LLM/BSC Watershed Protection Plan

Urban/Infrastructure WG Meeting February 10th, 2021

<u>Agenda</u>

- Welcome and Introductions
- Modeling Efforts
- LLMBSC Existing Data
- Stakeholder Input for Model Assumptions
- Adjourn

Welcome & Introductions

Modeling Efforts

Water Quality Modeling

•SELECT calculates and allocates potential bacteria loadings from various sources via an ArcGIS environment at a sub-watershed level. <u>Delineating the watershed into smaller sub-watersheds aids in</u> <u>targeting specific areas that may be "hot spots" for potential bacteria</u> <u>loadings</u>. Spatially Explicit Load Enrichment Calculation Tool (SELECT)

 Identify Potential Bacteria Loadings by Watershed

Load Duration Curves (LDCs)

- Flow Conditions where Loads are Exceeded
- Define Potential Load Reductions



-oad Duration Curves



Watershed	Potential E. coli sources	Daily potential E.	<i>coli</i> load (CFU/day)	
		Minimum	Maximum	CFU/day
	Cattle	2.30e+9	3.36e+14	Walnut Creek
	Deer	1.05e+6	8.97e+10	
	Feral hogs	0	5.78e+12	1.48e+014 - 2.70e+014
Walnut Creek	Poultry operations	0	6.37e+13	2.71e+014 - 3.41e+014
	OWTSs	9.69e+6	5.41e+11	Spring Creek
	WWTFs	0	1.05e+9	3.69e+013 - 4.85e+013
	Cattle	1.30e+14	2.55e+14	4.86e+013 - 7.35e+013
	Deer	3.68e+10	7.37e+10	Pin Oak Creek
	Earal bags	2 220 12	2.0%0+12	1.82e+013 - 2.30e+013
Mud Creek	Perdi nogs	2.220+12	5.900+12	2.31e+013 - 3.30e+013
	Poultry operations	0	9.3/e+12	3.31e+013 - 6.11e+013
	OWTSs	6.15e+6	2.53e+12	6.12e+013 - 1.11e+014
	WWTFs	0	1.43e+9	
	Cattle	1 73e+13	1 09e+14	1.35e+014 - 1.51e+014
	L 9r	6 9 49	3e+10	1.5 +014 - 1.79e+014
k k	F ai ngs	7 3e+ 1	i 180+12	Campt IIs Creek
	OWTSs	25e+1	43e+11	4.5 0010 0510+012
	Cattle	3.58e+13	7.40e+13	6.52e+012 - 2.63e+013
Spring Creek	Deer	1.37e+10	2.99e+10	6.41e+013 - 6.81e+013
	Feral hogs	9.70e+11	1.79e+12	Walnut Creek Sub-watersheds
	OWTSs	6.07e+10	2.67e+11	Pin Oak Creek Sub-watersheds
Campbells Creek	Cattle	4.80e+12	6.64e+13	Spring Creek Sub-watersheds
	Deer	1.81e+9	2.70e+10	Campbells Creek Sub-watersheds
	Feral hogs	1 31e+11	2 05e+12	
	OWTSe	4 250+0	1 720+12	0 1.25 2.5 5 7.5 10 Miles N
	000155	4.258+9	1./20+12	

LLMBSC Existing Data

Land Cover



Drainage Districts



Irrigation Districts



FEMA Zones



FEMA Zones

	Flooding Zones	Area (sq mi)	Percentage
1	Α	7	1%
2	AE	83	13%
3	АН	22	3%
4	AO	8	1%
5	Open Water	0	0%
6	VE	52	8%
7	Х	423	66%
	Watershed Area	645	

FEMA Flooding Zones		
Zone A	Special Flood Hazard Area, within 100 yr floodplain, BFE not determined by	
Zone A	FEMA.	
Zono AE	Special Flood Hazard Area, within 100 yr floodplain, Detailed study by FEMA,	
ZOTIE AE	BFE determined by FEMA	
Zopo AH	Special Flood Hazard Area, within 100 yr floodplain, Areas of ponding, BFE	
Zone An	determined by FEMA.	
	Areas subject to inundation by 1-percent-annual-chance shallow flooding	
Zone AO	(usually sheet flow on sloping terrain) where average depths are between one	
	and three feet	
Zone X	Areas not in a Special Flood Hazard Area, outside The 500 yr floodplain.	

Wastewater Outfalls



Onsite Sewage Facilities



Onsite Sewage Facilities

Onsite Sewage Facilities (OSSFs)		
City of Brownsville	864	
City of San Benito	153	
City of Los Fresnos	168	
City of Los Rio Hondo	4	
Total	1,189	

<u>MS4s</u>



Desalination Areas



Municipal Solid Waste (MSW)



Colonias



Colonias

Colonias				
Color Class	Count	Description	Area (sq mi)	Percentage
Red	29	Lack of basic drainage systems	4	0.6%
Yellow	24	Adequate wastewater disposal	10	1.5
Green	47	Adequate basic drainage systems	10	1.5%
Total	100		645	

	Green	Yellow	Red
Drinkable Water	Yes	Yes	No
Wastewater Disposal	Yes	Yes	No
Approved Subdivision Plats	Yes	Yes	No
Paved Roads	Yes	No	No
Adequate Drainage	Yes	No	No
Solid Waste	Yes	No	No

Source: TCEQ, August 2013

Land Use



OSSFs number and location

Source	Value
TWRI/UTRGV Cameron County OSSF database (currently being developed)	Permitted systems are based on actual location data.
	Unpermitted systems are based on occupied locations outside of service areas, without permitted OSSFs. (1,189)

• OSSF failure rates

Source	Value
stakeholder input	As these rates are highly variable by locations and soils, failure rates will be heavily modified by stakeholder (especially Authorized Agent) input.
	The Texas average was found to be 12% according to Reed et al 2001.

• NPDES permitted Wastewater outfalls

Source	Value
TCEQ and EPA	Total permitted flow and loads, current loads, and future loading will all be considered
	Proposed Value: 32 WWT

• Desalination permits

Source	Value
TWDB, TCEQ, and EPA	Total permitted flow and loads, current loads, and future loading will all be considered
	Proposed Value: 2

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