Maui County
Department of Water Supply

Preliminary Results: Infrastructure and Financial Needs Assessment

Commission on Water Resource Management
March 28, 2012

By Water All Things Find Life

Today's Presentation

- Review of efforts to date
- Source vs. reliable capacity
- System optimization assessment
- Major policy issues

Where does my water come from?

38 Groundwater Sources

145 Storage Tanks

295 Million Gallons Total Storage Capacity

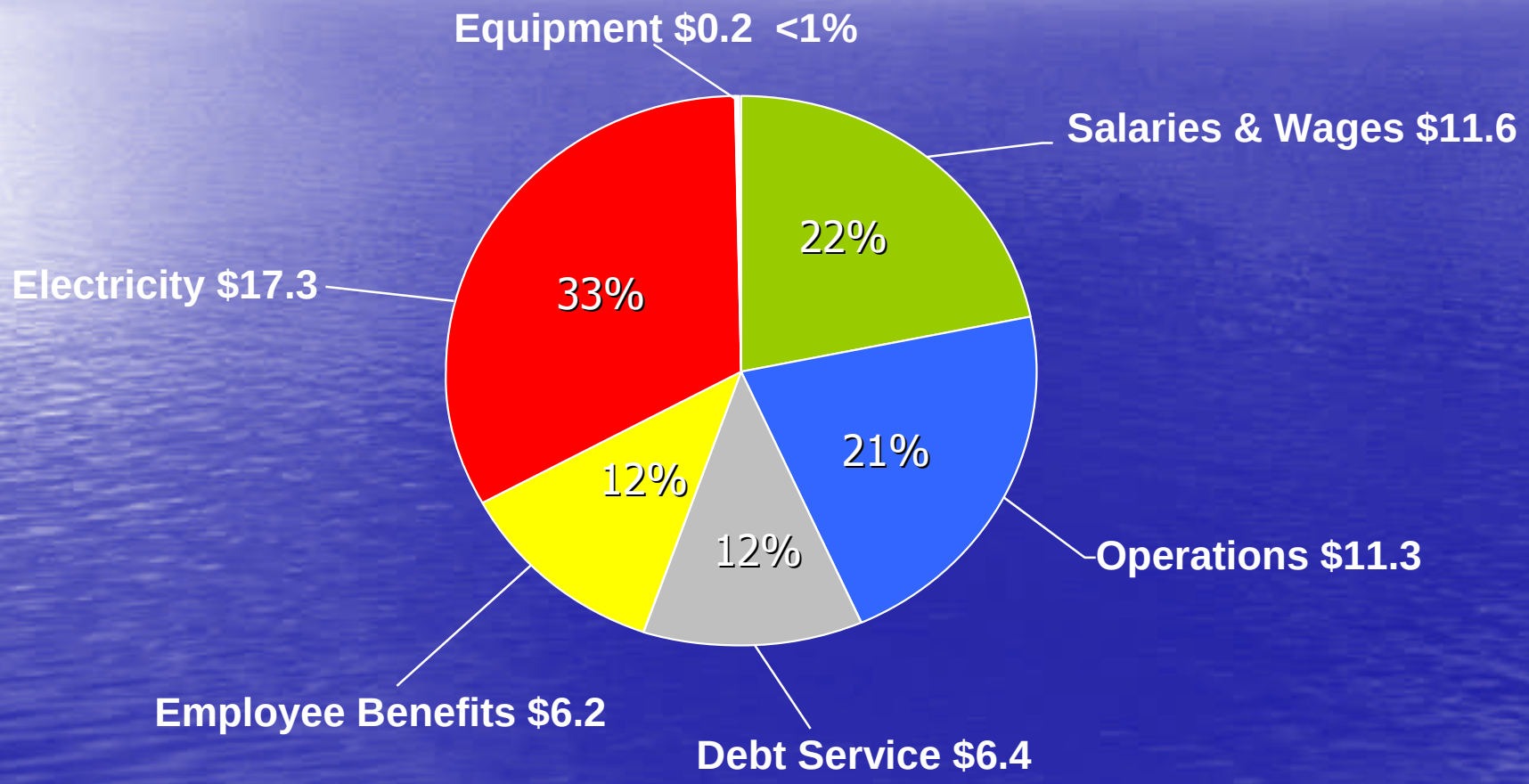
750 Miles of Pipeline

6 Surface Water Treatment Facilities

24/7 Service

37.4 million gallons provided daily

Department of Water Supply Fiscal 2012 Operating Budget Total $53 (in millions)



DEPARTMENT OF WATER SUPPLY – 2032 CIP PLAN

No.	CATEGORY/PROJECT	Prior Yrs	Est. Exp.	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
	EXECUTIVE																			
1	Business			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	Customer Billing Improvements																			
3	Customer Service Improvements																			
4	Customer Service Improvements - Capital																			
5	Customer Service Improvements - Operating																			
6	Customer Service Improvements Phase 2 Capital																			
7	Customer Service Improvements Phase 2 Operating																			
8	Customer Service Improvements																			
9	Customer Service Improvements																			
10	Customer Service Improvements																			
11	Customer Service Improvements																			
12	Customer Service Improvements				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
13	Customer Service Improvements				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Capital Budget																			
	DW-CIP-1																			
1	Kaneohe Water Tank																			
2	Kaneohe Water Tank - Construction/Rehabilitation																			
3	DW-CIP - Capital Cost			1.0 (0)																
4	DW-CIP - Operating Cost																			
5	DW-CIP - Construction Budget								1.0 (1.0)	1.0 (1.0)	1.0 (1.0)	1.0 (1.0)								
6	DW-CIP - Construction Budget												1.0 (1.0)	1.0 (1.0)						
7	DW-CIP - Construction Budget														1.0 (1.0)	1.0 (1.0)				
8	DW-CIP - Construction Budget																1.0 (1.0)	1.0 (1.0)		
9	DW-CIP - Construction Budget																		1.0 (1.0)	1.0 (1.0)
	DW-CIP-2																			
1	Kaneohe Tank				0.5 (0)															
2	Kaneohe Tank					0.5 (0.5)														
3	Kaneohe Tank						0.5 (0)													
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16	Kaneohe Tank																			0.5 (0.5)
	DW-CIP-3																			
1	Kaneohe				0.5 (0)															
2	Kaneohe Tank					0.5 (0.5)														
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16	Kaneohe Tank																			0.5 (0.5)
	DW-CIP-4																			
1	Kaneohe Tank				0.5 (0)															
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16	Kaneohe Tank																			0.5 (0.5)
	DW-CIP-5																			
1	Kaneohe Tank				0.5 (0)															
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15	Kaneohe Tank																		0.5 (0.5)	
16	Kaneohe Tank																			0.5 (0.5)
	DW-CIP-6																			
1	Kaneohe Tank				0.5 (0)															
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	DW-CIP-7																			
1	Kaneohe Tank				0.5 (0)															
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	DW-CIP-8																			
1	Kaneohe Tank				0.5 (0)															
2	Kaneohe Tank					0.5 (0.5)														
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15	Kaneohe Tank																		0.5 (0.5)	
16	Kaneohe Tank																			0.5 (0.5)
	Kapaa Water																			
	DW-CIP-1																			
1	Kapaa Tank																			
2	Kapaa Tank - Construction																			
3	Kapaa Tank - Rehabilitation																			
4	Kapaa Tank - Rehabilitation																			
5	Kapaa Tank - Construction			1.0 (0.5)																
6	DW-CIP - Capital Cost																			
7	DW-CIP - Operating Cost																			
8	DW-CIP - Construction Budget																			
9	DW-CIP - Construction Budget																			
10	DW-CIP - Construction Budget																			
11	DW-CIP - Construction Budget																			
	DW-CIP-2																			
1	Kapaa																			
2	Kapaa																			
3	Kapaa																			
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15	Kapaa																			
16	Kapaa																			
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	DW-CIP-1																			
1	Lihue Tank																			
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	DW-CIP-2																			
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15	Lihue Tank																			
16	Lihue Tank																			
	Kalaheo Water																			
	DW-CIP-1																			
1	Kalaheo Tank																			
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	DW-CIP-2																			
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	DW-CIP-3																			
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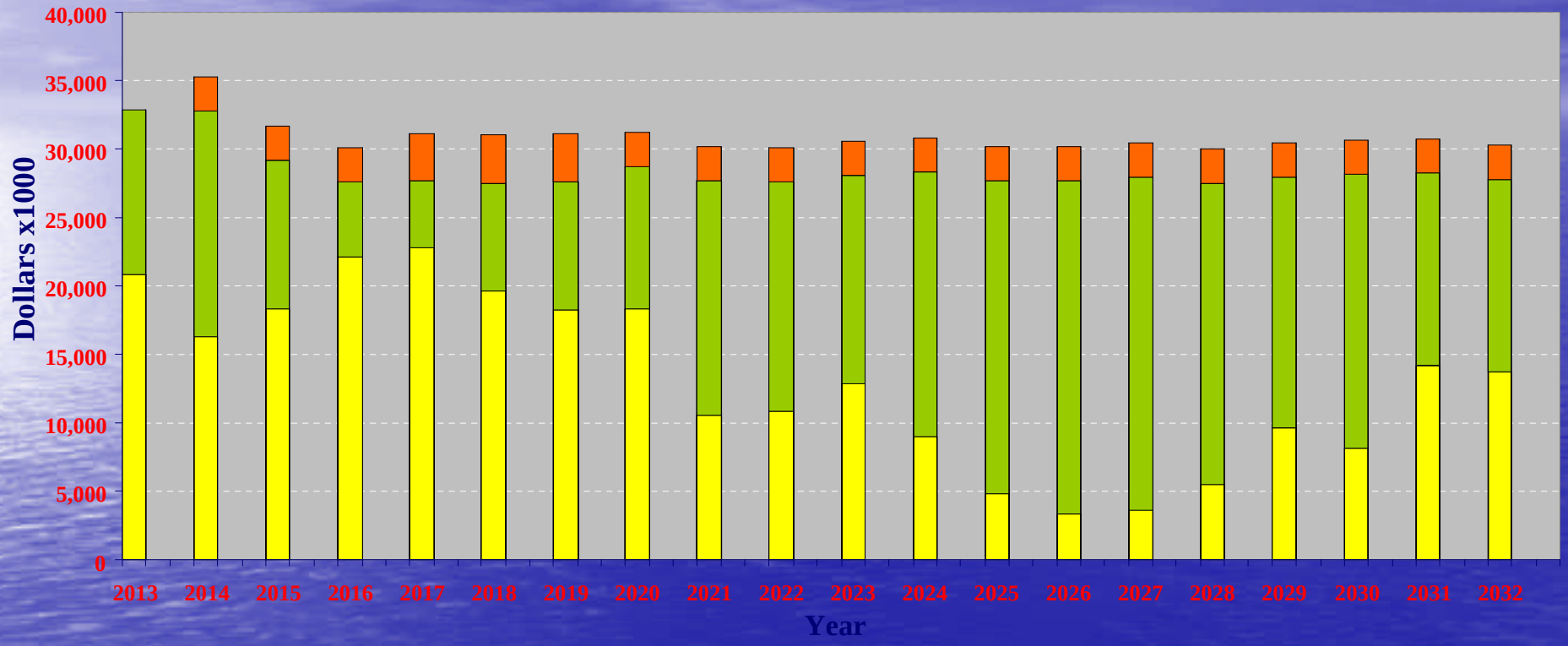
16	Kalaheo Tank																			

DEPARTMENT OF WATER SUPPLY - 2032 CIP PLAN

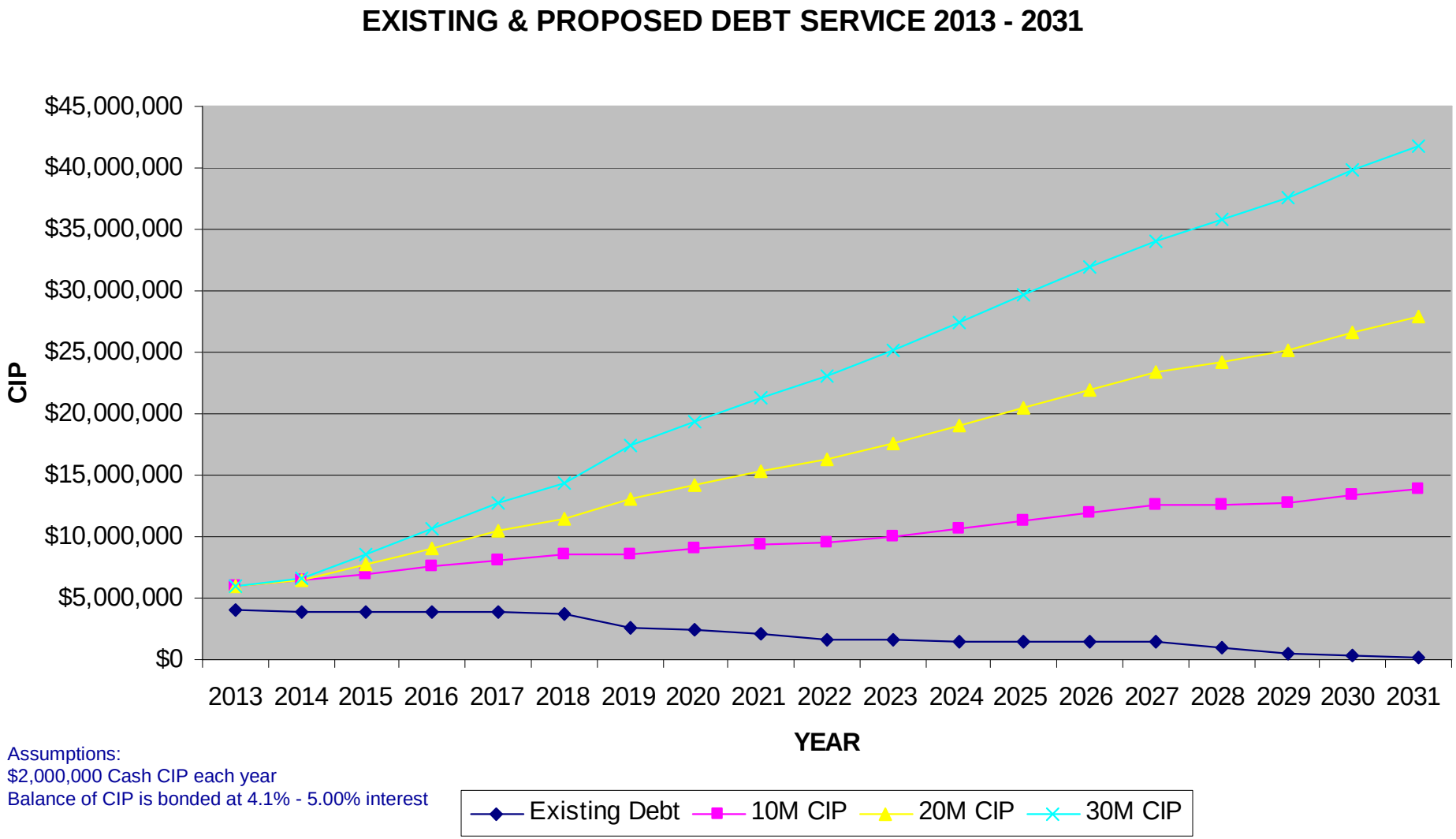
Code	CATEGORY/PROJECT	Prioritization				2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	COUNTYWIDE																								
F	*Facilities*					2,000	2,000	2,000	4,000	4,000	4,000	4,000	3,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	8,000
1	Countywide Energy Improvements																								
2	Countywide Archaeological Monitoring																								
3	Countywide Land Appraisal & Acquisition																								
4	Countywide Pipe & Facility Improvements																								
5	Countywide Pump, Facility & Energy Efficiency Upgrades																								
6	*- Motor Control & Electrical Upgrades*																								
7	Countywide Tank & Facility Improvements																								
8	Countywide Security Measures																								
FP	*County wide Fire Protection*						2,500	2,500	2,500	3,500	3,500	3,500	2,500	2,500	3,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
CO	*Conservation*																								
1	Countywide Conservation Program-DSM					1,000	1,000	2,000	2,000	3,000	3,000	3,000	3,000	3,000	3,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	Central District																								
S	SOURCE																								
W	*Wells*																								
PD	*Pre-Design Critical Projects* [illegible]																								
WC	*Well Construction*																								
4	Iao Well - Development					1,200 (C)																			
5	Well A - Exploratory (Future)											350 (D)	1,000 (C)												
6	Well A - Development (Future)													350 (D)	3,000 (C)										
7	Well B - Exploratory (Future)															350 (D)	1,000 (C)								
8	Well B - Development (Future)																	350 (D)	3,000 (C)						
9	Well C - Exploratory (Future)																			350 (D)	1,000 (C)				
10	Well C - Development (Future)																					350 (D)	3,000 (C)		
WP	*Well Pumps*																								
1	Mokuhau 501						200 (C)																		
2	Waihee 579							250 (C)																	
3	Waiehu Hts 514								100 (C)																
4	Kanoa #2									100 (C)															
5	N. Waihee #2											150 (C)													
6	Waihee 577												150 (C)												
7	Waihee 578													150 (C)											
8	Kepaniwai 511and N. Waihee #1														250 (C)										
9	Mokuhau 503 and Kanoa #1															400 (C)									
10	Mokuhau 501																200 (C)								
11	Waiehu Hts 515																	100 (C)							
12	Iao and Waikapu																			300 (C)					
13	Waihee 579 and Kanoa #2																						350 (C)		
14	N. Waihee #2																							150 (C)	
15	Waihee 577, Kepaniwai 511, N. Waihee #1, Maui Lani #5, Maui Lani #6, and Maui Lani #7																								700 (C)
E	*Electrical*																								
1	Mokuhau-Generator Substation						850 (C)																		
2	Waiehu Hts-Generator							200 (C)																	
3	Kepaniwai-Building Electrical Upgrade								350 (C)																
4	N. Waihee-Electrical Upgrade										200 (C)														
5	Kanoa-Electrical Upgrade												200 (C)												
6	Maui Lani-Electrical Upgrade															600 (C)									
T	TREATMENT																								
C	*Capacity Upgrade*																								
1	Iao WTF-Relocate WTF (Submerged Membrane)-system upgrade					5,000 (C)																			
2	Iao WTF-Relocate WTF (Submerged Membrane)-system expansion					10,000 (C)																			
3	Land Acquisition-New WTF																								5,000
W	*Water Quality Upgrade*																								
St	STORAGE																								
T	*Tanks*																								
1	Maui Meadows #1 Tank																3,000 (D/C)								
2	Makai Heights Tank																	4,000 (D/C)							
3	Waiale-Phase 1 Tank																		3,000 (D/C)						
4	Waiale-Phase 2 Tank																			3,000 (D/C)					
5	Waiko #1-phase 1 Tank																				2,000 (D/C)				
6	Waiko #1-phase 2 Tank																					2,000 (D/C)			
7	Maui Meadows #2 Tank																					3,000 (D/C)			
8	Waiehu Heights & Maui Meadows #3 Tank																						2,800 (D/C)		
9	Waihee Tank																							3,000 (D/C)	
10	Wailuku Heights Extension Low Level Tank																							1,200 (D/C)	
11	Waiko #2 Tank																								7,500 (D/C)
F	*Facilities*																								
1																									
2																									
O	*Others*																								
2																									
3																									
Tr	TRANSMISSION																								
1	Kihei 18" Pipe Replacement-Phase 1 to 6									2,000 (D)	5,100 (C)	6,500 (C)	6,500 (C)	6,500 (C)	6,500 (C)	6,000 (C)	4,500 (C)								
2																									
D	Distribution																								
P	*Pipe Replacement*																								
1	Kihei-Makena Waterline Upgrades					1,150 (D/C)																			
2	Paia Town Pipeline Replacement					3,000 (C)																			
3	Wailuku-Kahului Waterline Upgrades-Total							2,000 (D/C)	5,500 (D/C)	1,100 (D/C)	3,000 (D/C)														
4	Kea Street								3,600 (D/C)																
5	Hoheia Avenue, Hulai Drive, Palu Circle, Paluna Drive & Papa Place							2,000 (D/C)																	
6	Wakea Avenue and Mahiki Road								2,500 (D/C)																
7	Makani Road, Stable Road, and Kaiha Road									1,100 (D/C)															
8	North Kihei										3,000 (D/C)														
F	*Facilities*																								
E	**Electrical**																								
1	N. Waihee-Electrical Upgrade										200 (C)														
2	Mahiki-Electrical Upgrade									100 (C)															
3	Waiale-Electrical Upgrade						200 (C)																		
4	Wailuku Hts 31 and Wailuku Hts 30									1,600 (C)															
S	**Structural**																								
1	New/ Expand Water Quality Laboratory-Baseyard									3,000 (D/C)															
2																									
PM	**Pump Motors** [Age/performance characteristics/physical condition]																								
1	N. Waihee Bat #1, 2, 3, and 4									200															200
2	Wailuku Cntry Est. #1 1, Wailuku Cntry Est. #1 2, Wailuku Cntry Est. #3 1, and Wailuku Cntry Est. #3 2																		200						
3	Waiale 581 and Waiale 582							100														100			
4	Wailuku Hts 31 585, Wailuku Hts 31 584, Wailuku Hts 30 585, Wailuku Hts 30 586,						200														200				
5	Maui Meadows #17 506, Maui Meadows #17 507, and Maui Meadows #17 508																	150							
6	Diamond Resorts #1 and Diamond Resorts #2																100								
7																									
I	**Instrumentation/SCADA**																								
1	Replace Remote Terminal Units											2,000													
2	SCADA Telemetry Radio-Data					250																			

CIP by Priorities



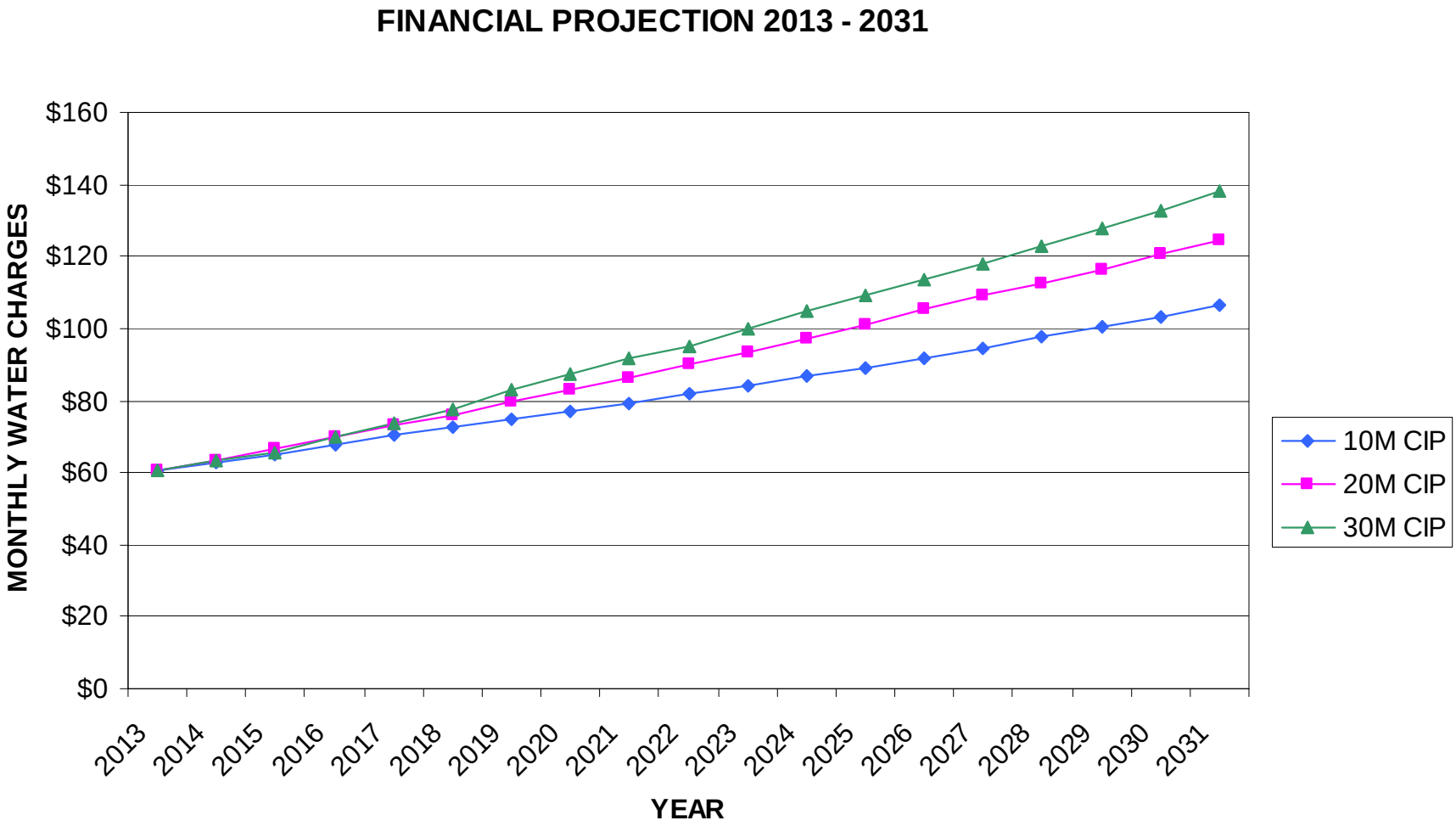
- Must Do on Shown Timeline to Prevent Disruption of Existing Service/Violation of Rules &Regulations or Safety
- Must Do Soon to Prevent Disruption of Existing Service/Violation of Rules or Safety, But Can Slip up to 2 years Before Becoming in the Red Category
- Needed For Reliability or Improved Service in Accordance with Long Term Planning, But Not Mandatory
- Needed for Growth
- Needed for Fire Protection

Debt Service Options



Assumptions:
$2,000,000 Cash CIP each year
Balance of CIP is bonded at 4.1% - 5.00% interest

Funding Options

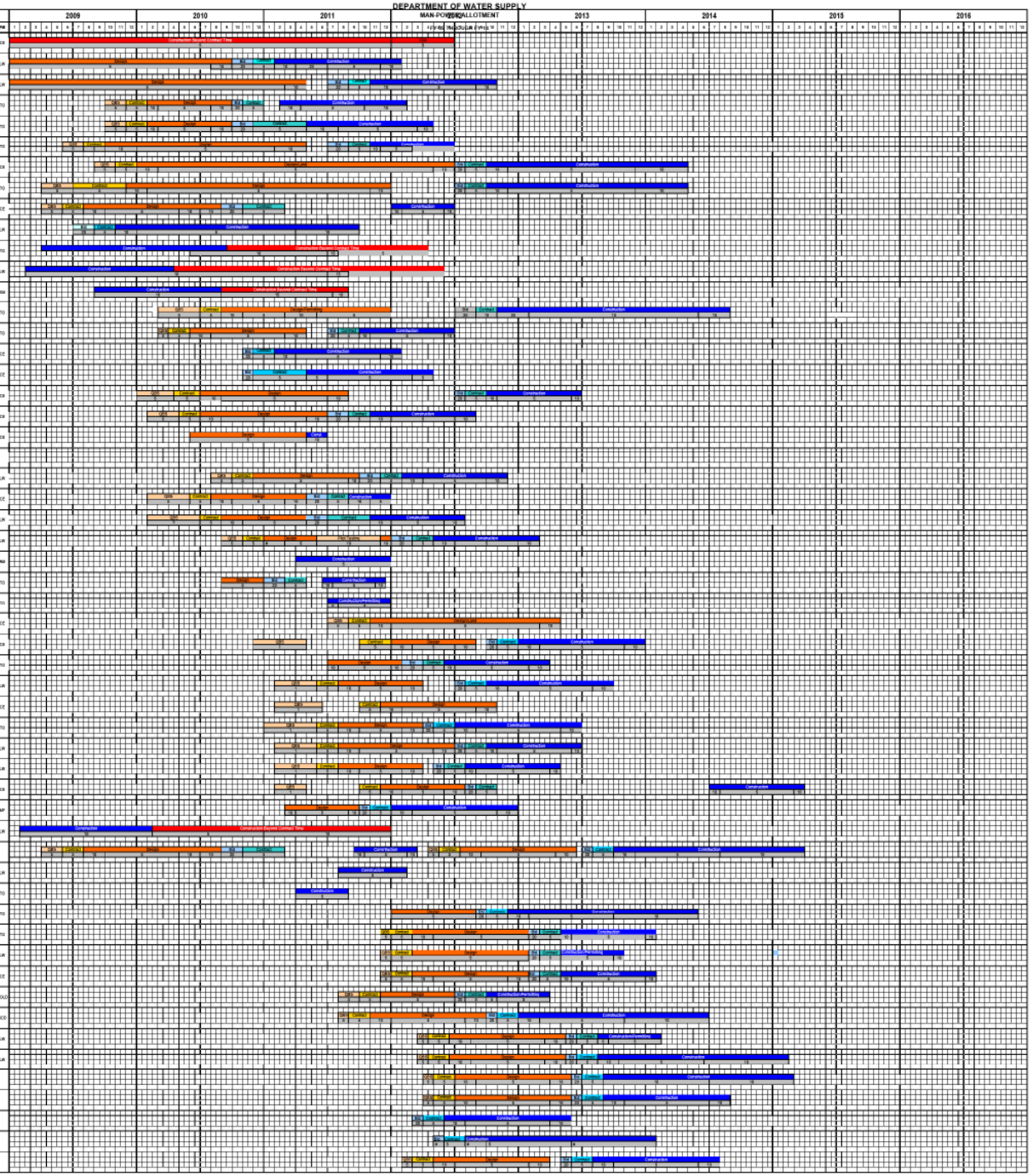


Assumptions:
Operational expense inflation of 3%/yr
Bond interest rate of 4.10% - 5.00%/yr.
Cash CIP of $2M per year
Residential water use of 18,000 gallons per month

DEPARTMENT OF WATER SUPPLY

MAN-POWER ALLOTMENT

NO.	PROJECT	FY	PM
1	N WAHIKIS WATER SOURCE, Kupaa Tank "N" Wells"	1997	DS
2	KAHOLE TREATMENT PLANT - HIGH LIFT PUMPS	2009	LA
3	MAUI MEADOWS #17 BOOSTER PUMP STATION	2009	LA
4	Upper Omaopio Water Tank Replacement	2009	TG
5	Lower Omaopio Water Tank Replacement	2009	TG
6	WAILUKU WELL #1 EXPLORATORY	2009	TG
7	HAKU WELL #1 & TRANSMISSION	2009	CS
8	HANAKAO SOUTH WELL - DEVELOPMENT	2009	TG
9	WEST MAUI EXPLORATORY WELL #2 - MAHINAHINA	2009	CE
10	MAHINAHINA WTP - INTAKE TRAVELING SCREEN UPGRADE	2009	LA
11	KO TANK SITE - WELL DEVELOPMENT	2009	TG
12	HANAKAO WELL DEVELOPMENT	2009	LA
13	WEST OLINDA WATER TANK REPLACEMENT	2009	RM
14	Waikamoi Flume Replacement	2010	TG
15	ULUMU ROAD WATERLINE REPLACEMENT Construction - Pending FY2012	2012	TG
16	ULULANAUA PHASE "L" TRANSMISSION LINE REPLACEMENT	2010	CE
17	LOWER PAIA TANK REPLACEMENT	2010	CE
18	KALIPAOALUA ROAD Waterline Replacement	2010	CS
19	UPPER KOKO DR Waterline Replacement Construction - Pending FY2012	2012	CS
20	WEST KUIHWA ROAD Pressure Reducing Valve Station	2010	CS
21	MOLOKAI MOBILE BACK-UP GENERATOR	2010	
22	NAHIKU WELL REPLACEMENT (HANA)	2010	LA
23	KAMEHAMEHA WATERLINE REPLACEMENT	2010	CE
24	KANOE, OHANA, ET AL. WATERLINE REPLACEMENT	2010	LA
25	PIIHOLO WTP ORGANIC CARBON REDUCTION	2010	LA
26	KANDA WATER TANK REPL. - MOLOKAI (In-house)	2010*	AM
27	Ka'a'ahi/Hana Drive Waterline Replacement	2011	TG
28	Small Waterline Replacement - Phase II	2011	TG
29	Haiku Well No. 2 Exploratory (Land Acq & Design)	2011	CE
30	KAMAOLE TANK REPLACEMENT Design - Pending FY2012 (no land acquisition)	2012	CS
31	WAILUKU WELL #3 - EXPLORATORY WELL Design - Pending FY2011	2011	TG
32	MAUI MEADOWS #18 BOOSTER PUMP STATION	2011	LA
33	PHASE 10 PUMP UPGRADES	2011	CE
34	OLINDA PLANT 2 MG CLEARWELL RETURBISH TANK Construction - Pending FY2012	2011	TG
35	KALAMAKAI EXPLORATORY WELL AT KAHULA (MOLOKAI) Construction - Pending FY2012	2011	LA
36	LALAPUA TANK & PIPING UPGRADES (MOLOKAI) Construction - Pending FY2012	2011	LA
37	MAIN, LONO, WALANI & KAHULA STREETS WATERLINES Construction - Pending FY2012	2011	CS
38	KAHULUI TANK #2	2011	MP
39	HANU "N" WATER TANK	2011	LA
40	MAHINAHINA WELL #1 EXPLORATORY/DEVELOPMENT Construction - Pending FY2012	2011	
41	WAIKOE WELLS - GENERATOR INSTALLATION	2011	LA
42	PUHAWAI ROAD WATERLINE REPLACEMENT - INHOUSE	2011	TG
43	WAILUKU WELL #1 SEVICE PUMP Const. - Pending FY2012	2012	TG
44	HALIMA ST WATERLINE REPL. - EWS Design - Pending FY2012	2012	TG
45	KAMOLE WTP - WAILOA DITCH STAMS UPGRADE Design - Pending FY2012	2012	LA
46	PAUKUKU WATER SYSTEM SRT/TMS Design - Pending FY2012	2012	CE
47	HAKU WELL #2 EXPLORATORY WELL Design - Pending FY2012	2012	FIELD
48	WAILUKU WELL #2 - DEVELOPMENT Design - Pending FY2012	2012	SCS
49	WEST MAUI MAHINAHINA EXPLORATORY WELL #2 Design - Pending FY2012	2012	LA
50	HANKU WELL REPLACEMENT - DEVELOPMENT	2012	LA
51	KO SURFACE WTP UPGRADE Design - Pending FY2012	2012	
52	PIIHOLO WTP - CONTROL UPGRADES Design/Const. - Pending FY2012	2012	
53	KAMOLE PLANT CHEMICAL & CONTROL BLDG RSTR/RR Construction - Pending FY2012	2012	
54	OLINDA PLANT 5.0MG RESIDENTIATION BACK RELINING Construction - Pending FY2012	2012	
55	WAILUKU HTS BOOSTER PUMP UPGRADE Design - Pending FY2012	2012	



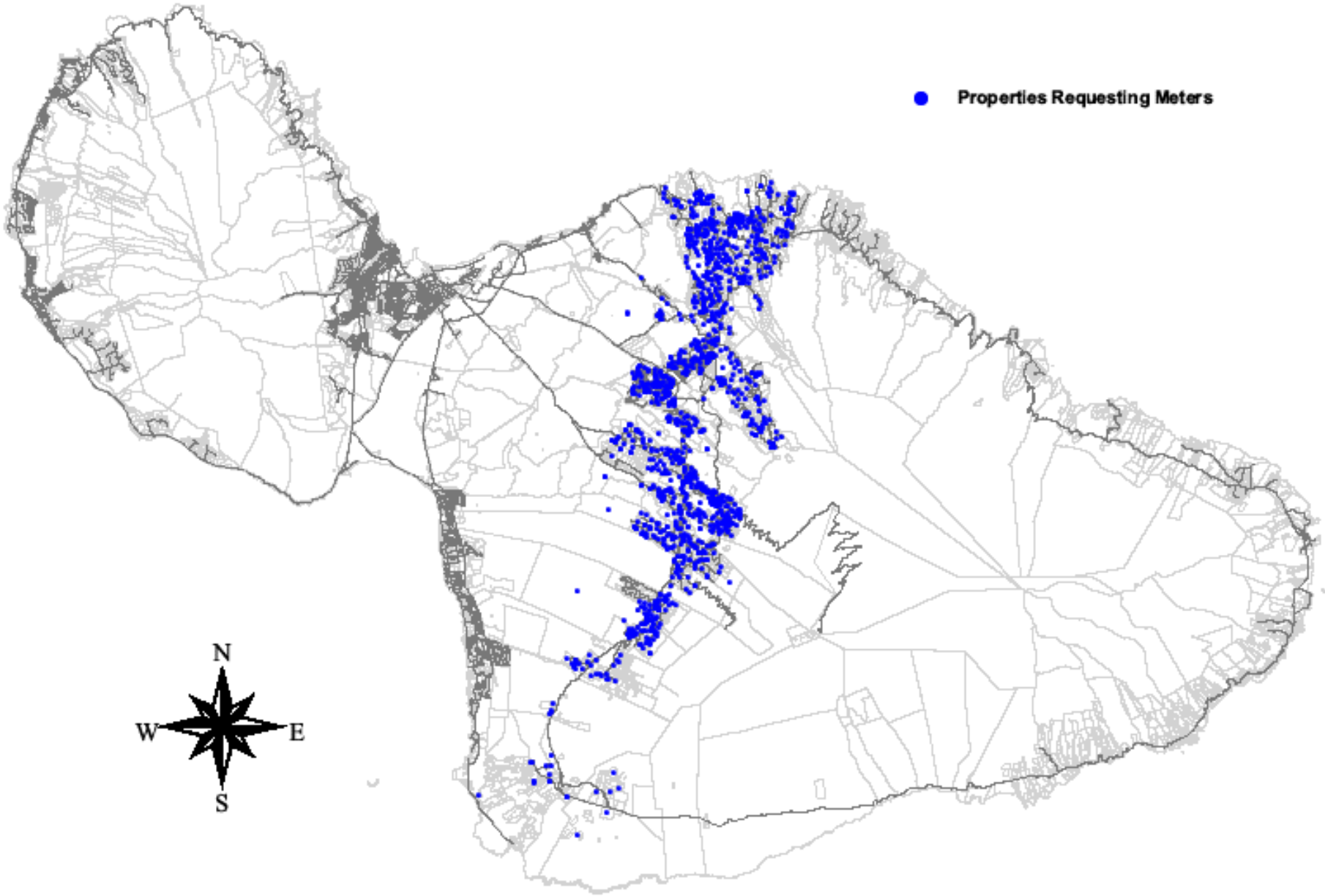
Water Source Options

WATER SOURCE DEVELOPMENT ESTIMATES - TARGETS

	Water Source	Implementation Time Planning, Design, & Const. (months)	Estimated Design & Const. Costs ($ - Millions)	Rated 24 hr Capacity Present/Future (mgd)[1]	Operation and Maintenance Costs ($/1000Gal)	20-Year Projected Cost (capital, maintenance, operation, replacement, design/construction) Dollars per 1000 Gallons[2]	Advantages - Disadvantages	Difficulties / Issues / Potential Problems
	El Paso Well #1 & #2 Unlimited Use	12	$1.20	[illegible]	$4.27	2.30-$1.00 gallons	Need to repair and repace the pressure tank the Lee of Hipolito Wells [redacted]	GAC cleaning and maintenance to be conducted by contractor in court case to state. After that, maintenance goes to EPWU. Hipolito Pressure Tank L. Maintenance is contract from concert service. Hipolito with pump/pressure to Sandia WTP or directly to Upper Pass Tank. All [illegible]
2	Repair Hipolito Intake to Upper P	8	0.20	[illegible]	not known	$6.00per - 1,000,000,000/yr $0.00/1000 gal	Safety issues regarding site location	
3	Repair Rural Well Kinkaid Place	48	[illegible]	estimated 1.00/0.0	estimated 0.0	$20.00/0.0 $10,500,000/0.0 $0.75/1000 gal	Environmental Assessment, Cost, DPE 40,480 Sheet Pile	Water conveyance material and product pipe, Sheet Z - HDPE, Steel, CDUS & CDE Pumping are cited at [redacted]
4	[redacted] Well Wells Well Water Well Well	36	7.2	21 hour pumping capacity = 1.0 (Normally rated 0.72 MGD)	12.50	$3.21 per 1000 gallons based on 20 of 20 pumping capacity (0.76 MGD)	[redacted]	
5	[redacted] Well Wells Well Water 200 Sheet Pile	43	0.5	24 hour pumping capacity = 0.67 (Normally rated 0.25 MGD)	$1.66	$5.94 per 1000 gallons based on 20 of 20 pumping capacity (0.25 MGD)	[redacted]	
6	[redacted] Well Wells Well Water 8 Masonry Circle Area	54	0	24 hour pumping capacity = 1.0 (Normally rated 0.42 MGD)	$4.80	$6.04 per 1000 gallons based on 20 of 0.42 pumping capacity (0.42 MGD)	[redacted]	
7	[redacted] Connection [illegible] - put into service	36	0.70	0.00/0.20	$0.00	$305.00/yr - $14,500,000/yr $1.00/1000 gal	[redacted]	[redacted]
8	Initial Water Treatment for Aquifer Storage & Volume Tank	48	$2.40		$1.00	1,66,66,500,000 gallons	[redacted]	[redacted]
9	Construct [illegible] & Infrastructure [illegible]	60	$35.00	0.0	$0.00	3,00,000,000 gallons	[redacted]	Contract closed, [illegible] is in progress. [redacted]
10	Develop 300 MG Raw Water Intake on Rio Grande [illegible]	66	138.0	0.0/0.0 MGD	1.00	$1.16,400	Permitting [illegible] Land Acquisition is a problem. EIS by Feb 2[illegible] and [illegible] permit by [illegible] Feb	Data Bad [illegible]
11	Repair Rural Raw water intake line	n/a	n/a	2.0 [illegible]	n/a	$0		Repair work replacing 120 of 42" AC pipe with 8" PVC pipe has not yet been actually failed. Cost of work cheaper compared to replacing intake screen [illegible]
12	Enlarge Rio Grande raw water intake line [illegible] Option A - construct diversion and [illegible] reservoir. Option B - Construct [illegible] reservoir. Reservoir water reserve [illegible] filter	12	0	2.0/3.0	0.00/[illegible]	[illegible]	Land acquisition issues? Need EIS, EA will be [illegible]	[redacted]
13	[redacted]	48	7.4 w/ Opt. A 50.0 w/ Opt. B	2.0/3.0 w/ Opt. A 2.0/3.0 w/ Opt. B	0.00 w/ Opt. A 0.00 w/ Opt. B	$0.00/yr w/ Opt. A $0.00/yr w/ Opt. B	Land and facility acquisition. Permitting. [redacted]	[redacted]
14	Purchase [redacted] Wells Well with Source Chaves	36	7.7	0 hour pumping capacity = 1.0 (Normally rated 0.42 MGD)	$1.25	$3.78 per 1000 gallons based on 20 of 20 pumping capacity (0.42 MGD)	[redacted]	[redacted]
15	Upgrade TCC w/ Quick WTP	36	10.0	1.7/1.7	0.0	$55.00/yr - [illegible]	Possible joint operation - [illegible]	GAC and WBX pilot plant testing to follow Pilot testing. Contractor [illegible]
16	Upgrade TCC w/ Bridge WTP	24	[illegible]	8.0/8.0	40.00	$24.00/yr - [illegible]	[illegible]	GAC and K-Cl pilot plant testing, ongoing. Permitting to run thru Oct. 2011. EPA original deadline - Dec. 1, 2012
17	Upgrade TCC WTP to 3.2 MGD	36	5.7	1.1/3.2	1.75	$0.00/yr - $[illegible]/0.00/yr $0.42/1000 gal	SCDH Permitting, Water Table Contamination, [illegible] land acquisition	[redacted]
18	Increase Rio Grande Pump Capacity on Rio Grande Hydro Lower Rio Grande Pecan Mesa Rio Grande Water Works	12	3.00	2 mgd under IC, 1 mgd under 6 Generators	$1.97 under IC, $2.32 under 6	4.08-$[illegible],000 gallons	Design and permitting. No significant obstacles.	[redacted]
19.1	Replacement and Management of 1 Reclaimed Wastewater for Displacement of Potable Water - Water Conservation Education	33 months (FY2013) Design, FY2014 Construction	$1,210,000.00	0.20 MGD (Seasonal Peak Value)	0.1/0	$2,921,000 gallons	Construction funding to be met by the Dept. of Environmental Management or the Dept of Water Supply?	Final environmental assessment needed for this project
19	Dept of Environmental Management R 1 Reclaimed Wastewater for Displacement of Potable Water - Hills Bridge Blue Kites High School	28 months (FY2013 Design, FY2014 Construction)	$1,135,000.00	0.30 MGD (Seasonal Peak Value)	0.1/0	$2,631,000 gallons	Construction funding to be met by the Dept of Environmental Management or the Dept of Water Supply?	Environmental assessment needed for this project?
19.2	Dept of Environmental Management R 1 Reclaimed Wastewater for Displacement of Potable Water - Hills Bridge Blue Shafts Gateway Road	28 months (FY2013 Design, FY2014 Construction)	$6,000,000.00	0.55 MGD (Seasonal Peak Value)	0.1/0	$2,631,000 gallons	Construction funding to be met by the Dept of Environmental Management or the Dept of Water Supply?	Final environmental assessment needed for this project

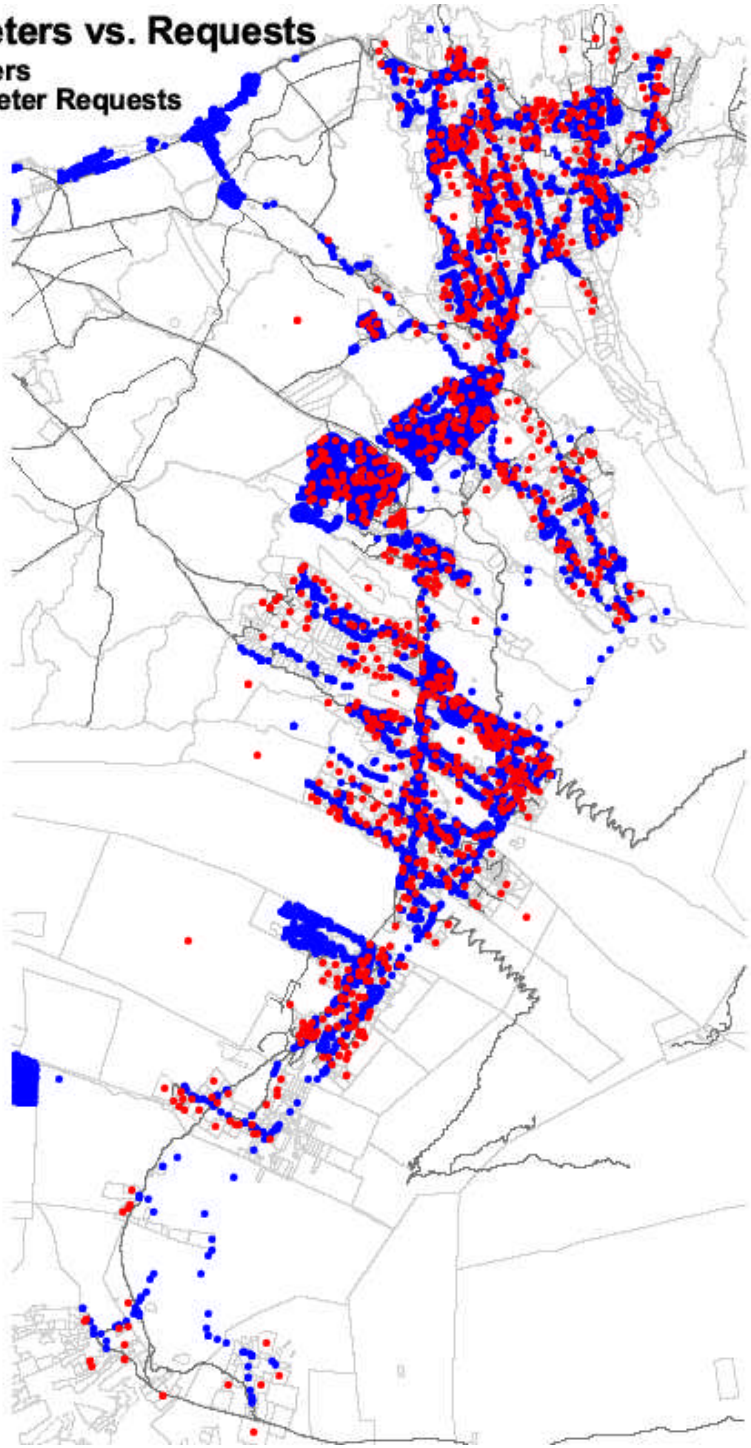
1 - For 10-100-36 capacity, the pumps will be calculated as 20 of 20 for the 24-hr time period
2 - Use 20-Year Assumptions: 2% Inflation, Uniform Capital Costs, Operation and Maintenance, Repair & Replacement Costs, Inflation, Income Economic Factors
* - Assumptions and costs apply only to added improvements
** - Assumptions and costs for Option C is conceptual, [illegible] utilization system between [illegible] building and [illegible] and power, [illegible] plant [illegible] system
*** - Costs from DEO study

Upcountry Water Meter Priority List - Total Requests = 1,312



Existing Water Meters vs. Requests

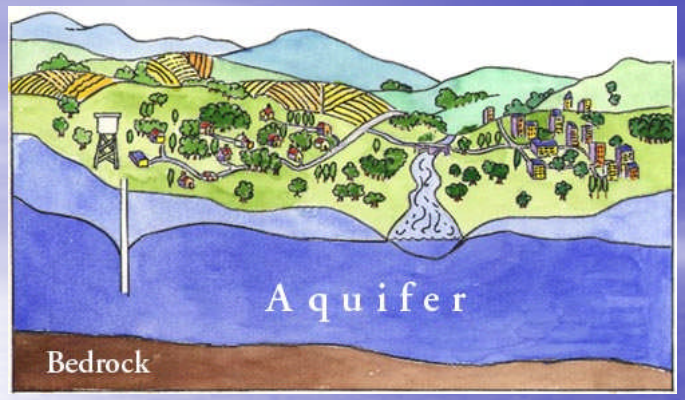
- Existing Water Meters
- Upcountry Water Meter Requests



"Source" vs. "Reliable Capacity"

- What's the difference?
- Why does it matter?
- How does this affect our future actions?

"Source" vs. "Reliable Capacity"?



Aquifer capacity = 5 MGD

Well capacity = 2 MGD

Well capacity = 3 MGD

Tank capacity = 4 MGD

Line capacity = 6 MGD

Options to Increase Available Water

- Additional source
- Backup wells
- Additional preventive maintenance
- More storage tanks
- Connecting storage tanks
- Larger waterlines
- Operational changes

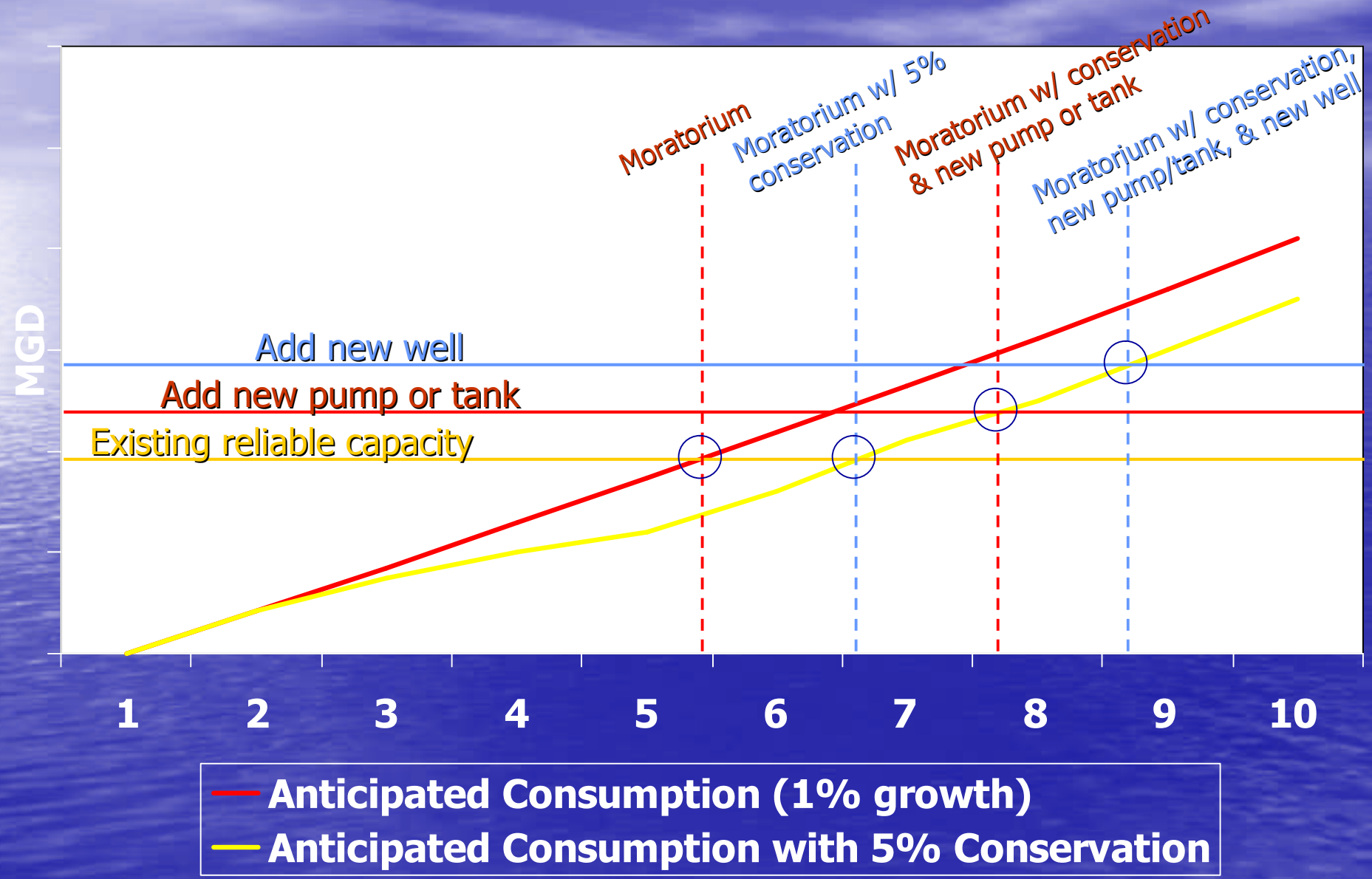
Options to Decrease Average Flow

- Water conservation
- Conservation pricing
- Efficiency

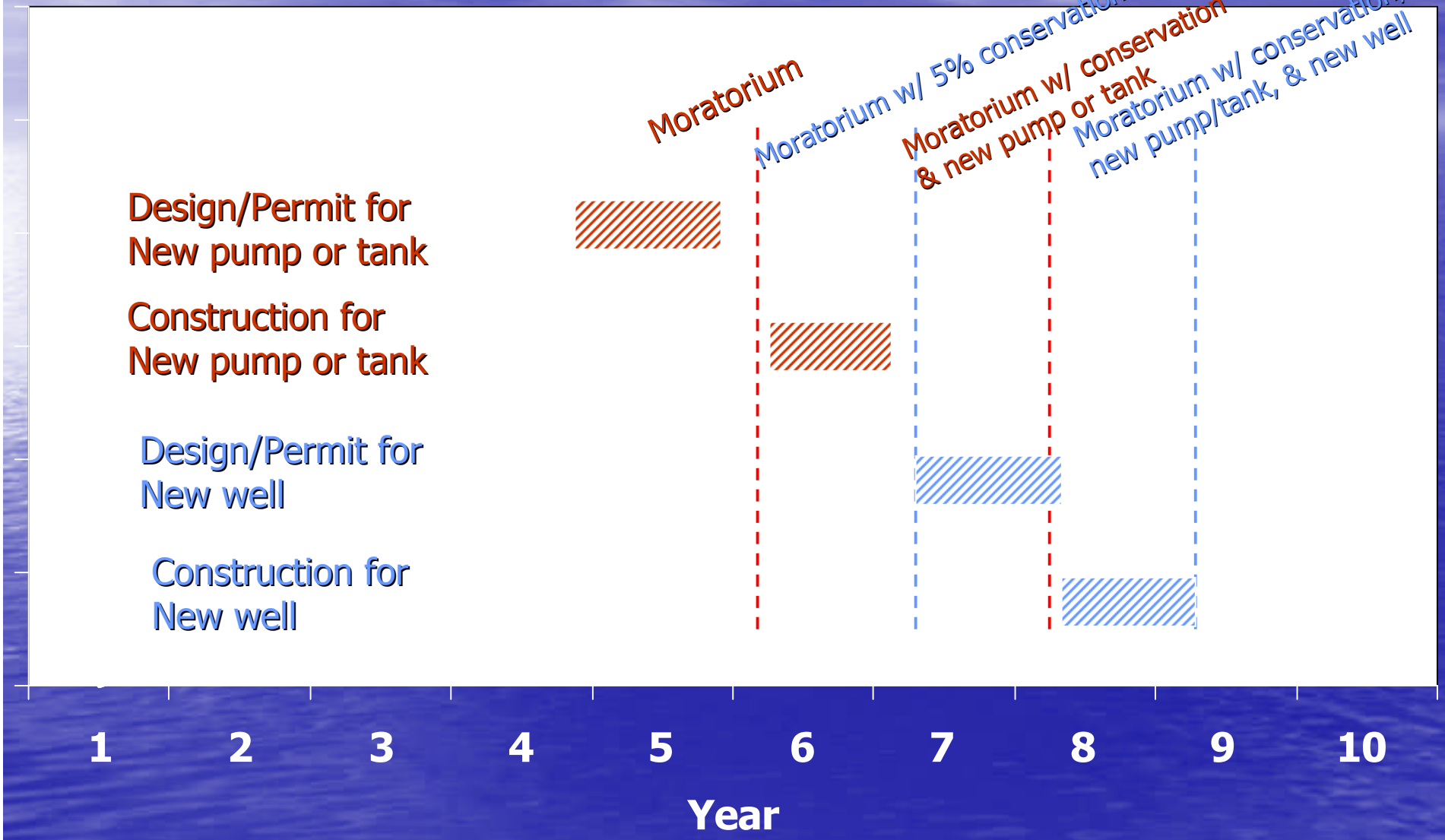
"Source" vs. "Reliable Capacity"

- How do we implement this concept?

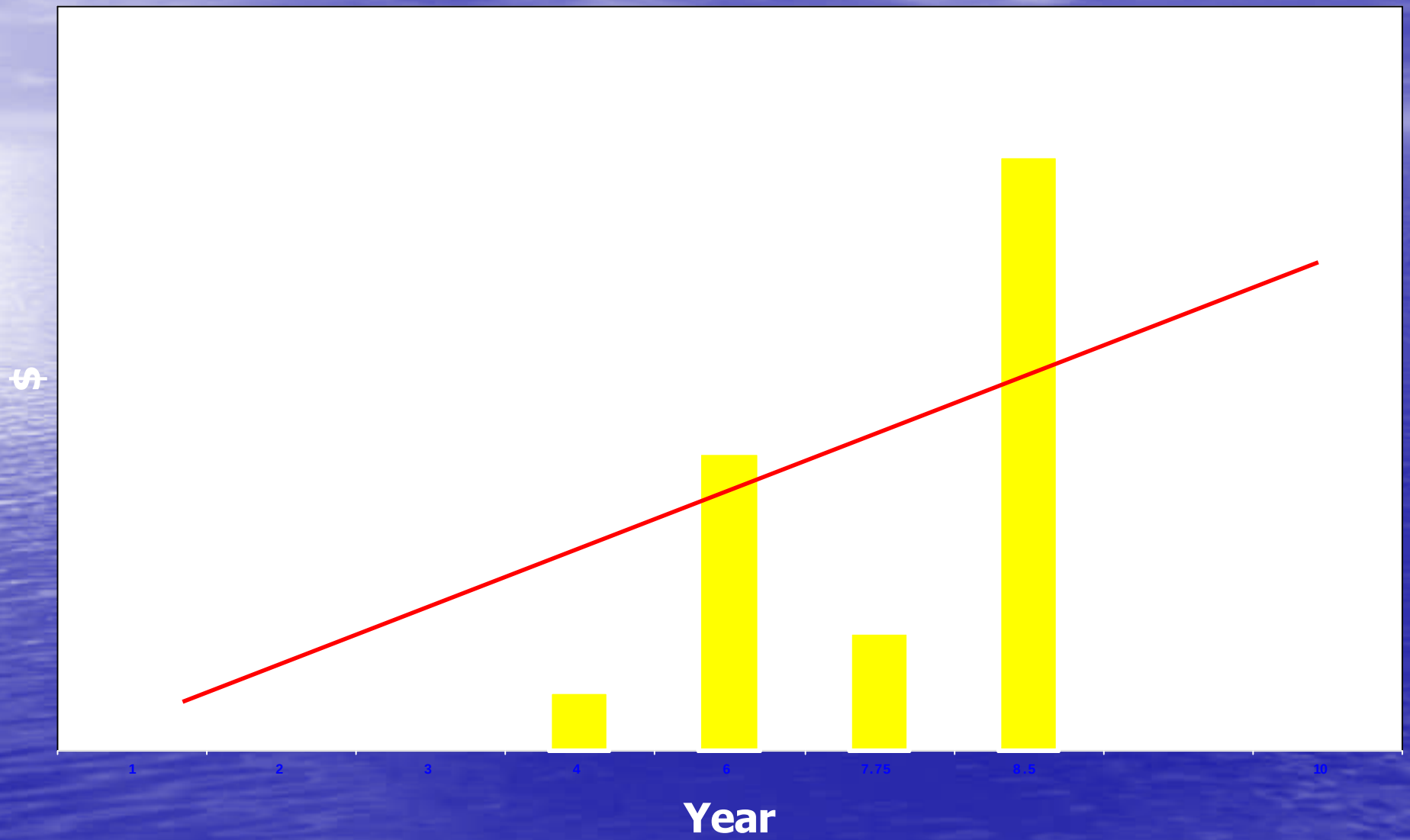
Water Resource Optimization



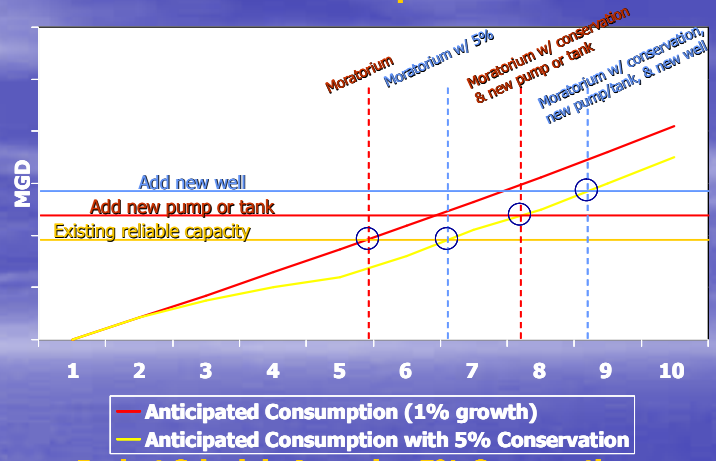
Project Schedule Assuming 5% Conservation



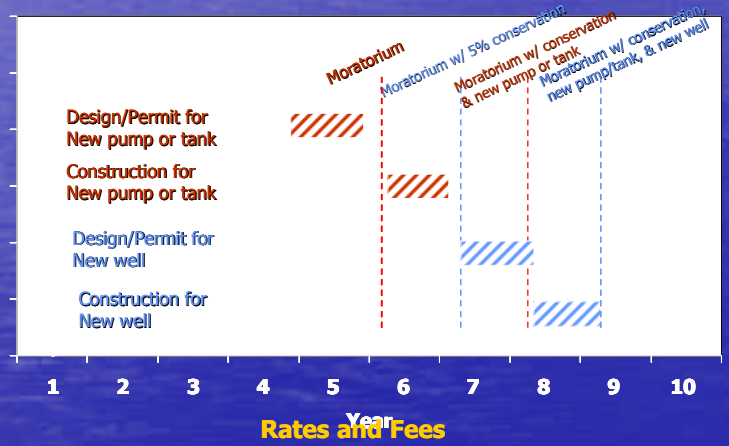
Rates and Fees



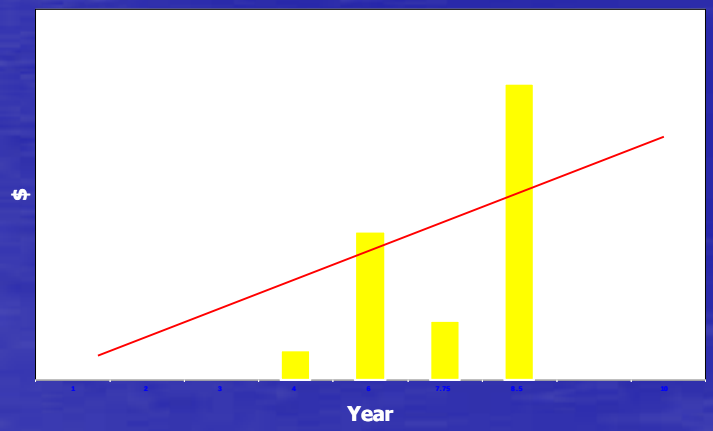
Water Resource Optimization



Project Schedule Assuming 5% Conservation



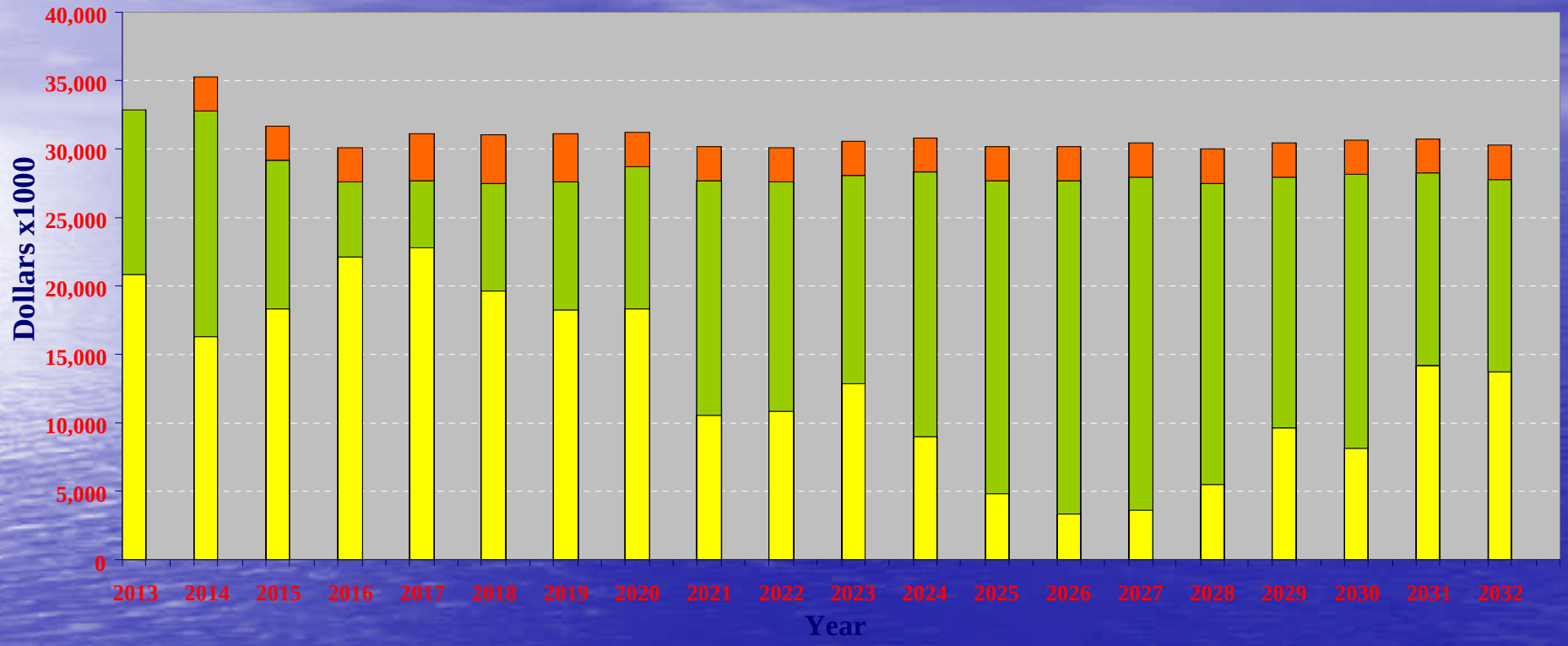
Rates and Fees



DEPARTMENT OF WATER SUPPLY - 2032 CIP PLAN

Code	CATEGORY/PROJECT	Prioritization				2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	COUNTYWIDE																								
F	***Facilities***					2,000	2,000	2,000	4,000	4,000	4,000	4,000	3,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	8,000
1	Countywide Energy Improvements																								
2	Countywide Archaeological Monitoring																								
3	Countywide Land Appraisal & Acquisition																								
4	Countywide Pipe & Facility Improvements																								
5	Countywide Pump, Facility & Energy Efficiency Upgrades																								
6	*- Motor Control & Electrical Upgrades*																								
7	Countywide Tank & Facility Improvements																								
8	Countywide Security Measures																								
FP	***County wide Fire Protection***						2,500	2,500	2,500	3,500	3,500	3,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
CO	***Conservation***																								
1	Countywide Conservation Program-DSM					1,000	1,000	2,000	2,000	3,000	3,000	3,000	3,000	3,000	3,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	Central District																								
S	**SOURCE**																								
W	***Wells***																								
PD	*Pre-Design Critical Projects* [illegible]																								
WC	*Well Construction*																								
4	Iao Well - Development					1,200 (C)																			
5	Well A - Exploratory (Future)											350 (D)	1,000 (C)												
6	Well A - Development (Future)													350 (D)	3,000 (C)										
7	Well B - Exploratory (Future)															350 (D)	1,000 (C)								
8	Well B - Development (Future)																	350 (D)	3,000 (C)						
9	Well C - Exploratory (Future)																			350 (D)	1,000 (C)				
10	Well C - Development (Future)																					350 (D)	3,000 (C)		
WP	***Well Pumps***																								
1	Mokuhau 501						200 (C)																		
2	Waihee 579							250 (C)																	
3	Waiehu Hts 514								100 (C)																
4	Kanoa #2									100 (C)															
5	N. Waihee #2											150 (C)													
6	Waihee 577												150 (C)												
7	Waihee 578													150 (C)											
8	Kepaniwai 511and N. Waihee #1														250 (C)										
9	Mokuhau 503 and Kanoa #1															400 (C)									
10	Mokuhau 501																200 (C)								
11	Waiehu Hts 515																	100 (C)							
12	Iao and Waikapu																			300 (C)					
13	Waihee 579 and Kanoa #2																						350 (C)		
14	N. Waihee #2																							150 (C)	
15	Waihee 577, Kepaniwai 511, N. Waihee #1, Maui Lani #5, Maui Lani #6, and Maui Lani #7																								700 (C)
E	***Electrical***																								
1	Mokuhau-Generator Substation						850 (C)																		
2	Waiehu Hts-Generator							200 (C)																	
3	Kepaniwai-Building Electrical Upgrade								350 (C)																
4	N Waihee-Electrical Upgrade										200 (C)														
5	Kanoa-Electrical Upgrade												200 (C)												
6	Maui Lani-Electrical Upgrade															600 (C)									
T	**TREATMENT**																								
C	***Capacity Upgrade***																								
1	Iao WTF-Relocate WTF (Submerged Membranes)-system upgrade					5,000 (C)																			
2	Iao WTF-Relocate WTF (Submerged Membranes)-system expansion					10,000 (C)																			
3	Land Acquisition-New WTF																								5,000
W	***Water Quality Upgrade***																								
St	**STORAGE**																								
T	***Tanks***																								
1	Maui Medows #1 Tank																3,000 (D/C)								
2	Makai Heights Tank																	4,000 (D/C)							
3	Waiale-Phase 1 Tank																		3,000 (D/C)						
4	Waiale-Phase 2 Tank																			3,000 (D/C)					
5	Waikapu #1-phase 1 Tank																				2,000 (D/C)				
6	Waikapu #1-phase 2 Tank																					2,000 (D/C)			
7	Maui Medows #2 Tank																					3,000 (D/C)			
8	Waiehu Heights & Maui Medows #3 Tank																						2,800 (D/C)		
9	Waihee Tank																							3,000 (D/C)	
10	Wailuku Heights Extension Low Level Tank																							1,200 (D/C)	
11	Waikapu #2 Tank																								7,500 (D/C)
F	***Facilities***																								
1																									
2																									
O	***Others***																								
2																									
3																									
Tr	**TRANSMISSION**																								
1	Kihei 18" Pipe Replacement-Phase 1 to 6									2,000 (D)	5,000 (C)	6,500 (C)	6,500 (C)	6,500 (C)	6,500 (C)	6,000 (C)	4,500 (C)								
2																									
D	**Distribution**																								
P	***Pipe Replacement***																								
1	Kihei-Makena Waterline Upgrades					1,150 (D/C)																			
2	Paia Town Pipeline Replacement					3,000 (C)																			
3	Wailuku-Kahului Waterline Upgrades-Total							2,000 (D/C)	5,500 (D/C)	1,100 (D/C)	3,000 (D/C)														
4	Kea Street								3,000 (D/C)																
5	Halenia Avenue, Hulau Drive, Pala Circle, Palama Drive & Papa Place							2,000 (D/C)																	
6	Waiko Avenue and Mahalani Road								2,500 (D/C)																
7	Makena Road, Stable Road, and Kaiha Road									1,100 (D/C)															
8	North Kihei										3,000 (D/C)														
F	***Facilities***																								
E	**Electrical**																								
1	N. Waihee-Electrical Upgrade										200 (C)														
2	Mahalani-Electrical Upgrade									100 (C)															
3	Waiale-Electrical Upgrade						200 (C)																		
4	Wailuku Hts 31 and Wailuku Hts 30									1,600 (C)															
S	**Structural**																								
1	New/ Expand Water Quality Laboratory-Baseyard									3,000 (D/C)															
2																									
PM	**Pump Motors** [Age/performance characteristics/physical condition]																								
1	N. Waihee Bat #1, 2, 3, and 4									200															200
2	Wailuku Cntry Est. #1 1, Wailuku Cntry Est. #1 2, Wailuku Cntry Est. #3 1, and Wailuku Cntry Est. #3 2																		200						
3	Waiale 581 and Waiale 582							100														100			
4	Wailuku Hts 31 583, Wailuku Hts 31 584, Wailuku Hts 30 585, Wailuku Hts 30 586,						200														200				
5	Maui Meadows #17 506, Maui Meadows #17 507, and Maui Meadows #17 508																	150							
6	Diamond Resorts #1 and Diamond Resorts #2																100								
7																									
I	**Instrumentation/SCADA**																								
1	Replace Remote Terminal Units											2,000													
2	SCADA Telemetry Radio-Data					250																			

CIP by Priorities



- Must Do on Shown Timeline to Prevent Disruption of Existing Service/Violation of Rules &Regulations or Safety
- Must Do Soon to Prevent Disruption of Existing Service/Violation of Rules or Safety, But Can Slip up to 2 years Before Becoming in the Red Category
- Needed For Reliability or Improved Service in Accordance with Long Term Planning, But Not Mandatory
- Needed for Growth
- Needed for Fire Protection

Priority Policy Issues

- Rates, fees and debt
  - Maximum annual debt allocation for DWS?
  - Maximum annual rate increase?
  - Maximum meter fees?
- Should meter fees vary by location to reflect actual cost of service? Or should low-cost areas subsidize high-cost areas? How much?
- Should current customers subsidize new users? How much?
- Subsidized rates for competing user groups? How much?

Additional Priority Policy Issues

- Desired growth rates for various areas? (Maui Island Plan?)
- Prioritize water infrastructure in given area versus others? (Maui Island Plan?)
- Drought tolerance vs. new users?

Summary of Key Issues

- Review of efforts to date
- Source vs. reliable capacity
- System optimization assessment
- Priority policy issues
- FY 2013 budget represents a fundamental change in DWS management

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By Water All Things Find Life