



Wake County Stormwater Management Task Force Meeting #16

September 20, 2007

Cary • Fuquay-Varina • Garner • Holly Springs • Knightdale •
Morrisville • Raleigh • Rolesville • Wake County • Wake Forest •
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Springs • Knightdale • Morrisville • Raleigh • Rolesville • Wake County •
Wake Forest • Wendell • Zebulon • Apex • Cary • Fuquay-Varina • Garner



Meeting Agenda

- Welcome from Commissioner Gardner
- **Update on Stormwater Manager's Meeting**
- Review and Comment on Implementation Steps/Resource Estimates
- Voting Exercise on Recommendations

Comparison of Task Force and Stormwater Manager's Priorities

Proposed Rec. #	Proposed DRAFT Recommendations	Task Force Priorities	Manager's Priorities
		Rank	Rank
1	Hydrologic and Hydraulic Modeling of the Stormwater System	3	2
2	Post Construction Stormwater Runoff Controls	2	1
3	Enhance Sediment and Erosion Control Programs County-wide	1	1
4	Implement County-Wide Call Center for Stormwater Issues	3	6
5	Risk-based Approach to Stormwater System Maintenance	1	3
6	Collaboration with County on NDPES Phase II Minimum Measures	1	6
7	Environmental Monitoring (Quantity and Quality)	4	6
8	Collaboration on Public Education Programs	2	4
9	Maintenance and Inspection of On-Site Wastewater Systems	5	5

Factors Influencing Priority Voting for Stormwater Managers

- *Modeling* - can be most important for future planning (i.e. 10, 20, 30 year horizon)
- *Post Construction* - Control of flooding events (i.e. 10-year storm) will provide benefit
- *S&E Enhancement* - High visibility; customer driven
- *Maintenance* - Long-term cost savings or cost avoidance

Thoughts to Consider from Stormwater Managers

- Need to ensure maintenance of BMPs; cost implications can be huge
- Recognize that H&H modeling is expensive, but very useful
- Collaboration is a good long-term strategy
- Monitoring can justify need for more improvements

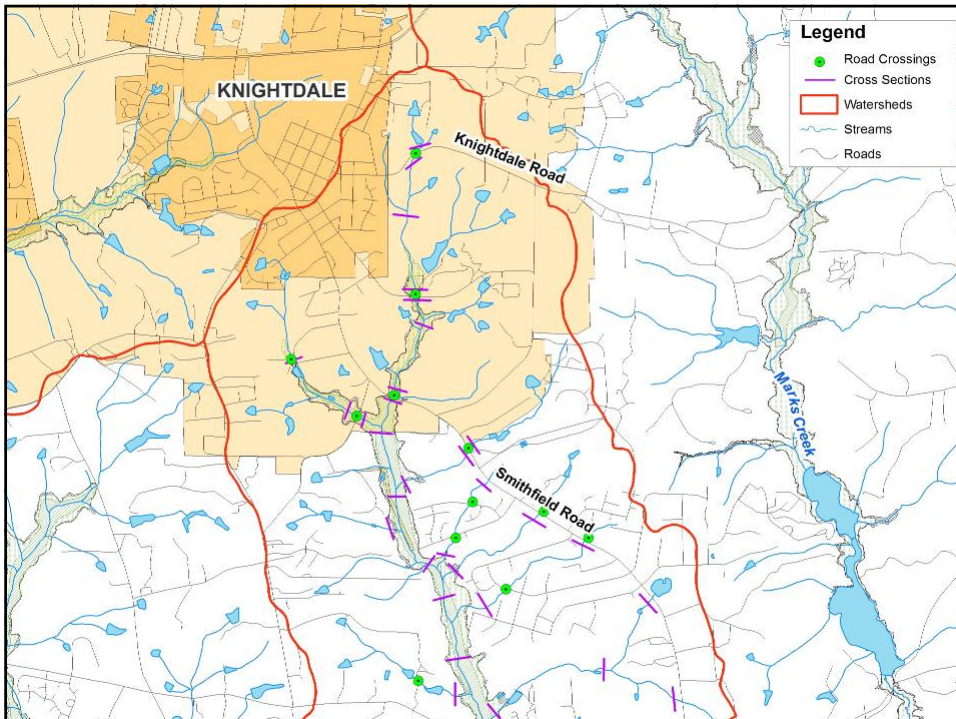


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#1 – Hydrologic and Hydraulic Modeling of the Stormwater System

No.	Implementation Steps	Estimated Resources
1	Perform Pilot Study/Model of Poplar Creek a. collect all land-use and development plan information for watershed b. augment current City of Raleigh survey data with new data c. delineated watershed into 100-acre sub-basins d. perform hydrologic and hydraulic modeling e. generate future conditions floodplain map outside of FEMA limits f. identify existing and future capital needs within watershed	Estimated \$275,000 for development of model and facilitation of Water Quality committee meetings
2	Convene Water Quality Committee to review findings of pilot study	
3	Facilitate discussion with Water Quality Committee to determine alternative solutions for predicted impacts	
4	Determine future use and application of watershed models (using committee)	
5	Use Water Quality Committee to prepare policy decisions on modeling	



#2 – Post Construction Stormwater Runoff Controls

No.	Implementation Steps	Estimated Resources
1	Convene coordination meetings with Towns to participate in joint program	Cost estimate is contingent upon degree of participation of jurisdictions
2	Develop uniform draft ordinance with NPDES Phase II minimum water quality control and with additional requirement for control of 10-year storm (flood protection)	
3	Provide Staff to Review and Enforce Design and Maintenance	
4	Review existing ordinances county-wide to determine compatibility with LID practices	
5	Convene committee (Water Quality committee) to develop incentives for non-structural controls and LID practices and to suggest ordinance changes related to impervious surfaces	

Post-Construction Ordinance Language

Sample language from City of Raleigh Ordinance

Sec. 10-9023. STORMWATER RUNOFF CONTROLS.

(a) Runoff limitation.

~~Following the application of this regulation*~~, the peak stormwater runoff leaving any site for the two-year and ten-year storms shall be no greater for *post-development* conditions than *pre-development conditions* . The same methodologies used to calculate stormwater runoff must be used for both *pre-development* and *post-development conditions* .

Potential Cost Implications of Flood Control Requirement

Sample Calculation for Two Sites

Residential Development

- Site Area = 10.25 acres
- % Imper. = 67 percent
- 2-yr Pond Cost = \$30K
- Increase for 10-yr Pond = \$3,150

Commercial Site

- Site Area = 3.62 acres
- % Imper. = 62 percent
- 2-yr Wetland Cost = \$35K
- Increase for 10-yr Wetland = \$13,000

For a more detailed analysis on the potential cost of regulations, consider reviewing:
<http://www.charmeck.org/Departments/StormWater/Contractors/PCCO++City.htm>

#3 – Enhance Sediment and Erosion Control Programs County-wide

No.	Implementation Steps	Estimated Resources
1	Modify ordinance to include requirement for silt fence on all residential lots	For workload of 50 permits/inspector, estimated cost would be \$595,000/year for salary + benefits (7 staff) county-wide
2	Develop risk criteria for disturbed sites and enforcement criteria for "high-risk" sites	
3	Perform workload projection study to determine necessary FTEs to provide S&E services	
4	Provide additional staff to enforce high-risk approach	
5	Develop cross-training program to educate field staff to report S&E violations	

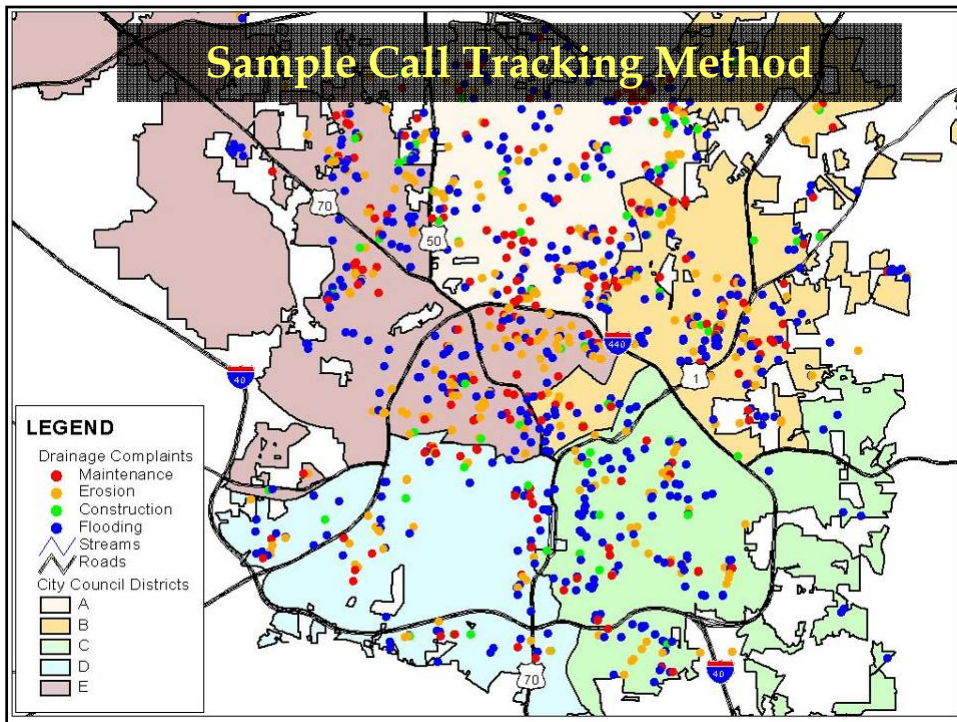
Enforcement of Standards: Inspector Workload & Production

S&E Staff/Inspector Workload				
Jurisdiction	Workload Breakdown			
	Inspectors	Active Permits	Permits / Inspector	Inspection/ Frequency
Town of Apex	1	32	32	2-weeks
Town of Cary	2	150	75	2-weeks
Town of Holly Springs	4	71	18	2-weeks
Town of Raleigh	7	500	71	2-weeks
Town of Wake Forest	4	112	28	1-week
Wake County	7	800	114	2-weeks
State/Municipal Projects				
Totals:	25 <small>see notes</small>	1,665	56 <small>per inspector</small>	2 <small>week frequency</small>

Note: Cary and Raleigh each have an additional vacant position for inspections

#4 – County-wide Call Center for Stormwater Issues

No.	Implementation Steps	Estimated Resources
1	Develop common tracking procedures for current customer calls/complaints	Cost of call center is contingent upon estimation of complaints/call volumes as determined in Step #1 to the left.
2	Compile information on all stormwater-related calls county-wide to estimate anticipated call volume	
3	Develop policies and procedures manual for call center activities	
4	Implement call center	
5	Provide staffing for required service level	



#5 – Risk-Based Approach to Stormwater System Maintenance

No.	Implementation Steps	Estimated Resources
1	Develop work plan of NCDOT-related maintenance issues and present to NCDOT	It has been anticipated that all activities will be accomplished with existing staff.
2	Develop risk-based protocol for maintenance priorities using local Stormwater Managers	
3	Develop computerized database of high-risk locations in each jurisdiction using modeling results, call logs, and field experience	
4	Develop maintenance plan for addressing high-risk sites	
5	Implement and perform maintenance procedures	

#6 – Collaboration with Wake County on NPDES Phase II Minimum Measures

No.	Implementation Steps	Estimated Resources
1	Convene meeting with interested jurisdictions and develop interlocal agreements	EPA estimates range from \$1.33/capita to \$10.96/capita to implement all six minimum measures depending on degree of collaboration with adjacent jurisdictions
2	Develop uniform ordinance for all jurisdictions	
3	Develop five-year workplan for program activities with associated staffing plan	
4	Develop joint permit for State approval	
5	Provide enforcement and reporting activities	

Estimated Cost for NPDES Phase II Implementation

Table 3. Summary Results

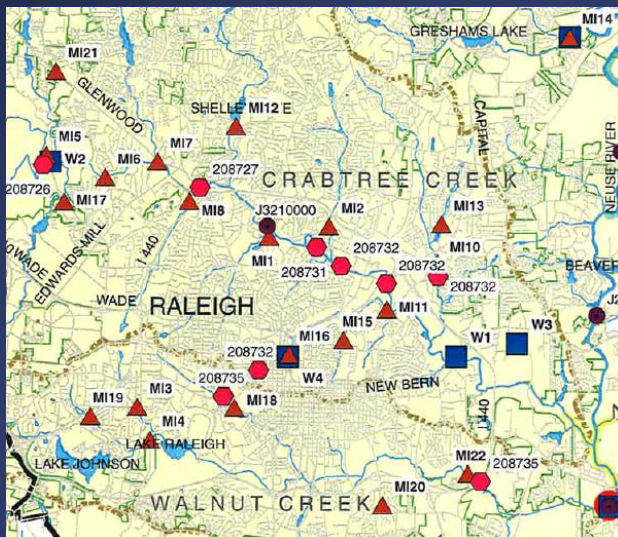
Minimum Control	Annual Per-Capita Cost	
	Small	Midtown
First 5-year Permit Period		
1 - Public Ed.	0.39	1.24
2 - Public Inv.	0.21	0.62
3 - Illicit Connections	0.24	1.77
4 - Construction	0.20	0.96
5 - Post Const.	0.14	5.78
6 - Housekeeping	0.15	0.59
Totals	1.33	10.96
Subsequent 5-year Permit Periods		
1 - Public Ed.	0.36	1.40
2 - Public Inv.	0.24	0.51
3 - Illicit Connections	0.10	1.16
4 - Construction	0.18	1.10
5 - Post Const.	0.13	1.26
6 - Housekeeping	0.10	0.20
Totals		5.63

Source: NPDES Phase II Cost Estimates, Reese, 2003

#7 – Environmental Monitoring

No.	Implementation Steps	Estimated Resources
1	Convene a series of meetings with all agencies supplying monitoring within Wake County to assess data gaps and identify program enhancements	Cost of monitoring plan is contingent upon outcome of meeting with local agencies.
2	Develop monitoring work plan that will include station locations, monitoring activities, and frequencies	
3	Develop interlocal agreements and cost share guidelines for participating jurisdictions	
4	Implement program enhancements per recommendations in the monitoring work plan	
5	Develop and implement procedures for a common reporting mechanism	

Current Water Quality Monitoring Sites in Raleigh



#8 – Collaboration on Public Education Programs

No.	Implementation Steps	Estimated Resources
1	Coordinate Task Force recommendations/suggestions with newly-formed County Environmental Stewardship Division	Cost for public education program will be determined following the formation of the County Environmental Stewardship Division
2	Convene a meeting with local jurisdictions and agencies to determine all local education programs for stormwater	
3	Develop and conduct a citizen survey to determine current knowledge level and deficiencies	
4	Convene a meeting of the Water Quality Committee to review survey data and other local programs to determine the focus areas for the new education program	
5	Develop materials and workshops to support desired education initiatives	

#9 – Maintenance and Inspection of On-site Wastewater Systems

No.	Implementation Steps	Estimated Resources
1	Perform a review of local and peer community maintenance practices	Estimated \$140,000 to complete planning stages of program
2	Convene stakeholders group to review practices and select alternatives	
3	Develop maintenance plan for on-site wastewater systems	
4	Implement maintenance and inspection program with appropriate staff	Risk-Based (\$570K) vs Proactive (\$900K) Program

Implementation Schedule

Activity	2007			2008					
	O	N	D	J	F	M	A	M	J
Presentations to Local Governing Boards									
Determination of Participation Level									
Poplar Creek Pilot Study									
Determine Risk-Based Criteria for S&E **									
Develop Uniform Post Construction Ordinance**									
Compile Maintenance "Hot-Spots" from Managers									
Coordinate Public Education with County Environmental Stewardship Initiative**									

** Phase II programs

Meeting Agenda

- Welcome from Commissioner Gardner
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- **Voting Exercise on Recommendations**

Voting Exercise for Level of Support for Recommendations

- Single-sheet with voting box for each recommendation

Strongly Disagree	<input type="checkbox"/>	Disagree	<input type="checkbox"/>	No Opinion/ Don't Know	<input type="checkbox"/>	Agree	<input type="checkbox"/>	Strongly Agree	<input type="checkbox"/>
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- Mark an "X" in the box that most closely aligns with your views on each recommendation
- Please provide any final comments in the space provided

Next Steps

- Task Force Wrap-up meeting in October
- October/November
 - Board of Commissioners briefing on recommendations
 - Receive comments
- November/December
 - Board of Commissioners act on recommendations

**Thank You For Your
Time And Interest!**



CDM