City of Franklin

Integrated Water Resources Plan

January 25, 2012

Stakeholder Meeting 7

CDM

Meeting Agenda

- Introductions and Workshop Goals
- Review of Workshop 6
- Response to Stakeholder Input From Workshop 6
- Final Rankings
- Plan Benefits
- Discussion and Feedback
- Next Steps
- Adjourn

Workshop Goals

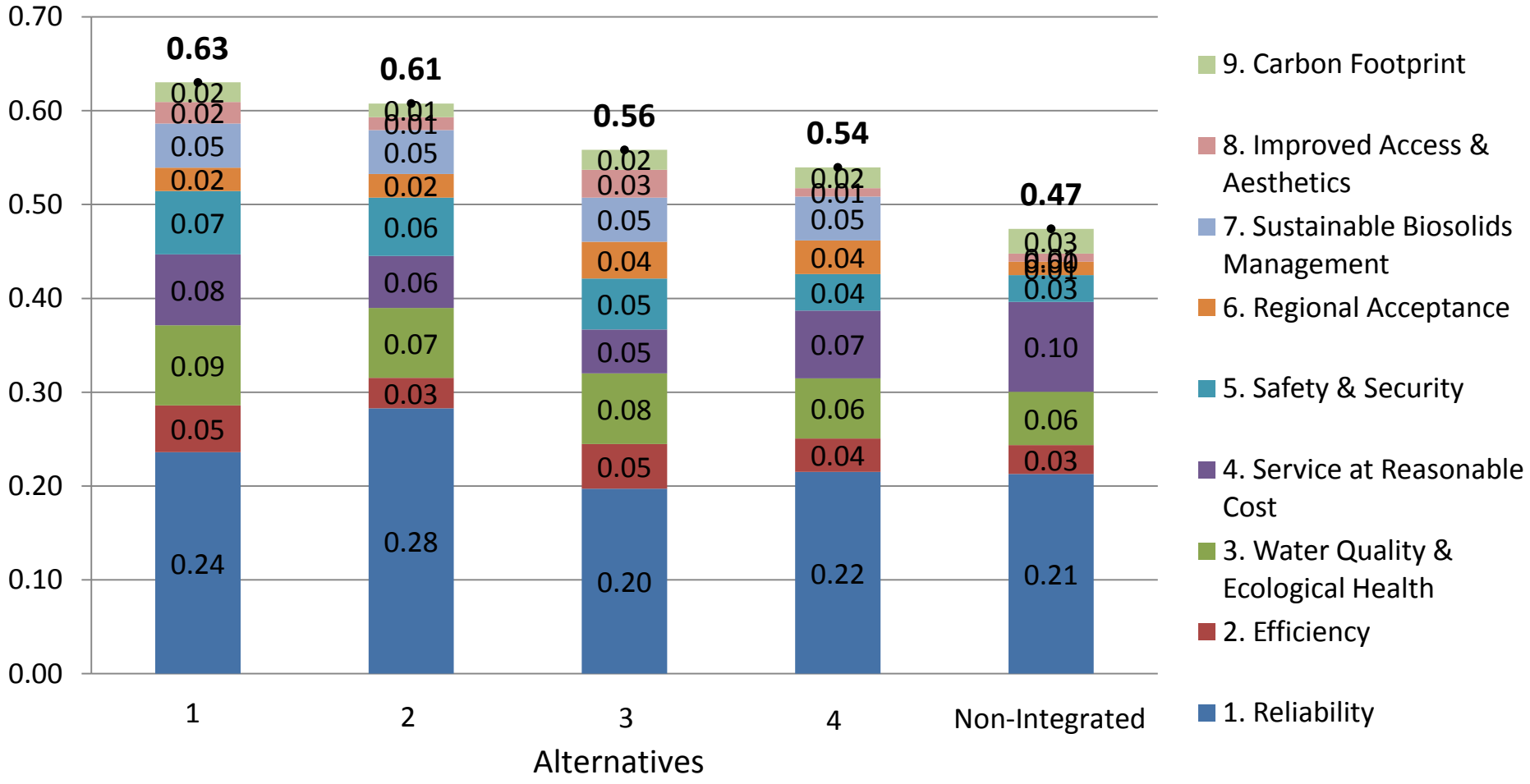
- Update Stakeholders on the Discussions from Workshop 6
- Present Final Stakeholder Recommendations for IWRP
- Summarize the Steps to Finalizing of the IWRP

WORKSHOP 6 REVIEW

Definition of Alternatives

	Non-Integrated	**Alt 1** *E+S&S*	**Alt 2** *Revised Rel.*	**Alt 3** *WQ Plus*	**Alt 4** *Revised LC*
Low-Head Dam Removal	No	Yes	No	Yes	Yes
Water Treatment Plant	2.1 mgd & HVUD Purchase	4 mgd & HVUD Purchase	Line to Cumberland & 12.5 mgd WTP	Decommission WTP & HVUD Purchase	2.1 mgd & HVUD Purchase
Water Distribution System	No	Model, WQ/Quantity Improvements, advanced metering	Model, WQ/Quantity Improvements	Model, WQ/Quantity Improvements, Advanced metering	Model, Advanced metering
Conservation	No	5% savings	2% savings	2% savings	No
Stormwater BMPs and LID	No	BMPs + LID	LID	BMPs + LID	No
Ecological Restoration	No	Low Head Dam Removal & Specific Restoration Projects	No	Low Head Dam Removal & Watershed Projects	Low Head Dam Removal
Existing WWTP	24 mgd	16 mgd	18 mgd	24 mgd	24 mgd
New Southern WWTP	None	8 mgd	6 mgd	None	None
Berry's Chapel/ Cartwright Flows	No	Yes	No	Yes	No
Collection System	Pump to Existing WWTP	Model, Septic Users, I/I Reduction	Model, Septic Users	Model, Septic Users ,I/I Reduction, Pump to Existing WWTP	Model, I/I Reduction, Pump to Existing WWTP
Reclaimed Water	No	Upgrade Pumping to 12 mgd & add Probable Customers	Upgrade Pumping to 12 mgd & add Probable Customers	Upgrade Pumping to 12 mgd & add Probable Customers	No

Phase II Alternatives



Ranking Results
Sensitivity Analysis of Alternatives Results

	Alt 1 ESS	Alt 2 RR	Alt 3 WQP	Alt 4 RLC	Non-Integrated
Stakeholder Weights	1	2	3	4	5
Equal Weights	1	3	2	4	5
Reliability 30%	1	2	3	4	5
Water Quality 30%	1	3	2	4	5
Safety & Security 30%	1	3	2	4	5
Cost 30%	1	4	3	2	5

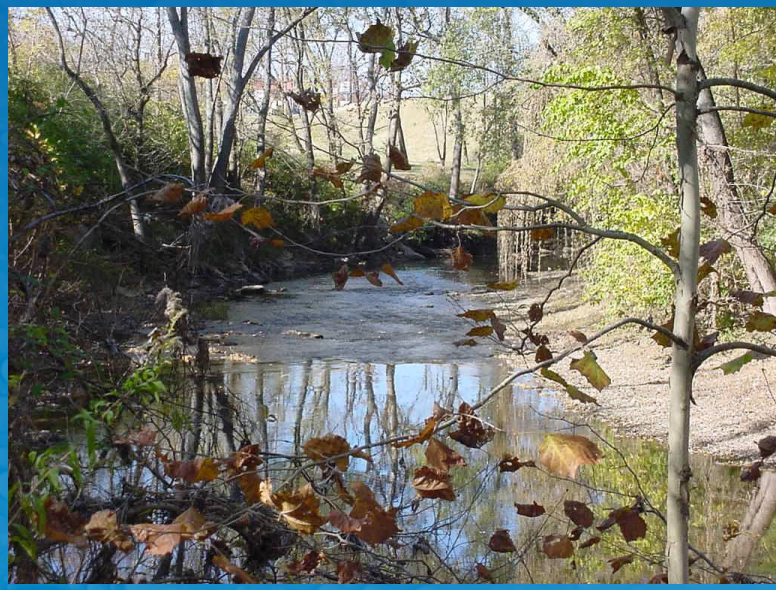
Changes Requested by Stakeholders

- September Median Flow: report the change in this flow rather than the exceedence of its old value
- Added escalation to biosolids disposal costs
- Reduced contingency on known equipment quotes
- Show ranking if only the top 5 performance measures are included
- Rank variations of the preferred plan
- TDEC requested changes in water quality input values

FINAL WATER QUALITY ANALYSIS

Our Understanding of the Harpeth River

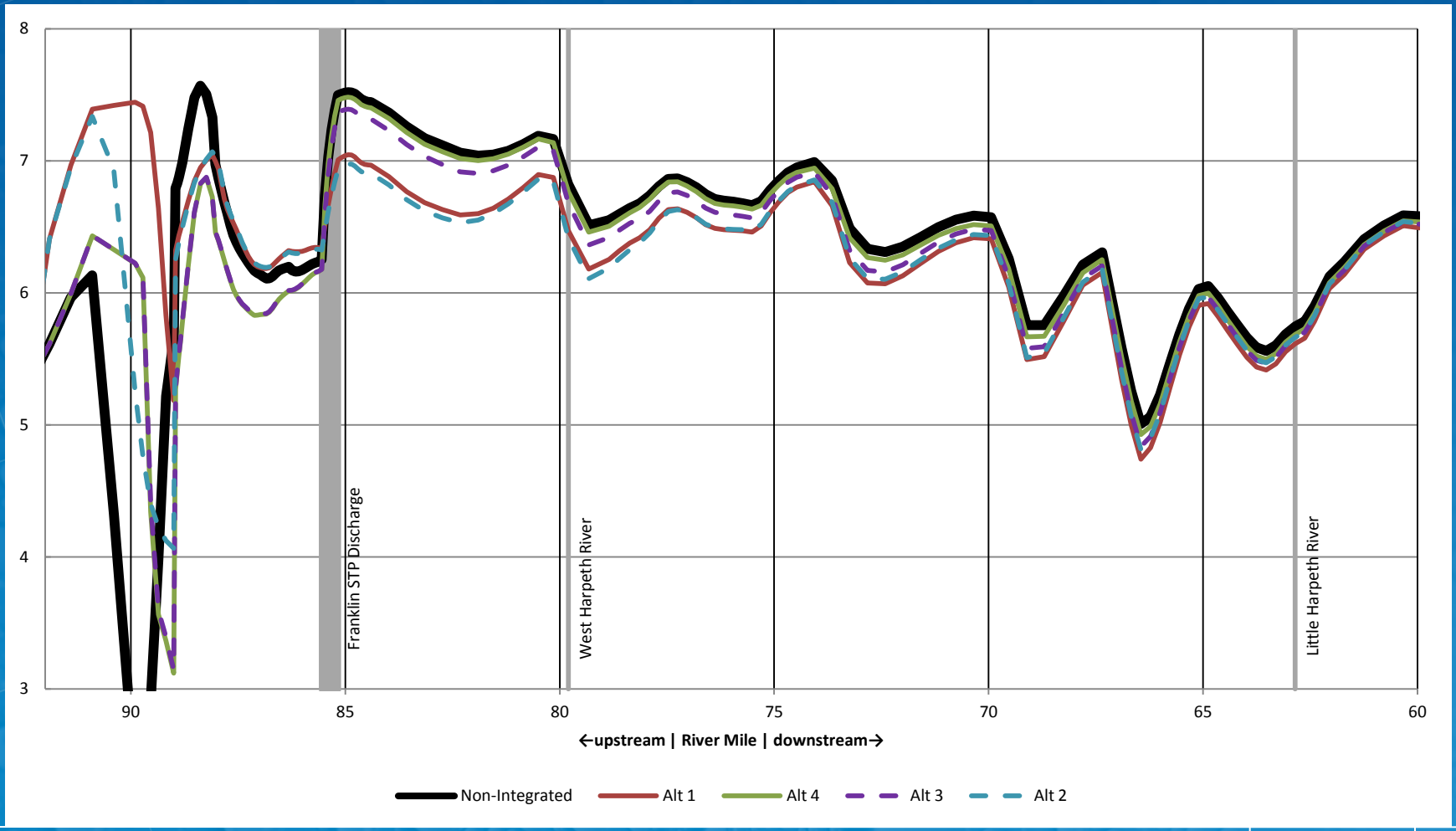
- WQ is impaired by the time it reaches Franklin
- The Harpeth River in Franklin, and downstream is dominated by streambed dynamics
  - Sediment Oxygen Demand
  - Fixed Algae (periphyton)
- Changes to WWTP
  - May help augment low flows
  - Have benefits and disadvantages
  - Not likely to have significant impact on dissolved oxygen



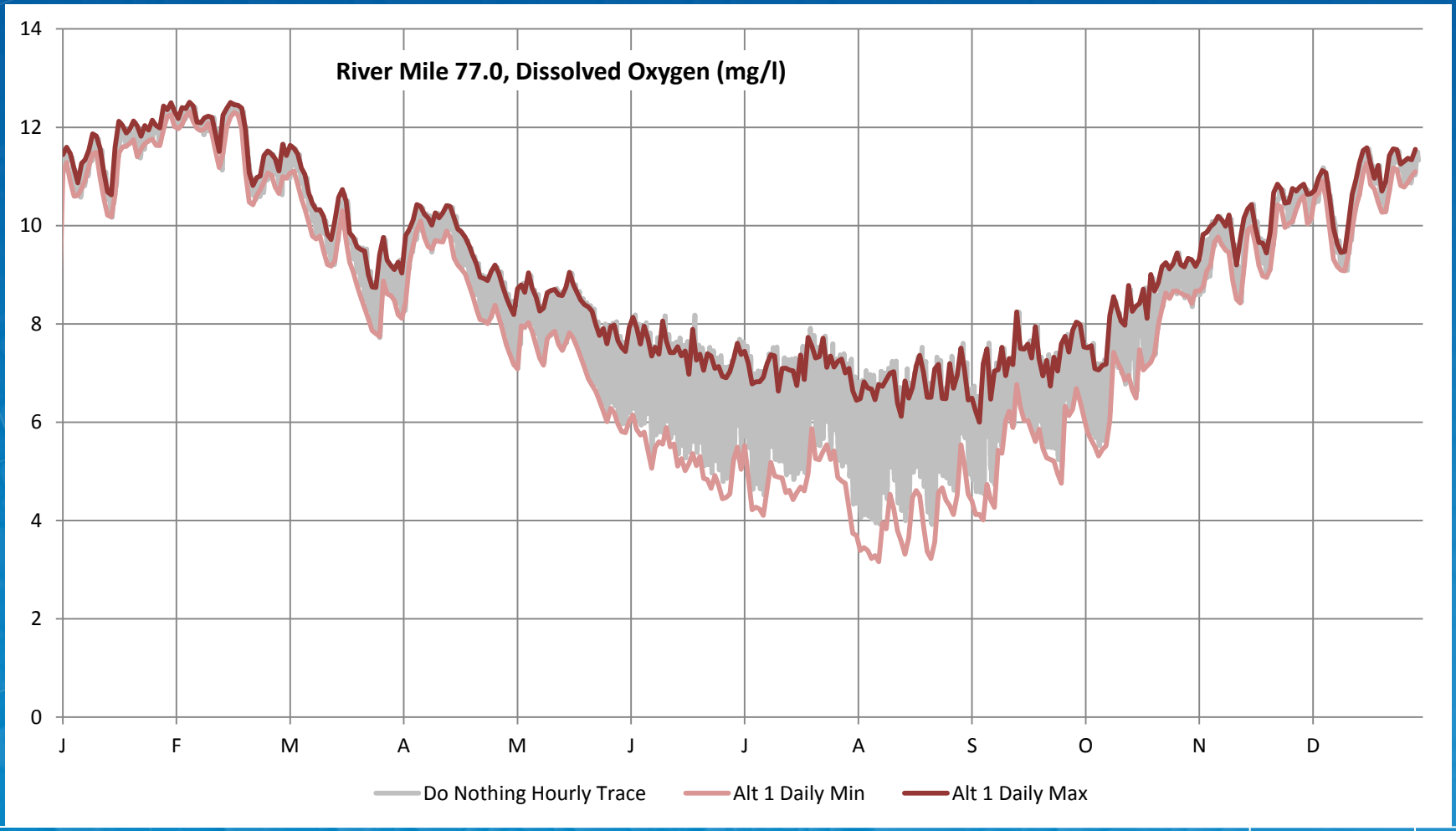
What Changed Since Last Workshop

- Input revised per TDEC guidance
  - CBOD converted to organic nutrients
- Adjusted Reuse Patterns: More discharge from South Plant
- Improved representation of the dam

Alternatives in Profile



Min and Max DO

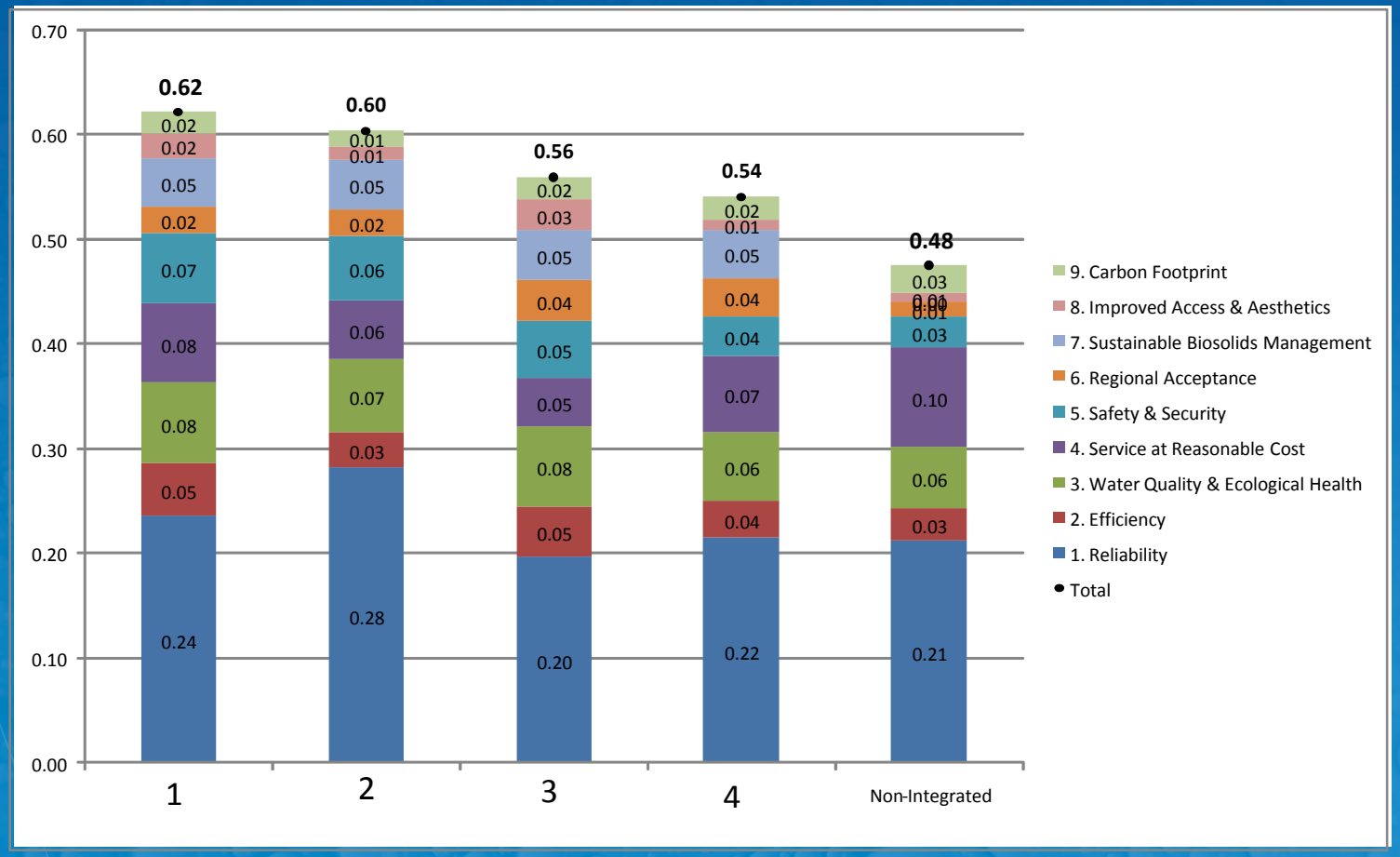


Technical Review and Water Quality Conclusions

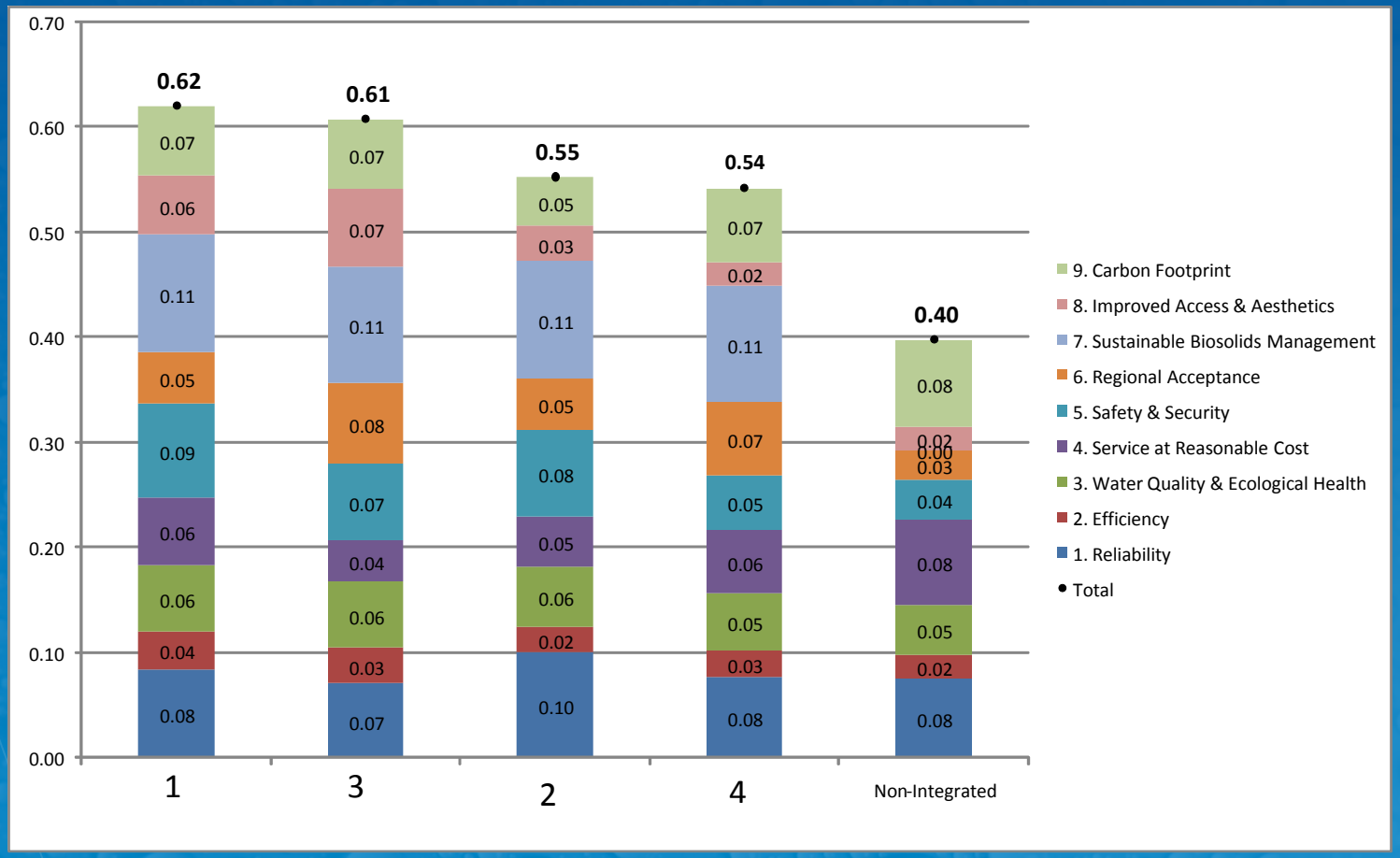
- Technical Review Meetings
  - Harpeth River Watershed Association
  - USGS
  - TDEC:
    - Model is good for IWRP alternatives analysis.
    - More data from tributaries and sediment needed for permitting.
- General Consensus
  - River is dominated by streambed effects
  - South plant has (+) and (-) as do all other alternatives
  - Dam removal appears to be beneficial
  - Differences between alternatives is very small
  - More data needed to examine river downstream of RM ~73

ALTERNATIVES RANKING ANALYSIS

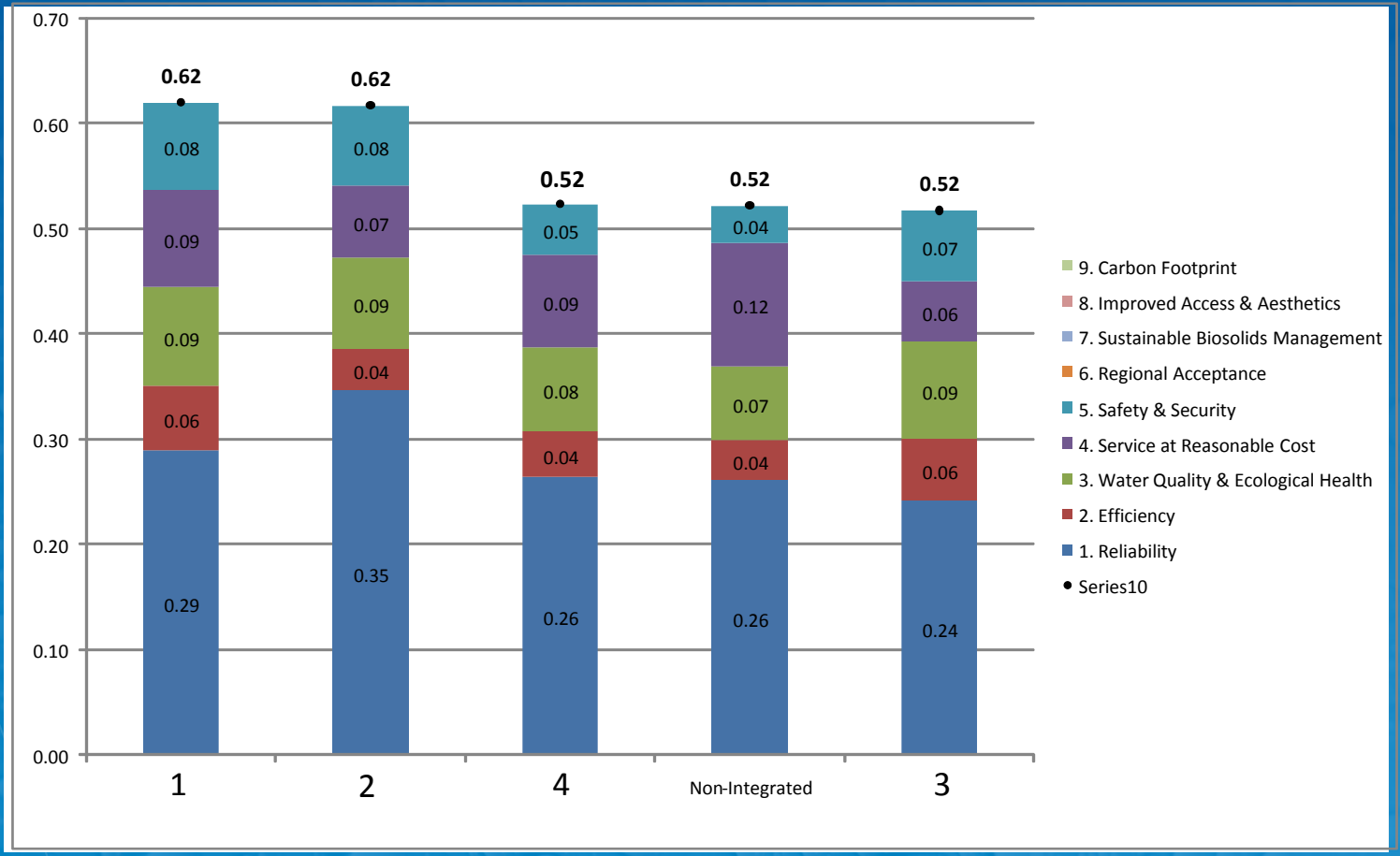
Rankings with Stakeholder Weights



Rankings with Equal Weights

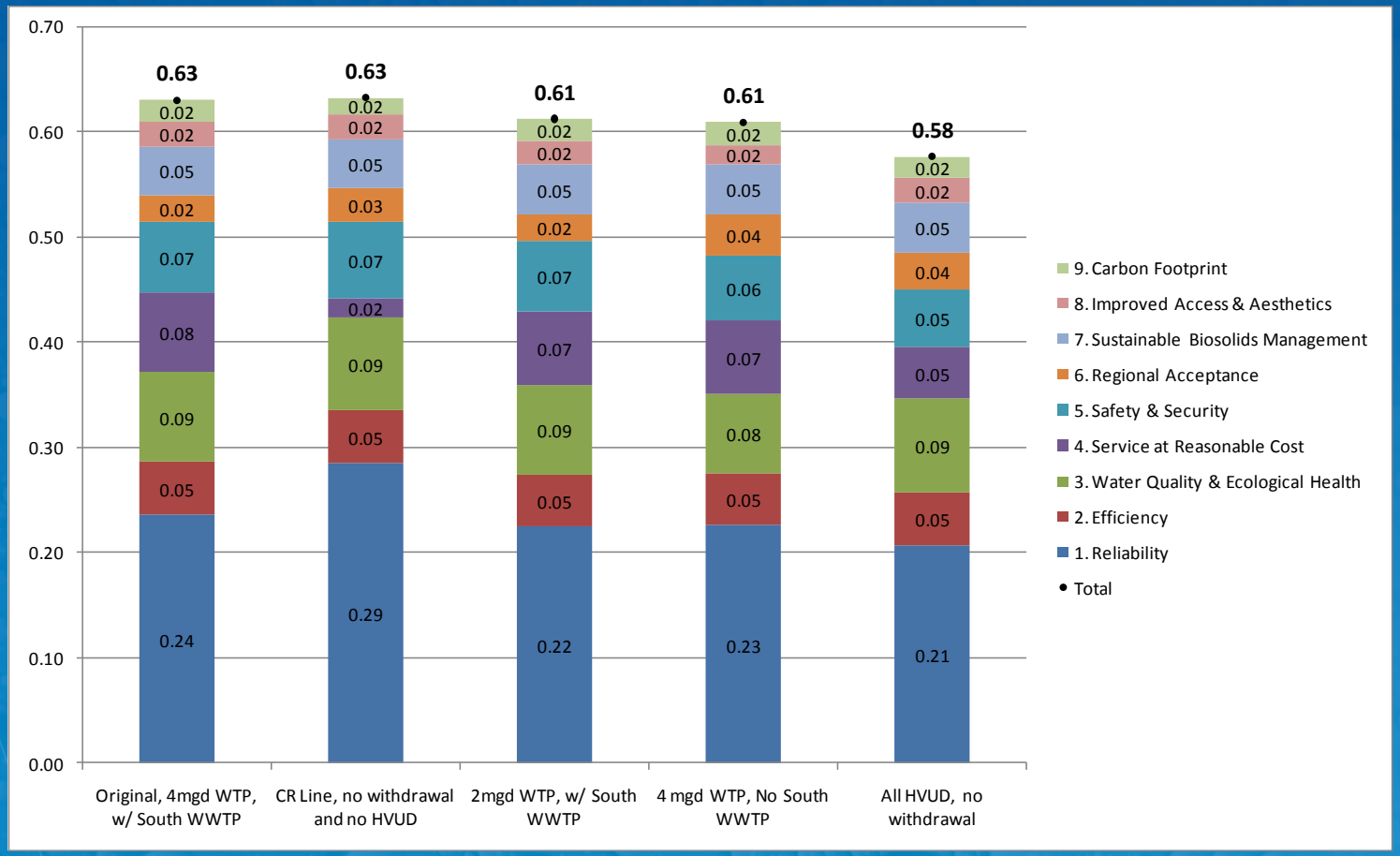


Rankings with Top 5 Criteria Only



Variations on the Preferred Plan

Note: Not updated with revised Sept. Median Flow Performance Measure



Conclusions

- Preferred Alternative still always ranks highest among all alternatives, even with Stakeholder revised input
- Original formulation of the preferred Alternative ranks highest
  - 4 mgd WTP
  - South Plant

Benefits of the Preferred Alternative

- 100% Reliable in meeting future water and wastewater demands
- Greater control and operational flexibility
- Meets most of the city's waste load allocations
- 30 miles of river restoration and stormwater BMPs
- Sustainable biosolids management
- Within 4% of the life-cycle cost of the low cost alternative and $100 million less than the most expensive alternative
- Provides flexibility in how projects are implemented and paid for

FEEDBACK AND DISCUSSION

Next Steps

- Draft Report Submitted to Steering Committee – late February
- Update Meeting with BOMA – February 28th
- Additional Update Discussions with BOMA – TBD
- Final Report – March-April

THANK YOU

Final Scorecard

Weight	Objective	Performance Measure	Sub-Weight	Unit	Better scores are:	Non Integrated	Alt 1	Alt 2	Alt 3	Alt 4
31.1%	Meet current and future demands for water and wastewater reliably	1.1 % time all demands met	25%	% time (all days)	high	100	100	100	100	100
		1.2 Freq of No Allowable Harpeth Withdrawal	25%	% time (all days)	low	16	3	3	16	16
		1.3 Vol of WW capacity surplus or shortfall	25%	average annual MGD	high	5.0	5.9	5.0	5.9	5.9
		1.4 Supply redundancy	25%	% of demand met (vol)	high	23	37	100	0	23
15.5%	Maximize efficiency of water use and value of water resources	2.1 Percent of stormwater reduced through LID	20%	% volume	high	0.0	33.2	0.0	33.2	0.0
		2.2 % total reuse demand satisfied	20%	% volume	high	100	100	100	100	100
		2.3 % demand reduction	20%	% volume	high	0	5	2	2	0
		2.4 Reduction in inflow and infiltration	20%	% volume	high	0	11	0	11	11
		2.5 % reduction in unaccounted for water	20%	% volume	high	0	4	0	4	4
13.5%	Improve water quality and ecological health of Harpeth River	3.1 Change in September Median Flow at USGS Gage 2350	20%	CFS, above or below 5.7	high	0.0	2.1	4.0	0.0	0.0
		3.2 Average summer BOD load	20%	LB/day (summer only)	low	1121	1152	1159	1106	1122
		3.3 Average summer nitrogen load	20%	LB/day (summer only)	low	325	281	288	265	316
		3.4 Ecological indicators	20%	qualitative	high	3.0	4.5	3.5	4.5	4.0
		3.5 Negative impacts of stormwater reduced	20%	qualitative	high	3.0	3.5	3.0	3.5	3.0
13.2%	Provide level of services at a reasonable cost	4.1 Life-cycle cost of projects and policies	40%	million $	low	585	785	793	870	752
		4.2 Capital Cost	40%	million $	low	132	216	286	254	193
		4.3 Meet secondary drinking water standards	20%	qualitative	high	3.5	5.0	4.0	2.5	3.5
8.3%	Provide safety and security of water resources systems	5.1 % of total wastewater on septic	25%	% volume	low	4	0	0	0	4
		5.2 Change in 100 year flood elevation	25%	qualitative	high	3.0	5.0	3.0	4.0	3.0
		5.3 Vulnerability of infrastructure & facilities	25%	qualitative	high	1.5	4.0	4.0	1.5	4.0
		5.4 Emerging water quality concerns	25%	qualitative	high	4.0	3.0	4.0	4.0	3.5
5.7%	Achieve regional acceptance	6.1 Extent of regional focus	50%	qualitative	high	3.0	3.5	3.0	4.5	3.0
		6.2 Likelihood of public acceptance	50%	qualitative	high	1.0	2.0	2.5	3.0	4.0
4.7%	Achieve sustainable biosolids management	7.1 Biosolids handled sustainably	100%	qualitative	high	1.0	5.0	5.0	5.0	5.0
4.5%	Provide improved access and aesthetics of Harpeth River	8.1 % of streamflow that is WWTP effluent	25%	% volume (Sept. only)	low	48.8	30.6	27.0	46.7	48.0
		8.2 Extent of bank stabilization	25%	miles	high	0	39	0	95	0
		8.3 Erosion potential	25%	qualitative	high	3.0	4.0	3.0	4.5	3.0
		8.4 Public accessibility	25%	qualitative	high	2.0	3.0	2.0	4.0	2.0
3.5%	Minimize carbon footprint of water resources operations	9.1 Average energy requirements	100%	Average kWh/day	low	59565	78161	99793	77666	74319