical survey and well surveys, the geothermal conceptual model in the Amatitlan area was prepared and updated. Based on these surveys, two exploratory wells, AMJ-1 and AMJ-2, were drilled and the production test was run. Finally, the extent and volume of geothermal reservoir was revealed and the exploitable resource was calculated within the target area.

An uplift zone related to faults in N-S direction and a dacitic intrusion characterizes the geological structure in the Amatitlan geothermal field. The geothermal reservoir exists place in the deeper portion along fractures developed with the formation of these geological structures. From the result of drilling wells, AMJ-1 and AMJ-2, the fracturing typed reservoir is recognized to locate at the volcanic rocks above the granitic basement. In addition, it is highly probable that the geothermal fluids flow even in granitic basement rocks.

At least 3 times of hydrothermal alteration activities are supposed to take place after the formation of the Amatitlan Caldera. It is also thought that the center of

the volocanic activities have migrated towards the south during the geological history in the Amatitlan area.

The geothermal system in this area is the hydrothermal convection type. Dacite intrusion plays a role as the direct heat source at the deeper portion beneath western Calderas and meteoric water comes from the southern highland and Amatitlan Lake. Volcanic activities has been activating since the Late Pleistocene (around 0.7Ma), representing as Pacaya Volcano. The residual magma reservoir and volcanic gas resulted in these activities became the regional heat source in Amatitlan geometrical area.

The meteoric water infiltrated into the deep underground is heated by the remaining magma and volcanic gas, and it forms the neutral Cl-typed reservoir with the temperature of 300 to 340°C in the granitic basement. This deep hot water is estimated to become the parental fluid in Amatitlan geothermal system. This parental fluid flows and rises along fractures at the western edge of NE-SW uplift zone and ring-shaped faults by caldera rim. Through these passages, the neutral-typed reservoir with the temperature of 290 to 300°C (Cl content; 2,700mg/l) is formed at the elevation of 500masl.

This hot water migrates from southwest to northeast along the NE-SW trend fracture at the great depth and partly flows toward west to northwest through the south rim of Amatitlan Caldera.

From the chemical analysis of well fluid, it was clarified that the geothermal fluid around the drilled wells shows neutral in pH, high Cl content, 260 to 280°C and is distributed from the same above-mentioned reservoir. In addition, it is recognized that wells AMJ-1 and AMJ-2 are hydrologically connected with well AMF-2 from isotopic analysis and interference test. The fluid from all of these wells is suitable for the geothermal generating use.

Of two JICA wells, well AMJ-1 was interpreted to have been drilled close to the western border of the targeted reservoir from the evidence of two-phase fluid condition and relatively low permeability around the well. On the other hand, two feed zones were found in well AMJ-2. An upper feed zone shows steam dominant and the lower zone indicates water dominant. Well AMJ-2 is similar to well AMF-2 in the outflow condition

4.1.2 Resource Assessment

The exploitable geothermal reservoir in Amatitlan area is located at the deeper

portion of the western part of Calderas. It made clear from well survey that the geothermal reservoir of 260 to 300°C extends widely along faults and fractures.

The total existing power potential in wells AMF-1, AMF-2, AMJ-1 and AMJ-2 is not sufficient to generate the 20MW output. However, according to the result of numerical simulation based on 3-D model, we could get a conclusion that there is the capacity of 50MW generation in Amatitlan geothermal resource.

Furthermore, well AMF-1 shows 1,160kJ/kg in enthalpy and constant steam/water ratio. While, well AMF-2 has produced for last 2 years with 1,600kJ/kg in enthalpy and constant steam/water ratio as well as well AMF-1. Therefore, these facts suggest the possibility of the huge geothermal potential in Amatitlan area.

4.1.3 Forecasting and Field Potential

The generating output was calculated by three kinds of scenarios and the additional drilling was scheduled for each scenario. The exploitable reservoir is targeted at the inside of the Calderas depression in all cases. Two alternatives of power plant locations are set as follows; one is inside the Calderas depression and the second is close to INDE's warehouse at EL Cedro. The scenarios are:

- 1. Scenario 1: Production of only 20MW
- 2. Scenario 2: Production of 40MW in two steps. 20 initial MW and after 3 years the second step of 20MW.
- 3. Scenario 3: Production of 40MW with two units of 20MW

The total existing power potential in wells AMF-1, AMF-2, AMJ-1 and AMJ-2 is not sufficient to generate the target power output of either scenario. Additional and spare drilling is required. The total simulation time was 25 years.

In the case of scenario 1, the reservoir is able to sustain the 20MW power plant without much difficulty with two additional wells, 1 production well and 1 reinjection well.

In the case of scenario 2, it needs the well number as same as scenario 1 for the initial power plant (20MW). However, it takes a long lead-time to operate the second plant due to the additional drilling (production well:4 to 5, reinjection well: 2) and the necessity of reservoir stability for 1 year.

In the case of scenario 3, the reservoir is able to sustain the two 20MW power plants without much difficulty with the same number of production and reinjection well as scenario 2. But, compared that scenario 2, this scenario make

shorten the construction period for 2.5 years and has economical merit.

Each scenario was economically evaluated to add one production well and one reinjection well for spare.

4.1.4 Development plan of Power Plant

Two sites are proposed for power plant construction taking into consideration distances from the production and reinjection wells, topographic/geological feature, and environmental issues. Site-I is near INDE's warehouse to west of the caldera where is advantageous in access and H₂S gas dispersion. Site-II is easily accessible to the existing production wells in the west of caldera.

For medium specific enthalpy geofluid, relatively low non-condensable gas (NCG) content and silica-rich brine produced in Amatitlan geothermal area, the single flashed steam cycle with condensing turbine is recommended for this project and the brine in the reinjection system will be kept at high pressure and high temperature.

The exploitable capacity of power plant is evaluated to be 40MW over from the reservoir simulation and the steam equivalent to 15MW is already available from the existing wells. Taking into consideration of INDE's opinion, the power plant was conceptually designed by two cases; 20MW x 1 unit and 20MW x 2 units. In case of 40MW P/P construction, both units will be installed at the same site.

The output of Amatitlan geothermal power plant will be connected to 138kV substation, named Palin 2 substation.

Regarding fluid collection and reinjection system (FCRS), steam/brine separate pipeline is employed because it has advantages in pressure loss and flow stability when the pipeline cross the caldera ridge.

The plant site is about 150m x 120m, and includes two 20MW generating units, switchyard, and administration office. The cooling towers should be in the downwind of the switchyard and the turbine buildings so that cooling tower exhaust with corrosive non-condensable gas and mist will not affect plant equipment. The cooling towers are placed in the south of the power plant site considering the annual prevailing wind direction.

The steam turbine for this project shall be designed and proven for geothermal application. Skid-mounted modular type turbine is preferred because of shorter design and manufacturing period, easy to transport, smaller foot print, faster

installation at site and lower construction cost.

4.1.5 Environmental Impact Assessment

Environmental regulations in Guatemala have changed recently, so in order to execute any kind of works relate to well drilling in connection with geothermal survey that is required to have an authorization extended by CONAMA. In the standards book published by CONAMA, no definite description regarding the environmental regulation and on the standard value was found. Up to day, EIA applications submitted to CONAMA standard value set forth by the WHO or IDB have been adopted.

On the basis of the proposed conceptual design of power plant, the measurement regarding water effluent, air emission and noise was assessed. Since the elements like As (7 to 8 ppm) and B (40 to 50 ppm) in geothermal hot water are high, the whole exhausted water from power plant should be disposed into the reinjection wells to the underground. The reinjection of hot water is necessary to help recharge the reservoir to maintain pressures in the reservoir. In addition, over flow water from cooling water system shall be also injected into the underground. Though H2S concentration exhausted from cooling tower in Amatitlan field is fairly low in comparison with other existing power plants, it is desired to mitigate of H2S emission by dilution and dissemination.

Regarding the noise, Noise level around residential area at the blow out test of AMJ-2 was 58dB as same level as background noise level. Noise levels when the power plant is completed and operated on normal condition won't exceed the noise levels at the blow out operation of wells.

4.1.6 Economic and Financial Evaluation

The country's effective installed capacity was about 1,380 MW at the end of 1999 while the peak demand of electric energy consumption reached 1,049 MW. When this project would be completed in 2005 or 2006, the forecast noted that the effective capacity of about 1,600 MW would be necessary. So, the introduction of geothermal power unit with a capacity of 40 MW will be very significant for stable power supply and power system diversification because the geothermal power can generate at a higher capacity factor using indigenous energy source.

The geothermal power utilizes its own indigenous renewable energy resource. Once 40 MW geothermal power should be implemented, it can avoid power

generation by diesel power and therefore foreign exchange saving would amount to 31.22 million US\$ annually.

In addition, two project site options are technically and environmentally considered, i.e., inside and outside caldera. With respect to a total of 6 cases, the base costs as of the year 2001 were estimated. The following economic considerations are made; transmission line length, proximity to steam gathering and disposal system from power plant, land acquisition, compensation to agricultural products and house removal.

Based on the above estimate, the unit construction costs and the generating costs at substation end per kW were calculated and compared. Economic and financial evaluation use the following exchange rate: 1 US = 120 Yen = 7.850 Quezal.

For each case, the construction unit cost per kW of the total output was calculated. Then the generating cost at substation end, using the operation conditions above and annualized capital cost at the discount rate of 10% for 25 years, was calculated.

The result is as follow:

	<u>Generating</u>	Cost (US Cent/l	(Wh)
	Scenario 1	Scenario 2	Scenario 3
Inside Caldera	4. 73	4. 11	3. 82
Outside Caldera	4.89	4. 17	3. 88

As the above, the Scenario 3 Inside Caldera, construction of 20MW x 2 Units in parallel, can provide the least generating cost. On the contrary, the Scenario 1 Outside Caldera, 20MW x 1 Unit, shows the highest cost.

Nonetheless, even this highest generating cost scenario of 20 MW development is still competitive with the other thermal power under operation as its total generating cost including the conceivable steam cost of 1.1 cent/kWh becomes 5.99 cent/kWh. Meanwhile, there are not so big differences between development of inside and outside caldera, 0.06 to 0.16 cent/kWh.

Financial internal rate of return (FIRR) for each case of assumed development plan was obtained, and the financial viability of each case was evaluated by comparison between the obtained FIRR and opportunity cost of capital. In addition, the cash flow of each case was prepared to check for financial soundness of the project. Further, the sensitivity analysis on several factors that were considered to affect greatly the profitability of the project, i.e., a plant capacity

factor, steam and power rates, etc. The calculation results were presented, with electric files, to INDE for its financial review when the project will be actually taken place in the very near future.

The power rate was set at 8.0 US cent/kWh in consideration of the current average power selling rate in Guatemala. The geothermal wells and steam supply facilities are depreciated for 10 years and the power plant facilities for 20 years.

All the cases are within 10 to 14 % in FIRR and are concluded as financially feasible. Because FIRRs of Case 1 and Case 2 are close to the opportunity cost of capital and subject to further study by cash flow, the Case 3, constructed and attained commissioning in a shorter period, is the most suitable to pursue. From the point of cash flow, the Case 1 and Case 2 will fall into short working fund for several years after commissioning, mainly due to repayment burden. On the other hand, the Case 3 could appropriate the profit soon after commissioning and will only fall in short fund in the year when the supplementary well will become necessary. As a conclusion, only Case 3 is financially feasible.

4.2 RECOMMENDATION

4.2.1 Exploitation in Amatitlan Geothermal Field

Reservoir evaluation in the survey area was done based on the conceptual model constructed and the reservoir characteristics from geothermal wells. From this evaluation, it became clear that the geothermal resources with the capacity of 40MW generation exist in Amatitlan area. Among 6 alternatives of exploitation scheme, the most economical alternative is evaluated to be scenario 3, which constructs 20MW x 2 units at the same time for the shortest lead time to the operation start. Furthermore, instead of the loan of US\$ currency from the International Development Bank and/or the Japanese Bank to avoid risk of variable exchange rate, it should take into consideration of using the loan of Japanese Yen currency from the Japanese Bank for the more favorable loan conditions. And it must select a loan condition not to fall into lack of the fund by the careful examination of grace period and repayment period, and so on. As an alternative of project financial viability, it is recommended to apply for Japanese government's yen credit (interest rate: about 2%), ordinary credit or environmental credit.

4.2.2 Site of Power Plant

Two sites are considered for power plant construction. One (site-I) is near INDE's warehouse outside caldera and the other (site-II) is adjacent to the center of the targeted geothermal reservoir inside caldera. Site-II is close to the existing wells and shows relatively lower generating cost compared than Site-I. However, at the point of environmental preservation, some disadvantage remains in H2S gas emission and dilution due to the topographical caldera feature. Since there are not so big differences between development of inside and outside caldera in economical evaluation, Site-I is desirable for plant construction.

4.2.3 Educative Activities and Understanding to Local Communities

In order to proceed smoothly to geothermal exploitation project following this survey, it is necessary to implement the educative activities related with geothermal development to the local communities in understanding and cooperation with CONAMA. If the site of power plant is selected inside caldera, it must be examined to install the H2S removal device in the power plant. In addition, it hopes for the additional simulation based on the detailed examination regarding wind direction, too.

4.2.4 Geothermal Potential in Surrounding Areas

As for the amount of the geothermal resources, the generating potential is clarified beyond 40MW inside caldera within the survey area. According the existing report and the 1st year survey, dacite dome is reported to exist in the northern part of the survey area in addition to dacite intrusion close to well AMF-2 and magma chamber beneath Pacaya volcano. Since the residual magma chamber related to this dacite dome has the possibility to play a role of another heat source, the exploitable geothermal reservoir might spread to the south of the Amatitlan Lake.

Including the surrounding area, geothermal potential becomes huge amount of generating resources. It is also important to explore at the northern dacite dome area in effective utilization of geothermal resource, as well as electricity generating in Calderas.

Appendix 1:

Financial Evaluation

(Inside Caldera)

Financial Evaluation: Inside Caldera

Case 1

Case 2

Case 3

- Financial Internal Rate of Return (FIRR)
- Income Statement
- Cash Flow
- Dept Service Ratio
- Repayment Schedule

FIRR Case 1-1 - 12
Preject Ametities Geothermal Subject FIRR - Case 1-inside File Name
Date 1980/5/21
Rev. 2001/10/12

死機攻病技術學(FIRR): Case 1 - Inside Financial Internal Rate of Return

-			The second secon			ď	Prejact Undertaking	Jul	1			
ş	•	Project Cost	Salable	Supple. Wells	O&M for Steam	OEM for P. Plant	Steam Cost	<u>*</u>	Generat. Cost Tt	Project Cast Total	Revenue	Balance
	-	SMA	Q.A.P	244 2	MIMS	MM\$	MMS	MMS	MMS	MMS	MMS	MMS
i-	Š		and the second second second	•			•	•		•	•	. !
	Š	4	•	•	•	•				28.1	•	(20.7)
	3	000	1			•		•	•	22.88	•	(25.98)
	Ŝ	20.80		•	,	5	1 70	1.61	4.74	4.74	11.62	6.88
	200		143.4		2 5	9	1 70	19	4.74	4.74	11.62	6.88
	8		140.4	•	2 5	6	4 70	19	4.74	4.74	11.62	6.88
	300	•	145.2	•	2 9	9 6	2.4		47.4	4.74	11.62	6.88
	2002	,	145.21		2 5	9,00		2	7.7	4.74	11.62	6.88
	2008		145.21		2 :	9	4.	4	4 74	4 74	11.62	6.88
	5008	•	145.21		2	9.0			47.4	474	11 62	6.88
	2010	•	145.21	•	1,13	0.90	9 6	5 6	7	7.7	1 69	888
	2011	•	145.21			0.30	5.5	ē, 6		72.9	11.62	88
	2012	•	145.21		1.13	0.30	5.7	6			1	70 6
	2013	•	145.21	4.26	1.13	8	1.70	20	B.	0 1	70.	
	2	•	145.21		1.13	0.30	1.70	8	5.02	20.5	11.62	00
	2		145.21	•	1.13	0.30	1.70	1.89	5.02	20.5	11.62	9.9
	2		146.21		1 13	0.30	1,70	.89	5.02	2.02	11.62	6.60
	2 3	•	146.24		1.13	0.30	1.70	±.89	5.02	5.02	11.62	6.60
	2	•	446.34			0.30	1.70	1,89	5.02	5.02	11,62	9,60
	2		2.044			9	1.70	68	5.02	5.02	11.62	9.60
	5018	•	143.4	,	2 2	86	1 70	8	5.02	5.02	11,62	9.60
	2020		145.4			8 8	1.70	88	5,02	5.02	11.62	9.6
	202	•	100.5	•		9 9	1.70	8	5.02	5.02	11.62	9.60
	2022	•	7.001	•	2 5	S C	2	28	5.02	203	11.62	9.6
~	2023		140.4	•	? \$	800	170	250	5.63	5.63	11.62	86
~	202		7001	•	2 5	800	2	2.50	5.63	5.63	11.62	86
	\$059	•	145.41	•	2 5	200	1 70	263	5.78	5.76	11.62	5.88
~	202	•	140.61			000	70	2.63	5.76	5.76	11.62	5.86
~	2	•	700			050	1 70	2.63	5.76	5.76	11.62	5.8
27	2020		145.21		1.13	0.30	2	2.63	5.76	5.76	11.62	5.86
					•	•		٠	٠	•	•	•
	3 6			•	•	•	•		•	•		· ·
5	3		Parket in the second se			-	00.77	90.20	174 7E	187.50	302.12	114.62

					İ				- roject	JUGGLERAL							
					Operation Cost		Steam Cost	Dep	Depreciation	Cost	Profit		Profit	Ë	nterest Payment	•	Net.
	Constated	Selebie		Supple.	Man of Man	O&M P.		Steam	Power Plant	Cotal		, Ke	¥	Japan Bank	Int'l Bank	Total	INCOME
No. Year	Forman	Fractiv	Mevenue	Wei	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Ę.		Supply						MAJE	FALA	MMS	MMS
	HAS	Į.	SMS.	MMS	MMS	¥M\$	MMS	MMS	MMS	MMS	MWS	\$MA	Ž.	200	NIA!		
2001	į					•		•	•	•			•	0.98	1.28	2.26	(2.26).
		•	•		,	•		•	•	•		•	•	2.01	2.64	4.65	(4.65)
2 2003	60	•	•	•	٠		, ;				4	181	3.58	2.19	2.85	40.0	(1,46)
200	154.18	145.21	11.62		1.13	0.30	1,70	7	96.	2 6			85.6	2.08	2.79	4.87	(1.29)
2005			11.62		1.13	0.30	1.70	35				4	900	197	2.72	69.4	(1.11)
2006			11.62	•	1,13	0.30	1.70	35	86.		e d	9 4	85.6	25	2.64	4 48	(06'0)
2007			11.62		1.13	0.30	1.70	3	86.		. ·		3.58	1.70	2.57	4.27	(0.69)
7 2008			11.62	•	1.13	0.30	1.70	35	 86 6			5 4	85.6	50	2.49	9	(0.46)
2009			11.62		1.13	0.30	1.70	35		54.0	0 4	- E	2 6	38	2.40	3.78	(0.20)
2010		-	11.62	•	1,13	0.30	1.70	25		200	 	9	2 6	9	2.30	3.49	0.09
201		•	11.62	•	1.13	0.30	1.70	32	1.98	54.0	<u> </u>	0. 4	3 4	8	2 19	3.10	0.39
11 2012			11.62	•	1.13	0.30	1.70	33	1.98	6.43	A C	- C	200	82.0	200	2.86	(2.22)
2013			11.62	4.28	1,13	0.30	1,70	33	86.	10.69	56.0	6.43		2 6	1 95	250	1.70
2014			11.62		1.13	0.30	1.70	0,	86:	0.00	60.0	0 0	25	9 6	282	2 10	2.10
4 2015		145.21	11.62	•	1,13	0.30	1.70	643	86	200	50.9	. 2	2. 4	} .	1.68	28	2.52
5 2016		145.21	11.62	•	1.13	0.30	1.70	0.43	9 6	200	900		4 20		1.52	1.52	2.68
2017			11.62		1.13	0.30	1.70	0,43	89 6 F 1	200	60.0		202	,	1.35	8	2.85
7 2018			11.62		1.13	0.30	1.70	34.	8.6	9 6	800	2 0	4 20		1.17	1.17	3.03
2019			11.62		1.13	0.30	1.70	5	8 8	n c	8 8		4 20	•	0.97	26.0	3,23
9 2020			11.62	•	1.13	0.30	0. i	5.43	8.8	200	8 4	200	4.20		0.76	0.76	3,44
202			1,62	٠	1.3	S :	0 1	3 6	9 6	200	600	9	4.20	•	0.53	0.53	3.67
2022			11,62	•	1.13	0.30	2.5	3 6	8 6	7 4	800	2	4.20		0.29	0.29	3.91
2 2023	3 154.18	145.21	11.62	•	1.13	96.0	0,1	2 6	8	3 44	20.0 4	5	5.57		•	•	5.57
3 2024	154.18	145.21	11.62	•	1.13	0.30	2.1	2	•	200		5	5.57			,	5.57
202	5 154.18	145.21	11.62		1.13	0.00	2.7	3	•	3 6	07.6	2.63	80			•	5.86
5 2026	6 154.18	145.21	11.62		1.13	0.30	2 :	•	•		9 40	2.63	5.86				5.86
202	7 154.18		11.62	٠	1.13	080	2,7		•		A 49	2.63	5.86	•	٠	•	5.86
202	8 154.18		11.62		1.13	DE 0	2 9	•		, c	67 8	2.63	5.86	•	ı	•	5.86
8 2029		145.21	11.62		1.13	0.30	5	•		· ·	;		,	•	•	•	•
9 2030	-	•	,			•	•			•	•			,			
503	-	- !	•				2	10.01	OR OF	143 46	158 66	49.20	109.46	19.50	66.04	80.49	48.97
1810		3,775.48	302.12		FC 62	C/",	1	0.01	2000			4					

r		•										
1				-	1	T		Jacan Bank	Int's Bank		1000	
			Nat locame	Dep. Steam		Total	Project	Principal		Total	Bolence	Balance
2				Facilities	Facilities		200	Payment	۹,	***************************************		
	-	MMS	253	MMS	Z-RAS	ZMS	SMS MS	MM\$	MMS	MMS	SWY.	ZWZ
1:	2001	+	-	-		•				. ¦	, 6	90.00
	200	75.77	(2.28)			24.51	26.77			// SP. /	(07.7)	(4.20)
	7 6		(487)	٠		21.33	25,98	•		25.98	(4.65)	(6.91)
	2002	20.07	(3)		40	1 84	•	1.19	0.77	8.	(0.12)	(7.03)
	2005		(3.46)	9 9	86.			30	0.83	2.13	(0.12)	(7.15)
	88	•	(67:1	7	B 6	2 5		141	060	2.31	(0.12)	(7.27)
	2008		£.5	132	8 8	200	, ,	3	960	2.52	(0.12)	(7.39)
	2002	•	(06:0)	_	B (•	40.	50	2.73	(0.12)	(7.51)
_	2008	,	(0.69)	-	5		,	3 5	1	86.	(0.12)	(7.63)
_	2009	•	(0.46)	•	8	10.7	•	2 5	22	3.22	(0.12)	(7.75)
	2010		(0.20)		8 1	9.50	•	9	8	3.51	(0.12);	(7.87)
0	2	1	600		B 1	9 0	•	2 5	1.43	3.81	(0.12)	(7.98)
-	2012	•	0.39		8. 1	20.0		9 6	2	7 7	(3.06)	(11.04)
~	2013		(2.22)		8. 5	00.	•	9 6	187	4.50	(0.40)	(11.44)
6	8		5.7		3	, i		3 7	S	10.4	040	(11.85)
-	2015		2.10		1.38	9,50	1	5	3	3	2.08	(8.86)
10	2016	•	2.52		8	4.92	•		<u>.</u>		900	(8.8.2)
6	2017	•	2.68		98	5.08	,		2.2	2 5	900	5.5
-	2		2.85		1,98	5.25		•	7.7	7.7	00.7	9
	5	•	3.03		1.98	5,43	•	•	2.45	2.45	2.98	0.00
0 0	2 6		323		1.98	5.63			2.65	2,85	20.5	3,04
D 0	3 6	•	3 44		96	4.8		•	2.86	2.86	2.98	6.03
5 ,	200				96	6.07	•		3.09	3.09	2.98	9.04
	7077	•	5 6		60	6.31	•	,	3,57	3.57	2.74	11.78
Ñ	2023		5 5		3	9	,	•		,	5.99	17 78
6	2024	•	20.0		•	90.4	1	•		,	5.99	23.77
4	2025		5.57		•	9 4	. ,			•	5.86	29.63
'n	2020	•	8		,	3 6			٠	•	5.86	35.50
9		•	5.86			9 6					5.86	41.36
1		1	5.86			98.0			•		A A	47 22
			5.86			5.86	,	i		•	3	١.
8		•	•			•		•		•	•	
0				1	•	•	-				20.67	
ŀ		A C 2	70 07	10.21	02.05	140 6	27.62	200			77.	

Service Control of	ĺ	Carlo dans	arion.							
		Cash Cenerado	Long				Dairoin		Accumu	Dept Service
g	,	Operating	Depreciation	Ĭą.	Total	Payment	Payment	Total	Total	Ratio
			, M./C	MMS	MMS	MMS	MMS	MMS	ZE/S	
{	The sections of the	ZWWS	Mark					•		
0	202	•		•		2.26	•	2.26	2.26	
	2002			•		185	,	4 65	6.91	
N	2003	•				2	1 0.8	7.00	13.91	0.49
•	2004	3.58	3,30	6.88	20.00	5	5.6	1 2	2000	0.66
. 9	500	3.58	3.30	6.88	13.77	4.87	Ž	3 8	20.04	72.0
,	3 6	9	5	6.88	20,65	4.69	231	8.5	76.77	2 1
n	ş	200	3 6	4	57.53	4.48	2.52	400	34.92	6.7.0 0.78
φ	<u>5</u>		05.5	900	3 3	10.7	2.73	7.00	41.93	0.82
~	2008		3,30	000	7 :	2	300	7 00	48.93	0.8
00	5002	3.58	333	6.88	00.14	5 1	9 6	8	45.03	0.86
a	2010	60 60 60 60 60 60 60 60 60 60 60 60 60 6	3,30	6.88	48 19	50.00	3.44	3 5	3 6	900
ç	20.		3.30	6.88	55.07	3.49	3.51	3.5	02.30	200
:	2		3.30	6.98	81.95	3.18	3.81	3	, i	60.0
- 5	2 6		3.30	30.6	65.90	2.86	4,14	1 00	75.94	0.00
٧.	2 2		241	5 BO	72.50	2.50	4.50	7.00	93.94	8.0
2	2	_		6	79.10	2.10	4.91	7.01	90.95	0.87
₹	8		* 7	90.0	PK 71	8	1.94	3,62	94,57	0.91
Š	20.6	_	7.7	3 6	3 2	2	2 10	3.62	98.19	0.94
ē	2017	_	2.4	000	94.0		100	3.62	101.81	
Ē	2018	_	2.4	000	20.00	1	2.45	3.62	105.43	
18	2013	_	2.41	00.0	70.00	200	265	3.62	109.05	
13	2020	4.20	2.41	8	7 7	e c	9	6	112.67	
20	2021	_	2.41	9.80	18.72	E 6	8 6	6	118.29	
5		4.20	2.41	6.60	8	200	9 6	98.6	120 15	
2		4.20	2.41	6.60	131.93	7.0	10.0	8	150.4	
8			0.43	68.5	137.93	•		•	2 5	
7			0.43	5.99	143.92	•			100.4	
. ?				5.86	149.78			•	CL021	
0			•	28	155.65		•	•	120.15	8.
9 1				2	161.51	•		•	120.15	
3				5	167.37	•			120.15	
38		96.0	•	3	•					•
ន				•		,		•	,	
용	8	1	1				20 02	A+ AC+		and the same of the same of the same of
			10	167 37	2 212 07	80.48	00.00	2		

Amatitian Geothermal Repayment Bchedule, Case 3-kreide Project Bubject File Name Date Rev.

	*				
FOR RE	¥	FOR REPAYMENT SCHEDULE	EDULE	i	
		Total	Japan	inci	TOTAL
YEAR			40%	*09	
		\$ **	SAMS	ZW2	MW S
	-	28.77	10.71	16.06	26.77
	c	25.94	10,39	15,59	25.98
	~				
	4				
	40			•	٠
	•				
	١	52.75	21.10	31.65	52.75

% Yee/ Yeers LOAN TERM Interest Grace P. Repayment WACC

Continued Cont							2000				PO06			2005	Loan			2006	Loan			1			
Value Column Co			2002	Losen			XOU3	C080		*							Oulstand	ł			Outstand	Ž	E 1881	o o	
2001 10.5 (1.16) 1.20 (1.16) 1	<u>*</u>		Principal		Repey-	outstand- ing Relance		interest			rincipal Inte						ing Balance			Repey-			_	ļ	
2000 10.59 11.65 0.09 11.65 0.09 11.65 0.09 11.65 0.09 11.65 0.09 11.65 0.09 11.65 0.09		-																				į	,		
2008 10.39 11.45 0.08 11.45 0.08 11.55 0.09 12.57 0.08 12.75 0.08 12.75 0.08 12.75 0.08 12.75 0.08 12.75 0.08 12.75 0.08 12.75 0.08				•	,			•		•							•	•	•	•			88.0		
2000 1139 123 123 123 123 123 123 123 123 123 120 </td <td>•</td> <td></td> <td></td> <td>ð</td> <td></td> <td>11.69</td> <td>٠</td> <td>٠</td> <td></td> <td>•</td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td>,</td>	•			ð		11.69	٠	٠		•		•					•		•	•					,
2004 0.05 1.00 1.59 1.55 0.25 1.59 <th< td=""><td></td><td></td><td></td><td></td><td></td><td>27 C+</td><td></td><td>98.0</td><td></td><td>11,34</td><td>•</td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td><td>•</td><td>•</td><td>•</td><td></td><td>5.5</td><td>. ;</td><td>. :</td></th<>						27 C+		98.0		11,34	•						•		•	•	•		5.5	. ;	. :
2000 0.00 110 120 0.00 130 130 130 130 1007 130 130 1007 130 130 130 130 130 130 130 130 130 130									4	0.78							•	•	•			<u>0</u> 2		Z	2
2006 0.05 1.10 1.79 1.44 1.87 3.38 2009 0.75 0.75 0.89 0.89 0.89 1.99 3.38 2009 0.85 0.75 0.86 0.89 1.89 3.89 1.70 3.88 3.99 2009 0.85 0.75 0.86 0.75 0.89 1.89 3.89 1.70 3.88 3.99 2009 1.05 1.79 6.80 0.86 0.86 1.89 3.38 1.50 1.70 3.88 1.50 1.70 3.88 1.50 1.70 3.88 1.50 1.70 3.88 1.50 1.70 3.88 1.50 1.70 3.88 1.50 1.70 3.88 1.50 1.70 3.88 1.50 3.38 1.50 3.38 1.50 1.70 3.88 1.50 3.78 1.50 3.78 3.78 3.78 3.78 3.78 3.78 3.78 3.78 3.78 3.78 3.78		2004							9			,	,			•	•		•		•	8		2.08	3.38
2009 0.75 1.54 1.59 1.04 0.33 2009 0.75 1.59 1.04 0.33 1.59 0.30 1.59 0.30 2009 0.86 0.97 1.99 0.87 0.59 0.79 0.70 0.75 0.33<		2005							e i							,	•		•			;		1,97	3.38
2007 0.05 0.09 1.79 9.88 0.75 0.05 1.69 1.70 3.33 2009 0.05 0.09 1.29 0.09 1.69 0.73 0.09 1.69 0.73 0.09 1.69 0.33 0.09 1.69 0.73 0.09 1.60 0.08 0.73 1.69 0.73 0.09 1.69 0.73 1.99 0.09 1.69 0.73 1.99 2.00 1.69 0.73 1.99 2.00 1.10 2.00 1.10 2.00 1.10 2.00 1.		2006	0						1.59	9.50				•			•					7		20	3.38
2009 0.55 0.56 0.75 <th< td=""><td></td><td>2002</td><td>80</td><td></td><td></td><td></td><td></td><td></td><td>1.59</td><td>9.78</td><td></td><td></td><td></td><td>•</td><td></td><td></td><td></td><td></td><td>•</td><td></td><td>•</td><td></td><td></td><td></td><td>35</td></th<>		2002	80						1.59	9.78				•					•		•				35
2000 0.67 0.86 0.72 1.56 0.28 0.72 2001 0.67 0.86 0.73 1.56 0.72 1.59 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.73 0.72 0.72 0.72 0.73 0.72 0.73 0.73 0.72 0.73 0.74 0.73 0.74 0.73 0.74 0.73 0.74 0.		000							1,59	7.99				•		•			•		•	2 :			
2010 1.06 0.73 1.79 6.94 0.05 1.39 6.19 1.19 3.38 2010 1.06 0.73 1.79 6.94 0.05 1.39 6.19 1.19 3.38 2010 1.06 0.73 1.79 6.94 0.05 1.79 6.94 0.05 1.79 2.00 1.19 3.38 2010 1.16 0.05 1.79 1.06 1.30 0.05 1.79 1.64 1.32 0.37 1.39 1.47 0.13 1.60 0.05 1.79 1.64 0.15 1.79 0.28 0.29 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	·	0000	_						55	7.12						•	•	•		•	•	. 63		0 1	0 1
2010 1.149 0.152 1.29 1.149 1.203 1.	٠,-	9							9				,	-		•	•		•			8		1.38	3.38
2011 1.16 0.65 1.79 5.75 1.10 3.38 2012 1.26 0.64 1.79 5.75 1.70 0.45 1.59 2.80 2013 1.26 0.41 1.72 0.47 1.59 2.80 2014 1.20 0.31 1.79 1.64 1.47 0.13 1.60 2015 1.20 0.31 1.79 1.64 1.47 0.13 1.60 2016 1.20 0.31 1.79 1.64 1.47 0.13 1.60 2017 2018 1.20 0.31 1.70 1.64 1.47 0.13 1.60 2018 2019 1.20 0.31 1.20 0.31 1.60 2019 2020 1.20 0.31 1.20 0.31 1.60 1.41 0.20 2020 2020 1.20 0.31 1.20 0.31 1.20 0.31 1.60 1.41 0.20 2020 2020 1.20 0.31 1		2010	• -															•	•		•	2.19	,	1.19	338
1.26 0.53 1.79 2.60 0.53 1.79 2.60 0.73 2.60 0.73 2.60 0.73 1.59 2.80 0.29 1.79 1.64 1.33 0.29 1.47 0.13 1.60 0.45 1.79 1.64 0.15 1.65 1.65 1.65 1.65 1.65 1.65 1.65 1		2011							P.	0.0									•	٠	•	2.38	,	1.00	3.38
1.36 0.44 1.79 3.14 1.22 0.37 1.59 2.80 0.29 1.39 0.47 1.79 1.47 0.13 1.60 0.29 1.39 0.47 1.79 1.47 0.13 1.60 0.29 1.39 0.47 1.47 0.13 1.60 0.29 0.30 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.60 0.45 1.47 0.13 1.47 0.13 1.47 0.13 1.60 0.45 1.47 0.13 1.47 0.13 1.47 0.13 1.47 0.13 1.47 0.13 0.13 1.47 0		2012	1.4						- 59	4.03							•					09	,	82.0	38
150 0.29 1.79 164 1.33 0.28 3.38 1.66 0.15 1.00 0.29 1.79 1.60 1.79 1.60 0.15 1.79 1.60 0.15 1.79 1.60 0.15 1.79 1.60 0.15 1.60 0.15 1.79 1.60 0.15 1.79 1.60 0.15 1.6		2013							1.59	2.90	٠		,			•	•		•	•		3		910	300
1.47 0.13 1.60 0.15 1.79 1.47 0.13 1.60 0.15 1.79 1.47 0.13 1.60 0.15 1.79 1.47 0.13 1.60 0.15 1.79 1.47 0.13 1.60 0.15 1.79 0.15 1.79 0.15 1.79 0.15 1.79 0.15 1.79 0.15 1.79 0.15 1.79 0.15 1.70 0		2014	-						1.59	1.47											•	2 :		3 6	9 6
2.209		2046							1,60	•					,	•		•		•	•	5.5		07.0	20.0
2.209		2016					•	•		•				•			•		•	•		,	i		
2.24 9 2.39		-		•	٠			٠	٠	•				•			•				•		•		
2.209					•	۰	•	٠		•				•			•			•	•	,			
2.20								•		•				•			•	•	•			,	•	•	
2.209		SLO2		•	•							,	,							•					
2.20		2020		•	•	•	•									,	•	٠	•	•					
2.09		202		•	•					•									•	٠			•		
2.209		2022		•	•		•					,		•			•								
22.09		2023		•	•	•				•							•		,	•	•				
2.09	٠.	2024	,	٠	•	•		•		•						•	•	•				•			
22.09		202		•		•	•	,		•				•		•	•		•	•	•			,	
22.09		1000		٠	٠	•	•			•						•	•	•	•						,
22.09		2005	_	•	•	٠	•			•							•		•	•	•			,	
2029 2039 2030 2030		200		į.	•	,		•	٠	•	,						•	•	•	•					
2020 2030 2030		9707		•	•					•							•		•						
2030) 2031		5073		,			, 1									•	٠	•		•	•		•	•	
2031	-	2030	· 		•					•			, ,			,	•	•	•	٠					
	•	203	•	•		.										 -					-	24 09			09.0

International Bank Loan Repayment Schedule (Million US\$), Case 1 fnaide

UNIT: MIRON US\$

Var. Control C			1				2003	Lon		- 1	2004						-busiand						<u>=</u>		Repay-	
National			Z002:	L. CO.		1				: -bustanc		0		1				Deinolina						nieresi	u de	e e
100 2000.00 1648 128 178 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 128 178 1884 1					Repay		Principal	_									Balance						police			Salance
100 100	<u>ج</u>		Principal		<u> </u>					Balance			1	92												
2,000,000,000,000,000,000,000,000,000,0	2	-															•				•	,		•	•	, ;
2,000,00 16,00 173 1872 1873 1874 1874 1874 1875 1875 1875 1875 1875 1875 1875 1875								٠		•						•				,	•		1.28		,	47.34
Column C				•	٠			ì						-		٠	•						2.64		•	35.57
COME TATE TATE <th< td=""><th></th><td></td><td>2</td><td>1.2%</td><td>•</td><td>17.3</td><td></td><td>•</td><td>,</td><td></td><td></td><td></td><td></td><td></td><td>•</td><td>•</td><td></td><td></td><td>•</td><td>•</td><td></td><td></td><td>i</td><td></td><td>163</td><td></td></th<>			2	1.2%	•	17.3		•	,						•	•			•	•			i		163	
2000.00 1558 0.01 1552 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1864 0.05 155 177 1865 0.05 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 155 177 1865 0.05 177 177 1865 0.05 177 177 1865 0.05 177 177 1865 0.05 177 177 1865 0.05 177 177 1865 0.05 177 177 177 177 177 177 177 177 177 17		_				78.73		1.25		16.84						•	•				•	2.0	3	. !	1	
March Marc									1.71	16.48				•					•	•	•	0.83	٠	2.79	3.62	
1,500,000 0.04 1,47 1,51 1,546 0.035 1,524 1,71 1,510 1,525 1,525 1,71 1,510 1,525		00400	0									,				•	•	•				9		27.0	3.62	
1,000, 2,000, 0,000,		3							1.71	0.00					•	•	•	•			•	28.5	•		5 6	
200 200		00.00	÷						17.	15.67				•	•						,	85°C		300	3.62	
0.00 0.00 1.22 1.71 1.72 2.40 1.22 2.71 1.72 2.40 1.22 2.71 1.72 2.40 3.62 1.22 2.73 2.40 3.62 1.22 2.71 1.72 2.70 3.62 <th< td=""><th></th><td></td><td>ő</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td>•</td><td>•</td><td>•</td><td></td><td></td><td></td><td></td><td>2</td><td></td><td>2 57</td><td>3.52</td><td></td></th<>			ő											-	•	•	•					2		2 57	3.52	
1,000, 1,000,		2000	ì						<u>-</u>	7.6					•	•	•				•	50.				
Column C		00,700	9						171	14,72											•	1.13		7	3.02	
200 200		00,000												•		•	•	•	•			60.4		2.40	3.62	
1,000, 1			4						=					_	•	•		•			•	1			6	
1, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,		00000	٠ د						1.7	13.62		,		 •					•	,	•	1.32	•	2.8	3.52	
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,		010.00	90						:	20 64		,				•		•	•			. 43		2 19	3.62	
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,		200	7						=	20.0					•	•		•				?				
1,000 1,00	_	91.0							1.7	12.33									•			Š		2.0	3.52	
2.00 2.0100 CARE 1.57 0.02 1.57 0.02 1.50 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.03 1.77 0.03 0.03 1.77 0.03 <		012.00	0.7													•	•					1.67	,	1.95	3.62	
Column C	٠-	2000	2						-						•	•		•			•			5	63.6	
154 154	-	20.00							-	10.83								•	•			2		8	100	
1,00 1,00	_	011.00	6 0							56.6	,					•						6		1.68	3.62	
2.00 2.00 0.00 <th< th=""><th></th><th>016.00</th><th>ď.</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>-</th><th></th><th>•</th><th>•</th><th></th><th>•</th><th></th><th></th><th></th><th></th><th>ç</th><th>3.52</th><th></th></th<>		016.00	ď.											-		•	•		•					ç	3.52	
5.00 2.47 1.71 5.10 2.27 1.73 3.02 5.00 2.47 bit 2.45 bit 1.71 5.10 2.27 1.73 3.62 7.00 2.01 bit 2.02 bit 1.71 3.04 2.27 1.71 3.62 2.01 bit 2.02 bit 2.03 bit 2.04 bit 2.05 bit 2.04 2.05 bit 3.04 bit 3.05 bit		200	-						5,7	200					•	•	•	•	•	,		9		1		
1, 1, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,		00.010	•						1.71	9.10									•			2.27	,	2	30.0	
7.00 2.0140.00 1.21 0.70 1.014 1.02 0.05 1.71 5.89 0.97 3.62 0.00 2.0140.00 1.51 0.06 1.71 4.68 0.77 1.71 4.68 0.77 1.71 3.67 0.75 3.82 0.75 3.85 0.75 3.85 0.75 3.85 0.75 3.85 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75		01700	-						121	7 04	•					•	•				•	245		1.17	3.62	
1.00 2.019.00 1.00 0.61 1.91 6.20 1.17 3.29 0.65 1.77 1.86 0.76 3.82 0.76 3.82 0.76 3.82 0.76 3.82 0.76 3.82 0.76 3.82 0.76 0.76 3.82 0.76 0.76 0.76 0.76 0.76 0.76 0.76 0.76		01810														•	•		•					700	3.67	
0.00 2.00 0.00 <th< td=""><th></th><td></td><td>*</td><td></td><td></td><td></td><td></td><td></td><td><u> </u></td><td>20.0</td><td></td><td></td><td></td><td></td><td>•</td><td>•</td><td>•</td><td>•</td><td>•</td><td></td><td></td><td>2.63</td><td>•</td><td>5</td><td></td><td></td></th<>			*						<u> </u>	20.0					•	•	•	•	•			2.63	•	5		
\$500 2,222000 1,41 0.59 1,51 3.45 0.59 0.59 0.59 0.59 0.59 0.59 0.59 0.5		03.00	-						1.71	4.65									•		,	2,86		0.75	70.0	
1.52 0.39 1.31 3.40 1.52 0.39 1.31 3.40 1.52 0.39 1.31 3.40 1.52 0.39 1.31 3.40 1.32 0.32 1.71 1.86 0.15 2.01 1.31 0.14 1.85 0.25 1.71 1.86 0.15 2.01 1.71 0.14 1.85 0.15 2.01 1.71 0.14 1.85 0.15 2.01 1.71 0.14 1.85 0.15 2.01 1.71 0.14 1.85 0.15 2.01 1.71 0.14 1.85 0.15 2.01 1.71 0.14 1.85 0.15 2.01 1.71 0.14 1.85 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.1		.020.00	7						171	334						•	•				,	3.09		0.53	3.62	
100 202200 154 027 159 177 145 0.75 2.01 2.00 2.023.00 177 0.74 1.85 0.75 2.01 2.00 2.023.00 177 0.74 1.85 0.75 2.01 2.00 2.023.0		00.00	1.5						į	40						•		•				Ç		90.0	285	٠
2.00 2.023.00 1.77 0.14 1.85 0.15 2.01 2.02 2.02 2.02 2.02 2.02 2.02 2.02			-						5	BO:						•	•			•		ò		}		
0.00 (2023.00 1,71 0) 1 0.1 1	~	30.750					1.88		2.01	•							•		•					3		•
2.00 2.025.00 5.00 2		.023.00	- -			e e				•						•									٠	
(50) 2/2/25.00 50) 2		024.00		•	•		•				•			-		•						,		٠	ı	•
5.00 2.025.00 5.00 2.027.00 5.00 2.025.00 5.00 2		6		•	•	•	•			•	į.					•	•									
5.0 2.0276.00 5.0 2.0276.00 5.0 2.020.00 5.0 0.00 5.000.00 5.000.00 5.000.00 5.000.00 5.000.00 5.000.00 5.000	_	20.000				•		•	•	•			•			•	•	•	•						•	
\$500 2,027.00 \$500 2,028.00 \$500 2,030.00 \$500 2,033.00 \$500 2,033.00 \$500 2,033.00 \$500 2,033.00 \$500 2,033.00	_	.026.00		•	,			٠		•	,		•			•						•	,			,
7.00 2.025.00 8.00 2.030.00 9.00 2.030.00 9.00 2.033.00 9.00 2.033.00 9.00 2.033.00 9.00 2.033.00 9.00 2.033.00		027.00		٠	•											•	•		•				٠		٠	•
2.00 2.028.00 9.00 2.030.00 3.00 2.033.00 34.66 18.73 22.08 38.14 16.94 16.91 34.50		8		•	•	•			,	•	,					•	•				,	•				
8.00 2.03500 8.00 2.03500 3.00 2.033.00 31.66 1873 22.00 38.14 16.04 16.91 34.50		3070			•	•				•	4	•				•	•				•	•	,			•
9.00 2.03.00 2.00 2.033.00 34.66 18.73 22.08 38.14 16.94 16.91 34.50		020.00		•			,			•						•			٠		•				•	
0.00 2.033.00 31.65 18.73 22.00 38.14 16.04 16.91 34.50		030.00		•	•																	34.67	6.77	34,22	72.64	
31.65 18.73 22.08 38.14 16.84 18.91		03 1 00		•			٠									•				•		2				
		Į,				4	16.04		3		-							İ								

FIRR Case 2-1 - 12
Anathlan Geothernal
Subject FIRR - Case 2 - Inside
File Name 1999/5/21
Rev. 2001/10/12

文字文字文字 (FIRR); Case 2 - Inside Financial Internal Rate of Return

FIRR = 11,15%

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ze 77 22.88 22.47	Salable Energy GWh	Supple. Wells	Steem	O&M for P.	Steam Cost	Tex	General. Cost Tt	Project Cost Total	Revenue	Balance
 	55.98 55.98 54.06 52.47	ew'r							•		
	22.47	STATE OF THE PERSON NAMED IN	2	S S	MMS	MMS	MMS	MMS	MMS	MMS	MMS
	22.47	,							, ,		7 90)
A COMPANY OF THE PROPERTY OF T	22. 42. 2. 06. 08. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	٠					•		7.07		
	22.47	•	, ,			•		٠	25.98		622
	22.47	. !	•	, ;	0.0	1.70	1.60	4.73	4.73	11.60	6.83
	22.24.74.74.7	145.01	•	2 9	9 6	,	1.60	4 73	28.78	11.60	(17.18
	74	145.01		.13	200	2 6	200	473	27.20	11,60	15.6
2007 2008 2010 2011 2012 2013 2013		145.01		1.13	0.30	0,1	20.4	7 0	10.38	23.20	12.8
2009 2011 2012 2013 2014 2014		290.01	,	1.35	33	3.39	4.26	0.00	000	23.20	12.8
2008 2010 2011 2012 2013		290.01		1.35	58	3.39	97.7	10.35	000	22.20	12.8%
2010 2012 2013 2014 2014		290.01	,	1.35	1.35	3,39	4.26	10.38	0.00	20.00	ç
2012		290.01		1.35	135	3,39	4.28	10.38	10.38	73.20	9
2013		290.01		1.35	1.35	3.39	4.28	10.38	10.38	23.20	9 9
2 2 2		500		3.35	1.35	3,39	4.28	10,38	10.38	23.20	0 6
2 2		20.07		1.35	1.35	3.39	4.28	10,38	10.38	23.20	0
207		2000	•	1.35	1.35	3.39	4.69	10 79	10.79	23.20	7
2000		200.00		1,35	1,35	3.39	4.69	10.79	10.79	23.20	7
2013	•	2000	5.5.2	1.35	1.35	3.39	3.14	13.77	13.7	23.20	4.0
9 5		2000		1.35	1.35	3.39	4.55	10,65	10.65	23.20	C'7
200	•	2000		1.35	1,35	3.39	4.55	10.65	10.65	23.20	6 F
2 6	•	2000		1.35	1,35	3.39	4.55	10.65	10.65	23.20	12.5
2	•	2000		2	1.35	3.39	4,55	10.65	10.65	23.20	12.5
2020	•	2000	,	*	3	3.39	4.55	10,65	10.65	23.20	12.5
2021		2000	•	5 5	£	339	4.55	10.65	10.65	23.20	12.5
2022	•	2000	•	13	38	3.39	4.55	10,65	10.65	23.20	12.5
	•	2000		135	8	3.39	5.16	11.26	11.26	23.20	2.5
•	•	2000	•		1.35	3.39	5.18	11.26	11.26	23.20	11.9
-	•	2000		135	38	3.39	5.30	11.40	11,40	23.20	±.
		2000		5	35	3.39	5.30	11,40	11,40	23.20	1.8
		000		5	8	3.38	5.30	11,40	11.40	23.20	1.8
	•	446.01		1.0	96.0	1.70	2.63	5.76	5,76	11.60	80 V)
6707		145.03	,	5	0.30	1.13	2.63	5.18	81.0	11.60	60
•	•	145.01	•	1.13	0.30	1,13	2.63	4.08	9.3°	11.60	C
٦,		1000	13 Y	36.58	31.58	83.64	113.24	268,41	367.69	280.00	212.3

神林大	資本計算 Case 2 - Inside								Project	Project Undertaking							412
					Onerstine Cost		Steam Cost	Depre	Depreciation	Cost	Profit		Profit	É	Interest Mayment		6
- 1		7:	1	6					Power Plant	Total		ž	After Tax	Japan Bank	Int's Bank	eto .	NCOME
No. Year	Senerated France	FORTEN	Revenue	₩.	D&M Steam	P.		ij		2000	******	MMS	MMS	MMS	MIMS	KSMS	NM\$
	2	130	MMS	MMS	MMS	ZYZ Z	MESS	MINS.	Mild			. •	!• !		•		
	5	; ·		: •		•	•	•	•			•	•	96.0	1.28	2.26	
3			•			•	•		•					2.01	2.64	4.65	(4.65)
707				•		•	•	•	•		. ;			9 0	2.85	5.04	Ξ
 88		•	. ;			S	170	32	1.98	6.43	5.17	3	5	2.7	3 6	9	. ε,
2004	54 18	145.01	11.60		2 5	200	12	2	1.98	6.43	5.17	9	3.57	8.7	5	0	
2005	154 18	145.01	11.60		5.	9	2 6		708	8.43	5.17	8	3.57	3.80	5.05	200	٠ -
3006	154	145.01	11.60	•	1.13	06.90	0/-	7 5	000	040	08.5	4.28	9.52	4,11	5,15	9.56	
	45.00	20.00	23.20	•	1.35	135	3.39	1.32	8		2 6	4 2 K	0	3.85	5.03	8.83	90
3	200	000		٠	35	1,35	3.39	.32	35 -	4. 9.	00.51	2 6		3 58	26.4	8.47	50.1
8	306	5	25.53		35	135	3.39	.32	1.98	04.6	13.80	97.6	3.02	200	73	5	
200	308.35	290.0	73.20		3	8	3.39	133	1.98	9.40	13.30	4.29	9.52	3.20	2 1		
2010	308.35	290.01	23.20		8	2	30	2	196	9.40	13.80	4.28	9.52	2.95	o i	5 6	
8	308.35	290.01	23.20	•	<u> </u>	2 1		3	5	9.40	13.80	4.28	9.52	2.59	\$6.4 \$6.4	0	
2012	308.35	290.01	23.20		33	65.1	500	4 6	8	076	13.80	4.28	9.52	2.20	4.19	6.39	
2013	308 35	290.01	23.20		1.35	6	200	7	3 8	2	15 12	69	10.43	62.1	3.98	5.77	-
4.6	308 35	290.01	23.20	1	1.35	1,35	50.00	•	8 8	200	15.12	69	10.43	1.31	3.76	5.07	5.36
	30 36	290.01	23.20	,	1.35	1,35	3.39		8 3	9 6		41.6	7.00	0.90	3.52	4.32	•
2 8	2000	2000	23.30	4.53	-	1.35	3.39	0.45	8	8 6	<u>.</u>		0,0	0.55	3.25	3.80	
3	200.33	2000	23.20		58.	1.35	3.39	0.45	86:	6.5	Ď.	3 4	2 0	0.00	2.96	3.25	_
2	308.33	200	23.20	•	55.1	1.35	3.39	0.45	88.	6.53	70.4		9		2.66	2.66	-
2	506.30	0.00	200		25.	1,35	3.39	0.45	88	8.53	74.67	g (2 9		3 23	232	
20	306.35	290.01	72.52		8	1,35	3.39	0.45	8	8.53	14.67	S.	2.0		9	8	
2020	308 35	790.0	3.5			4.0	3.30	0.45	26.	8.53	14.67	4. CC.	10.16		9 1	t	
2021	308,35	290.01	23.20	•	2	2 4	000	0.45	3	8,53	14.67	4.55	10.12		/¢:L	ă ș	
2022	308.35	290.01	23.20		8	6 3	9 6	940	8	00	14.67	4.55	10.12	•	1.16	9	
	308.35	290.01	23.20		1,35	1.35	2		8	200	16.65	5.16	11,49		0.68	0.68	10.81
300	308.35	290.01	23.20	•	1.35	1.35	339	6	•	3 4	46.68	9. 4	11.49		0.48	0.48	11.01
	30.00	290.01	23.20		1,35	1.35	3.39	0.43	•	0 0	3 5	, r	11.80	•	0.27	0.27	11.53
2 8	2000	200 01	23.20	•	 85.	1.35	3.39	•	•	2 9	2 9	3 6	11.80		•		
	200	290.01	23.20		135	1.35	338	ı		2 9	2 5	 5 K	11.80	•			1.80
	9000	2000	23.20		8	1.35	3.39		•	ا تو	2 !	240	88.8	•			
27 2028	300.33	730.0			1.13	0.30	0.7			9.43	7	50.7				•	28.5
	26.38	0.0	3			6	170	•		3.13	8.47	2.63	e D	•			
29 2030	154.18	145.01	1.50	•	2 5	200	1 70		•	3.13	8.47	2.63	Z,	•			

			3		•						
) A	Logur	Nat Income	Dep. Steam Facilities	Cep. P.	Total	Project Cost	Japan Bank Principal	Int'l Bank Principal Perment	Total	Annual	Balance
		# 1 To 1	27.07	- ACIECIONAL SERVICES	MMS	MMS	MMS	MMS	MAS	MMS	MMS
	MMS	200	MINE								
2001		•	•	,				٠	28.77	(2.26)	(2.28
2002	26.77	(2.26)	,		24.51	77.07		1	0 40	(4.65)	6.04
2003	25.98	(4.85)			2.33	25.98			60.00	100	
900		(1.47)	1.32	1.98	8	•	1.19	0.77	1.96	(0.73)	5 6
3 5	90 70	(3 3 3)	132	1.98	24.03	24.06	1,30	0.83	26.19	(2.16)	0.29
2 5		(80.9)	- 33	86	20.49	22.47	14.	060	24.78	(4.29)	(13.49
e e	75.77	(3.20)	4 5	80	8	,	2.78	1.66	4.44	(0.87)	(14.36)
2007		0.20	4 5	, t	8 6		3.04	1.78	4.82	(0.87);	(15.24
2008		0.64	7	90.	1 7	•	331	192	5.23	(0.87)	1191
8		60.	75.	n 0	1			200	5.69	(0.87)	(16.98
2010			77	96.		•	304	2.24	6.18	(0.87)	(17.88
2011	•	2.00	1.32	0.4	0.50	•	433	2 42	6.72	(0.87)	(18.73
2012	•	25.5	1.32	20.0			9	080	7.33	(0.87)	(19.61
2013	,	9.13	1.32	RG.	0	•	8	2	103	(1.28)	(20.89
3014	•	4.66		88	40.0		2 6	3 6	69	1 20	81 (6)
2015		5.36	•	1.98	2	•	80°C	3.05	2 6	(04.0)	1 8
2018	•	2.68	0.45	- -	5.11		2.70	3.23	96.6	(0.90)	3 (4)
2 6		55.5	0.45	1.98	8.75		2.95	8 8	6.51	2.24	Z0.0Z
3		6.87	0.45	1.98	9.30	•	3.14	3.85	9.69	2.31	(18.51
9 6	•	27	2.0	6	680	•	٠	4.15	4.15	5.74	(12.78
607	•	9 6	2,00	80	10.23		•	4.49	4.49	5.74	(7.02
200		9. 0	44.5	40	10.59		٠	4.85	4.85	5.74	1.28
2 2	•	9	44.	86	10.98	•		5.24	5.24	5.74	4.46
7707	•	200	945	200	11.39	•	•	5.89	5.69	5.50	966
2023		96.0	945	}	11.26	,	•	2.51	2.51	8.75	18 72
507			345		1146	•		2.71	2.71	8.75	27 47
200	•	2	S	ı	11 83	٠		3.33	3.33	8.20	35.67
2026		20.5	•	• 1	1180	•			•	11.80	47.47
2027	•	1.00	•		1.80					11.80	59.28
2026	•	00.			2 84	•		•		28.6	65 12
8 ZOZ9		0 N	•		8 4	•	•	•	•	5.84	70.96
2 2		9 9			. 28				1	5.84	76.81
R			47.73	30.60	292.08	AC 99	49.02	66.97	215.27	76.81	
<u>e</u>	97.66	120.4	7/:	3		2		1 1 1 1 1 1	A	4 - H 14M	

-	Chan Generation	ration			1	O. inching		Accumo.	Dept Service
Ş Q	Year Operating	Depreciation	Total	Total	Payment	Payment	Total	Total	Partic
	SWW.	MMS	MMS	MMS	Z W	2XX	MMS	MMS	
1	TIME TO THE TAX A STATE OF THE T				,				•
3 :	· 5 !			•	2.26		2.26	2.26	
2	2002	•			4.63		4.65	6.9	•
2		. ;			40.4	1.96	20	13.91	0.49
2	2004 3.57	3.30	9.6	0.0	5 6		6	22.95	0.60
20	3.57	3.30	6.87	13.75	3	2 7			0.60
		330	6.87	20.62	8.85	2.31	11.16	ţ	3
3 2	2000	5	12 82	33.44	9.26	4,44	13,70	47,81	0.70
3 3		900	12.87	46.28	8.88	4.82	13.70	61.50	2.5
₹ :		200	5 6	90 0	8.47	5.23	13,70	75.20	0.79
2		3.5	707		5	69 5	13.70	88.89	0.81
		3.30	70.7		1 83	8	13.70	102.59	0.83
	2011 9.52	3,30	12.82	0	40.4		12.70	116 29	0.84
11 20		3.30	12.82	97.59	6.98	0.15	20.00	80.00	
-		3.30	12.82	110.38	6.39	7.31	2.70	00.67	
			12.41	122.79	5.77	7.93	13.70	143.08	
			12.41	135.20	5.07	8.63	13.70	157.38	
	50.01	6.6	0.43	144.63	4.32	5.89	10.31	167.69	
			***	187 18	3.80	6.51	10.31	178,00	
	_		200	180	2.28	68.9	10.24	188.24	
17 20			66.24	27.001	94.0	4.15	.89	195.05	
8	2019 10.12		5.35	57.70	2 5		, a	201.86	
19 20	2020 10.12		12.55	194.8	75.7			19.00	
			12.55	207.39	<u>8</u>	6. CD	0.0	9	
:			12.55	219.94	1.57	5.24	E 9	7.0.40	
	2000		12.55	232.50	1.16	5.89	7.05	222.53	
7			11 94	244.44	0.68	2.51	3.19	225.72	
				258.38	0.48	2.71	3.19	228.91	
	2025			200 40	0.27	3.33	3.60	232.51	
				200	•	,	•	232.51	
<u> </u>			11.80	719.90	•			232.51	
			08.11	67:187	•			232.51	
28 20	2029 5.84	•	3	20.162	•	i		222 54	13
		٠	3	303,47			•	232	
			5.84	309.32	•	•		277	1
	-	57.13	309 32	4 582 29	118.52	115.99	232.5	-	

Project Arnalitian Geothermal Subject Repayment Schedule, Case 3-Inside Sie Name Date Rev.

 FOR REPAYMENT SCHEDULE
 Initiation
 TOTAL

 YEAR
 TOTAL
 Japan
 Initiation
 TOTAL

 YEAR
 AMMS
 AMMS
 MMS
 AMMS
 LOANTERM Japan Intl Misses % 8.11% 8.00 Grace P. Yeer 2 2 Repayment Yeers 12 2 WACC 8.44 pen Benk Losn Repsyment Schedule (Millon USS), Cass 2 - millos

UNIT. Million US\$

															2000				2006	Loan			TOTAL				
							, wo	180			2004	Loan			57.03	10.0			1			i		interest in	_	0	Outstand
			2002 Loun	Logen	Repey	Outstand	1		Repay	Outstand-	Principal	ı	Repay	Outstand	d- Principal	Interest	Repay-	Outstand ing Ratence	Principal	f interest	Repay	ing Balance	Principal		nterest	ment	Balance
	¥	5			Tielf.	Balance	1		E .	- [ا			-	-				-							•	•
-													٠	•		•	•	•		•				0.58	•	٠	£
0	2001				•	• •	•		•			•	•	•	•	•	•	•		•				2.0		•	2
-	2002								,	-	7.		•	•	•	•	•	•									
~	2003												•	•		•	•	•					7	0,40			
	2004										2		•	•		õ	88	Ĩ.									
•	2005								,		 			٠		~	31	12.		_	2.82						
	2006										20.5				40		-	11.4				_		٠ 10 -			
n 4	2002													•	, d		•							•	9		
 D F	200										8			•				01 69						,	n (
- •	000													•											3.2		
	2										18			•	3 i									,	2.9		
 GB	2010		3 5								2			•	ö .										65.		
2	201	-	2 .	200				1.12 0.47		1.59	4.03			•	0.95		0.77	59'5		60.4	27.0	6	5.98	σ.	2.20	6.89	19.47
<u> </u>	2017		9 5								.80		•	•	: 									,	<u></u>		
2	2013		5											•	<i>=</i>										e.		
₽ 12	2014	•	3											•											9.0		
	2013		<u>-</u>											•											0		
5	2016		•		•			•	,				•	•	<u>.</u>										0		2
•	2017		•		•	•			•						<u>;</u>			. 89				67.	· ·	,	٠		
-	Ŕ	•	•		•	•			•					•		•						•		•	•	•	
•	2	·	•		•	•		•	•					•	•	•								•	٠	•	
2	202	ó	•		•				•						_	•		,						,	•	•	
8	202	, -		,	•				•					•		•						•		,	•	•	
~	202			•	•	•			•			,		•		•								•	•	•	
2	202		•		•				•				•	•		•					,			•	•	•	
ន	2024	•			٠	•									•	•		•						•	•	•	
75	202			•	٠	•								٠	-	•			•.•				•		•	•	
2	2026	*	•		•	•								•	•	•		•						,	•	•	
8	202	1	•		•	•								•		•							•		•	•	
22	202			•	•	•						,	•		•	•			***		,			•		•	
88	2028	do	•	•	•	•								•		•		•	-	,				•	' '	•	
6	2030	,	1	•	•	•								•		•					1		60.07	, je	33.83	82 56	9
ဓ္ဌ	203	-	-						10	10 12	-				12.06		10.14 20	20.31	-	12.88	2 09.6	27.88	12.4				
						•																					

UNIT: Million US\$

Control Cont							2003	logo.			2004			6002	Lagu					ĺ	Outstand	100	nterest in			Custand
Name Column Col			2002	ioen			ì			O. Selenge				9			Cultipage					•				ç
200100 15.69 128 1734 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-		Principal		Repay.	Outstank	4					_					ing Belence	Principal	nierest		-	- 1		Ì	- 1	Baiance
200100 1.50				:		Balance			4	a)				3		1										٠
2002000 158 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 128 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173 188 173																•	k.		•		•		36			7.7
1,000,000 1,500				•	•	•		•								٠		•			•		1			26.63
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,				123		17.	4	•				•			•	•					•		7.04		. :	
2,000.00 1,55 1,15	-					48.		1,25		16.84										٠	•	0.77		2.85	3.62	Ž,
2,000.00 1444 0.41 140 141 140 141 140 141 140 141 140 141 140 141 140 141 140 141 140 141 140 141 140 141 140 141										18.48		•				٠	•	•			•	6	4.	2.79	3.62	46.56
1,000, 1,000,															-		15.55	•		•	•	3			60.0	7 7 7
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	_									16.09						2	78 95		1.08		4.56	06 0	2.33	7.15	3.0.0	
2,000.00 134.6 145.1 145.1 145.1 145.2 177.1 145.2										15.67		•							4	97.	18.24	92		5.15	6.81	82
2007/10 0.52 1.39 1.48 1.25 1.71 1.42 1.71 1.65 0.04 1.25 1.71 1.42 1.71 1.65 0.04 1.25 1.71 1.42 1.71 1.65 0.04 1.25 0.04 1.25 0.05 1.18 1.71 1.41 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 1.71 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.25 0.04 1.05 0.04 1.25 0.04	•																		9	9		3 1				4
200000 0.66 1.53 1.91 16.20 1.71 1.82 7.71 1.82 7.71 1.82 7.71 1.82 7.71 1.82 7.71 1.82 7.72		2 Ann 7 An	*0							7									7	 84.	3.90	0		3		
2000000 0.66 (14) (15) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (14) (14) (17) (14)		20.500								14.72		į							:	1.48	13.53	182		68,4	5.81	ŝ
2000000 0.66 1.37 1.47 1.57 1.47 1.57 1.47 1.57 1.47 0.44 1.25 1.77 1.57 0.44 1.25 1.77 1.51 0.44 1.25 1.77 1.52 0.44 1.25 1.77 1.52 0.44 1.27 1.47 0.44 1.27 0.45 1.02 1.48 1.22 0.45 1.47 1.52 0.44 1.77 1.51 0.46 1.02 1.48 1.22 0.44 1.77 1.41 0.46 1.02 1.48 1.22 0.44 1.77 1.41 0.46 1.02 1.48 1.22 0.44 1.77 1.41 0.46 1.72 0.44 1.77 1.44 0.44 1.77 1.44 0.44 1.77 1.44 0.44 1.77 1.44 0.44 1.77 1.74 0.44 1.77 1.74 0.44 1.77 1.74 0.74 0.44 1.77 1.74 1.77 1.74 1.77		2,008.00								9		,	,								6.0	2.09		6.73	6.83	57.0
2011.00 0.65 1.26 1.71 1.34 0.44 1.22 1.71 1.44 0.46 1.27 1.74 1.44 0.46 1.27 1.74 1.44 0.46 1.27 1.27 1.44 0.46 1.27 2.22		- 00.600.2	0																3	*	2	3 1	1	ţ	.0	Ž
2011000 0.70 1.21 1.51 1.41 1.41 1.41 1.41 1.41 1.41 1.4		00 000	40							13.02				_					1.05	1.48	2,70	2.2		70.4	6.0	6
2011/100 0.05 1.15 1.91 1.36 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.45 1.71 1.25 0.54 0.44 1.45 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.46 1.72 2.05 0.05 1.71 2.05 0.05 1.71 2.05 0.05 1.71 2.05 0.05 1.71 2.05 0.05 1.71 2.05 0.05 1.71 2.05 0.05 1.71 0.05 0.05 1.71 0.05 0.05 1.71 0.05 0.05		0000								13.00									5	44.	12.24	2.42		4.39	6.81	52.3
2012.00 0.076 113 113 1279 0.272 0.39 177 116 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	٠	2,011,00	ŝ				•			12.33			•					·-··	9 6		76	7.53		4.19	6.81	-83
2013.00 0.82 1.69 1.91 1.2.79 0.74 1.49 1.71 1.2.90 0.54 0.94 1.41 1.22 0.94 1.49 1.02 1.91 1.02 1.91 1.02 1.91 1.03 0.84 0.87 1.71 1.09 0.75 0.99 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.75 0.89 1.20 2.03 2.016.00 0.66 0.48 0.87 1.71 8.09 0.65 1.77 8.09 0.65 1.73 0.66 1.48 9.73 3.26 2.20 2.20 0.74 0.74 1.48 9.72 3.26 2.20 0.74 0.74 1.49 5.29 3.26 2.20 0.80 1.48 9.75 1.49 5.29 2.20 2.20 0.74 0.74 1.49 5.29 2.20 2.20 2.20 0.74 0.74 1.71 0.75		2.012.00	ô																0.0	 B		7.07			4	48.0
201430 0.66 1/62 1/51 1/56 0.67 1/54 1/71 1/22 0.59 0.49 1/29 0.69 1/29 0.59 <		00 640 0	*°											-					3	9	11.20	2.83		5	9.0	
2.014.00 0.66 0.86 1.91 1.024 0.84 0.87 1.71 8.99 0.07 1.04 0.75 0.89 1.71 1.69 0.72 0.89 1.71 1.69 0.73 0.89 1.71 1.69 0.73 0.78	-	2000								10.83									6	1.48	10.62	3.06		3.76	6.81	43
201500 0.06 <		2,014.09								66.8			•	• 						4	00	2.29		3.52	6.81	405
2018.00 1.37 2.01 0.38 1.31 2.39 0.38 1.31 2.39 0.39 0.73 1.71 8.10 0.68 0.73 1.71 8.10 0.68 0.77 1.71 8.10 0.68 1.77 7.04 0.89 0.77 1.71 8.07 0.79 0.69 1.48 8.57 3.52 2.018.00 1.27 0.70 0.81 1.37 4.65 0.89 0.77 1.71 8.67 0.74 0.74 1.48 8.57 3.52 2.018.00 1.37 4.67 1.39 0.89 0.77 1.77 8.69 8.57 1.77 8.69 8.54 4.49 8.54 4.49 8.54 4.49 8.54 4.49 8.54 4.49 8.54 4.49 8.54 4.49 8.54 4.49 8.54 4.59 8.54 4.59 8.54 4.59 8.54 4.59 8.54 4.59 8.54 4.59 8.54 4.59 8.54		2,015,00	5							90.6				٠ -					9			9		3,6	8 8	37.0
201700 1.12 0.79 1.91 0.87 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.74 0.77 0.79 0.69 0.74 0.77 0.79 0.69 0.74 0.77 0.79 0.69 0.74 0.77 0.74 0.77 0.79 0.69 0.74 0.77 0.74 0.77 0.79 0.69 0.74 0.77 0.74 0.75 0.79 0.69 0.62 1.49 0.75 0.49 0.77 0.79 0.69 0.62 1.49 0.78 0.74 0.77 0.79 0.69 0.62 1.49 0.75 0.74 0.75 0.79 0.69 0.62 1.49 0.75 0.74 0.77 1.77 0.74 0.78 0.77 1.77 0.74 0.78 0.77 1.77 0.74 0.77 1.77 0.74 0.77 1.77 0.74 0.77 <		7.016.00	÷ 																0.80	. P	7	R i				
2018/20 1.21 0.70 1.81 7.88 4.15 7.78 4.15 2018/20 1.22 0.70 1.87 7.88 4.15 7.78 4.15 2018/20 1.30 0.87 1.87 4.85 0.89 0.73 1.77 8.09 0.66 1.48 6.23 4.49 2018/20 1.31 4.87 1.24 0.47 1.77 4.65 0.66 0.65 1.48 6.39 4.49	٠.	. 0017.00	:							2				-					0.74	.48	12.0	8		2.3	9 4	3
201300 1.30 0.67 1.97 6.28 1.77 5.89 0.56 0.57 1.77 8.09 0.66 0.62 1.48 6.92 4.49 0.20 0.50 1.37 1.77 8.09 0.66 0.62 1.48 6.92 4.49 0.20 0.50 1.37 1.77 1.86 0.58 1.77 7.09 0.59 0.59 0.59 0.59 0.59 0.59 0.59 0		90	-							*2.									69.0	1.48	7.78	4.15		7.56	18.0	2.5
2,003,00 1,37 4,65 0.98 0,73 1,7 6,08 0,73 1,7 6,09 0,48 0,73 1,7 0,09 0,48 0,53 1,48 0,59 4,85 4,85 1,7 0,09 <th< td=""><td>٠</td><td>20.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2,83</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0.63</td><td>148</td><td>6 92</td><td>67.4</td><td></td><td>2:32</td><td>6.81</td><td>2</td></th<>	٠	20.00								2,83									0.63	148	6 92	67.4		2:32	6.81	2
2020.00 1.44 0.50 1.37 7.73 3.31 1.77 3.31 1.77 3.32 1.77 7.03 0.83 0.83 0.83 1.85 1.85 1.77 1.86 1.77 7.03 1.73 0.83 1.89 5.24 2022.00 1.64 0.27 1.91 1.77 1.86 0.17 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 1.77 1.86 2.77 1.88 2.77 1.88 2.77 1.88 2.77 2.88 2.77 1.88 2.77 2.88 2.77 2.88 2.77 2.88 2.77 2.89 2.88 2.77 2.89 2.88 2.77 2.89 2.89 2.89 2.89 2.89 2.89 2.89 2.89 2.89 2.89 2.89	~ **	2,019,00	· -							4.65				حة -				_				30 7		90	5	9
2021.09 1.52 0.29 1.54 0.35 1.71 0.66 1.77 5.84 1.52 0.24 2022.00 1.64 0.27 1.71 1.64 0.07 1.77 1.69 0.40 1.48 3.91 5.69 2022.00 1.77 0.14 1.86 0.15 2.01 1.66 2.74 2.54 2023.00 1.77 0.14 0.15 2.01 1.86 0.15 2.74 2.54 2023.00 2.025.00 1.77 1.65 1.77 1.65 1.74 2.74 2.54 2.026.00 2.026.00 1.77 1.65 1.77 1.65 1.74 2.74 2.74 2.026.00 2.026.00 1.65 2.00 1.48 0.12 1.60 3.33 2.026.00 2.026.00 2.026 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 2.02 <t< td=""><td></td><td>3.020.00</td><td>*</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>• •••</td><td>0.0</td><td>7.45</td><td>h i</td><td>7</td><td></td><td></td><td>4</td><td>7 7</td></t<>		3.020.00	*															• •••	0.0	7.45	h i	7			4	7 7
202200 164 027 131 171 145 026 177 180 047 177 445 109 040 148 359 569 202200 177 014 185 177 177 177 177 177 177 177 177 177 17		2021.00	-		•					2									0.48	1.48	- P	7.0		7	9 6	
200300 1.71 0.14 1.85 0.15 2.01 1.34 0.37 1.71 3.30 1.17 0.31 1.48 2.74 2.55 2.51 2.023.00 2.023.00 1.25 0.22 1.48 1.48 2.71 2.023.00 2.02		. 00000			-					09.			•						0.40	1.48	3.91	5.89		9.1	3	n i
2000.00 2000.0		00000	ç			, 10	-			,				 					0.33	1.48	2.74	2.51		0.68	3,19	9
2,225,00 1,45 0,15 2,00 1,44 0,12 1,60 3,33 2,225,00 2,22	٠.	C,U23.UV	·				_	•	,	,										,	148	27.		0.48	3,39	ص ص
2,005,00 2,0076,00 2,0076,00 2,0076,00 2,000,00		2,024,00	•	•	•	•				٠									77.5	9 1	•	i		100	8	•
2,005.00 2,0		.025.00		•	٠	•	•	•		• • • •				·-			9	.48	9	1.60	•	56.5		•	3	
2.027-00 2.028-00 2.030-00 2.0		00 800		•	٠	•		•		•								•			•					
2.024.00 2.025.00 2.025.00 2.025.00 2.025.00 2.025.00 2.025.00 2.025.00 2.025.00 2.025.00 2.025.00				٠	•	•		•		•						1				٠	•			,		,
2,000.00 2,0	_	207/207	-					•		,				•		•	•									•
2,002,00 2,003,00 2,003,00 2,003,00 2,003,00 2,003,00 16,84 2,005 34,49 14,56 16,24 29,72 66,97 7,40		2,029.00		•		•					•					•	•	,		,	•			1		
2,000,00 2,001,00 2,001,00 2,001,00 1,6,54 2,005 3,4,49 1,6,51 1,6,54 2,005 3,4,49 1,6,51 1,6,54 2,005 1,4,56 1,6,24 2,57,7 1,6,54 2,005 2	_	. 00000		•	•	•	•		•	•						•					•				•	
2,001.00		2000		•	٠	•	•	•		•					٠	•		•		•	•				.!	
Z.031.00 18.04 20.03 34.00 18.04 18.91 34.50		00000		٠	٠	•	•	•							1	1		11 KK	16.74	28 72		66.97	2.40	69.69	136.85	
	ᆟ	2,031,00		2000	. 00		16 P.						•	2	1			1			-					

FIRR Case 3-1 - 12
Project
Subject FirR Case 3-Inside
File Name
1999/521
Rev. 2001/10/12
PRSp ##

文法公债公司(FRR), Case 3 · Inside Financial Internal Rate of Return

2	Project Cost	Salable	Supple. Wells	Odd for Steam Prod	O&M for P. Plant	Steam Cost	ž	Gost Tel	Project Cost Total	Revenue	Balance
	MMS	GWh	×₩\$	MMS	MMS	MM\$	MAS	AN.	MIKS	MMS	MMS
2001	1					•	•			•	.30 62)
2002		•	•		•				70.60		9
2		٠						•	42.14	•	(42.14)
3 6	8	247 51	•	102	0.45	2.54	2.47	6.47	13.37	17.40	4.03
5 6		2000		135	080	3.39	3.85	9.19	9.19	23.20	14.01
2		290.0		,	90	95.6	3.85	9,19	9.19	23.20	14.01
2002		20000			9	339	3.85	9.19	9.19	23.20	14.01
200	•	2000	. ,		090	60.0	3.85	9.19	9.19	23.20	14.01
200		2000		Υ.	8	3.39	3.85	9.19	9.19	23.20	14,01
8		780.u	•	3 4	8	339	3.85	9.18	9.19	23.20	14.01
200		290.0		3 %	90	339	3.85	9.19	9.19	23.20	14.01
2	•	230.0	•	2	9 6	60 E	3.85	9,19	9,19	23.20	14.01
8		230.0		3 4	3 6	339	2 53	12.13	12.13	23.20	11.07
2		200.0	i i	35	8	3.39	4	9.68	9.88	23.20	13.52
		2000		3.5	080	3.39	4	9.68	9.69	23.20	13.52
3		2000		4	OBO	339	40.4	9.68	89.6	23.20	13.52
3		2000		45	090	600	5	9.68	89.6	23.20	13.52
2 2		0.000	•		8	3.39	4	9.6	9.63	23.20	13.52
2		2000	•		9	3.39	4	9,68	9.69	23.20	13.52
	,	2000	•	, .	800	339	40.	89.6	9.68	23.20	13.52
507	,	2000			080	3.39	4	9.68	89.6	23.20	13,52
2 2	,	2000		, F	8	3.39	4.34	89.6	9.68	23.20	13.52
700		2000		1.35	90	3,39	4	9.68	9.68	23.20	13.52
7 5		2000		1.25	080	3.39	5.55	10,88	10.88	23.20	12.32
3 5		2000	•	38	090	3,39	\$35	10.88	10.88	23.20	12.32
300		2000	•	35	0.60	3.39	5.54	10.86	10.88	23.20	12.32
2		0.004		35	O 60	933	40.0	10.68	10.88	23.20	12.32
2 5		2000		3.5	090	3.39	40	10.88	10.88	23.20	12.32
202	,	72.50		2,5	0.15	0.85	1.38	2.72	2.72	5.80	3.08
200			,	; •	•	•	•		•	•	
200		, ,		,	•		•		•		•
2			90,	20.00			00 004	VO are	07 455	C0 083	345 30

No. Year Canarated Canar	Revenue Revenue WH NH NH 17.51 99.001 99.001 99.001 99.001 99.001	Supple Well													
Cowit H H M M M M M M M M M M M M M M M M M	\$ 2	+			Crash Cost	Depreciation	ciation	Cont	Profit		Profit	Đị.	Interest Payment	:	Net
Converted 6 Converted 6 Converted 6 Converted 6 Converted 6 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Convert 7 Converted 6 Converted	2 2		1		100	. :			: !	į	Afrar Tax	Jacon Bank	Int) Bank	otal	NCOME
2001 2002 2003 2004 2005 2006 2006 2008 2009 2009 2009 2011 2012 2014 2014 2014 2015 2017 2018 2018 2019 2019 2019 2019 2019 2019 2019 2019			O&M Steam	Trail d		Supply	Power Flant	3	1			947	1444	MANA	MMS
2002 2004 2005 2006 2006 2006 2006 2008 2008 2011 2011 2014 2014 2014 2014 2014 2014	55555		MMS	MMS	MMS	Z Z Z	MMS	ZWZ	MMS	SWW	S S	CMIM	,		•
2002 2003 2003 2004 2005 2006 2009 2009 2009 2011 2011 2013 2014 2013 2014 2018 2019 2019 2019 2019 2019 2019 2019 2019	The second secon				•	•	•	•	,		• .	. 44	1.90	3.34	(3.3%
2003 2004 2005 2006 2006 2007 2009 2010 2011 2011 2013 2014 2014 2014 2015 2017 2018 2017 2018 2019 2019 2019 2019 2019 2019 2019 2019	NAME IN ADDRESS OF THE PARTY OF		•	•	•		•	•	•	•	•	1	4.07	7.18	(7.18)
2000 2000 2000 2000 2000 2000 2000 200					•	•	•	• .	. }	ļ			4 7.3	838	(2.89)
2005 2006 2006 2007 2007 2007 2009 2009 2010 2011 2011 2011 2011 2011		17.40	1.02	0.45	2.54	2,00	3.43	00 44	8 9	10.7	0	200		60	(0.51)
2000 2000 2000 2000 2000 2000 2010 2011 2011 2012 2014 2014	and the second selection of the state of an archive and	2	1.35	0.60	3.39	2.00	3.43	10.77	12.43	6	90.0) d	9 6	20 20 20 20 20 20 20 20 20 20 20 20 20	(0.20)
2000 2000 2000 2000 2000 2011 2011 2012 2014 2013 2014 2018 2017 2018 2018 2018 2018 2018 2018 2018 2018		8	1.35	09'0	338	2.00	3.43	10.77	12.43	200	00.0	0.00	88.		0.13
2009 2009 2009 2010 2011 2013 2014 2013 2014 2018 2019 2018 2019 2018 2019 2018 2019 2019 2019 2019 2019 2019 2019 2019		2	1.35	0.60	3.38	5.00	3.43	10.77	12.43	9.00	0.00		2 7	9 6	0.50
2000 2000 2010 2011 2011 2013 2013 2014 2018 2018 2019 2019 2019 2019 2019 2019 2019 2019		23.20	1.35	0.60	3.39	2.00	3.43	10.77	12.43	20.0	80.0	20.0	18.1	- 50	0.89
2017 2017 2017 2017 2017 2018 2019 2019 2019 2019 2019 2019 2020 2021 2021		20	1.35	0.60	339	5.00	3.43	10.77	12.43	000	000	97.0	977	7.26	132
2012 2012 2013 2014 2015 2016 2016 2016 2018 2018 2020 2020 2020 2020 2020 2020	290 04 23	2	1.35	0.60	3.39	8	3.43	10.71	12.43	0.00	0.00	00.5	0.4	27.42	1.79
2013 2013 2014 2014 2014 2016 2016 2018 2018 2020 2020 2021 2022 2023 2023 2023 2024 2024 2023 2024 2023 2024 2024		23,20	1.35	09.0	338	200	3.43	10,77	12.43	20.0	90.0	2.30	5 4	6.28	2.30
2012 2014 2015 2016 2017 2016 2017 2018 2020 2020 2021 2021 2022 2023 2023 2023		20	1.35	09.0	338	8.8	3.43	10.77	12.43	 0 i	000	- a	200	1	600
2014 2015 2017 2017 2018 2017 2018 2021 2021 2022 2021 2023 2023 2023 2024 2023 2024 2024 2025 2025 2026 2026 2027 2028 2028 2028 2028 2028 2028 2028		23.20 4.2	26 1.35	0.60	338	200	3.43	15.03	71.0	6.7	9 9	0.4	22	5.13	4
2015 2016 2016 2017 2018 2020 2020 2022 2022 2023 2023 2024 2023 2024 2024		50	1.35	09'0	338	0.43	3.43	9.20	8 5	4	9000	8	9	448	5.18
2016 308.35 2017 308.35 2018 308.35 2020 308.35 2021 308.35 2022 308.35 2024 308.35 2024 308.35 2024 308.35 2024 308.35 2024 308.35		23.20	1,35	09'0	3.39	0.40	3.43	070	3 5		900	200	42.6	3.76	5.90
2017 2018 2018 2020 2021 2021 2023 2023 2023 2023 2024 2024 2025 2024 2024 2025 2024 2029 2029 2029 2029 2029 2029 2029		23.20	1.35	09'0	338	0.43	3,43	9.20	8 8		99.0	70.0	9 6	2.98	6.58
2018 308.35 2019 308.35 2021 308.35 2022 308.35 2023 308.35 2024 308.35 2024 308.35 2024 308.35 2024 308.35		20	1.35	09:0	339	0.43	3.43	9.20	8.5	3	99.0		27.5	271	98.9
2012 2022 2022 2022 2022 2023 2023 2024 2024		50	1.35	0.60	3.30	0.43	3,43	9.20	8 3	, .	99.0	•	1.7.0	241	7.25
2022 2022 2022 2022 2023 308.35 2024 308.35 2024 308.35 2024 308.35 308.35 308.35 308.35		20	1.35	09:0	3.39	0.43	3.43	9.20	3.5	7	000		80.0	2 DB	7.58
2022 308.35 2022 308.35 2023 308.35 2024 308.35 2025 308.35 2025 308.35		23.20	1.35	09:0	3.39	6.43	3,43	9.20	8 3	2 .	99.6		 	1 72	7
2022 308.35 2023 308.35 2024 308.35 2025 308.35 2025 308.35		20	1.35	09:0	3.39	0.43	3.43	9.20	8 5	3	90.6		26.	35	8.32
2023 308.35 2024 308.35 2025 308.35	290.01	23.20	1.35	0.60	339	0.43	3,43	8.20	3.4		3.00		6	6	8 73
2024 308.35 2025 308.35 2025 308.35		23.20	1.35	0.60	338	0.43	3.43	8.20	8		99.6		2000	000	2
2025 308.35	_	23.20	1.35	09:0	3.39	•	•	5.34 24	22	X i	12.32	•	ì		12.32
2023		22.20	33	09:0	3.39	•	•	2. 2.	17.86	X S	12.32				5
•		3 8	135	090	3.39	•	•	5.34	17.86	25.52	12.32				20.25
300 36		23.20	50.	0.60	3.39	•		5.34	17.86	, No.	12.32			•	45.5
2000 300 30		23.20	135	090	3.39		•	5.34	17.86	S S S	12.32	•	•		4.4
2028 300.33			0.34	0.15	98'0	•	,	1.34	4 46	<u>ස</u>	3.08		,		90.5
2030			•	•	•	•		•	•	•				•	•
2031			•						000	. 90	241.05	3R 12	76.95	115.07	-25.98
The state of the s	7,250,25 580,00	8	33.85	14.91	84.75	24.27	68.64	70.057	00.040	100.40	1				

No. Loar Loar Loar Dec. Principal Project James Bank (Fill Bank) Annual Principal Ann	Γ				Cash Flor	Flow Out			5	CE NOT LIST	-		
NAME NAME	9		Logu	Net Income	Dep. Steam	Dep. P.	Total	Project	Jepan Bank Principal	fnt'l Bank Principal	Total	Annua! Balance	Balance
MANS MANS <th< th=""><th></th><th></th><th></th><th></th><th></th><th>Facilities</th><th></th><th></th><th>The Grant</th><th>T SAME</th><th></th><th>MME</th><th>RAMA</th></th<>						Facilities			The Grant	T SAME		MME	RAMA
2007 39,662 (3.34) 36,28 39,862 (3.34) (3.35) <th>-</th> <th>-</th> <th>MMS</th> <th>SAMS</th> <th>MMS</th> <th>MMS</th> <th>MMS</th> <th>MMS</th> <th>CMM</th> <th>CMINS</th> <th>PMIM</th> <th>PILL</th> <th>'</th>	-	-	MMS	SAMS	MMS	MMS	MMS	MMS	CMM	CMINS	PMIM	PILL	'
2002 38,622 38,624 38,734 38,728 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 35,002 36,002 <td>0</td> <td>2001</td> <td></td> <td>•</td> <td>t</td> <td></td> <td>. ;</td> <td></td> <td></td> <td>•</td> <td>30.62</td> <td>(134)</td> <td>(3.35)</td>	0	2001		•	t		. ;			•	30.62	(134)	(3.35)
2003 42.14 (7.18) 34.89 42.14 <th< td=""><td>-</td><td>2002</td><td>39.62</td><td>(3.34)</td><td></td><td></td><td>36.28</td><td>29.65</td><td></td><td></td><td>20.00</td><td>100</td><td>(10.52</td></th<>	-	2002	39.62	(3.34)			36.28	29.65			20.00	100	(10.52
2004 (5.80) (2.89) 2.00 3.43 9.45 6.80 2.15 1.39 3.55 1.37 2005 (0.20) 2.00 3.43 4.52 2.35 1.51 3.85 1.37 2006 (0.20) 2.00 3.43 5.59 2.56 1.51 3.86 1.37 2008 0.13 2.00 3.43 5.59 2.56 1.56 1.37 3.86 1.37 2008 0.13 2.00 3.43 5.59 2.05 1.50 1.37 2.06 1.37 3.86 1.37 3.86 1.37 3.37 3.86 1.37 3.3	~	2003	42.14	(7,18)			34.96	42.14		•	47.14	(7.30)	200
2005 (0.57) 2.00 3.43 4.92 2.16 1.39 3.55 1.37 2006 (0.20) 2.00 3.43 5.59 2.56 1.51 3.96 1.37 2007 (0.20) 2.00 3.43 5.59 2.80 1.76 4.56 1.37 2008 0.50 2.00 3.43 6.23 2.86 1.86 1.37 2008 0.50 2.00 3.43 6.25 3.06 1.90 4.56 1.37 2010 1.73 2.00 3.43 6.25 3.06 1.90 4.56 1.37 2011 1.73 2.00 3.43 7.72 3.96 2.40 6.36 1.37 2012 2.00 3.43 3.77 3.96 2.40 6.36 1.37 2014 4.53 0.43 3.43 9.04 4.72 2.79 6.36 1.37 2014 4.53 0.43 3.43 1.11 <t< td=""><td></td><td>Š</td><td>8</td><td>(2.89)</td><td>2.00</td><td>3.43</td><td>9.45</td><td>6.90</td><td></td><td>•</td><td>86.6</td><td>60.2</td><td>20.7</td></t<>		Š	8	(2.89)	2.00	3.43	9.45	6.90		•	86.6	60.2	20.7
2006 (0.20) 2.40 6.23 2.55 1.51 3.96 1.37 2008 (0.20) 2.00 3.43 5.56 2.56 1.53 4.19 1.37 2008 (0.20) 2.00 3.43 5.59 2.56 1.50 4.96 1.37 2009 (0.20) 2.00 3.43 6.22 2.56 1.53 2.05 1.37 2001 1.32 2.00 3.43 6.72 3.63 2.05 5.38 1.37 2011 1.77 2.00 3.43 6.72 3.65 2.40 6.36 1.37 2012 2.00 3.43 5.34 4.72 2.79 6.36 1.37 2013 2.00 3.43 9.04 4.32 2.59 6.91 1.57 2014 4.53 3.43 9.04 4.32 2.59 6.91 1.57 2014 4.53 3.43 9.04 5.15 3.01 1.55 <td>2</td> <td>200</td> <td>3</td> <td>(0.51)</td> <td>2.00</td> <td>3.43</td> <td>4.92</td> <td></td> <td>2.16</td> <td>1.39</td> <td>3.55</td> <td>1.37</td> <td>(6.60</td>	2	200	3	(0.51)	2.00	3.43	4.92		2.16	1.39	3.55	1.37	(6.60
200 0.13 2.00 3.43 5.56 1.63 4.19 1.37 2008 0.00 0.34 5.59 2.06 1.76 4.56 1.37 2008 0.00 3.43 5.29 2.06 1.90 4.95 1.37 2010 1.32 2.00 3.43 6.72 3.06 1.90 4.95 1.37 2011 1.79 2.00 3.43 7.72 3.63 2.05 5.36 1.37 2012 2.00 3.43 7.22 3.63 2.05 5.36 1.37 2013 2.00 3.43 5.34 7.22 2.59 6.34 1.37 2014 3.43 3.43 9.76 6.43 3.43 10.54 4.72 2.79 6.89 1.45 1.67 2014 3.43 3.43 3.43 10.54 4.72 2.79 6.89 1.60 6.88 1.60 1.60 1.60 1.60 1.60		900		ŝ	2.00	3.43	5.23		2.35	1.51	98. 73.	1.37	(5.23
2004 1,75 4,56 137 2008 0,89 2,00 3,43 6,59 2,80 1,76 4,56 137 2008 1,00 3,43 6,23 3,30 2,05 5,98 137 2010 1,32 2,00 3,43 7,72 3,63 2,22 6,88 137 2011 1,79 2,00 3,43 7,72 3,98 2,40 6,38 137 2012 2,00 3,43 3,73 3,98 2,40 6,38 137 2014 4,53 0,43 3,43 9,76 4,72 2,79 7,51 0,88 2014 4,53 0,43 3,43 10,61 4,72 2,79 7,51 0,88 2014 4,53 0,43 3,43 10,61 4,72 2,73 3,61 10,88 2014 4,53 0,43 3,43 11,11 -4,72 2,73 10,89 10,10 2015 </td <td>n 6</td> <td>2 5</td> <td></td> <td>(0.00)</td> <td>900</td> <td>64.6</td> <td>\$6 10</td> <td></td> <td>2.56</td> <td>1.63</td> <td>4.19</td> <td>1.37</td> <td>(3.86</td>	n 6	2 5		(0.00)	900	64.6	\$6 10		2.56	1.63	4.19	1.37	(3.86
2010 200 200 3.43 6.32 3.05 1.90 4.95 1.37 2010 1.32 2.00 3.43 6.72 3.63 2.05 5.38 1.37 2011 1.73 2.00 3.43 6.72 3.63 2.20 5.38 1.37 2012 2.00 3.43 5.34 6.73 2.25 5.85 1.37 2013 2.00 3.43 5.34 4.72 2.79 6.91 (1.57) 2014 4.53 0.43 3.43 9.04 4.72 2.79 7.51 0.88 2014 5.90 0.43 3.43 9.04 5.15 3.01 8.16 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88 1.37 0.88	0 1	3 8		2 6	9 6	(F)	593		2.80	1.76	4.56	137	(2.49
2010 1.32 2.00 3.43 6.75 3.33 2.05 5.38 1.37 2011 1.79 2.00 3.43 7.22 3.63 2.22 5.88 1.37 2012 2.00 3.43 7.22 3.63 2.25 6.84 1.37 2013 2.00 3.43 3.43 8.39 4.72 2.59 6.91 (1.57) 2014 4.53 0.43 3.43 8.39 4.72 2.79 6.91 (1.57) 2014 6.59 0.43 3.43 9.76 6.84 3.27 8.91 0.88 2017 6.59 0.43 3.43 10.54 - 5.64 3.27 8.91 0.88 2018 7.29 0.43 3.43 11.11 - 4.40 4.40 6.86 1.08 2017 7.24 0.43 3.43 11.44 - 4.43 7.01 4.43 7.01 2022 7.24 </td <td></td> <td>8 8</td> <td>•</td> <td>200</td> <td>8 6</td> <td>3.43</td> <td>6.32</td> <td></td> <td>3.05</td> <td>8.</td> <td>4.95</td> <td>1.37</td> <td>(1.12</td>		8 8	•	200	8 6	3.43	6.32		3.05	8.	4.95	1.37	(1.12
2014 179 2.00 3.43 7.72 3.63 2.22 5.85 137 2.02 2.03 2.03 2.03 2.03 2.03 2.03 2.03	D 6	800		1 32	90	6	6.75		3.33	2.05	5.38	1.37	0.25
2011 2.30 2.00 3.43 7.73 3.98 2.40 6.36 1.37 2013 2.00 3.43 5.34 4.82 2.59 6.91 (1.57) 2014 4.53 0.43 3.43 9.94 4.72 2.79 7.51 0.88 2014 4.53 0.43 3.43 9.04 5.15 3.01 8.46 0.88 2016 5.90 0.43 3.43 9.04 5.15 3.01 8.46 0.88 2017 6.68 0.43 3.43 10.61 3.27 8.95 7.01 2018 7.24 0.43 3.43 11.11 4.10 4.10 7.01 2019 7.24 0.43 3.43 11.14 4.43 4.73 4.73 4.73 4.73 4.73 4.73 7.01 2021 7.24 0.43 3.43 11.80 7.01 4.73 4.73 4.73 4.73 4.73 4.73	, (3 8	•	1 2	00.0	3.43	7.22		3.63	2.22	5.85	1.37	1.62
2013 (0.03) 2.00 3.43 5.34 4.72 2.55 6.91 (1.57) 2.00 2.00 2.00 2.00 3.43 3.43 8.39 4.72 2.79 7.51 0.88 2.00 2.00 0.43 3.43 8.39 4.72 2.79 7.51 0.88 2.00 0.43 3.43 9.76 5.64 3.27 8.91 0.85 0.88 2.00 0.43 3.43 9.76 5.64 3.27 8.91 0.85 0.88 2.00 0.43 3.43 9.76 5.64 3.27 8.91 0.85 0.88 2.00 0.43 3.43 10.54 5.00 3.80 7.01 8.00 0.43 3.43 11.11 4.10 4.10 4.10 7.01 2.00 2.00 7.01 7.28 0.43 3.43 11.14 7.44 7.43 4.43 7.01 2.00 2.00 7.01 7.34 0.43 3.43 12.59 7.01 2.00 2.00 7.01 7.32 7.01 2.00 7.01 7.32 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	5	2 8		200	8	143	7.73	•	3.96	2.40	6.36	137	2.99
2014 4.53 0.43 3.43 8.39 4.72 2.79 7.51 0.68 2014 2.00 0.43 3.43 9.04 5.56 4.32 7.0 6.88 2014 5.59 0.43 3.43 9.04 5.56 4.32 7.01 8.16 0.88 2014 5.59 0.43 3.43 10.54 2014 5.50 3.50 3.53 3.53 3.53 7.01 2.02 2.03 7.59 0.43 3.43 10.54 7.01 7.54 0.43 3.43 10.54 7.01 7.54 0.43 3.43 10.54 7.01 7.54 0.43 3.43 11.44 7.01 7.04 7.01 7.01 7.02 202 7.01 7.54 0.43 3.43 11.44 7.01 7.01 7.01 7.03 202 7.01 7.54 0.43 3.43 11.44 7.01 7.01 7.01 7.01 7.02 202 7.01 7.24 0.43 3.43 11.44 7.01 7.01 7.01 7.01 7.02 202 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	- 6	2 8		800	8	3.43	25.34	•	4.32	2.59	6.9	(1.57)	1.42
2014 5.18 0.43 3.43 9.04 5.15 3.01 8.16 0.88 2016 5.90 0.43 3.43 9.76 5.64 3.27 8.91 0.65 2017 6.68 0.43 3.43 10.64 5.64 3.27 8.91 0.65 2018 7.25 0.43 3.43 10.61 7.01 4.10 4.10 7.01 2019 7.24 0.43 3.43 11.11 4.10 4.10 7.01 2020 7.54 0.43 3.43 11.44 4.79 4.79 7.01 2021 7.54 0.43 3.43 12.89 7.01 7.01 2022 1.18.7 3.43 12.89 5.17 5.17 5.17 7.01 2024 1.13.3 0.43 3.43 12.26 5.37 5.97 5.87 5.87 5.87 5.97 12.32 12.32 12.32 12.32 12.32 12.32	4 (3 8			0.43	3.43	8.39		4.72	2.79	7.51	0.88	2.31
2017 6.66 0.43 3.43 9.76 5.64 3.27 8.91 0.85 2014 2.02 0.43 3.43 9.76 5.64 3.27 8.91 0.85 2014 2.02 0.43 3.43 10.54 2.02 0.43 3.43 10.54 2.02 0.43 3.43 10.54 2.02 0.43 3.43 10.54 2.02 0.43 3.43 11.11 2.02 0.43 3.43 11.11 2.02 0.43 3.43 11.11 2.02 0.43 3.43 11.11 2.02 0.43 3.43 11.11 2.02 0.43 3.43 11.11 2.02 0.43 3.43 11.12 2.02 0.43 3.43 12.59 2.02 0.43 3.43 12.59 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.43 12.52 2.02 0.43 3.03 2.02 2.02 0.43	,	3 8		8. 8	0.43	3.43	906		5.15	3.01	8.16	0.88	3.19
2017 6 668 0.43 3.43 10.54 3.53 3.53 7.01 2.01 2.01 2.01 2.01 2.01 2.01 2.01 2		2 5	•	8	0.43	3.43	9.76		50.00 40.00	3.27	16.8	0.85	4.03
2018	0	2 8		9 4	0.43	3.43	20.01	,		3.53	3.53	7.9	±.
2012 7.25 0.43 3.43 11.11 4.10 4.10 7.01 2013 2013 7.25 0.43 3.43 11.11 4.10 4.10 4.10 7.01 7.01 2013 7.20 7.20 7.20 7.20 7.20 7.20 7.20 7.20	۰	3		9	0.43	2 43	10.83	•		3.80	3.80	7.01	18.05
2013 7 758 0.43 3.43 11.44 4.43 4.43 7.01 7.01 2.02 2.02 7.58 0.43 3.43 11.44 7.01 2.02 7.01 2.02 7.01 2.02 7.01 2.02 7.01 2.02 7.01 2.02 7.01 2.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	<u> </u>	2 2		66	4.0	3 43	11 11	•		4.10	4.10	7.01	25.06
2022 1.34 0.43 3.43 11.80 4.79 4.79 7.01 7.01 2.02 2023 1.34 1.34 1.24 2024 1.34 0.43 3.43 11.84 2024 1.32 0.43 3.43 11.84 2025 1.232 1.232 2026 1.232 2027 1.232 2028 1.232 2028 1.232 2029 1.232 2030		5 8	•	03.4	43	64.6	44			4.43	4.43	101	32.07
2022 8.73 0.43 3.43 12.19 5.17 5.17 5.17 7.01 2023 8.73 0.43 3.43 12.59 5.58 5.58 7.01 2024 11.84 12.29 5.97 5.97 5.97 5.01 2025 12.32 12.22 12.32 12.32 2027 12.32 12.22 12.32 12.32 2036 3.08 3.08 3.08 3.08 1 2030 2030 2.427 68.64 307.54 88.65 43.66 63.89 196.20 111.33	, c	2020	•	1 -	64.0	64.6	98	,	,	4,79	4.79	7.01	39.08
2022 8.73 0.43 3.43 12.59 5.58 5.58 7.01 2.22 2.22 17.23 17.	2	200		, a	54.0	4.5	12.18	•	•	5.17	5.17	7.01	46.09
2024 11.84 5.97 5.97 5.97 5.97 5.87 2.87 2.82 2.82 12.32 12.	- S	378	•	0.04	64.0	3.43	12.50	•	•	5.58	5.58	7.01	53.10
2026 12.32 1	7 F	200	•	11.84	;	! .	28		•	5.97	5.97	5.87	58.97
2026 12.32 1	1:			10 30		,	12.32				•	12,32	71.29
2027 12.32 1	,	2000	•	10.00	•		12.32		ı		•	12.32	93.61
2028 12.32 12.32 12.32 20.8 20.9 3.08 3.09 3.08 3.09 3.08 3.09 3.09 3.09 3.09 3.09 3.09 3.09 3.09	0 9	2022		12.32	•		12.32	•	٠	•	•	12.32	95.93
2030 3.08 3.09 3.08 3.09 3.09 3.09 3.09 3.09 3.09 3.09 3.09	9 6			12.32	,		12.32		٠	٠.	•	12.32	108.25
2030 2031 2031 8 88 65 43.66 63.89	. «			308	•		3.08			•	•	3.08	111.33
2031 8 88 65 43.66 63.89	g		•	•		•				•	•		•
88.65 125,98 24,27 68.64 307.54 68.65 43.65 63.89	9	-		•		•		•	•	•			• .
	ŧ	1-	88.65	125.98	24.27	68.64	307.54	88.65	43.66	63.83	196.20	11.33	:

Γ.		Cash Generation	ation		4		•	LOSE PSymen		
2	۶	Operating	Depreciation	Total	Total	Interest	Principal Payment	Total	Aceumu. Total	Dept Service Retio
- 1	1	ande Alexander	34444	5MAX	MMS	MMS	MAS	MMS	MMS	
1	,	e idika	NO	•						
	3	•	•	_		939		38	3.34	
-	2002			•		7 18		7.18	10,52	•
o.	2003	• ;			60.03	g q		8.38	18,90	0.58
6	2007		5,43	Sh i	20.00	9 6	2 66	12 84	5	0.79
-	2002	8.58	5,43	14.01	74.34	808	9		4	880
40	2006	8.58	5.43	1.0	38.95	9.78	3.80	***	7 6	36
•	2002	8.58	5.43	14.01	52.96	6.45	4.19	2	20.00	200
	200	85.8	5.43	14.01	66.97	8.08	4.56	12.64	69,46	8 9
- 0	3 6	9 4	E7 'S	14.03	80.98	7.69	4.95	12.64	82.10	66:0
D 6	200	9		14.01	8	7.26	5.38	12.64	2.73	5. 6.
, 5	2 5	9 6	5.43	14.03	109.00	6.79	5.85	12.64	107.37	1.02
≥ ;	2 5	9	2 4	14.0	123.01	6.28	6.36	12.64	120.01	1.02
= 9	2	0.00	e e e	11.07	2	5.73	6.91	12.64	132.65	1.01
~	2	F 0	7 U		447.60	5.13	7.51	12.64	145.29	1.02
	₹	20.5	0.00		181 12	4 48	8.16	12.64	157.93	1.02
*	2	D 6	3.50	2 2	174 84	3.78	8.91	12.67	170.60	1.02
9	2	000	0.00	13.57	488	2.08	3.53	6.51	177.11	1.06
ĕ	2	20/5	3.30	20.00	2 6	i c	08.0	4	183.62	1,10
4	2018	99'6	3.86	73.52	201.07	7	9 5		1001	61.
8	8	9.66	3.86	13.52	61.012	7.41	9 9	1	408 B4	4
9	2020	9.66	3.86	13.52	228.71	202		9 6	2000	
2	2021	99.6	3.86	13.52	242.23	1.72	A. A.	50.0	203.10	
3	202	995	3.86	13.52	255.75	<u>.</u>	5.17	6.51	209.60	77.
2	5003	995	3.86	13.52	269.27	0.93	5.58	6.5	216.17	1.25
3	2006	12.32	•	12.32	281.59	0.48	5.97	6.45	222.62	97.
,	Š	10.01		12.32	293.91	٠		•	222.62	1.32
	3 6	25.55	•	12.32	306 23	•		•	222.62	1.38
3		2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		22.0	318.55			•	222.62	1.43
9 1		4 6 6		13.23	330.87			•	222.62	1,49
-		7 00	•	100	333 96		•	•	222.62	<u> </u>
8		3.00	•	3			٠	•		•
2		•	•					1		•
8	233	•	•					00000		
ŀ		30,110	02 01	30.55	4 RRS 24	115.07	107.55	70.777		

Rep Case 3-i

Project Ametiten Geoffnermal, Subject Repayment Schedule, Case 3-Inside The Name Chie State | | 400 | name of | in the | TOTAL |
|-----|-------|---------|--------|-------|
| | 2 | | | |
| FAR | | 40% | | |
| | ž | _ | S MMS | MAY 2 |
| ľ | 39.62 | Ī | l | 39.62 |
| • | 42.14 | 4 15.85 | | 42,14 |
| , | 6.90 | | | 96.9 |
| | • | ٠ | | • |
| • | • | • | | •. |
| • | | • | | • |
| | 88.65 | 5 35.46 | 53.19 | 98.65 |

UNIT: Milion US\$

Repay: Countraind Countra											100	70			2005	CEOT			2006	Loan			7	-			
Vary Lian Principal Tennes (Approximation of Approximation of Approx			200		ç		- 1	١	U80"		î.	-							٠		00000						
144 172 144 144	-					ì		Principal.				ncipal Inte.									ment					ment	Balance
2001 114 172 154 1839 3.01 3.14 2002 164 172 154 1839 3.01 3.25 3.01 3.14 3.15 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>- 1</td> <td></td> <td>alance</td> <td></td> <td></td> <td>1</td> <td></td> <td>,</td> <td></td>									- 1		alance			1												,	
2000 716 144 7729 149 0.55 3.0 2.0<	-	-	-													•	•			•		•		. ;			-
2000 (144) (172) (154)	_	2001		,							•	•					,	•		•	•		٠				:
2000 idea 1.57 3.640 1.44 1.84 20.0 3.0 2.6 3.0 2.6 3.0 <th< td=""><td></td><td>000</td><td>48.84</td><td></td><td>4</td><td>•</td><td>17.29</td><td></td><td>•</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td><td>٠</td><td>•</td><td></td><td></td><td>3,11</td><td></td><td></td><td>ò</td></th<>		000	48.84		4	•	17.29		•									•		٠	•			3,11			ò
200 1.7 2.8 1.6 1.8 2.8 3.0 1.8 2.8 3.0 2.8 2.8 3.0 1.3 2.8 3.0 2.8 2.8 2.8 3.0 2.8 2.8 3.0 2.8 2.8 2.8 3.0 2.8 2.8 2.8 3.0 0.15 0.2 0.2 2.7 0.2 2.8 2.8 2.8 2.8 1.8 2.8 <td></td> <td>7 6</td> <td>2 4</td> <td></td> <td>7</td> <td></td> <td>16.85</td> <td></td> <td>1.5</td> <td></td> <td>18,39</td> <td></td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>٠</td> <td>•</td> <td>•</td> <td></td> <td>3.65</td> <td></td> <td></td> <td></td>		7 6	2 4		7		16.85		1.5		18,39			•						٠	•	•		3.65			
2004 1,10 187 2.99 19.55 0.09 1.51 2.88 2.55 2006 1,11 189 2.99 19.55 18.95 18.95		2003	0.00	•			84 00		1.68	٠	20.07		0.25		5							•	2.16		3.97	6.13	41.50
2006 11/2 167 2.89 16.0 2.82 2.82 2.83 2.82 2.83 2.83 2.83 2.83 2.83 2.84 2.82 2.84 2.82 2.84 2.82	_	200	2.76		4.	. ;		6		000	20 00	510	0.27		. 98					•	•				2 7 6	£ 13	
2006 111 178 289 1724 114 174 225 289 123 123 289 123 123 289 1724 118 144 287 163 0.02 233 0.02 233 289 120 230 233 282 144 0.03 0.02 233 0.02 233 0.02 233 0.03 0.02 130 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 0.02 0.03 </td <td></td> <td>2006</td> <td>•</td> <td>1,02</td> <td>1.87</td> <td>2.89</td> <td>19.35</td> <td>8</td> <td><u> </u></td> <td>70.7</td> <td></td> <td></td> <td>97</td> <td></td> <td>70</td> <td>•</td> <td></td> <td></td> <td></td> <td>•</td> <td>٠</td> <td>•</td> <td>cc.7</td> <td></td> <td>9 1</td> <td></td> <td></td>		2006	•	1,02	1.87	2.89	19.35	8	<u> </u>	70.7			97		70	•				•	٠	•	cc.7		9 1		
200 123 158 228 154 228 154 228 153 152 152 152 152 152 152 152 152 152 152 153 152 153 <td></td> <td>3006</td> <td></td> <td>111</td> <td>-</td> <td>2.85</td> <td>18.45</td> <td>5</td> <td>7</td> <td>2.02</td> <td>0.6</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td> <td>•</td> <td>•</td> <td></td> <td>2.56</td> <td>٠</td> <td>3.07</td> <td>2</td> <td></td>		3006		111	-	2.85	18.45	5	7	2.02	0.6	2	2					•		•	•		2.56	٠	3.07	2	
2009 1.27 1.87 2.89 1.68 1.03 0.42 2.34 2009 1.44 1.68 2.89 1.69 1.03 0.42 2.34 2010 1.44 1.68 2.89 1.28 1.28 1.64 1.89 1.73 0.42 1.50 2011 1.71 1.28 2.89 1.29 2.82 1.84 0.35 0.99 0.27 1.89 2011 1.71 1.72 2.89 2.89 1.80 1.90 2.82 1.89 0.45 1.89 0.47 0.45 1.89 0.47		3			4 60	08.0	17.24	1.18	9.	2.82	16.83	0.12	0.25		2								2.80		3.33	6.13	
2008 134 165 209 144 165 209 144 165 209 144 165 209 144 165 209 144 165 209 144 165 209 144 165 209 144 165 209 144 165 209 144 0.22 189 129 129 209 209 209 173 178 208 178 178 178 0.22 178 179 179 0.22 178 179 179 0.22 178 179 179 0.22 179 0.22 178 179 179 0.22 179 0.22 179 0.22 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02 179 0.02<		7007	•	1.4	3		000	2	55	2.82	15.54	0,19	0.23		3	•			•	•	,		20.0	,	3.08	6.13	
2010 157 132 289 1247 139 138 282 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75		288	•	1.32	/Q"	£0.7	20.00	•	;	2.82	,	0.21	0.21		13				•						0	4	
2010 1.75 1.18 2.89 1.20 1.30 1.30 1.30 0.17 0.42 1.45 1.45 2.89 3.89 3.89 3.89 3.89 3.89 3.89 3.89 3		5002		4	- 45	2.89		2 (0.33	91.0		- 06				•	•	•	•	2	•	3 6	9 4	
2011 177 118 228 1130 1187 115 228 1034 017 014 014 118 228 1034 017 014 014 118 228 1034 013 014 118 228 118 118 118 118 118 118 118 118		2010		1.57	1.32	2.89	15.91	5	2	7.07	0.7	3	2 1							•	•		3,63		200	ó	
2011 187 102 289 833 1482 1.00 282 713 022 013 042 108 201 472 201 088 289 5.09 289 713 022 013 042 108 201 082 201 082 289 5.09 2.89 6.29 6.29 6.29 6.29 6.29 6.29 6.29 6.2		,		171	1.18	2.88	11.20	0.	1.15	2.02		0.25	71.0		2					٠	•		36°C		2.17	6.13	
2014 2.24 0.35 2.69 7.29 1.99 0.83 2.82 0.13 0.42 0.17 0.42 0.17 0.29 0.13 0.42 0.17 0.42 0.17 0.29 0.13 0.40 0.47 0.42 0.47 0.45 2.49 0.40 0.24 0.47 0.42 0.40 0.45 0.45 0.45 0.45 0.45 0.45 0.45		5	•		2 2	2 60	6033	28.1	8	2.62	9.12	0.27	5,15								•	٠	4.32		1.81	6.13	
2014 2.23 0.46 2.89 5.06 2.17 0.65 2.82 4.96 0.12 0.10 0.42 0.17 5.04 2.83 2.80 0.02 0.17 0.42 0.42 0.42 0.42 0.44 2.83 0.24 2.89 0.024 2.89 0.024 2.89 0.024 0.48 0.48 0.035 0.07 0.42 0.48 0.04 0.48 0.48 0.024 2.89 0.024 2.89 0.024 0.48 0.024		202	•	ě i	7 2		4 20	8	6	2.12	7.13	0.29	0.13		- 60					•	•	i	1	٠	141	6.13	
2014 2.23 0.66 2.89 2.00 2.17 0.46 2.80 0.35 0.07 0.42 0.42 2015 2.10 0.45 2.80 0.35 0.07 0.42 0.42 2015 2.10 0.46 2.80 2.80 0.24 2.84 2.84 0.45 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.46		33		2.04	0	£.03	44.			0 0	70.0	0.30	0.10		- 11	•			•	•	•		4 1		6	4	
2016 2.43 0.46 2.89 2.53 2.37 0.49 0.46 0.42 0.09 0.46 0.45 2.89 2.20 0.24 2.84 0.42 0.09 0.46 0.46 0.46 0.45 0.09 0.46 0.46 0.46 0.45 0.09 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.46	_	410	'	223	0.66	S S	9	7	9 4	1	9	46.0	200		2				•	•			n		9 6		
2017 2.83 0.24 2.87 2.80 0.24 2.84 0.42 0.04 0.40 0.40 0.40 0.40 0.40 0.4	_	2015	-	2.43	0.46	5.89	2.63	23	0	70.7	3	2				•			•	•			5.64		20.00	ò	•
2001 2020 2020 2022 2022 2022 2023 2024 2026 2027 2029 2020 2020 2020 2020 2020 2020		Š		2.83	0.24	2.87		2.60	0.24	2.84	•	0.42	* 0.0							•			٠	•		•	•
2011 2018 2020 2022 2022 2022 2022 2022		200		}	•	,	,	,			•			•													
2001 2020 2022 2022 2022 2027 2029 2029 2029		É	,						٠					•					•	•	•			۰			
2001 2022 2022 2023 2024 2026 2026 2027 2027 2028 2029 2029 2029 2020 2020 2020 2020		20.			•			,		•										•	•	•	•			,	
2022 2022 2023 2024 2025 2027 2027 2029 2029 2029 2029 2029 2029		2019	-	•		٠			,	•				•		,				•	٠		•		•		
2022 2022 2024 2026 2026 2027 2027 2028 2029 2029 2029 2029 2029 2029 2029		2000		,					,		•		,			•		•		•	•						
2022 2023 2024 2025 2027 2029 2029 2029 2029 2029 2029 2029		3				•	,				•									•	•				•		
2022 2023 2026 2026 2027 2028 2029 2029 2039 2030 2030 2030 2030 2030		4	-			٠	,		,	•	•											•			,	•	
2022 2024 2026 2027 2027 2029 2029 2039 2030 2031 2031 2031 2031 2031 2031 2031		7707	,				-	1		,	,									•	•			,	٠		
2025 2026 2027 2027 2028 2039 2030 2030 2031 2031 2031 2031 2031 2031		2023		,			•												•	•	•						
2025 2027 2027 2029 2029 2030 2030 2031 2031 2031 2031 2031 2031		2024	•				•				•			•		•				•	•	•	•		,		
2022 2022 2028 2039 2030 2030 2031 2031 2031 2031 2031 2031		Ser.											•	•						•						•	
2028 2029 2029 2030 2031 2031 2031 2031 2031 2031 2031		2			•	•	•				•											•	•		•	•	
2027 2028 2039 2030 2031 2031 2031 2031 2031 2031 2031		9707	•						•		•					•				•	•				•	•	
2022 2029 2030 2031 2031	•	202	•				•			٠	•		,	•		•					•	•					
2009 2004 2001 2001	_	2028	•						•					•		•				•		•				•	
2030 43.66 8.20 2031 2031 2032 5.08		2029		,	•			•	ì		•									•	•	•					
2001 2001 2.02 5.08 8.00		2030	•		,			•	٠									•		,	•						-
, 232 5.09 3.384 3.01 2.32 5.09		ž	_			•	,	•													-		43.66	8 20	29.92	73.58	
		3	•			20.00		2000	8	33 84		30	2.32	5.09					-	.]					1		

International Bank Loan Repayment Schedule (Mitten USS), Case 3 Inside

UNIT: Million US\$

Column C	Part Cart Part							2003 Loan	40		2004	Loan			2000	ا ا		· -posterio			_	Outstand		¥		•	- Carano
				2002	Logo.		П	ļ	į I		land.		ě	Outstand													
1.00 1.00	1, 10, 10, 10, 10, 10, 10, 10, 10, 10,	, and	ue o 1	Principal			4		_			ipal Interes		ing Balance		interest	ļ		i	-	ļ	plance	ž	po			921
1,50	150 150		1			١	Balance			1											•	•		•			•
12 12 12 12 12 12 12 12	March Marc	-										•	•	•				•		,		•		8			25.67
1.00 1.00	1.5 1.5	•					•	•		•	•		•	•		•		•						4 07			55.32
Column C	Column C				8		25.67	•										•		,							63.89
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	Column C			•			27 72		2.02		27.30		•					•						2		2 2 2	63 60
Column C	12 12 12 12 12 12 12 12				3	,			,	•	79.48	o		d.						•		•	39		7	ś	
Column C	Column C				2.22		44.64	. ;	7		20.00	010	_					•	•				1.53		8	6.51	66.93
Color Colo	Color Colo					3,05	29.29	0.64	2.36						-	•		•							4.88	6.51	59.36
Color Colo	Color Colo		3 9			3.05	28.58	0.69	2.31									•				•	9 6		4.75	6.51	57.60
000000 0.022 2.22 3.05 2.00 2.72 0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.0	10	5,00.5	8.0			305	27.82	0.75	2.25							٠		•				•	9 1	•			55.70
08800 0.082 2.15 3.00 24.79 0.14 0.32 0.46 3.47 0.49 2.09 24.79 0.14 0.32 0.46 3.47 0.49 0.49 2.09 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.00 24.79 0.49 2.09 2.09 2.09 2.09 2.09 2.09 2.00 24.79 0.49 2.09 2.09 2.09 2.09 2.09 2.09 2.09 2.0	008000 0.087 2.12 3.05 2.14 10.0 10.0 11.0 10.0 10.0 11.0 10.0 10	5.00		2			90.60	0.83	2.13							,			•				8		ř		
15 15 15 15 15 15 15 15	14	7.00 2.00	00.0	0.62		6.05	00.72	1 6	:				-							,			2.05		4.46	6.51	03.00
Color Colo	1.0 1.0	8.00 2.00	000	0.89		3.05	26.73	ò :	2 6				_									•	2.22	٠	£.3	6.51	51.43
104 20 305 244 102 189 300 2245 20 20 2245 20 20 2245 22 22 22 22 22 22	104 201 205 2244 102 198 310 2246 103 200 2447 102 198 310 2248 103 200 2447 201 202 2248 201 202 2248 201 202 2248 201 202 2248 202 2	000		960		3.05	25,15	Š	6.5					-				•					2.40		1.	6,51	49.03
1.2 1.53 3.05 2.1.28 1.10 1.80 3.10 2.2.28 1.10 1.80 3.10 3.2.28 3.11 3.00 2.1.47 3.2.2 5.11 3.00 2.1.47 3.2.2 5.11 3.00 2.1.47 3.2.2 5.11 3.00 2.1.47 3.2.2 5.11 3.00 2.1.47 3.2.2 5.11 3.00 3.1.4 3.00 3.1.4 3.00 3.1.4 3.00 3.1.4 3.00 3.2.2 3.2.2 3.2.2 3.2.2 5.1.2 3.2.2 5.1.2 3.2.2 5.1.2 3.2.2	1.12 1.13 1.15	200		1.04		3.05	24.11	<u>5</u>	86.							•		•					8		3.92	6.51	46.44
121 144 305 2047 118 118 120 026 026 026 026 026 027 027 028 026 027 027 028 028 028 028 028 028 028 028 028 028	121 184 30.5 20.77 118 137 30.0 20.18 127 30.0 20.18 127 30.0 20.18 127 30.0 20.18 127 30.0 20.18 127 30.0 20.18 127 30.0 20.18 20.28	2		1.12		3.05	22.99	1.10	8							•	•	•	•			•	52.6		3.72	15'9	43.65
1.54 3.05 12.04 1.28 1.72 3.00 18.31 1.74 3.05 12.04 1.25 3.00 18.31 1.74 3.05 12.04 1.25 3.00 18.31 1.74 3.05 12.04 1.25 3.00 18.31 1.74 3.05 12.04 1.25 3.00 18.31 1.25 3.00	13	3		121		3,05	21,78	1,19										•					6		3.50	5.51	40.64
144 154 305 178.0	141 164 305 1806 152 305 153 209 653 160 152 305 1731 024 022 366 227 353 229 653 917600 145 145 145 158 159 300 1731 024 027 305 227 443 227 237 651 917600 145 145 146 158 0.06 128 0.46 158 0.46 158 0.47 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 0.54 0.57 <th< td=""><td>200</td><td>5 5</td><td>1.31</td><td></td><td>3.05</td><td>20.47</td><td>1.28</td><td>7.7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>,</td><td></td><td></td><td>70.5</td><td></td><td>3.24</td><td>6.51</td><td>37,37</td></th<>	200	5 5	1.31		3.05	20.47	1.28	7.7											,			70.5		3.24	6.51	37,37
1453 152 305 158 159 150 150 150 150 150 150 150 150 150 150	153 152 305 150 <td></td> <td></td> <td>14.</td> <td></td> <td>3.05</td> <td>19.06</td> <td>e i</td> <td>1.62</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td>•</td> <td>68.0</td> <td></td> <td>2.98</td> <td>6.51</td> <td>33.84</td>			14.		3.05	19.06	e i	1.62							•	•	•				•	68.0		2.98	6.51	33.84
1465 1440 3005 1450 1767 128 3005 1450 1767 128 3005 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1450 1767 1767 1767 1767 1767 1767 1767 176	01700 1465 1440 3005 1518 175 125 300 1339 0.28 0.18 0.46 139 0.18 0.46 159 0.18 0.46 159 0.18 0.46 159 0.18 0.46 150 0.18 0.46 150 0.18 0.46 150 0.18 0.46 137 0.00 0.18 0.46 137 0.00 0.18 0.46 137 0.00 0.18 0.10 0.10 0.10 0.10 0.10 0.10	5.00	909	1,53		3.05	17.53	8	8						,	•		•					3.80		12.71	6.51	30.05
1.78 1.27 3.05 12.16 1.26 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	1.78 1.47 3.05 1.27 3.05 1.27 3.05 1.20 0.16 0.46 1.69 5.51 3.05 0.15 0.46 1.69 6.51 3.05 0.15 0.46 1.69 6.51 3.05 0.15 0.46 1.20 0.15 0.46 1.69 6.51 3.05 0.14 0.46 1.27 3.05 1.20 0.14 0.46 1.27 3.05 1.20 0.14 0.46 1.27 3.05 1.24 0.15 0.44 3.05 1.24 0.15 0.44 3.05 1.24 0.15 0.44 3.05 1.24 0.15 0.44 3.05 1.24 0.25 0.14 0.05 0.48 0.23 0.23 0.24 0.25 0.24 3.05 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.2	6.00 2.01	8	1.65		3.05	5.66	70	9							,		,				•	Ç		2.41	6.51	25.94
1.92 1.13 3.05 1.15 2.09 1.12 2.00 1.004 0.32 0.14 0.46 1.37 0.55 1.00 0.004 0.32 0.14 0.46 1.37 0.55 1.00 0.004 0.32 0.14 0.46 1.37 0.45 0.35 0.19 0.46 0.32 0.14 0.46 0.32 0.15 0.46 0.84 0.84 0.84 0.84 0.84 0.84 0.84 0.84	01800 1.52 1.13 3.06 10.216 2.00 10.04 0.32 0.14 0.46 1.37 1.22 5.51 1.32 5.	7.00 2.01	88	1.78		3.03	4.30	5 5	27.						,	•		•		•			6.43		2.08	6.51	21.5
020,00 2.08 0.97 305 10.0 2.0 0.59 3.00 7.84 0.35 0.11 0.46 1.02 0.00 0.00 0.00 0.00 0.00 0.00 0.00	020,00 2.08 0.97 305 746 2.20 0.30 748 0.35 0.11 0.46 1.02 2.00 0.30 0.30 748 0.35 0.11 0.46 1.02 2.00 0.30 0.30 0.30 0.31 0.32 0.31 0.32 0.32 0.31 0.32 0.32 0.32 0.33 0.32 0.34 0.35 0.34 0.35 0.32 0.35 0.34 0.35 0.32 0.32 0.32 0.32 0.32 0.32 0.32 0.32	8.00 2.03	00.8	1.92		3.05	12,38	86	7.00							•	•		•				01		5,7	6.51	16.72
224 0.81 3.05 4.80 4.4 0.90 5.4 0.80 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.	021.00 1.224 0.81 3.05 5.44 2.37 0.63 3.00 5.47 0.36 0.08 0.46 0.83 6.51 0.22 0.23 6.51 0.22 0.23 0.51 0.23 0.24 0.81 0.23 0.24 0.83 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24	200	0.0	2.08		3.05	10.10	3 8	5									•				•	5.17		1,34	6.51	11.55
022.00 2.42 0.69 3.05 2.44 2.35 0.00 2.91 0.63 0.46 0.23 0.02 0.25 0.25 0.25 0.25 0.25 0.25 0.25	02200 2.42 0.63 3.05 2.44 2.55 0.00 2.91 0.05 0.44 0.05 0.46 0.23 0.02 0.25 0.25 0.25 0.25 0.25 0.25 0.25	200	97.0	2.24		308	98/	3 1	0.00				_	-									5.58		0.93	6.51	5.87
023.00 2.61 0.44 3.05 2.83 2.90 0.22 0.02 0.02 0.02 0.02 0.02 0.02	243.00 2.48 0.44 3.05 2.83 2.91 0.22 3.14 0.22 0.02 0.25 0.02 0.25 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.0	1.00	2.00	2.42		3.05	# 1	7.7	3 3				_	Ī	•	•		•				•	26.5		0.48	6.45	٠
025.00 2.83 0.23 3.06 2.50 0.25 3.06 0.25 3.06 0.25 0.05 0.05 0.05 0.05 0.05 0.05 0.05	024.00 2.43 0.23 3.06 2.43 0.23 3.06 2.25.00 2	2.00 2.02	3.00	2.61		303	283	8 6	8						•	•		•				•			,		٠
025,00 227,00 228,00 028,00 039,00 039,00 039,00 039,00 039,00 039,00 039,00 039,00 039,00 039,00	025.00 227.00 22	100 202	00 1	2 3		90.6	,	3	3	:			•	•	•			•				•				,	•
025.00 227.00 028.00 029.00 030.00 031.00 031.00 031.00 031.00 031.00	025.00 025.00 025.00 035.00 031.00 141.11 39.04 51.03 181.	4.00 2.02	200		•		•	•	ı						•	•	•	•									•
227.00 208.00 20	027.00 028.00 030.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00	5.00 2.00	- 00'9	•	•	•	•	•		•				•		,		,					,				٠
028.00 028.00 030.00 030.00	028.00 029.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00 031.00	26.00 2.02	.7.00	,			•					,	•	•													•
028.00 020.00 030.00 031.00	029.00 031.00 17.74 61.01 29.46 34.66 50.14 4.47 4.85 8.99 66.25	27.00 2.0	. 000			•	,		•			,			•	•									,		٠
030.00	030.00 10.00	28.00 2.02	19.00		•	•	•							•		•		•		•							•
00100	031.00 63.00 37.24 61.03 29.46 34.86 50.14 4.47 4.65 8.89	29.00 2.0	. 00.00				•		•					•	•					-		-	8	10.70		130 14	
	29.46 34.46 50.04 37.24 61.01 29.48 34.86 50.14	20.00	8				•	۱ ،				1		g				1	 			1			1		

Appendix 2:

Financial Evaluation
(Outside Caldera)

Financial Evaluation: Outside Caldera

Case 1

Case 2

Case 3

- Financial Internal Rate of Return (FIRR)
- Income Statement
- Cash Flow
- Dept Service Ratio
- Repayment Schedule

FIRR Case 1—O
Project Ametries Geothernel
Subject FIRR Case 1-Outside
File Name 1999/5/21
Dale 1999/5/21
Rev. 2001/10/12

		-				Ē						
2) h	Project Cost	Salable	Supple.	OLM for Steam Brod	O&M for P. Plant	Steam Cont	Ę	Generat. Cost Tu	Project Cost Total	Revence	Belance
†	+	MAS	GWh	MMS	MMS	MAS	MMS	MMS	₹	ZEZ	MMS	MMS
c	2007								•	•	•	•
	Š	27 BO				•	•			27.80	,	(27.80)
	5 6	2	•			,				27.50	•	(27.50)
4 (3 8	3	145.21			0.30	1.60	2	4.67	4.67	11.62	6.95
,	3	•	200			98.0	160	79	4.67	4.67	11.62	6.95
	3 6		145.21		5 5	08.0	1.60	9	4.67	4.67	11.62	6.95
n u	3 6	•	145.21		= =	0.30	1.60	4	4.67	4.67	11.62	6.95
2 6	200		145.21		1.13	0.30	1.60	1.64	4.67	4 67	11.62	6.95
- 0	8 6		145.21		1.13	0.30	1.60	3 6.	4.67	4.67	11.62	6.95
- a	3 6	•	146.21	,	£	0.30	1.60	\$	4.67	4 67	11.62	6.95
. =	2 5		145.21	,	1.13	0.30	1.60	5 0.	4.87	4.67	11.62	6.95
=	5		145.21	•	1.13	0:30	1.60	9.	4.67	4.67	11.62	6.95
:	5		145.21	4.28	5	0.30	1.60	0.32	7.61	7.6:	11.62	4.01
4 5	2 5		145.21		1.13	0.30	1.60	8	4.95	4.95	11,62	6.67
2 3	4		148.21	•	113	0.30	1.60	1,92	4.95	4.95	11.62	6.67
	2 6		145.21	1	1.13	0.30	1.60	1.92	4.95	4.95	11.62	6.67
=	2017	•	145.21		1.13	0.30	1.60	1.92	4.95	4.95	11.62	6.67
	2018		145.21	•	1.13	0.30	1.60	- 36	4.95	4.95	11.62	6.67
	5 6	•	145.21		1.13	0.30	1.60	6.	6.9	4.95	11.62	6.67
9	200		145.21		13	0.30	1.80	8	4.95	4.95	11.62	6.67
. 5		•	145.21		1.13	0,30	1.60	6	4.95	4.95	11.62	6.67
3 2		•	145.21	٠.	1.13	0.30	1.80	35	4.95	4.95	11.62	6.67
2	-	•	145.21	•	1.13	0.30	1.60	5.08	5.08	5.08	11.62	5.
2		•	145.21	•		0.30	1.60	5.66	5.69	5.69	11.62	5.93
7		•	145.21		1.13	0.30	1,60	2.66	5.69	5.69	11.62	5.93
			145.21		1,13	0.30	1,60	2.66	5.69	5.69	11.62	5.93
18		•	145,21	٠	1.13	0.30	1.60	2.66	5.69	5,69	11.62	5.93
2	2028	•	145,21		1.13	0.30	1.60	7.68	5.69	2.69	11.62	5,93
82		•							٠	•	•	
8		•		•	•		•	,	•		•	•
8		•	•			-			•	- 4	•	
2		55.30	3,630.25	4 26	28.21	7.45	4 0 00	47.71	127.63	182.93	290.50	107.57

Ė	一年十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二	ONTRIGO							Project	releat Underteking							
					Operation Cost		Steam Cost	Depr	Depreciation	Cost	Profit	 	Profit	2	Interest Payment	1	
	Separated	Salable Salable		Supple.	OEM Steam	08M P		Steam	Power Plant	Total		ř	After Tax	Japan Bank	ht'i Bank	Total	NCOME
No. Year		Energy		¥e¥		Pant		Addre	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2770	MMS	MMS	MM\$	MMS	MMS	ZWZ	NW.
	SWH	HMS	MMS	MMS	MMS	MMS	MMS	SIMIS	MMS								• }
Š.	١.					•						•	•	1.01	1.33	2.34	(2)
3 8	- 6	•		٠			,		•					2.11	2.76	4.87	4.8
3	· · ·							•	ı	• !			300	02.0	2.99	5.29	9.1.
2003			***		1.13	0.30	09	1.32	1.98	6.33	57.5	0.	3 3	2	6	A 10	41.4
8		145.21	707			5	1.60	1.32	1.98	6.33	5.29	.54	8	8 .7 d	200	6	(126)
2005		145,21	701	•	2 5	6	180	1 32	1.98	6.33	5.29	1.84	3	20.7	3 1	G	5
2006		145.21	11.62	•	2 4	3 6	9	1.33	1.98	6.33	5.29	1.64	3.65	1.92	7.77	n 1	2.0
2007	7 154.18	145.21	11 62		5.1.	9 6	3 5	5	1.98	6.33	5.29	1.64	3.65	1.77	2.68	0.4.4	9
2008		145,21	11.62		1.13	0.30	8 5	3 6	•	6.33	5.29	1.64	3.65	1.62	2.60	77.7	
2009		145.21	11.62		1,13	0.30	3 1	7 6		20.0	2,0	49	3.65	1,44	2.50	ь 6	9
2010			11,62	٠	1.13	030	9	25.	96.7		200	2	3,65	1,25	2.39	3.64	0.01
2 5			11.62	•	1.13	0.30		7.32	_ ,	3 6	200	2	3.65	10,1	2.29	3.33	0.32
;			11.62	,	1,13	0.30	7.60	1.32		2	3 8	333	17.0	0.81	2.16	2.97	(2.26)
į		145.21	11.62	4.26	1.13	0.30	1,60	1.32	1.98	 6.3	3 6		107	0.56	205	2.60	1.67
		1 1 1 1	11.62		1.13	0.30	1.60	0.43		5.43	6.0	26.	10.	200	80	2.18	2.0
207		100	73.67	•	1.13	0,30	99	0.43	•-	5.43	9.19	26.	7.5	;	7.7	174	2.53
2013			1		1	0.30	99:	0.43	•	5,43	6.9	36.	7		9	X.	2.0
2016			7 6	1		0.00	1.60	0.43	1.98	5.43	6.19	1.92	17.4	•	3 5	5	
2017			79.1		2 .	950	8	0.43	1.98	5.43	6.19	1,92	4.27	•	0 .		
2018	154,18		11.62	•	2 9	9 6	9 9	0.43		5.43	6,19	1.92	4.27		1.2.1	7	2000
2019	9 154.18		11.62		5.5	9 6	3 5	0.43	•	5.43	6.19	1.92	4.27		8.2	3	5 6
2020	0 154,18		11.62		,	500	5 4		•	5.43	6.19	1.92	4.27		9.7	0.77	OG i
		145.21	11.62	•	1,13	9 9	26.	2 6		5.43	6.19	1,92	4.27	•	0.53	0.55	m
	154.18	145.21	1.62		1,13	5.6	8 9	2	•	50.5	6.61	2.05	4.56	•	0.27	0.27	4.29
	3 154.18	145.21	11.62	•	1,13	0.30	20.0		2		85.8	2.66	2.93			•	5.93
23 2024		145.21	11.62	•	1.13	0.30	<u> </u>		•	200	8 50	266	5.93			•	5.93
		145.21	11,62	•	1.13	0.30	36		•	8 6	8	2.66	5.93				¥ò.
			11.62	•	1.13	0.30	1.60			200	9	89	5.93	•	i		5.93
		145.21	7 62	•	1.13	0.30	8	•		300	9	265	5.93	,			ķ
		145,21	11.62	•	1,13	0.30	96.		•	2			•			•	•
2029			•			•		•	•			.,			t		•
	· io	•		•		•			,	,				•	•	•	•
		•	1	•	•	,							15 000	10000	A2 68	62.03	43.21
										27 000	1		1CD /4	70.7	3	3	

		_									
							Joseph Bank	Part Sank			
No Year	, Com	Net Income	Dep. Steam Facilities	Plant.	Tota	Project Cost	Principal	Principal Payment	Total	Annuar	Balance
4.4.4.4.4.4.4	SWMS.	MMS	MMS	MMS	MMS	MM\$	MMS	MMS	MAS	MMS	MMS
200			•				٠	•			
200		(2.34)	٠	•	25.46	27.80	•		77.00	(4.04)	
2 6	3 5	28.7	•	,	22,63	27.50			27.50	(4.87)	
3	-		,	40.4	1 56		1.25	0.81	2.06	(0.40)	
Š		(1.04)	70.	0.0			1.36	0.89	2.25	(0.40)	
2002		(1.45)	1.32	98.	3	•	2	800	2.44	(0.40)	
2006		(1.26)	1.32	1.98	200		. ·	8	986	(0.40)	
2007		(40.5)	1.32	1 98	2.26	•	2	30.	8 8	9	
2 6		(0.80)	1.32	1.98	2.50		1.78	1,12	2.30	(0.40)	
5		4		80	2.73		1,93	120	3,13	(0.40)	
8	1	(10.0)	1		5		2.11	1.30	3,41	(0.40)	
2010	•	(67.0)	7,32	08.	5 6	•	0.30	1.41	3.71	(0.40)	
2011	•	0.01	1.32	S,	500	,			4 02	(0.40)	
2012		0.32	1.32	1,98	3.62	•	2.6		92.4	(3.74)	
2013		(2.26)	132	98	2		5.74	0.		(890)	
2,7		1.67	0.43	1.98	4.07		2.99	1.76	0/10	(60.0)	
		00'6	649	1.98	4.49		3.15	6.	90.0	(/c:n)	
CLOZ.		0.5	2 0	80	68.4	•	٠	5.06	90.00	2.87	
ž		2.3	2 5	2	90.4	٠	٠	2.22	222	2.87	
201		2.69	5.43	B. 5	200	•		2.40	2.40	2.87	
2018		2.87	0.43	96.	77.0			2 50	5 28	2.87	
		3.06	0.43	96.	9		1	9 6	0.80	2.87	
		3.27	0.43	1.98	2.B.		•	8 6	200	78.0	
		3.50	0.43	1.98	96			3.03	3 1	70.0	
		3.74	0.43	1.98	6.14		•	3.27	3.21	70.7	
		4 20		86	6.27			3.37	3.37	2.90	
222	•	27.0			68.8		•			5.93	
		26.0			60 4	٠			•	5.93	
		5.83			0.00	į		٠		5.93	
	9	5.83	•		20.00		•	•		6	
		5.93		,	5,93	•		•		. 20 %	
		5.93	•		5.93				•	2	
			•	•	•				•		3
2030					•	•				•	•
			1		,	•			• 1		
	CC 19	12.04	17.03	30.60	155.14	56.30	25.24	37.27	117.81	37.33	•

-		Cash Generation	ation							
	¥0. ∀	Operating	Depreciation	Total	Total	Interest	Principal Payment	Total	Accumu	Dept Service Retio
- 1		MAMA	MMS	MM\$	MMS	MMS	NWS.	MMS	MMS	
÷					•				•	•
	5 6					2.34		2.34	2.3	1
	7007	•	•			4.97		4.87	7.21	
	2003		• }		9	90.5	2.08	7.35	14.56	0.48
_	200	3.65	3.30	0	0.60	9 4	100	7.28	21.9	0.63
_	2005	3.65	3.30	6.95	13.91	5.40	37	2 6	90.00	2
	2006	3.65	3.30	6.95	20.86	16.4	2.44	3	07:27	
	200	3.65	330	6.95	27.81	4.69	5.68	7.35	35.61	9 1
	3	900	5	6.95	34.77	4.45	3.30	7,35	43.96	67.79
	8	9 6	200	40.4	41 72	4.22	3,13	7.35	51.31	
	2	60	5.0	200	40.69	8	3.41	7.35	58.66	0.83
	2010	3.63	3.30	0.00	5	2.0	2	7.35	66.01	28.0
-	201	0,00	3.30	0.80	3 6		4 02	7.35	73.36	0.85
<u>-</u> -	2012	3,65	3.30	0.80	05.00	200	4 38	7.35	80.71	0.83
C	813	0.71	3,30	10.4	20.00		4 4	7.35	88.06	0.83
<u></u>	2014	4.27	2.41	9.6	13.67	8.0	2 6	1 24	05.30	0.84
4	2015	4.27	2.41	6.67	5,0	7	8 6		90	0.87
47	2016	4.27	2.41	8.67	86.62	* :	8 8	900	9	- 0
9	2017	4.27	2.41	6.67	93.29	1,58	7 .	200	104.30	
 .	2018	4.27	2.41	6.67	96.06	1,40	2.40	3.80	100.70	, to
	91.00	4 27	2.41	6.67	106.84	1.21	2.59	3.80	110.50	16 .0
	5	4.27	2.41	6.67	113.31	1.00	2,80	3.80	114.30	660
		100	241	6.67	119.98	0.77	3.03	3.80	118.10	1.02
5	7	,		6.67	128 66	0.53	3.27	3.80	121.90	1.04
5	2022	77.	9	5 4	133.20	0.27	3,37	3	125.54	1.06
ď	3	P C	Ŗ		130 14				125.54	1.1
2	2024	3 6	,	2 6	148.07	•		•	125.54	1,16
T	2025	5.83		26.5	2		,	•	125.54	1.20
43	2028	283		3 6	3.5			•	125.54	1.25
	2027	5.83		200	, to 0	•		•	125.54	1.30
	2028	593	•	3	10.20	•	•	•	125.54	1.30
<u></u>	2029	•		•	107.01	•			,	•
8	2030			•		,	•	•		
	2031	٠	٠							
		106.24		162.87	2,330.26	63.03	62.51	125.54	1	The second secon

Rep Case 1-1

Project Ameritian Gaothermal, Case 1 Outside Subject Repayment Scheolife, Case 1-Outside File Name Case Ameritian State Case Rev.

LOAN TERM JADen Initi Timered % 9.11% 6.00% Grace P. Year 2 7 Repayment Years 12 27 WACC 6.44% pen Benk Loan Repayment Schedule (Millon USS), Case 1 Outside

UNIT: Million US\$

101 12.13 Poincipal Interest Repay Poincipal interest Repay Poincipal interest Repay Poincipal interest Poincipal i		}	ONIC	1			2003	Loan			2004	toan		2005	Lozn			2006	Loan			TOTAL				
2001 11.00 0.65 1.21 1.00 1.20 1.200 2.2002 11.00 0.65 1.21 1.00 1.200 1.11 1.00 1.22 1.200 1.10 0.65 1.21 1.00 1.200 1.11 1.00 1.22 1.000 1.200 1.11 1.00 1.22 1.000 1.200 1.11 1.00 1.200 1.200 0.000 1.10 0.1	*	reol	Principal	interest	Repay	Oulstand		a interest	Repay-	1	Principal in				Principel interest	Repay-	Y: Outstand- ing Batance		Principal Interest	Repay-	Oulstand- ing Balance	Principal 9	inlerest in grace In period	fnlerest m	Repay. ir	Cutstano ing Batance
2001 11.12 101 12.13 100 159 2002 11.00 1.11 13.24 - 1.00 1.59 2003 11.00 0.66 1.21 186 12.59 - 1.00 1.59 2003 0.75 0.71 1.66 1.66 1.11 0.66 1.09 1.59 2004 0.78 1.00 1.66 1.10 0.78 0.96 1.69 2007 0.78 1.00 1.66 1.10 0.77 0.96 1.69 2009 1.01 0.86 1.86 9.32 0.77 1.69 1.69 2010 1.01 0.87 1.86 8.31 0.82 0.89 1.69 2011 1.10 0.78 1.86 8.72 1.10 0.89 1.69 2012 1.10 0.75 1.86 9.32 1.13 0.89 1.69 2013 1.20 0.86 1.86 3.27 1.20 0						Galance																				
2002 11,12 1,01 12,13 1,00 2003 11,00 6,6 1,21 1,86 12,29 0.60 1,09 1,59 2004 0,6 1,21 1,86 12,29 0.60 1,09 1,59 2004 0,7 1,16 1,16 1,186 1,23 0.66 1,09 1,59 2003 0,7 1,16 1,6 1,6 0,7 0,91 1,69				•	•	•		•												•				•	,	÷
2002 11.00 1.11 186 12.24 1.00 1.69 2004 0.05 1.11 1.86 12.59 0.60 1.09 1.69 2006 0.79 1.06 1.69 1.89 0.60 1.09 1.69 2007 0.79 1.06 1.66 1.11 0.71 0.96 1.69 2009 0.85 1.00 1.10 0.87 1.08 0.81 1.69 2009 1.10 0.85 1.86 8.31 0.82 0.77 1.69 2010 1.10 0.85 1.86 8.31 0.82 0.77 1.69 2011 1.10 0.86 1.86 6.07 1.10 0.69 1.69 2012 1.11 0.85 1.86 4.70 1.10 0.69 1.69 2013 1.12 0.30 1.86 1.71 1.44 0.13 1.57 2014 1.11 0.16 1.87 1.71<	• 6		ç	ċ		12 13		•	•	•	٠	•				•				•			5 :			,
2003 1100 0.65 1.21 1.86 1.5.2 0.60 1.69 <t< td=""><td>Ý</td><td></td><td></td><td></td><td>٠</td><td></td><td>•</td><td></td><td></td><td>00.61</td><td></td><td>٠</td><td></td><td></td><td></td><td>•</td><td></td><td></td><td>•</td><td>•</td><td></td><td></td><td>2.11</td><td></td><td></td><td>ę</td></t<>	Ý				٠		•			00.61		٠				•			•	•			2.11			ę
2004 0.65 1.21 1.86 12.59 0.60 1.09 <t< td=""><td>พี</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td><td>•</td><td>•</td><td></td><td>1.25</td><td></td><td>2.30</td><td>3.55</td><td>23</td></t<>	พี																•		•	•		1.25		2.30	3.55	23
2009 0.71 1.15 1.86 11.80 10.4 15.8 2009 0.09 1.00 1.66 11.0 0.71 0.91 1.68 2000 0.65 1.01 1.86 1.02 0.75 0.91 1.69 2000 1.01 0.65 1.01 1.86 0.37 0.89 0.81 1.69 2001 1.01 0.75 1.86 9.32 0.85 0.71 1.69 2011 1.10 0.75 1.86 8.37 1.00 0.89 1.69 2012 1.31 0.86 1.86 8.77 1.20 0.89 1.69 2013 1.43 0.45 1.86 3.27 1.44 0.13 1.57 2014 1.71 0.16 1.87 1.71 1.44 0.13 1.57 2024 1.71 0.16 1.87 1.71 1.44 0.13 1.57 2024 1.71 0.16 1.87 </td <td>ส</td> <td>3</td> <td>9.0</td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>36</td> <td>•</td> <td>2.19</td> <td>3.55</td> <td>22</td>	ส	3	9.0											•								36	•	2.19	3.55	22
2009 0.78 1,09 1,69 1,69 2007 0.68 1,00 1,86 10,25 0.71 0,98 1,69 2009 0.68 1,10 1,86 10,25 0.89 0,81 1,68 2009 1,10 0.83 1,86 8,37 0,82 0,77 1,68 2010 1,10 0.78 1,86 7,21 1,01 0,69 1,69 2011 1,20 0.86 1,86 6,01 1,10 0,59 1,69 2012 1,31 0.55 1,86 4,70 1,10 0,69 1,69 2014 1,46 0.30 1,86 4,70 1,10 0,69 1,69 2015 1,71 0,16 1,87 1,71 1,44 0,13 1,57 2015 1,71 0,16 1,87 1,74 0,13 1,57 2020 2021 1,71 0,16 1,87 1,74 0,13 1,57<	~	100	0.7											•					•	•	ii	. 4		90.6	986	2
2007 0.66 1.01 1.86 10.25 0.79 0.91 1.68 2008 1.03 0.83 1.86 9.32 0.85 0.84 0.84 1.68 2009 1.01 0.85 1.86 9.32 0.85 0.84 0.87 1.68 2011 1.10 0.76 1.86 5.27 1.01 0.89 1.69 2012 1.31 0.56 1.86 4.70 1.20 0.89 1.69 2013 1.43 0.43 1.86 3.27 1.31 0.59 1.69 2014 1.73 0.49 1.71 1.44 0.13 1.57 2015 1.71 0.16 1.87 1.71 1.44 0.13 1.57 2016 2016 1.71 0.16 1.87 1.71 1.44 0.13 1.57 2021 2022 2024 2024 2024 2024 2024 2024 2024 2024 202		28	0.7											•					•	•				3 5	9 4	;
2008 0,83 0,93 1,96 9,32 0,85 0,84 1,69 2009 1,01 0.83 1,86 8,37 0,92 0,77 1,69 2010 1,01 0.85 1,86 6,01 1,10 0,59 1,69 2012 1,31 0.56 1,86 6,01 1,10 0,59 1,69 2012 1,43 0.56 1,86 6,01 1,10 0,59 1,69 2013 1,43 0.36 1,86 4,70 1,43 0.26 1,69 2014 1,51 0.16 1,87 1,44 0.13 1,57 2015 1,71 0.16 1,87 1,44 0.13 1,57 2020 2021 2022 2024 2026 202 202 2022 2024 202 202 202 202 203 203 203 203 203 203 203 203 203 203 <t< td=""><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>,</td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td>•</td><td>•</td><td></td><td>2 1</td><td></td><td>, ,</td><td>00.0</td><td>,</td></t<>			0								,							•	•	•		2 1		, ,	00.0	,
2010 1.01 0.08 1.06 0.31 0.92 0.77 1.69 2.20 0.77 1.69 2.20 0.77 1.69 2.20 0.77 1.69 2.20 0.77 1.00 0.08 1.09 2.20 1.00 0.08 1.09 2.20 1.00 0.08 1.09 2.20 1.00 0.08 1.09 2.20 1.00 0.08 1.09 2.20 1.00 0.08 1.09 2.20 1.00 0.08 1.09 2.20 1.00 0.08 1																			•	•		1.78			CC.7	
2009 1101 0.05 1.66 7.21 (3.4 1.6) 2.00 1.60 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1.69 1.69 1.69 2.01 1.00 0.05 1.69 1.69 1.69 2.01 1.00 0.05 1.69 1.69 1.69 2.01 1.00 0.05 1.69 1.69 1.69 2.01 1.00 0.05 1.00 0.05 1.69 1.69 2.01 1.00 0.05 1	4											,					•		•	•	•	.93		1.62	3.55	2
2010 110 0.75 1.89 7.27 1.10 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.89 2.01 1.00 0.50 1.80 2.01 1.00 0.50 1.80 2.00 1.80 0.50 0.50 1.80 0.50 1.80 0.50 0.50 1.80 0.50 1.80 0.50 0.50 1.80 0.	Ñ.		2																•	•		2.11		44.	3.55	3
2011 1.10 0.05 1.89 5.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 2		10	<u> </u>									. ,							,	•		2.30		1.25	3.55	11.39
2012 1431 0.55 1.86 4.70 1.34 1.59 1.69 2.01 2.01 2.01 2.01 2.01 2.01 2.01 2.01			2														٠		•	•		2.51		2	3,55	90
2013 143 0.40 1.30 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0			<u> </u>								,			-					•	•		2,74	,	0.81	3.55	ø
2014 1.126 0.310 1.00 1.00 1.00 1.00 1.00 1.00 1.0	-,		-									• 1							•	•		2.99		0.56	3.55	0
2016 2017 2019 2019 2020 2021 2022 2023 2024 2025 2029 2029 2029 2029 2029 2029 2029													. ,	•					•	٠		3.15		0.29	9 7 (C)	•
2277 1334 1121 2233 1200 916	•					à							,						•	•	•					٠
2277 1134 1121 2234 1200 916	Ň .				•	•	•		•			. ,	,				,		•	•						•
2277 1334 1121 2233 1200 916	Ñ				•	•	•	•	•	•	•							•	•	٠					•	•
2277 1134 1121 2234 1200 916	α			•	•		•		•	•									•	•	٠		,	,		,
2277 1334 1121 2233 1200 916	Ñ			•	•	•	•			•				•		,	į.						,			•
2277 1134 1121 2233 1200 916	<u>۾</u>			•		٠				•									•	•						•
2277 1334 1121 2233 1200 916	~		•	•	٠	•	•			,										•						
2022 2024 2025 2025 2027 2029 2030 2031 2031 2031 2031 2031 2031 2031		122		٠	•	•		•											•	•					,	•
2277 1334 1121 2233 1200 916	**	123	•	٠	٠	٠		•	٠	•				•		•			•	•						
2025 2027 2027 2029 2030 2031 2031 2031 2031 2031 2031 2031		20		•	•	•	•	•	•					•					•	•						
2022 2023 2029 2030 2031 2031 2031 2031 2031 2031 2031			•	٠	•			•	٠					•					•	•.					1	
2022 2029 2030 2031 2031 2031 2031 2031 2031 2031			_	٠	٠	,		•		•						•		•	•	•	٠			•		
2029 2029 2030 2031 2031 2031 2031 2031 2031 2031				•	٠	•		•	•	•			,					•	•	•					1	•
2029 2030 2031 2031 2031 2031 2031 2031 2031					•	•	٠			•								•	•	٠						,
2030 2031 1121 22 33 1200 9.16		20	• •		•	•	•	٠	٠	•							•	•		•	,				٠	•
2031 2272 13.24 11.21 22.33 12.00 9.16	_	30		٠	٠	٠		•	٠		•	•						•	•	•	•	•				
22.12 13.24 11.21 22.33 12.00 9.16				٠	1	•		•		•				•			•		•							1
		ļ	Ĺ			13	12	Ì									,					77.67	3.42	3		1

₽

Ţ
3
2
sideFIRRBase.xls.
utside
O

	2002	Loan			2003	Loan			2004 Lo	Loan	· [2005 Outstand	Loan Loan	ì	- [1		Renev	Outstand	:	Inderest In	1	Repay
Loan	Principal	Interest	Ropay- ment	Outstand: Ing Balance	Principal	Interest	Repay.	ing Balance	Principal In	Interest me	Repay-		Principal Interes	est repay.		Principal	interesi	ment	Balance	Princips	grace	Ē ;	
												•		•	٠		•	•	•				
	•	•	•	•		•	•			,							•	•	•		3 1		
16.68		1.33	•	19.01	· =		•	, 100						•			•	•		. ?	6/.7		
Ş	•	14.	•	19.	9	1.32		70.7	•						•		•	•	•		•		6.3
3					90.0		1.82	17.43				•			•		•	•		0.89			2.94
						1.39	1,82	17.00				•						•		0.95			2.85
	* :				470			16.54	•	,									•	103			2.77
	÷			10.00			1.82	16.04									•			1.15			2.58
	 							15.50				•		•		•	•	•		Ś			2 60
	35.0							200	,			•	,		•		•	•		3			
	0.62						1.82	4.92							•		•			33			200
								14.29	,			•			•		•	•		1.4.	•		5.38
								13.61	•			•					•	٠	,	1.51			2.28
	· ·							12.88				•	,	•	•					7			2.16
	2.0					103		12.09				•						•		7.			2.04
	60			90 13.32	28.0			11.24	,								•	•	•	ě	٠		1 89
,	δή : -							10.32	,			,					•	•		90.0	,		1.74
	860	68.0	06.			06		9.33				,	,					•	•	3 6			1.58
	Ö.						1.82	8.26	,			•			•		•	•		15	,		9
				27.5	2 4			7.10						•			•	•	,	2 07			7
	7				_			5.85				٠			•	•	•	•	•	9			9
		0.64		200				4.50	•		,				•	•	•	•		2.00			1
	1.4							305				•		,	•		•	•		2 6			
							•	146		,	•			•			•	•		2.6			3 5
	1.65	9 0.29		96 19.				Ì		•		•		•	•	•	•	•		5.5			ì
	1.91			. 8	1.48	18 0.12		•	•	Ù				•			•	•	•				
		٠	•	٠		•	•							•	•	-	•	•					
			•	•	•			•				•			•		•	•					
		٠	•				•	•	•		,	•					•	•	•				
	•		•	٠		•		•				•								٠			
		•	•	,		٠						•	,				,	,			٠		
		•	•	•					,						•	-	•	•					
	•	•	•	•	•	•	•							•	•	•	•	•					
•		•	•	•	•	•	٠	•	,	• 1							•	•	•			į	
	_																						

FIRR Case 2-0
Project Ametitan Geothermal
Subject FIRR - Case 2-Outside
File Name
Date
Date
7804.721
Rev. 2001/10/12

文物内部位排 (FIRR), Case 2 - Outside Financial Internal Rate of Return

10.87%

FIRR =

£)	Project Cost	Salable	Supple.	OEM for Steam	O&M for P. Plant	Steam Cost	¥	Generat. Cost Ttl	Project Cost. Total	Revenue	Balance
Ť	1	1.44.46	r Will	NAMS.	Z X	MMS	MAS	MMS	MMS	ZW.	\$ ¥\$	MMS
	1000	The state of the s			1					•	•	·
· ·	3	1			•					27.80		(27.80)
	2002	27.00		•	,		•	,		27.50	•	(27.50)
~	2003	27.50			. ;			9	77.77	4	11.60	6.87
<u>е</u>	200	•	145.01		2	0.30	0 .	3 8	ì	10.00	1.00	(16 RZ)
4	2005	23.54	145.01	•	1.13	0.30	P.7	90	2.73	797	3 3	200
	2008	72.47	145.01	•	1.13	0.30	1.70	8	4.73	27.20	11.60	(15.60)
> 4	2		2000		1,35	1.35	3.39	4.28	10.38	10.38	23.20	79.71
9 1	3 6		2000	٠	135	1.35	3.39	4,28	10.38	10.38	23.20	12.82
- (3 8	•	9000	,	\$	1.35	3.39	4.28	10.38	10.38	23.20	12.82
D	33		200	, ,		135	3.39	4.28	10.38	10,38	23.20	12.82
n :	200	•	2000	,	ř	1.3	3.39	4,28	10.38	10.38	23.20	12.82
2	2	•	200.04	,	, .	4.5	65.5	4.28	10.38	10.38	23.20	12.82
=	2012	•	10.062	•	3 4		3.30	4.28	10.38	10.38	23.20	12.82
2	2013	1	0.002	1	3 4		338	4.69	10.79	10.79	23.20	12.41
5	2014	•	230.0		3 6	3.5	3.39	4.69	10.79	10.79	23.20	12.41
<u> </u>	CLOZ		0.000	4.63		135	339	3.14	13.77	13.77	23.20	9.43
2 ;	20.0		200.00	}	8	1.35	3.39	4.55	10.65	10.65	23.20	12,55
2 !	707		20000		8	135	339	33	10.65	10.65	23.20	12.55
> 5	200	•	200.03			1.35	338	4.55	10.65	10.65	23.20	12.55
2 9	2 2 2	•	2000		*	1.35	339	4.55	10.65	10.65	23.20	12.55
9 6	200	•	2000	•	55	1.35	3.39	4.55	10.65	10.65	23,20	12.55
3	7 6	•	2000		38	1.35	3.39	4.55	10.65	10.65	23.20	12.55
5 5	7 66	•	290.04	•	8	1.35	3.39	4.55	10.65	10.65	23.20	12.55
3 8	3 6		2000	•	2	1,35	3.39	5.16	11.26	11.26	23.20	2
3 3	200	,	2000	٠	38	1.35	3,39	5,16	11,26	11.26	23.20	£.
3	5050				3,6	135	339	5.30	11.40	11.40	23.20	11.80
2 8	2077		2000		8 8	1.35	3,39	5.30	11,40	11.40	23.20	11.80
8 8	700		200.04		8	135	3.39	5.30	11.40	11.40	23.20	11,80
7 8	2000		10.80	,	1	0.30	1.70	2.63	5.76	5.76	11,60	5.84
9 6	• `		145.01	•	1.13	0.30	1.13	2.63	κ.) 	5.18	11.60	6.42
3 6	• •		145.01	٠	5	0.30	1.13	2.63	4.06	4.06	11.60	11.60
3	٠.		1000	Car	32.56	21.58	83 64	113.24	268.41	369,72	580,00	214.34

Profit And Loss Statement 複数字符号, Cese 2 - Outside

ĺ									ciation	į	Sold		Profit	Ē	Grest Payment		
		A Color Day	-		Operating Cost		STORES COST					-					
,	Generated	Salable	Revenue	Supple	O&M Steam	OSM P		Supply	Power Plant	Total		, š	After Tax	After Tax : Japan Bank	Int'i Bank	Total	NCOME
1	Energy	Energy	27976	WW.	MAGS	MMS	MMS	MMS	MM\$	MMS	MMS	MMS	MMS	MMS	MMS	MMS	SPN:
3001					,	ļ.				•	,	•	• 1	5	1.33	23.	(2.3
200			•	•		,	•		•	•	•	•			2.76	18.4	(4.8
100		,		•	•	•				•	, ;	. ;			0000	50.5	
3			1	٠	1 13	0.30	1,70	1.32	1.98	6.43	5.17	9.	3.5/	7.30	20.7	1 00	
2007		145.01	8 8	•		030	1.70	1,32	1.98	6.43	5.17	8	3.57	3.05	9 1	5 8	2 5
2005		145.01	2	•	2 6	200	2	1 33	60	6.43	5,17	1.60	3.57	3.94	5.15	8	o i
2008	154.18	145.01	11 60		51.1	0.50	2 6		65	0.00	13.80	4.28	9.52	4.32	5.25	9.57	Ö.Ö.
2007	308.35	290.01	22	٠	8	ر دن و	000	200	200	000	13.80	4.28	9.52	4.05	5.11	9.16	60
2008		290.01	23.23	٠	1.35	ch.	90°0	20.	200		13.80	4.28	9.52	3.76	4.97	80 E	0.7
2000		290.01	23 20		1.35	1.35	3.39	70.	97.	 6 6	9 6	80 7	0.52	3.45	4.80	8.25	12
2010		290.01	23.20	•	1.35	1.35	3.39	1.32	D (0)	96	200	25.	9 42	3.1	4 63	7.74	1.7
2011		290.01	23.20	•	1.35	1.35	3.38	.32	5	 9 9	000	36.	0 52	272	4 46	7.18	2.3
2012		290.01	23.20	•	1.35	1.35	3.39	1,32	1.98	9.40	200	200	65.0	232	4.25	6.57	2.9
1		290.01	23.20		1.35	1.35	3.38	1.32	1.98	0.40	3.00		10.63	1.87	8	5.91	4.5
2 5	308.35	290.01	23 20	٠	1.35	1.35	3.39		1.98	80.0	15, 62	9 8	2 6	3.5	3.80	5,18	5.2
2015		290,01	23.20	•	1.35	1.35	3.39	. ;	9 G	9 6	2 5	2 44	2 7	0.84	3.55	4.39	2.6
2018		290.01	23.20	4.53	1.35	1.35	3.39	0.45	88.	8.5	14.67	4 7.5	10.12	0.59	3.28	3.87	6.3
2017		290.01	23.20	•	1.35	1.35	3.39	6.4	9 4	0 0	14.67	55.4	10.12	0.30	2.98	3.28	6.84
2018		290.01	23.20	•	1.35	1.35	3.39	, c	0 0	9 0	14.67	4 55	10.12	•	2.67	2.67	7.4
2019		290.01	23.20	•	1.35	1,35	3.39	Ç Ç	0 00	3 6	14.67	4 55	10.12	•	2.32	2.32	7.8
2020		290.01	23.20	•	1.35	1.35	3.39		0.0	3 6	14.67	4 55	10 12		1.94	1.94	œ.
2021		290.01	23.20	•	1.35	55	50.00	5 6	0. e	 20 8	14.67	55.	10.12		Ÿ	Ŋ	8.5
2022		290.01	23 23	•	1.35	3.35	90.0	9	9 0	3 6	14 67	4.55	10.12	•	1,11	1.13	9.01
2023		290.01	23.20	٠	1.35	8	90.00		0 00'	2 4	18.65	5 15	11.49	•	0.65	0.65	10.84
2024		290.01	23.20	•	1.35	1.35	95.0	Ç (3 4	48.00	4	1 6	•	0.45	0.46	11.0
2025		290.01	23.20		1.35	1.35	3.39	Q.	•	3 6	17.50	, r	11.80	•	0.24	0.24	11.5
2026		290.01	23.20	•	1,35	1.35	3.39			9 4	14.5	200	1.30			•	11.8
2027		290.01	23.20	•	1.35	1.35	3.38			2 9		200	5			•	11.8
2028		296.01	23,20		1.35	1.35	3.39			2 9	2 1	200	3			•	5.8
9000	_	145.01	11.60	1	1.13	0:30	1.70			 	4.0	20.7	5 6			•	W.
20 2020	2	145.01	11.60		1.13	0:30	1.70			3.13	8.47	2.53	8 2		•	•	5.84
		145.01	1160	٠	1.13	0,30	1,70	•		3.13	8.47	2.65	Z			140 44	\$ 65.
3																	

Net Income Dep Steam Dep Dep Program Proteinest	-	•										
2007 Tabilities Facilities Paging Payment		ļ	1	Dep. Steam	Dep. P.	Total	Project	Japn Barik Principal	int'i Bank Principal	Total	Annual	Balance
2001 27.80 C.2.4 27.80 27.80 (2.34) 2002 27.50 27.50 27.50 27.50 27.50 27.50 (487) 2003 27.50 <th></th> <th>-</th> <th></th> <th>Facilities</th> <th>Facilities</th> <th></th> <th>100</th> <th>Payment</th> <th>Paymen</th> <th></th> <th>**************************************</th> <th>MMK</th>		-		Facilities	Facilities		100	Payment	Paymen		**************************************	MMK
2000 27.80 27.80 27.80 27.80 (2.34) 2000 27.50 (487) 22.63 27.80 27.50 (487) 2000 27.50 (487) 22.63 27.50 27.50 (487) 2000 27.54 (372) 1.32 1.98 20.25 22.47 1.49 1.66 25.52 (5.26) 2006 22.47 (3.52) 1.32 1.98 20.25 22.47 1.49 1.66 25.52 (5.26) 2000 0.36 1.32 1.98 2.06 2.94 1.57 1.49 1.32 2010 1.27 1.32 1.98 2.06 3.47 1.98 (1.31) 2011 1.27 1.32 1.98 4.57 2.98 4.77 1.98 1.32 2011 1.28 1.38 3.06 3.07 2.11 1.33 1.33 2011 1.28 1.32 1.98 6.26 4.91 2.11	ļ.,	-	MMS	MMS	MMS	MMS	NAM.	ŽE.	- Maria	• ·		1
2002 27.80	200	_				•	•	,			(20.0)	(25.0)
2004 2.2 53 2.7 50 <td>2005</td> <td></td> <td>(2,34)</td> <td>•</td> <td></td> <td>25.46</td> <td>27.80</td> <td>٠</td> <td>1</td> <td>20.12</td> <td></td> <td>100</td>	2005		(2,34)	•		25.46	27.80	٠	1	20.12		100
2006 1.25 1.25 1.25 1.25 0.34 2006 22.47 1.32 1.38 2.3.2 2.3.54 1.32 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.34 1.32 1.33 <t< td=""><td>è</td><td></td><td>(4 97)</td><td></td><td>•</td><td>22.63</td><td>27.50</td><td></td><td>٠</td><td>27.50</td><td>(4.0/</td><td>(17.1)</td></t<>	è		(4 97)		•	22.63	27.50		٠	27.50	(4.0/	(17.1)
2006 22.54 (3.52) 1.32 1.32 23.54 1.36 1.43 26.33 (3.00) 2006 22.47 (3.54) 1.32 1.98 20.25 22.47 1.49 1.56 25.56 (5.56) 2007 0.06 1.32 1.98 20.25 22.47 1.49 1.66 25.56 (5.26) (1.32) 2008 0.27 1.32 1.98 4.09 3.74 1.65 4.49 (1.32) 2010 1.77 1.32 1.98 5.69 4.12 2.28 6.40 (1.31) 2011 1.78 1.32 1.98 5.69 4.75 2.18 6.40 (1.31) 2011 1.78 1.32 1.98 5.69 4.55 2.68 6.97 (1.31) 2012 2.34 1.32 1.98 6.26 4.51 2.88 6.97 (1.31) 2013 2.34 1.36 6.25 0.45 1.98 6.25	9		£ \$	1 32	9	5		1.25		1.25	0.34	(6.87)
2006 22.47 (3.52) <td>2</td> <td></td> <td>(1.1)</td> <td></td> <td>ő</td> <td>CEEC</td> <td>23.54</td> <td>1.36</td> <td>1,43</td> <td>26.33</td> <td>(3.00)</td> <td>(9.87)</td>	2		(1.1)		ő	CEEC	23.54	1.36	1,43	26.33	(3.00)	(9.87)
2006 22.47 (5.52) 1.32 1.32 2.02 2.02 2.03 1.67 4.58 (1.32) 2007 0.05 1.32 1.98 3.25 3.18 1.67 4.59 (1.32) 2008 0.36 1.32 1.98 3.65 3.78 2.11 5.89 (1.31) 2010 1.27 1.32 1.98 5.64 4.12 2.28 (1.31) 2011 2.34 1.32 1.98 5.64 4.51 2.28 6.40 (1.31) 2012 2.34 1.32 1.98 5.64 4.51 2.88 6.97 (1.31) 2013 2.34 1.32 1.98 6.50 5.36 2.88 6.97 (1.74) 2014 4.52 4.51 2.88 6.50 5.36 2.89 3.17 1.97 2015 6.25 0.45 1.98 9.27 2.36 2.86 2.04 1.74 1.74 1.74 1.74 </td <td>200</td> <td></td> <td>(3.52)</td> <td>7.7</td> <td>96.</td> <td>1000</td> <td>200</td> <td>90</td> <td>1.56</td> <td>25.52</td> <td>(5.26)</td> <td>(15.13)</td>	200		(3.52)	7.7	96.	1000	200	90	1.56	25.52	(5.26)	(15.13)
2008 (1.05) 1.32 1.88 3.42 5.42 1.81 1.89 (1.32) 2008 0.79 1.32 1.98 4.09 3.47 1.95 6.42 (1.32) 2010 1.27 1.32 1.98 4.09 3.47 1.95 6.42 (1.33) 2012 2.34 1.32 1.98 5.64 4.51 2.48 6.97 (1.31) 2012 2.34 1.32 1.98 5.64 4.51 2.48 6.97 (1.31) 2013 2.34 1.32 1.98 5.64 4.51 2.48 6.97 (1.31) 2014 2.34 1.32 1.98 6.50 5.88 3.10 8.98 (1.74) 2015 2.45 1.98 5.04 2.28 3.35 6.19 (1.15) 2016 2.45 1.98 6.04 2.28 3.35 6.19 (1.15) 2016 2.45 1.98 9.04 1.04 </td <td>2002</td> <td></td> <td>(5.52)</td> <td>1,32</td> <td>2</td> <td>20.43</td> <td>1.33</td> <td>r d</td> <td></td> <td>4 58</td> <td>(132)</td> <td>(16.45)</td>	2002		(5.52)	1,32	2	20.43	1.33	r d		4 58	(132)	(16.45)
2009 0.36 1.32 1.88 4.96 3.47 1.95 5.22 (1.32) 2010 1.27 1.32 1.98 4.57 2.11 5.89 (1.31) 2011 1.27 1.32 1.98 5.64 4.57 2.48 6.97 (1.33) 2012 2.34 1.32 1.98 6.25 4.91 2.88 5.77 2013 2.34 1.32 1.98 6.25 4.91 2.88 5.77 2013 2.34 1.32 1.98 6.25 4.91 2.88 5.77 2014 4.52 3.98 5.04 2.98 3.35 6.19 1.17 2016 6.25 0.45 1.98 8.68 3.09 3.35 6.19 1.17 2016 6.24 0.45 1.98 8.69 3.09 3.52 6.71 1.17 2016 6.24 1.98 9.27 3.02 3.62 4.55 4.55 <t< td=""><td>8</td><td></td><td>(0.05)</td><td>1.32</td><td>S i</td><td>3.43</td><td></td><td></td><td>, d</td><td>4 99</td><td>(132)</td><td>(17.78)</td></t<>	8		(0.05)	1.32	S i	3.43			, d	4 99	(132)	(17.78)
2010 1,32 1,38 4,09 3,76 2,11 5,89 (1,31) 2010 1,78 1,32 1,98 4,09 3,78 2,11 5,89 (1,31) 2011 2,24 1,32 1,98 5,64 4,57 2,48 (1,31) 2012 2,24 1,32 1,98 6,50 4,57 2,48 6,57 2013 2,24 1,32 1,98 6,50 6,23 2,86 7,57 2014 4,52 1,98 6,50 5,36 2,86 3,77 1,74 2015 6,25 0,45 1,98 8,66 3,09 3,62 6,77 1,74 2016 6,25 0,45 1,98 9,27 2,04 3,09 3,62 6,77 1,74 2017 6,45 1,98 9,27 2,09 3,62 6,77 1,97 2018 6,46 1,98 9,27 3,99 3,62 6,77 1,97	2002		0.36	1.32	66	8 1				5 43	(3.22)	(119.11);
2010 1.27 1.32 1.98 4.57 3.78 2.11 3.09 1.31 2011 2.34 1.32 1.98 5.64 4.51 2.48 6.97 (1.33) 2012 2.34 1.32 1.98 5.64 4.51 2.48 6.97 (1.31) 2013 2.24 1.32 1.98 6.25 5.86 3.10 8.98 7.57 (1.31) 2015 2.25 1.98 6.50 5.86 3.10 8.98 (1.74) 2016 2.26 1.98 6.04 2.84 3.35 6.19 (1.74) 2016 2.26 1.98 8.69 5.04 3.75 6.19 (1.15) 2016 2.61 0.45 1.98 9.86 1.15 1.15 1.15 2017 3.02 3.02 3.02 3.02 3.02 5.69 2018 1.06 0.45 1.98 9.86 4.21 4.21 4.21	2003		0.79	1.32	- 38	60.4		4 6	2			(20.42)
2011 1.78 1.32 1.98 5.08 4.12 2.28 5.40 (1.3.1) 2012 2.34 1.32 1.98 5.04 4.51 2.48 5.97 (1.3.1) 2013 2.24 1.32 1.98 5.04 4.51 2.48 5.97 (1.3.1) 2014 2.52 1.98 6.50 5.96 3.10 8.92 (1.7.1) 2015 2.51 0.45 1.98 8.63 3.10 8.98 (1.7.1) 2016 6.52 0.45 1.98 8.22 3.91 7.23 5.04 2017 6.52 0.45 1.98 8.22 3.91 7.23 5.04 2018 7.45 0.45 1.98 10.23 7.45 5.74 5.75 5.69 2020 7.80 0.45 1.98 10.61 5.32 5.90 5.90 5.90 2021 8.85 0.45 1.98 10.61 5.90 5.90 5.90 5.90 2022 1.130 0.45 1.98 11.01 5.32 5.90 5.90 5.90 2023 1.130 0.45 1.144 5.54 5.74 5.74 5.74 5.74 5.70 2026 1.130 0.45 1.180 1.180 1.180 1.180 2027 1.130 0.45 1.180 1.180 1.180 1.180 2028 5.84 5.84 5.84 5.84 5.84 5.84 5.84 5.8	2016		1.27	1.32	1.98	4.57		3.78	7.1	000	(10.5)	
2012 2.34 1.32 1.98 5.64 4.51 2.46 6.97 (1.33) 2013 2.95 1.32 1.98 6.25 4.55 7.57 (1.31) 2014 4.52 1.98 6.25 6.26 5.86 7.77 (1.74) 2015 5.25 1.98 6.25 5.64 3.35 5.61 (1.74) 2016 6.25 0.45 1.98 8.68 3.09 3.67 (1.15) 2016 6.25 0.45 1.98 9.86 3.09 3.61 (1.15) 2018 6.25 0.45 1.98 9.86 3.09 3.61 (1.15) 2018 6.64 0.45 1.98 9.02 3.32 3.91 7.23 2.04 2020 7.24 0.45 1.98 10.61 4.21 4.21 4.21 5.65 2022 8.54 1.98 11.44 5.74 5.74 5.74 5.74 5.74	Ę		1.78	1.32	1.98	5.08		4.12	2.28	6.40	(5.5)	(21.73)
2.95 1.32 1.39 6.25 4.91 2.65 7.57 (1.37) 2013 2.96 1.32 1.39 6.26 2.86 2.86 2.77 (1.77) 2016 2.25 1.39 6.50 5.04 2.84 3.35 6.19 (1.15) 2016 2.26 1.39 6.04 2.84 3.35 6.19 (1.15) 2017 6.25 0.45 1.99 9.27 3.32 3.31 7.23 2.64 2019 6.44 0.45 1.99 9.27 3.32 3.31 7.23 2.64 2019 7.80 0.45 1.99 10.23 3.32 3.31 7.23 2.65 2020 7.80 0.45 1.99 10.61 4.92 4.55 4.55 5.67 2021 8.19 0.45 1.99 10.61 4.92 4.55 5.74 5.74 5.74 5.74 5.74 5.74 5.74 5.74	3 8		2 34	5	1.98	20.00	•	4.51	2,46	6.97	(1.32)	(23.06)
2013 4.52 1.98 6.50 5.36 2.85 1.71 2014 4.52 1.98 7.23 5.88 3.10 8.89 (1.74) 2016 2.54 1.98 6.50 2.88 3.10 8.89 (1.74) 2017 6.25 0.45 1.98 8.64 3.09 3.62 8.71 1.97 2017 6.25 0.45 1.98 9.27 3.32 3.91 7.23 2.04 2018 0.45 1.98 9.28 3.32 3.91 7.23 2.04 2019 0.45 1.98 9.28 3.32 4.21 4.25 5.65 2020 7.80 0.45 1.98 11.01 4.92 4.82 5.65 2021 8.18 0.45 1.98 11.44 5.32 5.32 5.65 2022 8.18 0.45 1.144 5.74 5.74 5.70 2024 11.30 11.56 <t< td=""><td>3</td><td></td><td>1 10</td><td>1</td><td>3</td><td>8.25</td><td></td><td>4.91</td><td>2.65</td><td>7.67</td><td>(1.31)</td><td>(24.37)</td></t<>	3		1 10	1	3	8.25		4.91	2.65	7.67	(1.31)	(24.37)
2014 5.24 1.98 7.23 5.86 3.10 8.99 (1.74) 2016 2.61 0.45 1.98 5.04 2.84 3.35 6.19 (1.15) 2016 6.25 0.45 1.98 8.04 3.09 3.52 6.19 (1.15) 2018 6.25 0.45 1.98 9.27 3.32 3.91 7.23 2.04 2018 6.64 0.45 1.98 9.02 3.81 7.23 2.04 2020 7.80 0.45 1.98 10.61 4.21 4.21 5.65 2021 7.80 0.45 1.98 10.61 4.25 4.55 5.68 2022 8.61 1.98 10.61 4.25 4.55 5.68 2022 8.61 1.98 11.44 5.74 5.74 5.74 5.70 2022 1.1.30 4.45 4.45 5.74 5.74 5.74 5.74 5.74 5.74	Ś	,	4.53		6	98.90	,	5.36	2.85	8.22	(1.71)	(56.09)
2010 2.61 0.45 1.98 5.04 2.84 3.35 6.19 (1.15) 2011 6.25 0.45 1.98 8.69 3.09 3.62 5.71 1.97 2017 6.25 0.45 1.98 9.66 3.09 3.62 5.71 1.97 2019 6.64 0.45 1.98 9.87 3.32 3.91 7.23 2.04 2019 7.80 0.45 1.98 10.61 4.21 4.21 4.21 5.67 2020 7.80 0.45 1.98 11.01 5.32 5.69 5.69 5.69 2021 10.84 0.45 1.98 11.44 5.74 5.74 5.74 5.72 5.73 5.70 5.30 5.59 5.30 5.30 5.30 5.30 5.70 5.30 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70 5.70	Ę		7 4		8	7.23	,	5.88	3.10	86.8	(1,74)	(27.83)
2016	R		5.63		90	40.6		2.84	3.35	6.19	(1.15)	(28.9B)
2017 6.84 6.45 1.99 8.27 3.32 3.91 7.23 2.04 2.04 2.01 2.01 2.01 2.01 2.01 2.01 2.01 2.01	R	•	0.0	9	80	89.6		3.09	3.62	6.71	1.97	(27.01)
2018	Ę		C7'0	9 4	90	0.07	•	3.32	3.91	7.23	2.04	(24 96)
2020 7.80 0.45 1.99 10.23 4.55 4.55 5.68 2021 8.18 0.45 1.99 10.61 4.92 4.92 5.69 2022 8.18 0.45 1.99 10.61 5.74 5.72 5.69 2022 10.84 0.45 1.99 11.29 5.74 5.74 5.77 2024 10.84 0.45 1.144 5.90 5.90 5.39 2025 11.56 11.80 11.80 11.80 11.80 2027 11.80 5.84 5.84 5.84 2028 5.84 5.84 5.84 2039 5.84 5.84 5.84 2031 5.84 5.84 5.84 2031 5.84 5.84 5.84 2032 5.84 5.84 5.84 2033 5.84 5.84 5.84	Ŕ	,	5 1	4.4	9	200		, ,	4.21	4.21	5.67	(19.29)
2020 7.80 0.43 1.90 1.04 5.32 5.69 5.69 2021 8.18 0.45 1.99 11.01 5.32 5.32 5.69 2022 8.66 0.45 1.99 11.01 5.74 5.74 5.70 2022 10.84 0.45 1.99 11.48 5.90 5.90 5.30 2022 11.56 11.56 11.80 11.80 11.80 2022 11.30 11.80 11.80 11.80 2023 5.84 5.84 5.84 2024 5.84 5.84 5.84 2025 5.84 5.84 5.84 2026 5.84 5.84 5.84 2027 5.84 5.84 5.84 2028 5.84 5.84 5.84 2030 5.84 5.84 5.84	8		64.7	0 4	8 8	20.00		٠	4.55	4.55	5,68	(13.61)
2022 8.56 0.45 1.98 11.01 5.32 5.32 5.69 5.70 2.025 11.30 0.45 1.98 11.44 5.74 5.74 5.74 5.74 5.70 5.70 5.00 5.00 5.00 5.00 5.00 5.00	8		OR' /	6.0	9 9	2 0		,	4 92	4.92	5.69	(7.92)
2022 8.65 0.45 1.96 11.01 5.74 5.74 5.72 5.70 5.00 5.00 5.00 5.00 5.00 5.00 5.00	8		8.18	64.0	B. 5	900			5.3	5.33	5.69	(2.23)
2022 10.84 0.45 1.29 5.90 5.90 5.39 11.48 11.80	8		8.58	6.0	8.5	2 1		•	5.74	5.74	5.70	3.48
2025 11.03 0.45 11.48 11.56 11.56 11.50 2025 11.56 11.50 11.	8		0.6	Ç. (06.1			•	e in	2.90	5.39	98.8
2025 11.03 0.45 11.56 11.56 11.50 11.30 11	Ž	•	10.84	0.0	•	27	•				11.48	20.35
2026 11.56 11.80 1	202	·	11.03	0.45		9					11.56	31.91
2027 11.80 11.80 11.80 5.84 5.84 5.84 5.84 5.84 5.84 5.84 5.84	202	9	11.56			00.7		•			11.80	43.71
2022 5.84 5.84 5.84 5.84 5.84 5.84 5.84 5.84	202		11.80			08.1				•	08.5	55.51
2022 5.84 5.84 5.84 5.84 5.2030 5.84 5.84 5.84 5.84 5.84 5.84			11.80		,	20.	•	•	•		88	6136
2030 5.84 5.84 5.84 5.84 7.00 10.00		•	5.84	•	•	0 0					88	67.20
2031 5.84			5,84	٠		4 6	•				88	73.04
		-	5.84			0.0			25.24		73.04	

		Cash Generation	Stion							
ŝ) }	Operating	Depreciation	Total	Total	Interest	Principal Payment	Total	Accumu. Total	Dept Service Ratio
1		MMS	MM\$	MMS	MMS	SMS.	NW.	MMS	MMS	
0	2001	The second second		•	•	٠;			. 6	
-	2002	•		•	•	2.34	•	7.7	3 6	
_	2003	٠		•	•	4.87	. :	0 1	7. (
	2000	3.57	3.30	6.87	6.87	5.29	1,25	độ có	13.73	200
· ·	3 8		5	6.87	13.75	7.09	2.78	9.88	23.62	0.58
	3	0.0		78.9	20.62	60'6	3.05	12.14	35.76	0.58
· ·	2008	\c.	9 6	12.83	24	15.6	4.58	14.15	49.90	0.67
 60	200	70'6	9 6	12.64	46.26	9.16	4,99	14,15	54.05	0.72
	2008	70.6	8 8	2 5	6	8.73	5.42	14,15	78.19	0.76
B	5003	70.6	8 8	5 5	7.00	8 25	5.89	14.14	92.33	0.78
	200	76.8	8 8	1 6	2	7.74	6.40	14.14	106.47	0.80
0	5	9.22	9.30	70.7	2 1	4.7	6.97	14.15	120,61	0.81
-	2012	9.52	3.30	7.07	200		7.57	14.14	134,75	0.82
N	2013	9.52	3.30	12.02	00.00	2	60.0	14 53	14887	0.82
E)	2014	10.43	8.	12.41	67.73		4 6	14 16	163.03	0.83
4	2015	10.43	85.	12.41	22.55		9	10.53	173.61	0.83
'n	2018	7.00	2.43	9.43	144 63	B. C.	- 1	2000	184 40	0.85
9	2017	10.12	2.43	12.55	157.18	3.67	- 6	10.30	104.10	264
^	2018	10.12	2.43	12,55	169.74	3.28	67.7	000	100	5 6
αç	2019	10.12	2.43	12,55	182.29	2.67	12.4	5.86	20.1.00	2 6
0	200	10.12	2.43	12.55	194 84	2.32	4.55	6.87	208.45	5.0
9	3 6	1010	2.43	12.55	207, 39	1.94	4.92	98.6	215.31	0.86
2 :	, ,	1	2.43	12.66	219.84	1.5	5.32	58.8	222.17	0.99
5 1	7707	20.01		12 65	03 050	F	5.74	6.85	229.02	1,02
3	2023	10.12	7	11 94	244 44	0.65	5,90	6.55	235.57	40.
3	2024	D. C.	2 4		95.00	0.46		0,46	236.03	1.09
7	2025	11.49	C#.0		97.000	7.0	,	0.24	236.27	1.14
ĸ	2026	£ 68		2 5	270.00	1			236.27	1,19
8	2027	11.80		2 5	619.90	•		٠	238.27	1.23
2	2028	1.80		3.80	6/187			. 1	236.27	1.26
8	2029	5.84		48.5	67		•			
29	2030	5.84	٠	5.84	303.47	•		,	•	
2		50.0		2.2	309.32		•	- 000	•	•
ŀ	٠.	00.30	£7.33	200	4 562.29	19,44	16.83	77:067		

Project Amailtain Geothermal, Case 2 Oubide Subject Repayment Schedule, Case 2-Oubide Dia Name Brain sessional State Subject Rev. Subject Subj

 FOR REPAYMENT SCHEDULE
 Intl
 TOTAL

 YEAR
 TOSAL
 Japan
 Intl
 TOTAL

 YEAR
 AMAS
 40%
 60%
 AMAS

 AMAS
 MAS
 MAS
 AMAS
 AMAS

 1
 27.80
 11.12
 16.69
 27.80

 2
 27.50
 11.00
 16.59
 27.50

 3
 22.47
 8.99
 13.48
 22.47

 6
 22.47
 8.99
 13.48
 22.47

 6
 101.31
 40.52
 60.79
 101.31

LOAN TERM Japan Int'l B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0 | 11% B.0

Japan Bank Loan Repayment Schedule (Millton USS), Case 2 Outside

UNIT: Millon US\$

Continued Cont							١			Ĭ	2004			2007	9							•	41 40 00 00			CONTRACTOR
Value Control Invest Raphy Outlier Out			2002	Low	1		İ	- LEO				1	1			0	Outstand-			Repay	Outstand	Delivering .				2
2007 11.1 161 12.2 1 10 12.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Loan	Principal				incipal h								i	_ {	Salance	Principal	Interest	inen:	Balance		-		į	alance
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,						-				-											,				٠	,
2007 1172 1174 1186 1259 1190 1271 1186 1259 1190 1287 1280 1190 1287 1280 1190 1280 1280 1280 1280 1280 1280 1280 128												•			•	•	•	•					6			12.13
2002 1112	Š					ç				•				•	•	•	•	•	•		٠		2.11			25.22
2004 110	50					12.13		. ;					•	•	•	•	•	•	•				•	2 20	3 66	24 00
0.65 0.75 0.75 0.86 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75						13.24		8		3					•	•		•	•		•	Ş		9		
2004 0.00 <th< td=""><td>-</td><td></td><td></td><td></td><td>1 86</td><td>12.59</td><td>0.60</td><td>60</td><td>69.</td><td> •</td><td>•</td><td></td><td></td><td></td><td></td><td>,</td><td>, ,</td><td>,</td><td>•</td><td>•</td><td>•</td><td>1.36</td><td>0.86</td><td>2.19</td><td>3.33</td><td>34.25</td></th<>	-				1 86	12.59	0.60	60	69.	 •	•					,	, ,	,	•	•	•	1.36	0.86	2.19	3.33	34.25
2006 6.89 0.78 1.10 0.71 0.89 1.69 1.00 0.71 0.89 1.50 1.00 0.71 0.89 1.50 1.00 0.71 0.89 1.00 1.20 0.72 0.89 0.78 1.00 0.71 0.89 1.00 1.20 0.72 0.89 0.78 1.00 0.72 0.89 0.78 1.00 0.72 0.89 0.72 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.89 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.72	8				3	9	0.65	90.	1.69	10.76				•	ś		9			,	05.50		1.88	2.06	3.55	47.34
2006 6.59 1.05 <th< td=""><td>ลี</td><td></td><td></td><td></td><td>6</td><td>8 9</td><td></td><td></td><td>ď</td><td>40.04</td><td></td><td></td><td></td><td></td><td>, T.</td><td>8</td><td>12.6</td><td></td><td></td><td></td><td></td><td></td><td></td><td>4 32</td><td>7.23</td><td>44.43</td></th<>	ลี				6	8 9			ď	40.04					, T.	8	12.6							4 32	7.23	44.43
2007 0.85 1/5 </td <td>29</td> <td></td> <td></td> <td></td> <td>1.86</td> <td>11.10</td> <td>0.71</td> <td>0.36</td> <td>20</td> <td>00.00</td> <td></td> <td></td> <td>•</td> <td>Ĝ</td> <td></td> <td>15</td> <td>78 12.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td>- 1</td> <td>30 31</td>	29				1.86	11.10	0.71	0.36	20	00.00			•	Ĝ		15	78 12.0							4	- 1	30 31
1,0 0,10 0	ž				1.86	10.25	0.77	0.92	1.69	87.9										•				CO.	(3.	2 6
2000 101 016 188 6.31 0.92 0.77 109 0.64 13.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2	2 3				38.	9.32	0.84	0.85	1.69	8.46										•			٠	3.76	7.23	37.79
2000 110 0.76 1.89 721 100 0.66 1.69 6.45 0.00 0.60 0.60 1.69 6.45 1.72 2200 0.97 0.74 850 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.	Ŕ		5			9.5	0 63	7.7	1.69	7.54				ن						•			٠	3.45	733	34.01
2010 0.76 189 6.07 1.00 0.76 189 6.09 1.78 8.95 0.39 0.39 1.78 8.95 0.39 0.39 1.78 1.30 0.74 1.50 0.73 1.30 0.74 1.50 0.73 1.30 0.74 1.50 0.73 1.30 0.74 1.50 0.73 1.30 0.74 1.50 0.73 1.30 0.74 1.50 0.73 1.30 0.74 1.5	Ŕ	60	-		0 0	2 6		9	5	6.55				o									•	1	7.23	29,90
120 0.66 1.86 6.07 1.09 0.00 1.69 0.	20	-	£.,		1.85	7.	3.	0.0					٠													200
1.31 0.45 1.86 4.70 1.19 0.50 1.89 4.70 1.19 0.50 1.89 4.70 1.30 0.70 1.89 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.70 1.30 0.30 1.70 0.70 1.30 0	20	-	7		1.86	6.01	1.09	09'0	60.	0	•	į.	•											7/-	1	
143 043 189 337 130 043 189 2.98 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5			13		98.	2	1,19	0.50	69	9														2.32	.23	20.43
1.35 0.30 1.86 1.77 1.42 0.27 1.69 1.57 1.35 0.53 1.30 0.473 5.89 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.34 1.37 0.39	3 6		1.0		186	3.27	1.30	0.39	1,69	2.98				- ·									,	.87	7.23	15.13
1,77 0.16 1.87 0.14 1.71 0.15 1.87 0.15 1.87 0.15 1.89 3.26 2.84 0.58 3.65 1.77 0.15 1.87 0.15 1	9 6				1.85	1.71	1,42	0.27	69.1	1.57		į		- ·										1 38	7.26	8 25
1.49 0.29 1.56 0.29 1.56 0.30 1.50 0.30 0.39 0.56 0.35 1.56 0.35 1.56 0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.35	3 8				1 87	•	1.57	0.14	17.	•														0.84	3.68	6.41
1,16 0.15 1,61 0.30 0.30 0.30 0.30 0.30 0.30 0.30 0.3	3 8	,	_							•													•	65:0	3.68	3.32
1.66 0.15 1.81 1.00 U.13 1.31 1.30 U.13 1.31 1.30 U.13 1	3		_							•				 										0.30	3.62	٠
1.10 27.1 51.42 5.88 35.26	8		•		•	•								÷								5	•		,	
7.00	8					•										•	•	•	•		•				٠	,
7.00	2		•	•	•				,							٠	•	•	•	•	,	,				
1.10 27.1 51.42 5.88 35.26	8	- 20	•							•			,			•	•	•	•	•						•
7.00	20		•			•						٠			•	•	,	•	•	•	•			,		•
1.10 20 1.1 S1.42 5.08 35.26	6			1		•		•		•							•		•	•	٠	•				•
1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10		3		•			,			,							٠		•	•						
1.10 10.00 29.71		4 2		•		•				•										•				•		٠
36.0	₹	*					,			•							•	•	•					•		•
1.10 10.00 29.71	8	125		•						•						•	•		•	•						•
1.10 1.10 22.71 51.42 5.86 35.26	2	98				•		•					•				•		•	•	•					٠
38.26	8	- 12							,	•				٠.		•	•		•	•				•		
12 to 10 to 10 10 10 10 10 10 10 10 10 10 10 10 10	8	- 28			•	,	,		•	•			•		•	•	•	•	•	•		÷	i		•	
12.00 10.00 1	8			•	•	•		•					•			•	•		•	•			,			
35.26	í 8		-			•	,		•	•						٠	•		•		•		,			
	4 6							•								l	,,	13.5			-	51.42	5.86	35.26	86.68	

International Bank Loan Repayment Schedule (Million US\$) Case 2 - Outsida

UNIT: MIKON US\$

					6	2003	ogo		25	2004 Loan	5		ZOO	104							D. de la rod.	1	CHEST IN	,		lstand-
			080		1	l		1	-bretand-				Outstand		Ren							Orinational Original	-a Internet	Yersy.		
Year	Loan	Principal fr	interest	Ropay-	Ing Ing	Princips In	Interest R	Repay. In	Ing Pri	Principal Inle	inlerest ner	nent ing		Principal Interest	rest ment	Balance	Principal	pa; interest	nent nent	į	Balance	Deriod	İ	ı		Balance
No.					Balance				200				-													
																,			,			,	. ;			
2,001.00			•		. ;																	,	2 4	•		37.27
	16.58		1.33		18.01		. !		,			,								,		. ;	7 .		000	36.46
2.00 2.003.00			1.44		19,45		132		70 /1												•	0.81	. !	5 X	900	
		0.40	1.56	86	19 03	0.39	£	1.82	17.43			•			4,7	,	15.25				•	0.99	1,13	2.91	3.80	20.05
		1 0	2	88	18.57	0.43	1,39	1.82	12.00	•			•				18.47		1.08		14.56	0.95	2.30	2.85	3.80	99.59
٠.	7	2 (,	2	19.08	0.46	1.38	1.82	16.54						77				47.	9	20.71	171		525	96.9	83.95
	13.48	A	9.	6.5	1 2	2	5	182	16.04				•	96.0	1.32		10.1	7.32	• ;			**			96.3	52 10
		0.53	÷	1	2	2		28	15.50			,		6:0	1.29		15.72	0.34	-	D :	13.30	2		20	3	60 11
7.00 2.008.00		0.58	1.40	86.	16.97	0.0	9	20.			,			0.42	1.26		15.30	0.37	1.1	1.48	13.53	6.		è	200	
	•	0.62	1.36	1.98	16.35	0.58	1.24	7.82	14.97			į.		970	. , ,		14.84	0.0	1.08	84.	13.13	2.16		99.	9.30	66.76
		0.67	13	1.98	15.68	0.63	1,19	1.82	14.29	,				9 9	4 4		14 35	0.43	1.05	64.	12.70	2.33		4,63	96.9	55.62
			40	40	14 95	0.68	7.7	1.82	13.61			,	•	0.43	n :			94.5	100	148	12.24	2.50		4.46	96.9	53 12
		2 6	2 5		14.17	0.73	1.09	1.82	12.88					0.53	6.		30.5			1 48	11.74	2.71		4.25	96.9	50.41
	•	3		5	13.32	62.0	1.03	1.82	12.09		•			0.57	11		0 0	0.00	90.0	4	. 5	2 82		2	96.9	47.49
12.00 2.013.00	•	0.00	2 5		2	2	0.97	1.82	11.24				•	0.62	90		14.03	7 6	* 600	9 4		3 - 2		3.80	96.9	44 33
	•	5 1	5.6	B 6	,	000	060	1.82	10.32					0.67	£.			0.00	200					3.55	96.9	40.92
	•	0.99	68.0	B. 6	100	0	0.83	1.82	9.33	,			•	0.72	96.0		11.24	0.63	0.00					82.5	8	37.24
	•	1.07	0.9	5	2 6		4	6	8.26			,		0.78	0.90		10.45	0.68	080	6.		9 6	1	3	90 9	32.28
		5.13	0.83	8 8	9 9	31.	9	2	7.10					9.0	0.64		9.62	0.74	7.0	P •		9 0	•	5.5	9	28 97
17.00 2,018.00		7.	0.74	8	8		2 6	6	5.85				•	0.91	0.77		1,1	67.0	0.69	1.48	0,70	67.4		5 6	3	2
18.00 . 2.019.00	•	.34	9.64	1 00.	5.62	07.	6.5	20.					•	0.98	0.70		7.73	C.86	0.62	1.48	6.92	40.4		107	9.0	7
٠.		1,45	0.53	8.	5,17	1,35	. T	797	200		•			901	0.62		6.67	C,93	0.55	1.48	2,99	5.02		3 .	8 2	5 6
	•	1,57	0.41	8	3.60	, A6	0.36	1.82	7			,		4.	550		5.52	1.00	0.48	1.48	4.99	5.42	,	.54	96.9	3.83
	,	1,69	0.29	98.	1.91	1.58	0.24	1.82	9						77		4.28	1.08	0.40	1.48	3.91	5.89		-	6.80	8.20
	•	1.91	0.15	2.08	1	1.46	0.12	1.58	•						130	1.68	2 94	1.17	0.3(1.48	2.74	2.51		9.0	3.16	5 68
			•	٠	•									į			5	1.26	0.22	1.48	1.48	2.70	•	0.46	3.16	2.99
	•		,		•				•				•	; ;	* :		3	148	2	160		2.99		0.24	3.23	,
					•			•	•				•	 	9 6	7		} .	,		•					
					•			٠													•					,
	•																									
	•				•			•	•				•													
	•	•			•	•								,											•	
29.00 2,030.00	•		•	•	•	,					,													. [-
30.00 2.031.00	•				•			,						16.47	19.42	33.54		1.56	16.24	29.72		68.31	7.52	70.80	139.11	-
1	60.79	19.45	23.00	39.68		17.82	19.56	90.00		,																

FIRR Case 3-O
Project Amatklan Geothermal
Subject FIRR - Case 3-Outside
File Name
Date
1999/5/21
Rev. 2001/10/12
解释等数数数等 (FIRR), Case 3-Outside
Filancial internal Rate of Return

FIRR = 13.40%

	-	•										
2 2	1	Project	Salable Energy	Supple.	Steem Steem	O&M for P. Plant	Steam Cost	,Ē	Generat. Cost Ttl	Project Cost Total	Revenue	Balance
	- + -	MMS	ev.	MMS	MM	MMS	MMS	MMS	MMS	MMS	MMS	NAMS
-12	2001		•					•	•			. 40 64
	2000	40.65		٠	•	•				40.65		(20.05)
	700	3		٠				,		43.18		(40.18)
	200	0.00			1 03	645	2.54	2.47	6.47	13.37	17.40	4.03
	2004	90.90	F6.712		46.	9	88.6	3.85	9.19	9.19	23.20	14.01
	2005	•	790.01		2	999	9.0	*	9.19	61.6	23.20	14.01
	2006	•	290.01		3 5	900	60.0	7 2	9	61 6	23.20	14,01
	2002	,	290.01	•	9 5	900	93.0	9 6	61.6	6	23.20	10.01
	2008		290.01	•	9	0.00	600	2 6		61.0	23.20	14.01
•	2009	•	290.01	•	1.35	0.00	500	9 6	9 6		23.20	14.01
	2010	•	290.01		33	0.50	50°C	9 6	n 6	9 0	23.20	16.0
0	2011	•	290.01		55	0.90	65.6	200	<u> </u>	n o	23.22	14.0
-	2012		290.01	٠	1,35	0.50	3.39	6.00	n (9 0	2000	11.07
-	2013		290.01	4.26	1.35	0.60	3.39	2.53	12.13	12.13	25.52	5 65
	2014		290.01		1,35	0.60	3.39	Α,	89'6	200	23.20	12.5
	č	•	290.01		3.35	0.60	3.39	4.94	9.6	826	23.20	13.32
	2 4		290.03	٠,	1.35	0.60	3,39	4.34	9.68	89 6	23.20	13.52
	2 6		280	ı	1.35	09.0	3.39	4	9.68	9 68	23.20	13.52
D 1			2000	٠	1.35	09'0	3.39	4.34	9.68	89.6	23.20	13,52
	9 6	•	2000	٠	1.35	0.80	3.39	4.34	9.68	9.68	23.20	13.52
•	800	•	2000		135	090	3,39	4.34	9.68	896	23.20	13.52
3	202	•	200		2	080	3.39	¥.	9.68	89.6	23.20	13.52
2	707		2000	. 4	135	0.60	3.39	4.34	9.68	89.6	23.20	13,52
s !	707	•	2000		35	0.60	3.39	4.47	9.81	9.81	23.20	13.39
N 5	2023		2000		3 12	0.60	3.39	5.54	10.88	10.88	23.20	12.32
3	*207		2000		2	080	339	40.00	10.88	10.88	23.20	12.32
	6707	•	20000		4	6	339	35.55	10.88	10.88	23.20	12.32
Q	2020	•	730.01			90	3 39	10	10.88	10.88	23,20	12.32
و	202/	•	730.01	•	3	9	330	r.	10 R8	10.88	23.20	12.32
	2028	,	290.01		CC .	8 5	9 6	,	4	27.0	8	3.08
5 0.	2029	•	72.50		0.3	51.0	200	Ş	7/.7	1		,
8	2030	•				•	•		•	•	. ,	•
8	2831			•					•		000	249 10
		Ph 73	7.050.05	4.26	33.85	16.91	84 75	108.41	246.17	336.90	200.00	745