Geothermal 2017 Proposed Budget

Sunrise Glow Over Plant 2 on 12/28/2015

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Assumptions

- All AFE Financials based on Power Management Forecast Prices Below

	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027
Average	$ 35.97	$ 36.88	$ 37.57	$ 39.20	$ 41.03	$ 42.81	$ 44.70	$ 46.62	$ 48.63	$ 50.72	$ 52.90	$ 55.17

- AFE Financials also included a $30/MW value for RECs.
- Annual value of local Capacity - $2,850,000.
- As predicted, Steam Flows not adversely affected by one year injection flow curtailment due to drought.
  - Actual Generation for CY15 = 1,832,524kph (1% higher than predicted)
- Annual Steam Field Report Generation Forecast:
  - Actual Generation for CY15 = 837.4GWhrs (1% higher than predicted)
- Value of FY15 energy produced with RECs and Capacity - $57,000,000.

GEO FY 2016 Proposed Budget

	FY 2015 Budget	FY 2015 Actual	FY 2016 Budget	Increase / (Decrease)	FY 2017 Proposed
Routine O&M Costs					
Variable	$871,000	827,446	$925,000	$15,000	$940,000
Fixed	3,673,731	3,059,429	3,687,700	$105,000	$3,792,700
Steam Royalties (variable)	1,876,000	1,907,001	1,876,000	($50,000)	$1,826,000
Administration	409,000	368,591	467,000	($3,000)	$464,000
Mandatory Costs	348,500	390,169	368,500	$5,000	$373,500
Inventory	270,000	260,423	275,000	($5,000)	$270,000
Transmission O & M	51,095	7,760	51,095	$0	$51,095
Routine O&M Costs w/o Labor	**7,499,326**	**6,820,819**	**7,650,295**	**67,000**	**7,717,295**
Labor	**8,583,728**	**8,129,983**	**8,595,890**	**845,585**	**9,441,475**
Total Routine O&M Costs	**16,083,054**	**14,950,802**	**16,246,185**	**912,585**	**17,158,770**
Other Costs					
Debt Service	5,106,985	5,106,985	5,108,929	816	5,109,745
CA ISO Charges (variable): 565-023-060-200-070-000- - - - ISO GMC Charges	312,417	2,027,082	303,858	4,054	307,912
Other Costs	4,063,606	3,664,753	4,232,219	(146,863)	*4,085,356
Generation Services Shared	887,157	548,827	769,302	(769,302)	0
Administrative & General	2,882,295	2,600,309	2,892,134	(2,892,134)	0
Total O&M Costs	**29,335,514**	**28,898,758**	**29,552,627**	**(2,890,844)**	**26,661,783**
Capital Projects					
O&M Projects	972,000	1,007,045	1,500,000	(1,100,000)	400,000
Capital Projects	369,400	367,513	425,000	1,750,000	2,175,000
Capital Development Reserve	1,650,000	1,650,000	1,000,000	(1,000,000)	0
Total Capital Budget	**2,991,400**	**3,024,558**	**2,925,000**	**(350,000)**	**2,575,000**
Annual Budget Cost	**32,326,914**	**31,923,316**	**32,477,627**	**(3,240,844)**	**29,236,783**

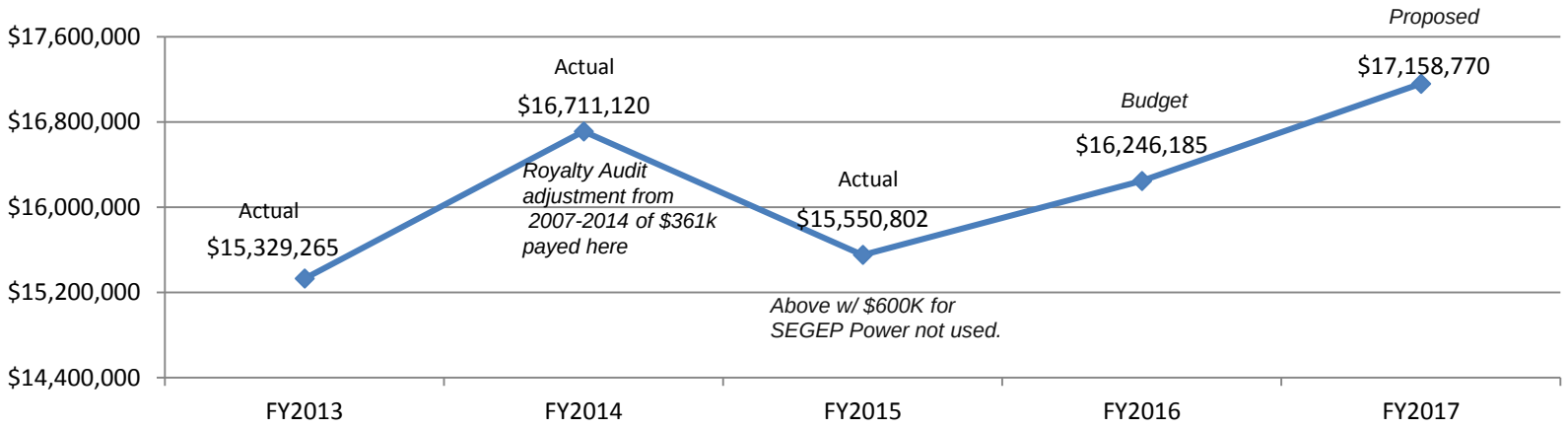
0.88% increase in Routine O&M additional lab costs due to retirement

Labor increase per Union MOU, Retirement Medical

* Note that this number could be altered yet by accounting

11.97% decrease in Projects

Routine O & M With Labor - Actual



GEO - FY 2017 Proposed Projects

0 & M Projects	Notes	$400,000
Plant, Yard and Road Repair Maintenance	M	250,000
Plant 1 Cooling Tower Structure Work	M/S	150,000

Capital Projects	Notes	$2,175,000
Vehicle Replacements	D	100,000
Plant 1 HVAC	M	1,000,000
Access Platforms	D	150,000
Plant 1 Auxiliary Steam Pipeline Modification	D	100,000
Boom Truck	D	175,000
Unit 4 Main Steam Pipeline	D	650,000

Capital Development Reserve Projects	$6,123,658 IN ACCOUNT	$-0-
Annual Fund Requirement		$0

Plant, Yard and Road Repair Maintenance

Project	Notes	Total Cost	FY 2017
Plant, Yard & Road Repairs	M	250,000	250,000

Notes:
- D Discretionary
- M Mandatory
- CR Annual deposit to the Capital Development Reserve

Financial Evaluation: Mandatory

- Steam field roads and plant yards require periodic maintenance to allow safe access and comply with permit conditions. Maintenance may include asphalt repair, crack sealing, re-coating of asphalt, chip sealing of roads, and road striping.
- Asphalt repairs were completed at Plant #2 in FY 2015 along with some road patching and sealing outside the plant area.
- Plans are to continue road maintenance work in FY 2017 on the main road to both Plants #1 and #2. Roads to F, H, P and Q sites will need some work.
- The main easement through the Calpine Facility should be chip sealed in FY 2017, with NCPA paying for 60% and Calpine paying 40%, per our road maintenance agreement.

Plant 1 Cooling Tower Structure Work

Project	Notes	Total Cost	FY 2017
Plant 1 Cooling Tower	M/S	150,000	150,000

Notes:
- D Discretionary
- M Mandatory
- Annual deposit to the Capital
- CR Development Reserve

Financial Evaluation:
Mandatory

The Plant 1 Cooling Tower has been in mostly continuous service for over 30 years and requires the below major maintenance:

1. The Deck on the top of the tower where the employees occasionally have to do work is in need of major maintenance.
2. Some railing work and the trays need to be overlaid for safety.
3. Plant 1 CT Distribution boxes need to be replaced.

Vehicle Replacements

Project	Notes	Total Cost to Complete	FY 2017
Vehicle Replacements	D	100,000	100,000

Notes:
- D Discretionary
- M Mandatory
- CR Annual deposit to the Capital Development Reserve

Financial Evaluation:
N/A

- Replace a 2000 Operations Truck with well over 110,000 Geysers miles on it.
- Estimated Cost $40,000.
- Replace a 1985 Ford 2WD F250 Maintenance Vehicle that has 142,746 miles with a 1 Ton 4WD vehicle, which will allow safer access to the entire wellfield in the winter.
- Estimated cost $60,000.
- The older, Operations and Maintenance vehicles will be sent out for sale following NCPA Policy.

Plant 1 HVAC System

Project	Notes	Total Cost to Complete	FY 2017
Plant 1 HVAC	M	1,000,000	1,000,000

Notes:
- D Discretionary
- M Mandatory
- CR Annual deposit to the Capital Development Reserve

Financial Evaluation: Mandatory

- The HVAC at Plant 1 is not working correctly.
- Efforts to adequately repair have been unsuccessful.
- During hot days, the doors to electronic rooms have to be open for cooling, which could be a NERC issue.
- Leaving the doors open exposes sensitive devices to a corrosive atmosphere.
- Based on engineers estimates, the replacement cost was going to be $500,000.
- Went out to bid, lowest bid was $1.5M.
- We plan on completing a portion of the project in FY16 and identified over $300,000 in cost savings for the project.
- Will still need $1,000,000 to finish.

Access Platforms

Project	Notes	Total Cost to Complete	FY 2017
Plant 1 Access Platforms	D	150,000	150,000

Notes:

- D Discretionary
- M Mandatory
- CR Annual deposit to the Capital Development Reserve

Financial Evaluation:

AFE Financial Measurements	Value
NPV @ Discount Rate	35,868
IRR	7.5%
Average Annual Benefits	7,197
Payback	12.0
Useful Life	25.0
B/C Ratio	1.25

- The total cost of installing the access platforms is estimated to be $150K. This total cost includes:
  - $30K for design of the platform structures.
  - $120K to install the platforms.

In order to properly check Plant 1 Unit Performance, a Man Lift needs to be rented to access both metering devices to get a more accurate reading.

- Rental of the Man lift is costly and when performance issues are suspected there is a delay between the time it is discovered and the delivery of a man lift. This delay can result in additional MW losses.
- A recent Safety evaluation identified improvements for the access to the devices that are necessary for the performance checks for Units 1 & 2.
- The installation of the platforms will enhance the safety of the personnel that need to access the equipment.

Plant 1 Auxiliary Steam Pipeline Modification

Project	Notes	Total Cost to Complete	FY 2017
Plant 1 Aux Steam	D	100,000	100,000

Notes:
- D Discretionary
- M Mandatory
- Annual deposit to the Capital
- CR Development Reserve

Financial Evaluation:

Useful Life (Years):	10
IRR:	47%
Payback (years):	2.00
NPV @ 5%:	$486,004
Est. Annual Benefits:	$ 77,272

- At present there is one well dedicated to the Auxiliary Steam Supply for the Gas Removal System (GRS).
- That well is experiencing a 1-2% decline.
- If the well drops below the necessary minimum pressure to run the GRS, the Unit will have to take a 5 MW Curtailment until another well is piped in to the system.
- This project will pipe another D Pad well in for a standby steam supply to the GRS if it is needed.

Boom Truck

Project	Notes	Total Cost to Complete	FY 2017
Boom Truck	D	175,000	175,000

Notes:
- D Discretionary
- M Mandatory
- CR Annual deposit to the Capital Development Reserve

Financial Evaluation:

Useful Life (Years):	10
IRR:	45%
Payback (years):	2.0
NPV @ 5%:	$359,368
Est. Annual Benefits:	$ 49,048

- The GEO purchased a 1996 Boom Truck over 10 years ago and the continued maintenance of that vehicle has become problematic.
- Increasingly, the existing NCPA Boom Truck is in for repairs which forces staff to either rent a truck or call one of the boom truck operators for assistance.
- Two sets of economics were run for this AFE:
  - Hiring a Truck and Operator.
  - Renting a Truck and having an NCPA Employee Operate it.
- The above economics is based on Hiring a Truck and Operator vs. buying a truck.

Unit 4 Main Steam Pipeline

Project	Notes	Total Cost to Complete	FY 2016	FY 2017
Remove/Improve Plant 2 Piping	D	950,000	300,000	650,000

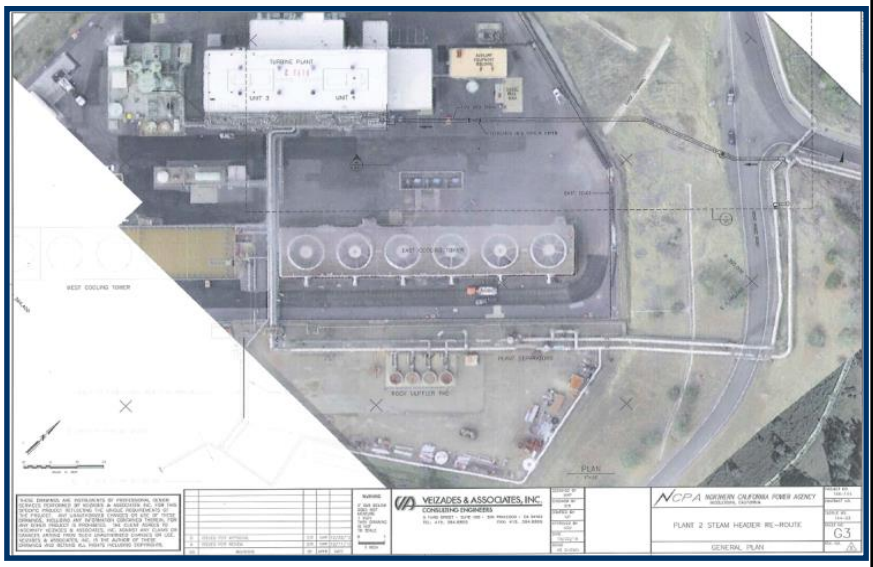
Notes:

- D Discretionary
- M Mandatory
- Annual deposit to the Capital
- CR Development Reserve

Financial Evaluation:

FINANCIAL EVALUATION SUMMARY	
Useful Life (Years):	15.00
IRR:	38.5%
Payback (years):	3.0
NPV @ 5%:	4,104,163
Est. Annual Benefits:	365,455

- FY16 budget has $300,000 to eliminate some piping issues.
- Presently, steam delivered to Unit #4 turbine drops 3.2 psig from outside the plant fence line to the turbine building.
- Numerical modeling/in-house calculations show that approximately half of this pressure drop can be eliminated by directly routing the steam into the turbine building.
- Approximately 1 MW of generation recovered if Unit #4 main steam pipeline uses proposed route.
- If approved, additional funds of $650,000 will be required in FY 2017 to accomplish the re-route to minimize pressure losses and improve steam deliverability to the turbine.



GEO - FY 2017 Proposed Projects

0 & M Projects	Notes	$400,000
Plant, Yard and Road Repair Maintenance	M	250,000
Plant 1 Cooling Tower Structure Work	M/S	150,000

Capital Projects	Notes	$2,175,000
Vehicle Replacements	D	100,000
Plant 1 HVAC	M	1,000,000
Access Platforms	D	150,000
Plant 1 Auxiliary Steam Pipeline Modification	D	100,000
Boom Truck	D	175,000
Unit 4 Main Steam Pipeline	D	650,000

Capital Development Reserve Projects	$6,123,658 IN ACCOUNT	$-0-
Annual Fund Requirement		$0

GEO – FY 2017 Reserve Fund Proposed Projects

Funding/(Expenditures)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Reserve Activity											
Unit One Overhaul				(1,500,000)							
Unit Two Overhaul				(1,500,000)							
Unit Four Overhaul	(1,871,000)						(1,500,000)				
Well Replacement /Workover			(3,900,000)			(3,900,000)			(3,900,000)		
Contingent maintenance											
Projected Requirements	(1,871,000)	-	(3,900,000)	(3,000,000)	-	(3,900,000)	(1,500,000)	-	(3,900,000)	-	-
Annual Funding Req*	1,000,000	-	1,300,000	1,800,000	1,800,000	2,000,000	1,300,000	1,300,000	1,300,000	1,300,000	1,300,000
Balance	6,123,658	6,123,658	3,523,658	2,323,658	4,123,658	2,223,658	2,023,658	3,323,658	723,658	2,023,658	3,323,658
Minimum Contingency Balance	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000

*Estimated

Maintenance Reserve Project(s)

Project	Notes	Cost	FY 2017	FY 2018
Well Workovers & Drilling - 2018	D/CR	3,900,000	0	$676,000

Notes:

- D Discretionary
- M Mandatory
- Annual deposit to Capital
- CR Development Reserve

FINANCIAL EVALUATION SUMMARY

- In order to maximize Steam Field Production, occasional drilling and well workover activities need to take place in the field.
- Originally planned to occur every three years, the drilling schedule has recently been extended due to a combination of lack of injection water in 2015 (allowing injection wells to dry out and heat up) and the success of the recent conversions of several wells to 'huff and puff' status.
- The delay of those drilling projects have allowed for sufficient funds in Maintenance Reserve to not request any collection in FY17.

Maintenance Reserve Project(s)

Project	Notes	Cost	FY 2017	FY 2018
Unit 1 Overhaul - 2019	D/CR	1,500,000	0	$208,000

Notes:

- D Discretionary
- M Mandatory
- Annual deposit to Capital
- CR Development Reserve

FINANCIAL EVALUATION SUMMARY

- An overhaul is scheduled every 6 years for the inspection, testing and cleaning of the Turbine, Generator and Auxiliary plant equipment to maintain them in a safe, reliable and efficient operating condition.
- There is sufficient funds in the Maintenance Reserve to date to not ask for a FY2017 contribution due to the delaying of drilling work for another year.
- The extension of the drilling schedule is primarily due to a combination of lack of injection water in 2015 (injection wells drying out and heating up) and the success of the recent conversions of several wells to 'huff and puff' status.

Maintenance Reserve Project(s)

Project	Notes	Cost	FY 2017	FY 2018
Unit 2 Overhaul - 2019	D/CR	1,500,000	0	$208,000

Notes:

- D Discretionary
- M Mandatory
- Annual deposit to Capital
- CR Development Reserve

FINANCIAL EVALUATION SUMMARY

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Maintenance Reserve Project(s)

Project	Notes	Cost	FY 2017	FY 2018
Unit 4 Overhaul - 2022	D/CR	1,500,000	0	$208,000

Notes:

- D Discretionary
- M Mandatory
- Annual deposit to Capital
- CR Development Reserve

FINANCIAL EVALUATION SUMMARY

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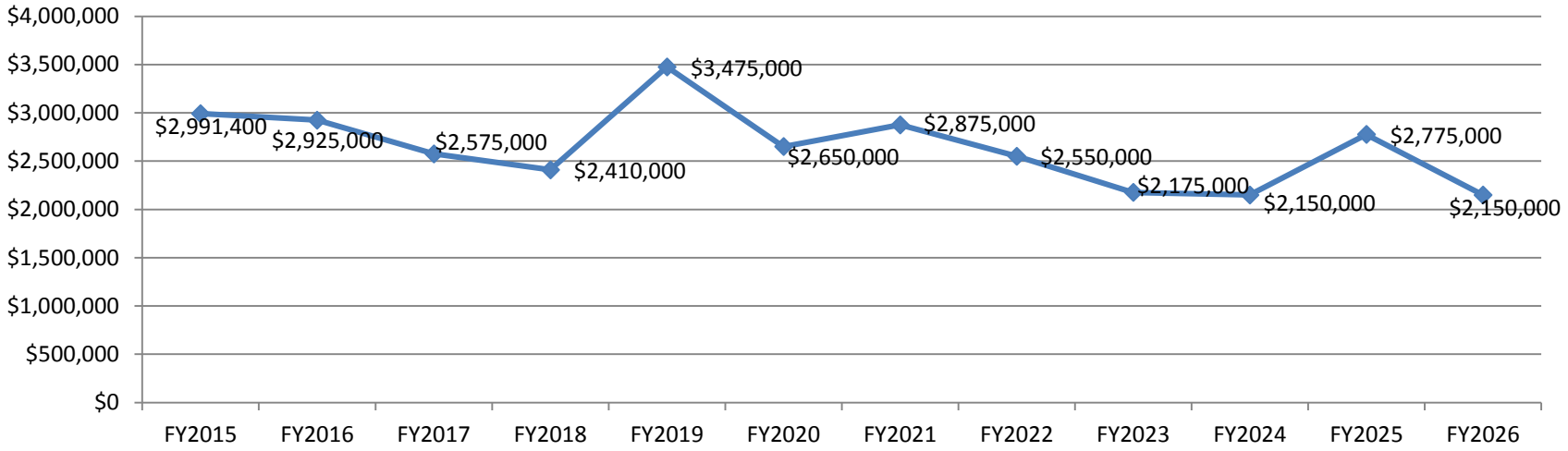
GEO Projects Expenditures Including Maintenance Reserve



GEO – Project Forecast

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
O&M Projects											
Plant 2 Fire System	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Plant, Yard & Road Repairs	175,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Wellhead Valve Replacements and Rebuilds	-	-	60,000	-	-	-	-	-	-	-	-
Undefined Projects	-	-	600,000	1,200,000	600,000	600,000	1,000,000	600,000	600,000	1,200,000	600,000
Plant 1 Bridge Crane Overhaul	100,000	-	-	-	-	-	-	-	-	-	-
SED Basin Concrete Maintenance & Coating	300,000	-	-	-	-	-	-	-	-	-	-
Chem Lab Up to Code	150,000	-	-	-	-	-	-	-	-	-	-
Q Site Condensate Tank	100,000	-	-	-	-	-	-	-	-	-	-
Physical Security	175,000	-	-	-	-	-	-	-	-	-	-
Main Steam Piping Modifications	-	-	200,000	200,000	-	-	-	-	-	-	-
Plant 1 Cooling Tower Structure Work	-	150,000	-	-	-	-	-	-	-	-	-
D-5 Abandonment	200,000	-	-	-	-	-	-	-	-	-	-
TOTAL O & M PROJECT Costs	**1,500,000**	**400,000**	**1,110,000**	**1,650,000**	**850,000**	**850,000**	**1,250,000**	**850,000**	**850,000**	**850,000**	**850,000**
CAPITAL PROJECTS											
Vehicle Replacements	-	100,000	-	25,000	-	25,000	-	25,000	-	25,000	-
Plant 1 HVAC	-	1,000,000	-	-	-	-	-	-	-	-	-
Access Platforms	-	150,000	-	-	-	-	-	-	-	-	-
Remove/Improve Plant 2 Piping	300,000	650,000	-	-	-	-	-	-	-	-	-
Concrete Pad for Large Truck Bins	125,000	-	-	-	-	-	-	-	-	-	-
Add Dedicated D Line Steam Wells	-	100,000	-	-	-	-	-	-	-	-	-
Boom Truck	-	175,000	-	-	-	-	-	-	-	-	-
TOTAL CAPITAL PROJECT COSTS	**425,000**	**2,175,000**	**0**	**25,000**	**0**	**25,000**	**0**	**25,000**	**0**	**25,000**	**0**
RESERVE FUND SPENDING											
BEGINNING YEAR BALANCE	6,994,658	6,123,658	7,423,658	5,323,658	4,123,658	6,123,658	3,523,658	3,323,658	4,623,658	2,023,658	3,323,658
Unit One Overhaul	-	-	-	1,500,000	-	-	-	-	-	-	-
Unit Two Overhaul	-	-	-	1,500,000	-	-	-	-	-	-	-
Unit Four Overhaul	1,871,000	-	-	-	-	-	1,500,000	-	-	-	-
Well Replacement /Workover	-	-	3,900,000	-	-	3,900,000	-	-	3,900,000	-	-
TOTAL RESERVE FUND SPENDING	**1,871,000**	**0**	**3,900,000**	**3,000,000**	**0**	**3,900,000**	**1,500,000**	**0**	**3,900,000**	**0**	**0**
ADDITIONAL FUNDING	1,000,000	-	1,300,000	1,800,000	1,800,000	2,000,000	1,300,000	1,300,000	1,300,000	1,300,000	1,300,000
END OF YEAR BALANCE	**6,123,658**	**6,123,658**	**3,523,658**	**2,323,658**	**4,123,658**	**2,223,658**	**2,023,658**	**3,323,658**	**723,658**	**2,023,658**	**3,323,658**
ALL PROJECTS COSTS WITH RESERVE FUNDING	**2,925,000**	**2,575,000**	**2,410,000**	**3,475,000**	**2,650,000**	**2,875,000**	**2,550,000**	**2,175,000**	**2,150,000**	**2,775,000**	**2,150,000**

Geothermal 2017 Proposed Budget

Sunrise Glow Over Plant 2 on 12/28/2015