Potential BMP Monitoring Sites Tour, Watershed Modeling, Upcoming Watershed Protection Plan Tasks and Implementation Activities

September 16, 2010

BMP Monitoring Site Tour

- Visited sites throughout the watershed
- Areas with row crops, cattle grazing and areas with failing OSSFs
- TCEQ is considering delaying monitoring, but we still need to set up sites and have a monitoring plan ready to go

BMP Monitoring Sites

- Anderson – Wharton County

BMP Monitoring Sites

- Boettcher – Wharton County

BMP Monitoring Sites

- Hankins – Brazoria County

Modeling QAPP

- SELECT (Spatially Explicit Load Enrichment Calculation Tool)
  - Has been used in other local watersheds including Plum Creek and Bastrop Bayou
  - It is TCEQ/EPA approved
  - Works with existing ambient monitoring data and population forecasts
  - Estimates pollutant loads for potential sources
  - Requires flow data
  - Requires a comparison step
  - Is currently being used for Bastrop Bayou

Table 1 – SELECT Model Inputs			
Name	Source	Date	Description
Land Cover	H-GAC	2002	GIS Shapefiles
Watershed	TCEQ	2003	GIS Shapefiles
Coastal Preserve	GLO\USGS	2000	GIS Shapefiles
County	TXDOT	2000	GIS Shapefiles
Urban Centers	Census Bureau	2000	GIS Shapefiles
Roads	H-GAC-Starmap	2007	GIS Shapefiles
Water Quality (incl. ambient)	H-GAC	2007	GIS Shapefiles
Wastewater SA	H-GAC	2007	GIS Shapefiles
WWTP Outfalls	TCEQ	2007	GIS Shapefiles
Soil	NRCS	2000	GIS Shapefiles
Potential Septic System	H-GAC	2005	Interpolated Data
Lidar Elevation	FEMA	2006	Most recent
Flood Zones	FEMA	2000	GIS Shapefiles
Population	Census Bureau	2006	Tabular, Estimate
Housing Units	Appraisal District	2006	Tabular
Inventory of Buildings	Appraisal District	2006	Tabular
Livestock population	NASS	2008	
Wildlife population	TPWD	2008	Tabular
Fecal production rates	USEPA	2004	Tabular
Pet population	AVMA	2001	Tabular

Table 2 - Source of SELECT Inputs	**Units**	**Source**
Soils data (SSURGO) coverage		F
Land Use/Land Cover (NLCD) coverage		F
Digital Elevation Model (USGS-NHD) coverage	m (elevation)	F
Curve number lookup table (NRCS)		L
Livestock population (NASS) coverage	number / county	F
Wildlife population (TPWD) coverage	number / area	F
Fecal production rates (USEPA)	cfu/day	L
Septic system age (health districts) coverage	age/subdivision	F
Population (US Census) coverage	number / area	F
Pet population (AVMA)	pets/household	L
WWTP location and permits (TCEQ) coverage	TCEQ	F

Modeling QAPP

- EPD-Riv1
  - Developed by the EPA, not a lot of support available yet
  - Moderately expensive, very complex
  - Not very time consuming to run
  - Excellent data quality
  - No flow data needed
  - Will also work for tidal areas
  - Also being used for Bastrop Bayou

EPDRiv1 Model Inputs	Units	Source
Cross-sections	m/m3/m2	F
Bathymetry	m	F
Flow (USGS, station 08078000 on segment 1108, Chocolate Bayou, as interpolated for Bastrop Bayou)	m3/s	F
Water Surface Elevation West Bay	m	F
Temperature	°C	F
Temperature coefficient for coliform mortality	1.047	L
Temperature coefficient for decay of Bacteria (constituent 1)	Variable	L
Temperature coefficient for decay of Bacteria (constituent 2)	Variable	L
Rate coefficient for Bacteria (constituent 1) day-1	Variable	L
Rate coefficient for Bacteria (constituent 2) day-1	Variable	L
Rate coefficient for coliform mortality, day-1	0.05-4.0	L

XPSWMM Inputs	Source
Soils data (SSURGO) coverage	F
Land Use/Land Cover (NLCD) coverage	F
Digital Elevation Model (USGS-NHD) coverage	F
Precipitation	F
Stream flow data (USGS, from station 08078000 on Chocolate Bayou, segment 1108, as interpolated for Bastrop Bayou)	F

Nine Elements of WPP

- Identification of the causes
- Estimate of needed load reductions
- Description of management measures
- Estimate of technical and financial assistance needed to implement the plan
- Information/education component to enhance public understanding
- Schedule for implementation
- Description of interim, measurable milestones
- Set of criteria to determine whether load reductions are being achieved
- Monitoring component to evaluate effectiveness of implementation

Sample 9 Element Table

(a) Causes and Sources of Bacterial Impairment (Est. Loads)	(c) Management Measures and Targeted Critical Areas	(b) Estimated Load Reduction Potential From Each Measure (Unit or Total)	(d) Technical and Financial Assistance Needed for Each Measure	(e) Education Component for Each Measure (and Other Education)	(f) Schedule of Implementation for Each Measure	(g) Interim, Measurable Milestones for Each Measure	(h) Indicators to Measure Progress	(i) Monitoring Component	(j) Responsible Entity
Malfunction-ing OSSFs (16% of loading)	Maintenance, repair, and replacement of malfunctioning OSSFs (Interim) (pp. 97-104, Table 11)	Assuming that 70% (175 of 250) of the malfunctioning OSSFs would be fixed, $9.60X10^{14}$ MPN or about 56.8% based on HSPF modeling) (Appendix C)	Part of current Phase II costs of $1,217,500 ($730,500from TCEQ 319 (h) grant Program , $60,000 from EAMD, $110,000 HCPID, $100,000 GBEP, $10,000 HCPCT 2, $2000 FWSD2, $10,000 H-GAC, $190,000 outstanding.) (pp. 124-126)	Education and outreach program on OSSF care and maintenance and behavioral modification of watershed residents (will be available in Spanish also) (pp. 95-97, 98-104, pp.109-, 113, pp.125-126)	Short term (2010-2011) (all schedules, please refer to Tables 11, 12 and 13)	Up to 450-500 homes will be evaluated, estimated half of those needing remediation, first round of inspections for site eligibility , completion of construction plans for eligible sites (pp. 98-104, pp.118, pp.121-123, Table 15)	Completion of qualification criteria and inspection criteria, completed inspections, completed plans for eligible sites, , number of malfunctioning OSSFs remediated.(p.118)	Post-implementation monitoring, survey septic violations, quantify water quality issue reduction, continuing maintenance, Halls Bayou ambient sampling (pp. 126-128)	Structural measures: EPA(funding), TCEQ (oversight), H-GAC (administration), EAMD (construction), HCPCID (survey and site plans), FWSD (criteria, etc) TAMUG, HCPCT2 (Sec. 1.5.1) Behavioral Measures: EPA, TCEQ, HGAC(administration, outreach), EAMD (outreach), FWSD (outreach), HCPCT2 (outreach), TBH (outreach/education)(Sec. 1.5.1)

Upcoming Tasks

- Watershed Characterization: Data Collection and Analysis Report
- Watershed Maps that Identify the Causes and Sources of Water Quality Problems
- Estimate of Pollutant Load Reductions Expected from Management Measures Report
- Financial and Technical Assistance Report

Implementation Activities

- Implementation Activities needed for the next phase of the Watershed Protection Plan – these do not necessarily have to be bacteria related
- Sediment reduction
  - Keeps dissolved oxygen levels up
- Reduction of trash dumping at bridges
  - Keep water flowing, keep flooding down
- Row cropping BMPs
  - Reduces bacteria, sediment and nutrients in water