

# WMA and LTEA Assessment Methodology

*Presented to the  
San Diego County Copermitees*

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## Outline

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- Overview of WMA and LTEA
- WMA
  - Example
- LTEA
  - Definitions
  - Example

## WMA vs. LTEA Methodology

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WMA assessments (watershed measurement tool)

- Triad approach based on Cumulative MLS Chemistry, Current Dry Weather Data, Current 3<sup>rd</sup> party data, Toxicity, and Bioassessment.
- Does not weight by sub-watershed.
- Provides path for recommended actions or decisions based on evidence.

## LTEA Water Quality Priority Results

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- Prioritizes Water Quality Issues on Subwatershed Basis
- Uses Five Years of Data
- Identifies Potential Data Gaps in Subwatershed Basis & Prioritizes Gaps
- Provides for Automation of Assessment Process

## WMA Assessment Methodology

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- Watershed Data Assessment Framework (MEC, 2004) developed with the Copermittees for uniform and consistent data assessments across all watersheds.
- Based on a defined assessment criteria.
- Triad Approach (Chemistry, Toxicity, and Biology).

## WMA Chemistry Assessment Process

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Step 1 – Compile MLS results table and compare #of values above WQO (historical record set)

Step 2 – Compile current dry weather data and/or 3<sup>rd</sup> Party data and # of values above dry weather action level.

Step 3 – Compile % above criteria based on # of data points.

# WMA Assessment MLS Example

## Escondido Creek Data Table (Refer to MLS data table handout)

- TSS – 5 of 15 above WQO = 33% above WQO
- 3 exceedances occurring in past 2 years

TSS – 5 of 15 above WQO = 33% above WQO  
 3 exceedances occurring in past 2 years. TSS Not monitored in Dry Weather Program

COC Frequency of Occurrence	Criterion No.	Definition
High ♦♦♦	1	Mass loading station tests results exceed WQO in greater or equal to 80% of samples.
	2	Six of the last consecutive storm samples at the MLS exceed WQO.
	3	Less than 80% and greater than or equal to 50% of the MLS samples exceed WQO <u>and</u> at least one DWS exceedance in the past year.
	4	Less than 80% and greater than or equal to 50% of the MLS samples exceed WQO <u>and</u> a significant increasing trend is found.
Medium ♦♦	5	Less than 80% and greater than or equal to 50% of the MLS samples exceed WQO <u>and</u> no exceedances or data available for DWS in the past year.
	6	Less than 80% and greater than or equal to 50% of the MLS samples exceed WQO <u>and</u> one or more exceedances found in last 2 years of monitoring at the MLS (generally applies to historical datasets).
	7	Greater than 50% of the DWS samples have exceedances in the past year.
Low ♦	8	DWS exceedances in 10 to 50% of the samples in the past year.
	9	MLS exceedances found in 25% to less than or equal to 50% of the samples <u>and</u> at least one exceedances found in last 2 years at the MLS (with or without DWS exceedances in the past year).
	10	Greater than 50% of the MLS samples have exceedances <u>and</u> no exceedances in the last 2 years at the MLS.
Coastal Program	11	Persistent exceedances (greater or equal to 80% of samples). Add one ♦ to bacteria determination (up to three ♦ maximum).



# Triad Assessment Table

(From Handout)

Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Example Actions or Decisions
1. Persistent exceedance of water quality objectives (high frequency COC identified)	Evidence of persistent toxicity	Indications of alteration	Strong evidence of pollution-induced degradation	1) Toxicity tests at higher dilutions to better quantify toxicity; Use TIE to identify contaminants of concern, based on TIE metric. 2) Evaluate/identify upstream source as a high priority.
2. No persistent exceedances of water quality objectives	No evidence of persistent toxicity	No Indications of alteration	No evidence of current pollution-induced degradation Potentially harmful pollutants not yet concentrated enough to cause visible impact	1) No immediate action necessary. 2) Conduct periodic broad scans for new and/or potentially harmful pollutants.
3. Persistent exceedance of water quality objectives (high frequency COC identified)	No evidence of persistent toxicity	No Indications of alteration	Contaminants are not bioavailable Test organisms not sensitive to problem pollutants	1) TIE would not provide useful information with no evidence of toxicity. 2) Continue monitoring for toxic and benthic impacts. Consider whether different or additional test organisms should be evaluated. 3) Initiate upstream source identification as a low priority.

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## Escondido Creek Triad Summary Results

Chemistry	Toxicity	Benthic Alteration	Possible Conclusion(s)	Possible Actions or Decisions
Persistent exceedances of water quality objectives (high frequency COC identified)	No persistent evidence of toxicity	Indications of alteration	Benthic impact due to habitat disturbance, not toxicity.  Test organisms not sensitive to problem pollutants.	1) Continue monitoring to gather long-term trend information. 2) Evaluate upstream source identification as a high priority. 3) Consider whether different test organisms should be evaluated. 4) Consider potential role of physical habitat disturbance. 5) TIE would not provide useful information with no evidence of toxicity.

## LTEA Methodology

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- LTEA (Prioritization tool)
  - Long Term Effectiveness Assessment
    - Wet weather chemistry (MLS);
    - Dry weather data (Padre Dam, SWAMP, Copermittee);
    - Toxicity (wet weather, SWAMP);
    - Sediment (ABLM chemistry)
    - Benthic Alterations (ABLM, bioassessment)
    - § 303(d) Listings
  - Past five years of data
  - Weights by sub-watershed.

## LTEA Constituent Groups

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- Constituent/Stressor Groups (Need input from monitoring group. Do you agree with parameter groupings)
  - Heavy Metals (Cadmium, copper, lead, zinc, selenium)
  - Dissolved Minerals (TDS, Manganese, Sulfate)
  - Organics Compounds
  - Oil & Grease
  - Sediment (TSS, Turbidity)
  - Pesticides (Chlorpyrifos, Diazinon, Malathion)
  - Nutrients (Nitrate, Nitrite, TKN, Total and Ortho P)
  - Gross Pollutants (pH, MBAS, BOD, COD, Ammonia)
  - Bacteria/Pathogens
  - Benthic Alterations
  - Toxicity

# Detailed Priority Calculation

3	(WMLA)	Percentage of Total Area	Heavy metal					Priority Level
			303(d)	Dry Weather	Wet Weather	Sediment	Score	
4								
5	Lower San Luis HA (903.10)	33%	N	0	0	0.0	D	
6	Monserate HA (903.20)	30%	N	2	0	1.0	C	
7	Warner Valley HA (903.30)	37%	N	0	0	0.0	D	
8	MLS Results (SLR)					0		
9	ABLM Results (SLR)					0		
10	Rating***					0.30		
11	Priority Level						D	
12	Notes:							

If §303(d) listed, then Y=3, else N=0

Count number of exceedences (WQO) or Action Level

Average of Results determines Score

$$\text{Priority Rating} = \% \text{Area1} * \text{Sub-watershed1 Score} + \% \text{Area2} * \text{Sub-watershed2 Score}$$

# Constituent Groups

- **Constituent Groups**
  - Heavy Metals (Cadmium, copper, lead, zinc, selenium)
  - Dissolved Minerals (TDS, Manganese, Sulfate)
  - Organics Compounds
  - Oil & Grease
  - Sediment (TSS, Turbidity)
  - Pesticides (Chlorpyrifos, Diazinon, Malathion)
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  - Gross Pollutants (pH, MBAS, BOD, COD, Ammonia)
  - Bacteria/Pathogens
  - Benthic Alterations
  - Toxicity

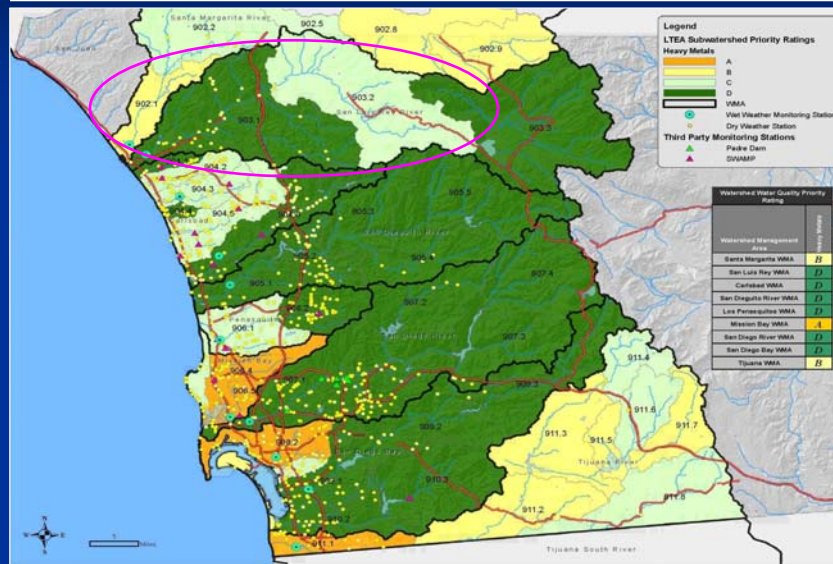
# Summary Results

1	2	Percentage of Total Area	Priority Ratings*														
			Constituent Groups										Groups				
			Heavy Metals	Dissolved Minerals	Organics	Oil and Grease	Sediments	Pesticides	Nutrients	Cross Pollutants	Bacterial Pathogens	Genetic Alterations	Toxicity				
3	Watersheds/Sub-watersheds																
4	San Luis Rey WMA	100%	D	B	D	D	C	D	C	D	D	B	B	C			
5	Lower San Luis HA (903.10)	33%	D	A	D	D	C	C	A	D	A	A	C				
6	Monserate HA (903.20)	30%	C	C	D	D	C	D	C	C	C	B	C				
7	Warner Valley HA (903.30)	37%	D	C	D	D	D	D	D	D	B	B	C				
8	Frequency of Occurrence Rating High			+++								+++					
9	Constituents of Concern			TDS								Fecal Coliform					
10																	
11	Notes:																
12	* = Rating Calculated Based on Area Weighted Averages of Score Value from the sub-watershed areas.																
13	** = Priority Level (Highest-A to Lowest-D)																
14	High Priority Level Based on Data																
15	303d listing																

# Final Results

1	Watershed Water Quality Priority Rating		Watershed Water Quality Priority Rating	
2	Watershed Management Area	Heavy Metals	Watershed Management Area	Dissolved Minerals
3	Santa Margarita WMA	B	Santa Margarita WMA	A
4	San Luis Rey WMA	D	San Luis Rey WMA	B
5	Carlsbad WMA	D	Carlsbad WMA	A
6	San Dieguito River WMA	D	San Dieguito River WMA	B
7	Los Penasquitos WMA	D	Los Penasquitos WMA	A
8	Mission Bay WMA	A	Mission Bay WMA	A
9	San Diego River WMA	D	San Diego River WMA	B
10	San Diego Bay WMA	D	San Diego Bay WMA	B
11	Tijuana WMA	B	Tijuana WMA	D

# Watershed Water Quality Priority Rating for Heavy Metals



Thank you

Questions?