

**EXHIBIT "I-9"**  
**PART H**

## Supply Options

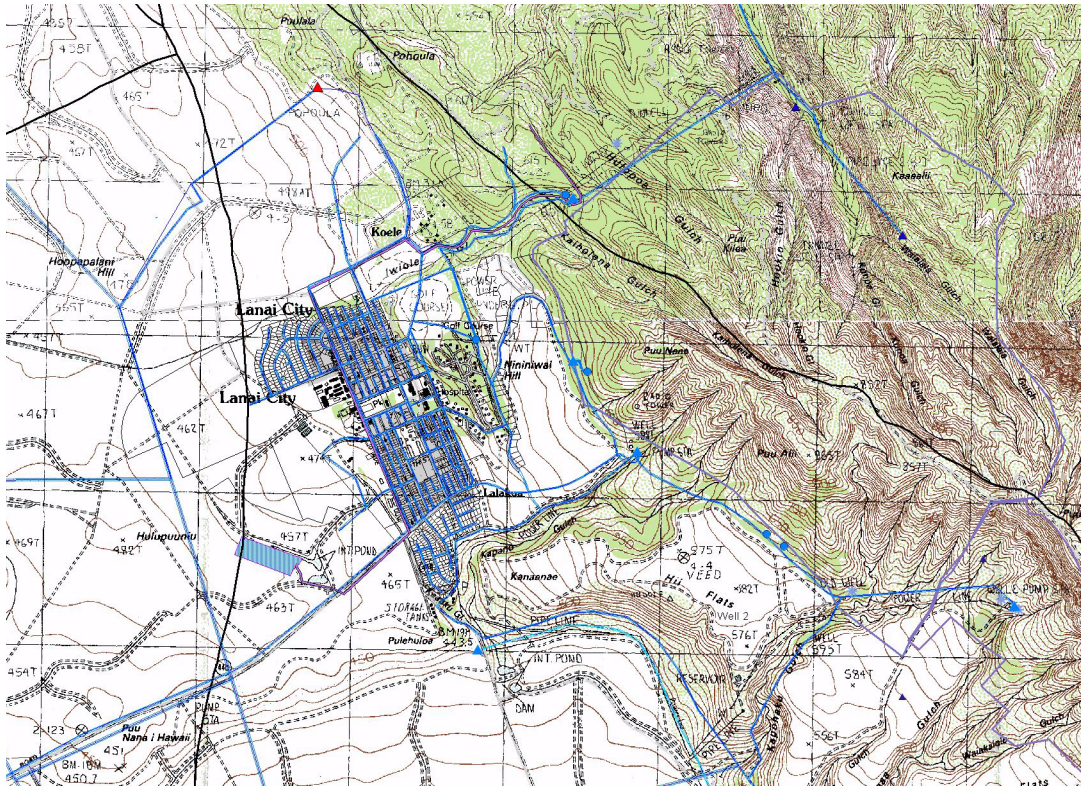
## Recommission Well 7

Well 7 is not presently in use. Although initial water levels appear to have been lower than those in many of the pumping wells, it offers some advantages. The fact that the well has already been drilled would help to keep costs of development down. Well 7 could readily be tied in to both the City system and the west end of the Palawai Irrigation Grid, offering operational flexibility. Well 7 could serve as a backup well to enhance system reliability.

The costs of bringing Well 7 on line were estimated assuming new transmission, storage and pump facilities. The well is at 1,775' elevation with a water level of 650'. The project includes the costs of engineering, refurbishing the pump site, development including ancillaries, connection to adjacent power and water transmission lines and contingencies.

Production is assumed to average 300,000 GPD. Capital costs are \$2.7 million. First year electrical energy cost is \$2.39 per thousand gallons. The total thirty-year levelized costs are \$6.02 per thousand gallons. This cost is comprised of \$1.78 capital cost, \$0.35 fixed operating and maintenance cost and \$3.89 electrical energy cost.

**FIGURE 5-11. Recommission Well 7**



## Potential Supply Options

**FIGURE 5-12. Recommission Well 7**

Capacity (MGD)				
Installed Capacity		0.720		
Max. Day Capacity		0.720		
Effective Sustainable Capacity		0.300		
Facility Capacity Factor		100%		
Average Facility Output		0.300		
Capital Costs (\$)	Total	Per MGD		
Exploration/Land/Power	\$0	\$0	HDA Estimate	Existing well site
Refurbish well site	\$50,000	\$166,667	HDA Estimate	Refurbish well site
Development	\$1,159,000	\$3,863,333	HDA Estimate	(1) pump 1 mgd @ \$550k, SCADA, ancillaries
Transmission Improvements	\$697,842	\$2,326,140		2900 ft 8" line @ \$200 pft to L.C. Tank
Storage Improvements	\$250,000	\$833,333		50Kgal contact tank; chlorinator
Design / Engineering	\$75,000	\$250,000	HDA Estimate	Hydrology, siting, well engineering
Contingencies	\$446,368	\$1,487,895	HDA Estimate	20%
Total Plant Cost (	\$2,678,210	\$8,927,368		
Const. Per. Esc. Rate (Nom.)	3.00%			
AFUDC Interest Rate (Nom.)	6.00%			
AFUDC Factor		1.000		
Total Capitalized Cost	\$2,678,210	\$8,927,368		
Fixed Operating Costs (\$)	Per Year	Per Y/MGD		
Dedicated Operating Labor	\$5,479	\$18,263		\$0.05 per kgal based on estimated Lanai average
Apportioned Operating Labor		\$0	HDA Estimate	
Maintenance Labor		\$0		
Fixed Operating Costs				
Electrical Demand	\$21,240	\$70,800		5 Kwh/Kgal/Kft lift efficiency*derived sys demand cost factor*electrical energy cost*installed capacity
Chemicals/Materials		\$0		
Maintenance Expenses		\$0		
Amort. of Capitalized Rebuild Costs		\$0		
Total Fixed Op. Costs	\$26,719	\$89,062		
Variable Operating Costs (\$)		Per KGal		
Operating Labor				
Maintenance Labor				
Electrical Energy		\$2.360	HDA calculation	5 kwh per kgal per thousand feet vertical lift @ \$.40 per kwh
Chemicals/Materials		\$0.008	HDA Estimate	Vertical lift from el 1000' water level to el 1850' tank
Maintenance Expenses				150% Maui system average cost
Total Variable Op. Costs		\$2.368		
Plant Life (Years)				
Functional Life	30			
Economic/Analysis Life	30			
Book Life	20			
Levelized Production Costs (\$)				
Cost of Capital	6.00%			
Discount Rate (Nom.)	6.00%			
Fixed Op.Cost Esc. Rate (Nom.)	3.00%			
Effective Fixed Op.Cost. Disc. Rate	2.91%			
Var. Op.Cost Esc. Rate (Nom.)	4.00%			
Effective Var. Op.Cost. Disc. Rate	1.92%			
First Year Cost w/Amortized Capital		\$/kgal		
Amortized Cap. Cost (Book Life)		\$2.131		
Fixed Op. Cost		\$0.244		
Variable Op. Cost		\$2.368		
Twenty-year Total NPV Cost	NPV \$/MMGD	Levelized \$/kgal		
Capital Cost (20 year Amort.)	8.927	\$2.131		
Fixed Op. Cost	1.336	\$0.319		
Variable Op. Cost	14.245	\$3.400		
Economic Life Total NPV Cost	NPV \$/MMGD	Levelized \$/kgal		
Capital Cost (Amort. per Econ. Life)	8.927	\$1.776		
Fixed Op. Cost	1.766	\$0.351		
Variable Op. Cost	19.573	\$3.893		



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## Supply Options

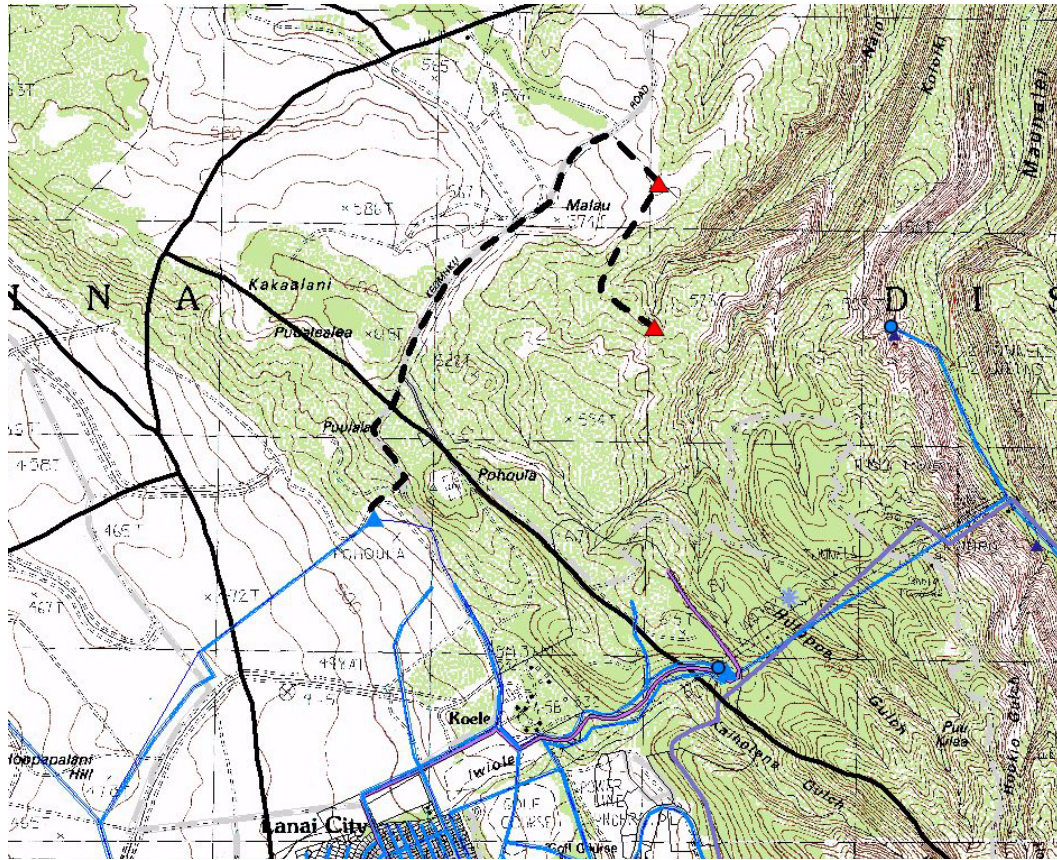
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### Windward Wells at Malau

The area north of Lana'i City along Commode Road near the ridge is in the northwest portion of the Windward aquifer. There are several possible well site locations in this area. This area is approximately one mile north of Well 6. This area is reasonably close to existing power and water transmission lines and would have economical road access.

Costs for a new potable well at this location were analyzed assuming a wellhead ground elevation of 1810 feet pumping from a water level of 1000 ft. to the Lana'i City tank elevation of 1850 feet. Production is assumed to be 300,000 GPD with a 0.864 MGD pump. Capital costs include engineering, drilling, well development and ancillaries, contact tank with chlorination, new 8" water transmission line to Lana'i City tank and contingency. First year electricity cost is \$1.71 per thousand gallons. The total thirty-year levelized costs are \$7.35 per thousand gallons. This cost is comprised of \$4.23 capital cost, \$0.31 fixed operating and maintenance cost and \$2.81 electrical energy cost.

**FIGURE 5-13. Windward Wells at Malau**





## Potential Supply Options

**FIGURE 5-14. Windward Wells at Malau**

Capacity (MGD)				
Installed Capacity		0.864		
Max. Day Capacity		0.864		
Effective Sustainable Capacity		0.300		
Facility Capacity Factor		100%		
Average Facility Output		0.300		
Capital Costs (\$)	Total	Per MGD		
Exploration/Land/Power	\$5,000	\$16,667	HDA Estimate	Connection to existing power line
Drilling	\$750,000	\$2,500,000	HDA Estimate	(1) well 12" at 1000 ft @ \$750 p/f
Development	\$1,159,000	\$3,863,333	HDA Estimate	(1) pump 1 mgd @ \$550k, SCADA, ancillaries
Transmission Improvements	\$3,000,000	\$10,000,000		15,000 ft 8" line @ \$200 p/f to L.C. Tank
Storage Improvements	\$250,000	\$833,333		50Kgal contact tank; chlorinator
Design / Engineering	\$150,000	\$500,000	HDA Estimate	Hydrology, siting, well engineering
Contingencies	\$1,062,800	\$3,542,667	HDA Estimate	20%
Total Plant Cost (	\$6,376,800	\$21,256,000		
Const. Per. Esc. Rate (Nom.)	3.00%			
AFUDC Interest Rate (Nom.)	6.00%			
AFUDC Factor		1.000		
	Total	Per MGD		
Total Capitalized Cost	\$6,376,800	\$21,256,000		
Fixed Operating Costs (\$)	Per Year	Per Y/MGD		
Dedicated Operating Labor	\$5,479	\$18,263		\$0.05 per kgal based on estimated Lanai average
Apportioned Operating Labor		\$0	HDA Estimate	
Maintenance Labor		\$0		
Fixed Operating Costs				
Electrical Demand	\$18,360	\$61,200		5 Kwh/Kgal/Kft lift efficiency*derived sys demand cost factor*electrical energy cost*installed capacity
Chemicals/Materials		\$0		
Maintenance Expenses		\$0		
Amort. of Capitalized Rebuild Costs		\$0		
Total Fixed Op. Costs	\$23,839	\$79,463		
Variable Operating Costs (\$)		Per KGal		
Operating Labor				
Maintenance Labor				
Electrical Energy		\$1.700	HDA calculation	5 kwh per kgal per thousand feet vertical lift @ \$.40 per kwh Vertical lift from el 1000' water level to el 1650' tank
Chemicals/Materials		\$0.008	HDA Estimate	150% Maui system average cost
Maintenance Expenses				
Total Variable Op. Costs		\$1.708		
Plant Life (Years)				
Functional Life	30			
Economic/Analysis Life	30			
Book Life	20			
Levelized Production Costs (\$)				
Cost of Capital	6.00%			
Discount Rate (Nom.)	6.00%			
Fixed Op. Cost Esc. Rate (Nom.)	3.00%			
Effective Fixed Op. Cost. Disc. Rate	2.91%			
Var. Op. Cost Esc. Rate (Nom.)	4.00%			
Effective Var. Op. Cost. Disc. Rate	1.92%			
		\$/kgal		
First Year Cost w/Amortized Capital		\$6.999		
Amortized Cap. Cost (Book Life)		\$5.074		
Fixed Op. Cost		\$0.218		
Variable Op. Cost		\$1.708		
	NPV \$M/MGD	Levelized \$/kgal		
Twenty-year Total NPV Cost	32.722	\$7.816		
Capital Cost (20 year Amort.)	21.256	\$5.074		
Fixed Op. Cost	1.192	\$0.284		
Variable Op. Cost	10.274	\$2.452		
	NPV \$M/MGD	Levelized \$/kgal		
Economic Life Total NPV Cost	36.948	\$7.354		
Capital Cost (Amort. per Econ. Life)	21.256	\$4.228		
Fixed Op. Cost	1.575	\$0.313		
Variable Op. Cost	14.117	\$2.808		

## Supply Options

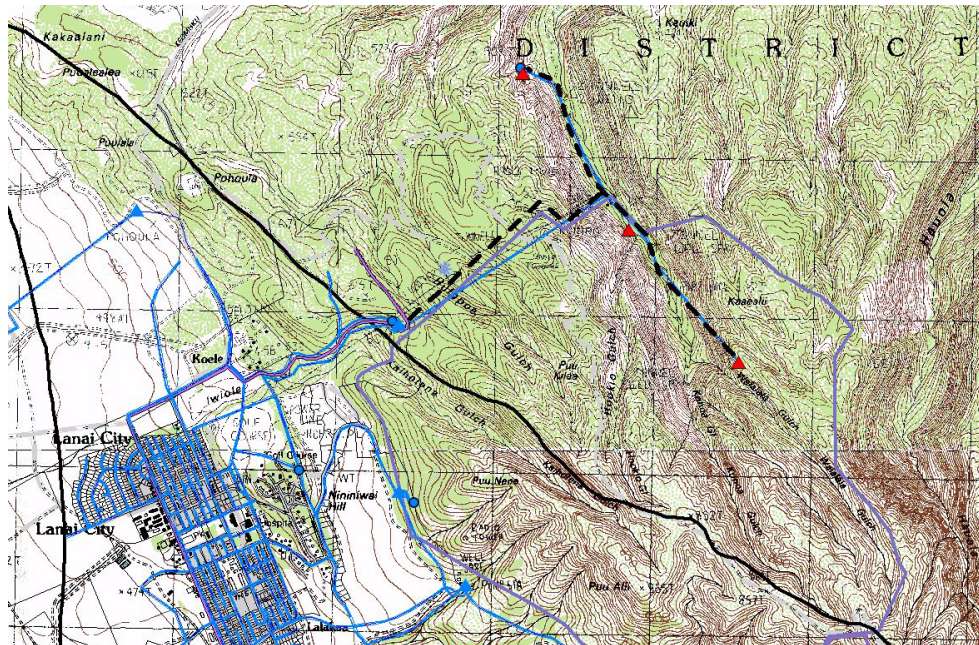
### Recommission Windward Maunalei Shaft and Tunnels

The Maunalei Shaft #2 and the Maunalei Tunnels #1 and #2 are located two miles northeast of Lana‘i City in Maunalei gulch. Shaft #2 is located at the 850’ elevation. The tunnels are located at the 1,100’ and 1500’ elevation respectively. These windward aquifer sources draw water at approximately the same elevation as the water levels in the leeward high level potable aquifer sources. These were once major developed sources of water for the island. Existing but old high pressure water transmission lines connect these sources with one another and up the side of the gulch to the location of Well 6.

The cost of using Maunalei sources was evaluated with four assumptions. In this option, existing sources could be refurbished, but transmission would need replacement. Although this scenario is unlikely, it is examined here for the benefit of cost comparison. It assumes the need for source improvements, a booster pump station and control tank. The feasibility of recommissioning these water sources would have to be determined by further study. Cost estimates include hydrology and feasibility study, engineering, new power and water transmission lines, source improvements, SCADA and ancillaries, booster station, control and contact storage tank and contingency.

Two principal cost elements for this project are the capital cost of the transmission improvements and electrical costs to pump water from the sources in the gulch up to the 2,060 foot hydraulic elevation at the ridge. Capitalized costs total \$10.1 million in this scenario. First year electricity cost is \$2.43 per thousand gallons. The total thirty-year levelized costs are \$8.40 per thousand gallons. This cost is comprised of \$4.02 capital cost, \$0.38 fixed operating and maintenance cost and \$3.99 electrical energy cost.

**FIGURE 5-15. Recommission Windward Maunalei Shaft and Tunnels**



## Potential Supply Options

**FIGURE 5-16. Recommissioning Windward Maunalei Shaft and Tunnels**

Capacity (MGD)				
Installed Capacity		1.000		
Max. Day Capacity		0.750		
Effective Sustainable Capacity		0.500		
Facility Capacity Factor		100%		
Average Facility Output		0.500		
Capital Costs (\$)	Total	Per MGD		
Exploration/Land/Power	\$175,000	\$350,000	HDA Estimate	Electrical controls, water utility power transmission ext. share Road improvements
Shaft / Tunnel Improvements	\$750,000	\$1,500,000	HDA Estimate	
Development / Booster Station	\$1,500,000	\$3,000,000	HDA Estimate	SCADA, ancillaries, booster station w/intake sump structure
Transmission Improvements	\$5,500,000	\$11,000,000	HDA Estimate	4500 ft 8" line @ \$200 pif feeds to lift 4750 ft 10" hp line @ \$500 pif Maunalei to ridge to Well #6 5000 ft 12" line @ \$445 pif Well#6 to Lanai City Tank
Storage Improvements	\$250,000	\$500,000		50kgal contact/control tank
Design / Engineering	\$250,000	\$500,000	HDA Estimate	Hydrology study, engineering
Contingencies	\$1,685,000	\$3,370,000	HDA Estimate	20%
Total Plant Cost (	\$10,110,000	\$20,220,000		
Const. Per. Esc. Rate (Nom.)	3.00%			
AFUDC Interest Rate (Nom.)	6.00%			
AFUDC Factor		1.000		
Total Capitalized Cost	\$10,110,000	\$20,220,000		
Fixed Operating Costs (\$)	Per Year	Per Y/MGD		
Dedicated Operating Labor	\$18,263	\$36,525		\$0.10 per kgal based on two times average due to remote location
Apportioned Operating Labor		\$0	HDA Estimate	
Maintenance Labor		\$0		
Fixed Operating Costs				
Electrical Demand	\$30,250	\$60,500		5 Kwh/Kgal/Kft lift efficiency*derived sys demand cost factor*electrical energy cost*installed capacity
Chemicals/Materials		\$0		
Maintenance Expenses		\$0		
Amort. of Capitalized Rebuild Costs		\$0		
Total Fixed Op. Costs	\$48,513	\$97,025		
Variable Operating Costs (\$)		Per KGal		
Operating Labor				
Maintenance Labor				
Electrical Energy		\$2.420	HDA calculation	5 kwh per kgal per thousand feet vertical lift @ \$.40 per kwh Vertical lift from el 850' water level to el 2060' hydraulic line at ridge"
Chemicals/Materials		\$0.008	HDA Estimate	150% Maui system average cost
Maintenance Expenses				
Total Variable Op. Costs		\$2.428		
Plant Life (Years)				
Functional Life	30			
Economic/Analysis Life	30			
Book Life	20			
Levelized Production Costs (\$)				
Cost of Capital	6.00%			
Discount Rate (Nom.)	6.00%			
Fixed Op.Cost Esc. Rate (Nom.)	3.00%			
Effective Fixed Op.Cost. Disc. Rate	2.91%			
Var. Op.Cost Esc. Rate (Nom.)	4.00%			
Effective Var. Op.Cost. Disc. Rate	1.92%			
First Year Cost w/Amortized Capital		\$/kgal		
		\$7.520		
Amortized Cap. Cost (Book Life)		\$4.826		
Fixed Op. Cost		\$0.266		
Variable Op. Cost		\$2.428		
Twenty-year Total NPV Cost	NPV \$M/MGD	Levelized \$/kgal		
	36.281	\$8.666		
Capital Cost (20 year Amort.)	20.220	\$4.826		
Fixed Op. Cost	1.455	\$0.347		
Variable Op. Cost	14.606	\$3.486		
Economic Life Total NPV Cost	NPV \$M/MGD	Levelized \$/kgal		
	42.213	\$8.402		
Capital Cost (Amort. per Econ. Life)	20.220	\$4.022		
Fixed Op. Cost	1.923	\$0.383		
Variable Op. Cost	20.069	\$3.992		



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**Supply Options**

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**Windward Wells at Maunalei Shaft and Tunnel Sites**

Wells could be developed in the bottom of Maunalei gulch. This would require similar improvements as recommissioning the Maunalei #2 Shaft and tunnels described above, including new or repaired transmission lines and a new booster station.

Cost analysis was performed for several scenarios. Two scenarios assume that the existing transmission pipes, right of way and electrical lines to the Maunalei sources could be used with some improvements. Booster station construction and other improvements in these scenarios are similar to the recommissioning scenario described above. Costs were derived for approaches that include development of two and three wells, respectively. A third scenario assumes that construction of new high pressure transmission lines will be necessary.

In all three scenarios it is assumed that the new wells would be in the vicinity of the Maunalei 2 Shaft and/or Maunalei Tunnels along the existing collector line that serves these sources. Costs of hydrology and engineering studies to locate and design the wells is included. The wells are assumed to be at an elevation of 850 to 1100 ft. pumping from a water level of 800 to 1,000 ft. Pumping costs are estimated based on pumping water over the ridge at the location of the existing line at an elevation of 2,060 ft. Wells are assumed to be 500 ft. deep installed with 1 MG pumps.

For two wells relying on improvements to existing transmission with a total average output of 500,000 GPD, the capital cost is \$6.8 million. First year electrical energy cost is \$2.43 per thousand gallons. The total thirty-year levelized costs are \$7.31 per thousand gallons. This cost is comprised of \$2.69 capital cost, \$0.62 fixed operating and maintenance cost and \$3.99 electrical energy cost.

For three wells using existing transmission, the total average output is assumed to be 750,000 GPD. The capitalized cost is \$8.0 million. First year electrical energy cost is \$2.43 per thousand gallons. The total thirty-year levelized costs are \$6.73 per thousand gallons. This cost is comprised of \$2.12 capital cost, \$0.62 fixed operating and maintenance cost and \$3.99 electrical energy cost.

For three wells with new transmission pipe installed from the wells to the Lana'i City tank the capital cost is \$6.5 million. First year electrical energy cost is \$2.43 per thousand gallons. The thirty-year levelized costs are \$8.49 per thousand gallons. This cost is comprised of \$3.87 capital cost, \$0.62 fixed operating and maintenance cost and \$3.99 electrical energy cost.

No picture is provided as these would be in the same area indicated on the previous page.

### Potential Supply Options

**FIGURE 5-17. Two New Wells at Maunalei Shaft and Tunnel Sites Existing Transmission**

Capacity (MGD)				
Installed Capacity		2.000		
Max. Day Capacity		1.000		
Effective Sustainable Capacity		0.500		
Facility Capacity Factor		100%		
Average Facility Output		0.500		
Capital Costs (\$)	Total	Per MGD		
Exploration/Land/Power	\$20,000	\$40,000	HDA Estimate	Connection to existing power line
Drilling	\$750,000	\$1,500,000	HDA Estimate	(2) wells 12" 500ft deep @ \$750/ft.
Development	\$3,318,000	\$6,636,000	HDA Estimate	(2) 1 MGD pumps@\$500k*, SCADA, Ancillaries Booster Pump Station, Intake sump well
Transmission	\$1,200,000	\$2,400,000	HDA Estimate	Repairs, improvements and connection to existing transmission line
Storage Improvements	\$250,000	\$500,000		50Kgal contact/control tank
Design / Engineering	\$100,000	\$200,000	HDA Estimate	Hydrology study for well location, well engineering
Contingencies	\$1,127,600	\$2,255,200	HDA Estimate	20%
Total Plant Cost (	\$6,765,600	\$13,531,200		
Const. Per. Esc. Rate (Nom.)	3.00%			
AFUDC Interest Rate (Nom.)	6.00%			
AFUDC Factor		1.000		
Total Capitalized Cost	\$6,765,600	\$13,531,200		
Fixed Operating Costs (\$)	Per Year	Per Y/MGD		
Dedicated Operating Labor	\$18,263	\$36,525		\$0.10 per kgal based on two times average due to remote location
Apportioned Operating Labor		\$0	HDA Estimate	
Maintenance Labor		\$0		
Fixed Operating Costs				
Electrical Demand	\$60,500	\$121,000		5 Kwh/Kgal/Kft lift efficiency*derived sys demand cost factor*electrical energy cost*installed capacity
Chemicals/Materials		\$0		
Maintenance Expenses		\$0		
Amort. of Capitalized Rebuild Costs		\$0		
Total Fixed Op. Costs	\$78,763	\$157,525		
Variable Operating Costs (\$)		Per KGal		
Operating Labor				
Maintenance Labor				
Electrical Energy		\$2.420	HDA calculation	5 kwh per kgal per thousand feet vertical lift @ \$.40 per kwh Vertical lift from el 850' water level to el 2060' hydraulic line at ridge*
Chemicals/Materials		\$0.008	HDA Estimate	150% Maui system average cost
Maintenance Expenses				
Total Variable Op. Costs		\$2.428		
Plant Life (Years)				
Functional Life	30			
Economic/Analysis Life	30			
Book Life	20			
Levelized Production Costs (\$)				
Cost of Capital	6.00%			
Discount Rate (Nom.)	6.00%			
Fixed Op.Cost Esc. Rate (Nom.)	3.00%			
Effective Fixed Op.Cost. Disc. Rate	2.91%			
Var. Op.Cost Esc. Rate (Nom.)	4.00%			
Effective Var. Op.Cost. Disc. Rate	1.92%			
First Year Cost w/Amortized Capital		\$/kgal		
Amortized Cap. Cost (Book Life)		\$3.230		
Fixed Op. Cost		\$0.431		
Variable Op. Cost		\$2.428		
Twenty-year Total NPV Cost	NPV \$M/MGD	Levelized \$/kgal		
Capital Cost (20 year Amort.)	13.531	\$3.230		
Fixed Op. Cost	2.363	\$0.564		
Variable Op. Cost	14.606	\$3.486		
Economic Life Total NPV Cost	NPV \$M/MGD	Levelized \$/kgal		
Capital Cost (Amort. per Econ. Life)	13.531	\$2.691		
Fixed Op. Cost	3.123	\$0.621		
Variable Op. Cost	20.069	\$3.992		

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**Supply Options**


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**FIGURE 5-18. Three New Wells at Maunalei Shaft and Tunnel Sites - Existing Transmission**

Capacity (MGD)				
Installed Capacity		2.000		
Max. Day Capacity		1.000		
Effective Sustainable Capacity		0.500		
Facility Capacity Factor		100%		
Average Facility Output		0.500		
Capital Costs (\$)	Total	Per MGD		
Exploration/Land/Power	\$20,000	\$40,000	HDA Estimate	Connection to existing power line
Drilling	\$750,000	\$1,500,000	HDA Estimate	(2) wells 12" 500ft deep @ \$750/ft.
Development	\$3,318,000	\$6,636,000	HDA Estimate	(2) 1 MGD pumps@\$500k", SCADA, Ancillaries Booster Pump Station, Intake sump well
Transmission	\$1,200,000	\$2,400,000	HDA Estimate	Repairs, improvements and connection to existing transmission line
Storage Improvements	\$250,000	\$500,000		50Kgal contact/control tank
Design / Engineering	\$100,000	\$200,000	HDA Estimate	Hydrology study for well location, well engineering
Contingencies	\$1,127,600	\$2,255,200	HDA Estimate	20%
Total Plant Cost (	\$6,765,600	\$13,531,200		
Const. Per. Esc. Rate (Nom.)	3.00%			
AFUDC Interest Rate (Nom.)	6.00%			
AFUDC Factor		1.000		
	Total	Per MGD		
Total Capitalized Cost	\$6,765,600	\$13,531,200		
Fixed Operating Costs (\$)	Per Year	Per YMGD		
Dedicated Operating Labor	\$18,263	\$36,525		\$0.10 per kgal based on two times average due to remote location
Apportioned Operating Labor		\$0	HDA Estimate	
Maintenance Labor		\$0		
Fixed Operating Costs				
Electrical Demand	\$60,500	\$121,000		5 Kwh/Kgal/Kft lift efficiency*derived sys demand cost factor*electrical energy cost*installed capacity
Chemicals/Materials		\$0		
Maintenance Expenses		\$0		
Amort. of Capitalized Rebuild Costs		\$0		
Total Fixed Op. Costs	\$78,763	\$157,525		
Variable Operating Costs (\$)		Per KGal		
Operating Labor				
Maintenance Labor				
Electrical Energy		\$2.420	HDA calculation	5 kwh per kgal per thousand feet vertical lift @ \$.40 per kwh Vertical lift from el 850' water level to el 2060' hydraulic line at ridge
Chemicals/Materials		\$0.008	HDA Estimate	150% Maui system average cost
Maintenance Expenses				
Total Variable Op. Costs		\$2.428		
Plant Life (Years)				
Functional Life	30			
Economic/Analysis Life	30			
Book Life	20			
Levelized Production Costs (\$)				
Cost of Capital	6.00%			
Discount Rate (Nom.)	6.00%			
Fixed Op.Cost Esc. Rate (Nom.)	3.00%			
Effective Fixed Op.Cost. Disc. Rate	2.91%			
Var. Op.Cost Esc. Rate (Nom.)	4.00%			
Effective Var. Op.Cost. Disc. Rate	1.92%			
		\$/kgal		
First Year Cost w/Amortized Capital		\$6.089		
Amortized Cap. Cost (Book Life)		\$3.230		
Fixed Op. Cost		\$0.431		
Variable Op. Cost		\$2.428		
	NPV \$M/MGD	Levelized \$/kgal		
Twenty-year Total NPV Cost	30.500	\$7.285		
Capital Cost (20 year Amort.)	13.531	\$3.230		
Fixed Op. Cost	2.363	\$0.564		
Variable Op. Cost	14.606	\$3.486		
	NPV \$M/MGD	Levelized \$/kgal		
Economic Life Total NPV Cost	36.723	\$7.309		
Capital Cost (Amort. per Econ. Life)	13.531	\$2.691		
Fixed Op. Cost	3.123	\$0.621		
Variable Op. Cost	20.069	\$3.992		



### Potential Supply Options

**FIGURE 5-19. Three New Wells at Maunalei Shaft and Tunnel Sites - New Transmission**

Capacity (MGD)				
Installed Capacity		3.000		
Max. Day Capacity		2.000		
Effective Sustainable Capacity		0.750		
Facility Capacity Factor		100%		
Average Facility Output		0.750		
Capital Costs (\$)	Total	Per MGD		
Exploration/Land/Power	\$25,000	\$33,333	HDA Estimate	Connection to existing power line
Drilling	\$2,250,000	\$3,000,000	HDA Estimate	(3) wells 12" 500ft deep @ \$750/ft.
Development	\$3,897,500	\$5,196,667	HDA Estimate	(3) 1 MGD pumps@\$500k*, SCADA, Ancillaries
Transmission Improvements	\$5,500,000	\$7,333,333	HDA Estimate	4500 ft 6" line @ \$200 pft Well feeds to lift
Storage Improvements	\$250,000	\$333,333		50kgal contact/control tank
Design / Engineering	\$250,000	\$333,333	HDA Estimate	Hydrology study for well location, well engineering
Contingencies	\$2,434,500	\$3,246,000	HDA Estimate	20%
Total Plant Cost (	\$14,607,000	\$19,476,000		
Const. Per. Esc. Rate (Nom.)	3.00%			
AFUDC Interest Rate (Nom.)	6.00%			
AFUDC Factor		1.000		
	Total	Per MGD		
Total Capitalized Cost	\$14,607,000	\$19,476,000		
Fixed Operating Costs (\$)	Per Year	Per Y/MGD		
Dedicated Operating Labor	\$27,394	\$36,525		\$0.10 per kgal based on two times average due to remote location
Apportioned Operating Labor		\$0	HDA Estimate	
Maintenance Labor		\$0		
Fixed Operating Costs				
Electrical Demand	\$90,750	\$121,000		5 Kwh/Kgal/Kft lift efficiency*derived sys demand cost factor*electrical energy cost*installed capacity
Chemicals/Materials		\$0		
Maintenance Expenses		\$0		
Amort. of Capitalized Rebuild Costs		\$0		
Total Fixed Op. Costs	\$118,144	\$157,525		
Variable Operating Costs (\$)		Per KGal		
Operating Labor				
Maintenance Labor				
Electrical Energy		\$2.420	HDA calculation	5 kwh per kgal per thousand feet vertical lift @ \$.40 per kwh Vertical lift from el 650' water level to el 2060' hydraulic line at ridge'
Chemicals/Materials		\$0.008	HDA Estimate	150% Maui system average cost
Maintenance Expenses				
Total Variable Op. Costs		\$2.428		
Plant Life (Years)				
Functional Life	30			
Economic/Analysis Life	30			
Book Life	20			
Levelized Production Costs (\$)				
Cost of Capital	6.00%			
Discount Rate (Nom.)	6.00%			
Fixed Op.Cost Esc. Rate (Nom.)	3.00%			
Effective Fixed Op.Cost. Disc. Rate	2.91%			
Var. Op.Cost Esc. Rate (Nom.)	4.00%			
Effective Var. Op.Cost. Disc. Rate	1.92%			
		\$/kgal		
First Year Cost w/Amortized Capital		\$7.508		
Amortized Cap. Cost (Book Life)		\$4.649		
Fixed Op. Cost		\$0.431		
Variable Op. Cost		\$2.428		
	NPV \$/MMGD	Levelized \$/kgal		
Twenty-year Total NPV Cost	36.445	\$8.705		
Capital Cost (20 year Amort.)	19.476	\$4.649		
Fixed Op. Cost	2.363	\$0.564		
Variable Op. Cost	14.606	\$3.486		
	NPV \$/MMGD	Levelized \$/kgal		
Economic Life Total NPV Cost	42.668	\$8.493		
Capital Cost (Amort. per Econ. Life)	19.476	\$3.874		
Fixed Op. Cost	3.123	\$0.621		
Variable Op. Cost	20.069	\$3.992		