

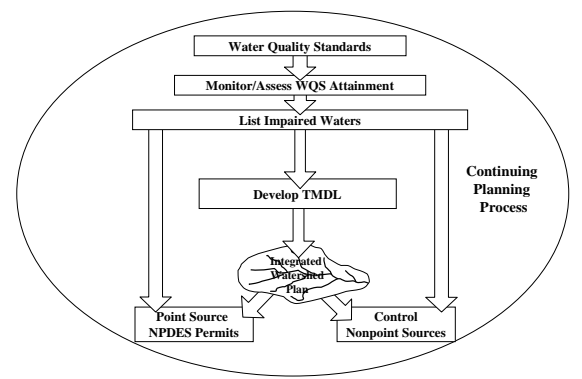
## Element A – “Identifying Sources and Causes of Impairment in the Waterbody”

### Watershed Plan Development Workshop

Bandera, Texas  
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## Clean Water Act Framework



## Element A

- ◆ An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan).

## What Does This Mean?

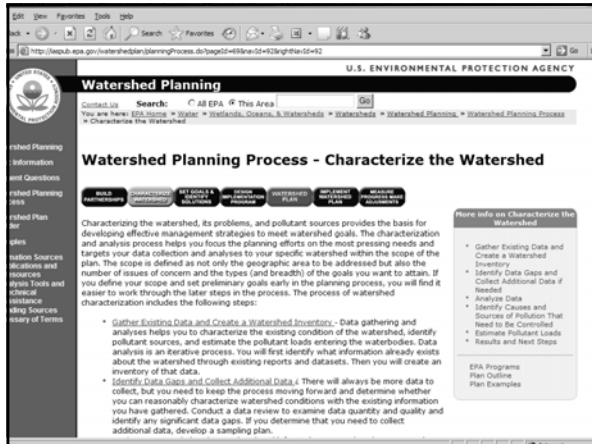
- ◆ Plan should include maps that locate major causes and sources of impairments.
- ◆ Set goals to address impairments that include at a minimum meeting WQ standard that threaten or impair.
- ◆ Account for point and nonpoint sources and natural background levels for pollutant load.
- ◆ IF, TMDL exists incorporate that into plan.

## Characterizing the Watershed is Element A

- ◆ Refer to Handbook Chapters 5,6,7
- ◆ Gather existing data/create inventory
- ◆ I.D. data gaps/collect additional data
- ◆ Analyze data
- ◆ I.D. causes and sources of pollution that need to be controlled
- ◆ Estimate pollutant loads

## Do your homework up front!



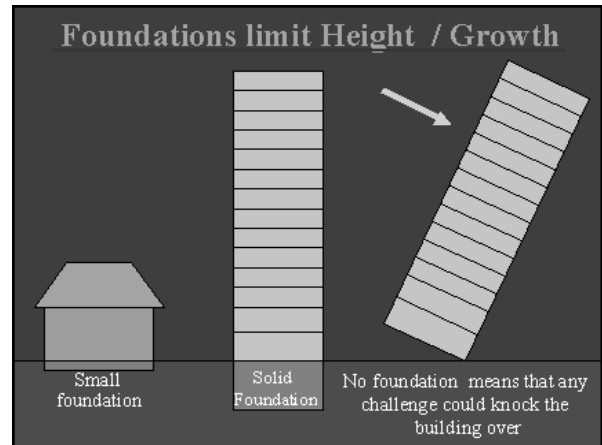


## Tools You'll Need for Characterization and Analysis

- ◆ GIS
- ◆ Statistical Packages
- ◆ Monitoring
- ◆ Load Calculations
- ◆ Model Selection Tools
- ◆ Models
- ◆ Databases (Social and Environmental tools)

## Data Typical for Watershed Characterization

- ◆ Physical and Natural Features
  - Boundary, Topography, Soils, Climate
- ◆ Land Use and Population Features
- ◆ Waterbody and Watershed Conditions
  - 305b report, source water assessments, exiting TMDL, 303d list
- ◆ Pollutant Sources
- ◆ Monitoring Data
  - Water Quality and flow/Biology

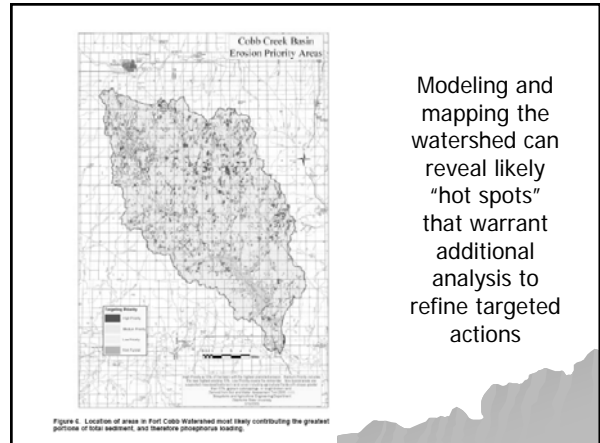
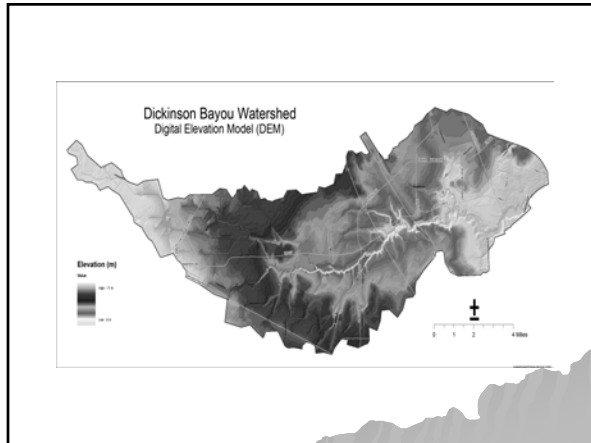


## Failing to Plan is Planning to Fail

- EPA's "Handbook for Developing Watershed Plans" dedicates the first 11 Chapters to characterizing the watershed, water quality and identifying load reductions and management strategies PRIOR to beginning development of the Watershed Plan.

## EPA Handbook for Developing Watershed Plans

- Chapter 4 – defines the scope – both geographic and scale of water quality issues
- Development through engagement with stakeholders
- Stakeholders likely have information of activities that have taken place in the watershed that will be useful in identifying causes and sources
- Stakeholders need access to water quality data from the responsible agencies in order to be successful
- Linkages and pathways of pollution between the sources and water body must be identified and defined
- Chapters 5 & 6 provides information on laying the groundwork towards establishing Element A



## EPA Handbook for Developing Watershed Plans – Chapter 7

- ◆ Chapter 5 – identifying and gathering water quality data – building an inventory
- ◆ Chapter 6 – review data, identify data gaps, and collect additional data
- ◆ This analysis is essential to defining the watershed's water quality goals
- ◆ Chapter 7 is the where Element A development begins

## EPA Handbook for Developing Watershed Plans – Chapter 7

- ◆ Identifying locations of impairments and problems
- ◆ Determining timing of impairments and problems
- ◆ Identifying potential sources
- ◆ Determining areas for quantifying source loads

## Element A – Cornerstone of a Watershed Plan

- ◆ Element A serves as the cornerstone for the logical development of the remaining eight elements of a watershed plan.
- ◆ Good sampling data collected through an appropriate water quality monitoring program, field surveys, and land-use characterization, are necessary to identify and quantify the sources of pollution causing waterbodies to not meet water quality standards.
- ◆ Data serves as a baseline from which to determine whether water quality goals have been met.
- ◆ Sufficient resources should be allocated to accumulate and analyze data before moving forward to developing Element B.

## Element A examples of information

- Baseline analysis of current waterbody conditions, including historical and newly acquired water quality data has been completed
- Field surveys and analysis are complete and is used to determine where most significant pollution contributions are coming from – site specific or geographical areas within the subwatershed
- Available data and information on critical zones/proximity to the stream have been visually inspected (ground-truth) and evaluated to isolate most significant pollution zones and site-specific geographic areas
- Pollution pathways have been identified and levels of pollution contribution to the waterbody has been determined
- If 319(h) funds were used to develop a TMDL that consisted primarily of NPS pollution contributions, this information should be considered for selecting critical sites for strategically locating BMPs to achieve the needed reductions in pollutants entering the waterbody

## Element A: Source ID, Current Loadings

• Minnesota: The South Branch Watershed



Table 1.1 Inventory of Fecal Coliform Producers in the South Branch TMDL Watershed

Category	Sub-Category	Animal Units	Number
Livestock	The basin contains an estimated 93 livestock facilities ranging in size from 1 animal units to 133 animal units	Dairy	1757
		Beef	4916
		Swine	1737
		Sheep	567
		Chicken	31
		Horse	45
	Human	Rural Population with Inadequate Wastewater Treatment*	
Rural Population with Adequate Wastewater Treatment			271
Municipal Wastewater Treatment Facilities			1
Wildlife		Deer (average 10 per mile) Other It was not possible to obtain estimates for other wildlife. This sub-category was estimated using an equivalency to deer in the basin.	
Pets	Dogs and Cats in Urban Areas**		812
	Dogs and Cats in Rural Areas***		618

\* 77% non compliant  
\*\* 1550 people / 2.5 people/household, 73 dogs/household, 73 cats/household  
\*\*\* 1180 people / 2.5 people/household, 0.58 dogs/household, 73 cats/household

## Minnesota – SB Watershed

### • "Bacteria Matrix" Spreadsheet Method

Contributions from Point and Non-Point Sources			
Category	Source	Contribution	
		Wet	Dry
Livestock	Overgrazed Pasture near Streams or Waterways	4%	32%
	Feedlots or Stockpiles without Runoff Controls	18%	
	Surface Applied Manure***	63%	
	Incorporated Manure	13%	
	Human	Failing Septic Systems and Unsewered Communities	2%
Wildlife	Deer	0.3%	3%
	Dogs and Cats	0.4%	
<b>Total</b>		<b>100.00%</b>	<b>100.00%</b>

Percent Reductions Necessary to Meet TMDL Allocation							
Sources:	Wet	Dry	All sources reduce equally				Reduction GOALS (1-8)
			RS1	RS1	RS1	RS1	
	Wet	Dry	Wet	Wet	Dry	Dry	
	Concn.	Concn.	Concn.	Concn.	Concn.	Concn.	
Overgrazed Pasture	4%	32%	22%	7	20%	6	78%
Feedlots/Stockpiles	18%	63%	22%	31	100%	60	78%
Surface Applied Manure	63%	0%	22%	110	20%	0	78%
Incorporated Manure	13%	0%	22%	22	100%	0	78%
Failing Septic Systems	2%	66%	22%	3	20%	12	78%
Wildlife**	0.3%	3%	100%	2	100%	3	0%
Pets	0.4%	0.0%	22%	1	100%	0	78%
	100%	100%					
			Concn	177		81	
			goal	180		180	
			WQG	200		200	

## Results

- Identified existing reports and data sets that exist within the watershed
- Water quality data inventory created
- Identified water quality data gaps and determined if new data needs to be collected
- Developed a monitoring plan and collected new water quality data as necessary
- Analyzed the data to determine the causes of impairments and the pathways and linkages of pollutants
- Initiated the identification of critical areas to target management efforts
- Estimated the relative contributions of the various pollutants

## Next Steps:

- Identify load reductions needed to attain WQ standards
- Identify what types of management strategies are needed to reduce the pollutant loads and where to implement those strategies to control the sources
- Implement control measures and monitor to see if it is working
- If reductions are found to attain water quality standards, write success story

Properly planned = Strong, long lasting foundation

