

CEQA Scoping Meeting

Site-Specific Selenium Water Quality Objectives and TMDLs for the San Diego Creek and Newport Bay Watersheds

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November 20, 2008

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Discussion Outline

Project Description

- What is Selenium?
- Selenium Effects
- Limits and Guidelines for Selenium
- What Are TMDLs?
- NSMP and the Se TMDLs
- Selenium Sources
 - San Diego Creek
 - Big Canyon Wash
- TMDL Impairment Assessment
- TMDL Numeric Targets and SSOs
- TMDL Implementation

Discussion Outline

CEQA

- What is CEQA?
- How it Applies to TMDLs/Basin Planning
- Substitute Environmental Documents
- Environmental Analysis
- Reasonably Foreseeable Methods of Compliance
- CEQA Checklist
 - First Step in Developing SED
 - Identifies Potential Impacts
 - Identifies Impacts Requiring Mitigation
 - Helps to Identify Cumulative Impacts

An aerial photograph of Newport Bay, California, showing the winding San Diego Creek and the surrounding urban and natural landscape. The bay is divided into three main sections: the Upper Newport Bay at the top, the San Diego Creek in the middle, and the Lower Newport Bay at the bottom. The image is in black and white, highlighting the textures of the water, land, and buildings.

Upper Newport Bay

San Diego Creek

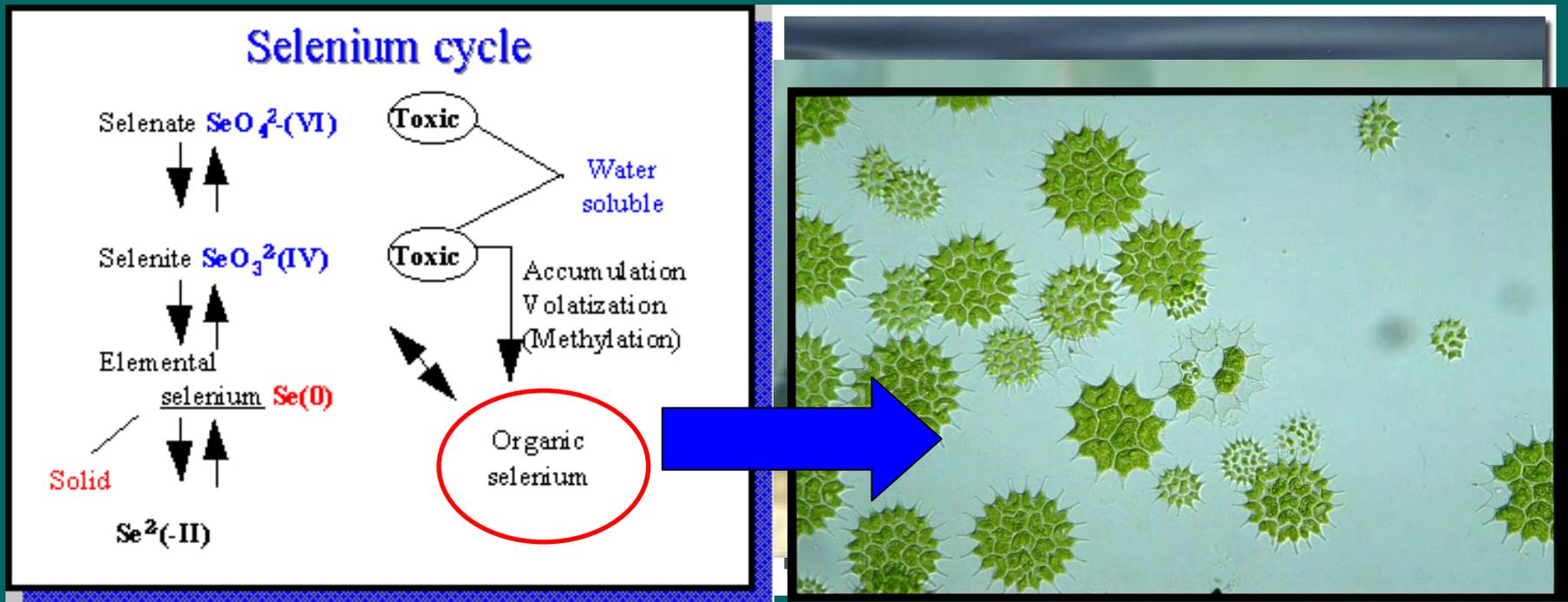
Lower Newport Bay

What is selenium?

- It is a mineral essential for reproductive health and immune system support for humans, fish and wildlife
- ***However, in the wrong amount, can harm the same functions it protects...***



Selenium bioaccumulates primarily through diet:



Effects of Excessive Selenium in Fish & Wildlife

Selenium Growth Effects



- 13 and 14 day-old avocet chicks from clean and seleniferous environment. (selenium exposure in egg only -Se exposed chick on the right)

Excessive Se can result in...

- Deformities
- Stunted growth
- Reduced hatching success
- Suppressed immune system function
- Overall reduced species viability

Why Do We Need to Be Concerned About Selenium in the SDC/NB Watershed?



Beneficial Uses of the San Diego Creek and Newport Bay Watersheds

Water Body	Beneficial Use																			
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST
Lower Newport Bay	+					X		X	X	X					X	X	X	X	X	
Upper Newport Bay	+							X	X	X				X	X	X	X	X	X	X
San Diego Creek Reach 1 – Below Jeffrey Road	+							X ¹	X		X				X					
San Diego Creek Reach 2 – above Jeffrey Road to headwaters	+																			
Other tributaries (Peters Cyn Wash, Santa Ana Delhi Ch, Big Cyn Wash, etc.)	+															X ²				

Limits and Guidelines for Selenium

■ Human Health:

- Drinking Water, <50 µg/L
- Consumption of fish*, 30 ppm dw (7.4 ppm ww)
<http://www.oehha.ca.gov/fish/gtlsx/pdf/FCGsATLs27June2008.pdf>

■ Protection of Fish and Wildlife:

- Freshwater chronic effects, <5 µg/L (CTR)
- Saltwater chronic effects, <71 µg/L (CTR)

* Assumes an adult consumption rate of 32 g/day or one 8 oz. fillet per week



What is a TMDL?

- **Total Maximum Daily Load:** The maximum amount of a pollutant that can a waterbody can receive and still attain water quality standards (i.e., meet applicable water quality objectives and support all beneficial uses)
- Triggered by placement on CWA 303(d) List



TMDL Elements

- Problem Statement
- Numeric Targets
- Source Analysis
- Existing Loads
- Loading Capacity/Linkage Analysis
- TMDL and Allocations
- Seasonal Variation/Critical Conditions
- Margin of Safety
- Implementation Plan

EPA developed technical TMDLs for selenium for:

- San Diego Creek
- Upper Newport Bay
- Lower Newport Bay and Rhine Channel



EPA's Selenium TMDLs

- **Used CTR and NTR to develop numeric targets, loads, and allocations**
 - CTR chronic freshwater criteria of 5 $\mu\text{g}/\text{L}$
 - NTR acute freshwater criteria of 20 $\mu\text{g}/\text{L}$
 - CTR chronic saltwater criteria of 71 $\mu\text{g}/\text{L}$
- **Selenium loads tied to flows in San Diego Creek**

Order No. R8-2004-0021

- Regulates De Minimus Discharges
- Regulates Short-Term Groundwater-Related Discharges
 - Well installation, testing, test pumping, purging
 - Aquifer testing wastes
 - Dewatering wastes from subterranean seepage
 - Groundwater wastes at construction sites

What is the NSMP?

- Nitrogen and Selenium Management Program
- Genesis of the NSMP – NPDES Permit (Order No. R8-2004-0021)
- 5 Year Work Plan to address Se & N in Newport Bay Watershed – groundwater focus
- Implemented by a Working Group of dischargers with input from State regulators and environmental community

The NSMP Working Group

- Caltrans
- County of Orange
- OC Flood Control District
- City of Costa Mesa
- City of Irvine
- City of Laguna Hills
- City of Laguna Woods
- City of Lake Forest
- City of Newport Beach
- City of Orange
- City of Santa Ana
- City of Tustin
- Irvine Ranch Water District
- Golden State Water Company
- The Irvine Company
- Tustin Legacy Community Partners
- Lennar
- Great Park Corporation
- Nexus
- Maguire Properties
- Integral Communities
- Santa Ana RWQCB (PM)
- Coastkeeper (PM)
- Stop Polluting Our Newport (PM)

PM = Participating
Member (Non-Funding)

NSMP Goals

- Develop treatment technologies/BMPs for selenium and nitrogen discharges
- Develop watershed management program to address impacts from groundwater related inflows
- If necessary, develop and recommend a site specific objective for selenium

The NSMP Work Plan

- Six Major Tasks
 - Complementary Monitoring Program
 - Develop and Evaluate BMPs and Treatment Technologies
 - Develop Offset, Trading or Mitigation Program
 - Evaluate Nutrient TMDL
 - Develop SSO (if necessary)
 - Management and Communication

Decision Made to Develop Se SSOs

- Recommended by NSMP Independent Advisory Panel
- USFWS Concurred
 - Selenium cycling & impacts are site-specific
 - Selenium is bioaccumulated primarily via diet
 - Not always a direct link between water concentrations and impacts in birds and fish
- *SSOs would allow the development of tissue-based water quality objectives*

Relationship of TMDL & NSMP Tasks

- Selenium Site Specific Objectives
 - SSO \Rightarrow TMDL numeric targets
 - SSO integrated into TMDL implementation plan
 - SSO CEQA analysis \Rightarrow TMDLs CEQA analysis
 - NSMP BMP Strategic Plan
 - Integrated into TMDL implementation plan
- *SSO and BMP Strategic Plan timeframes considered in the TMDL compliance schedule*

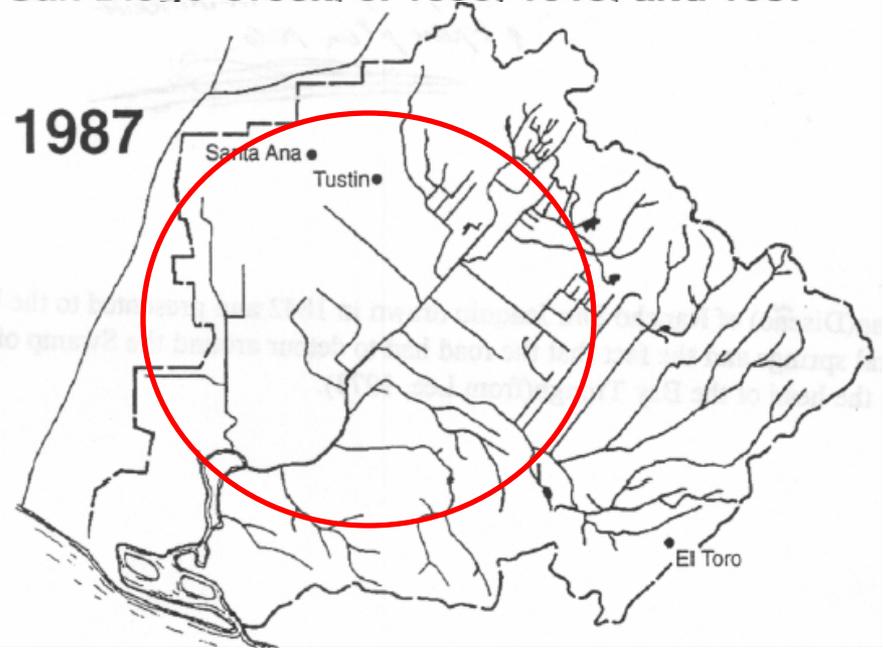
NSMP Assistance with TMDLs

- Data Spreadsheets
- Load/Waste Load Allocations
- Implementation Plan
- Economic Analysis
- Alternatives Analysis
- CEQA documentation

Sources of Selenium in the Watershed

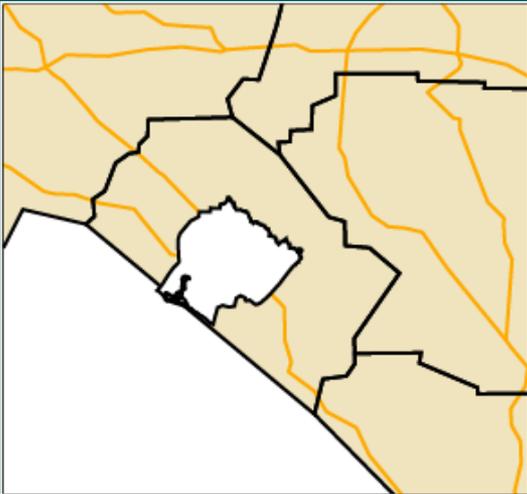


Changes in Hydrography
San Diego Creek. c. 1850, 1915, and 1987

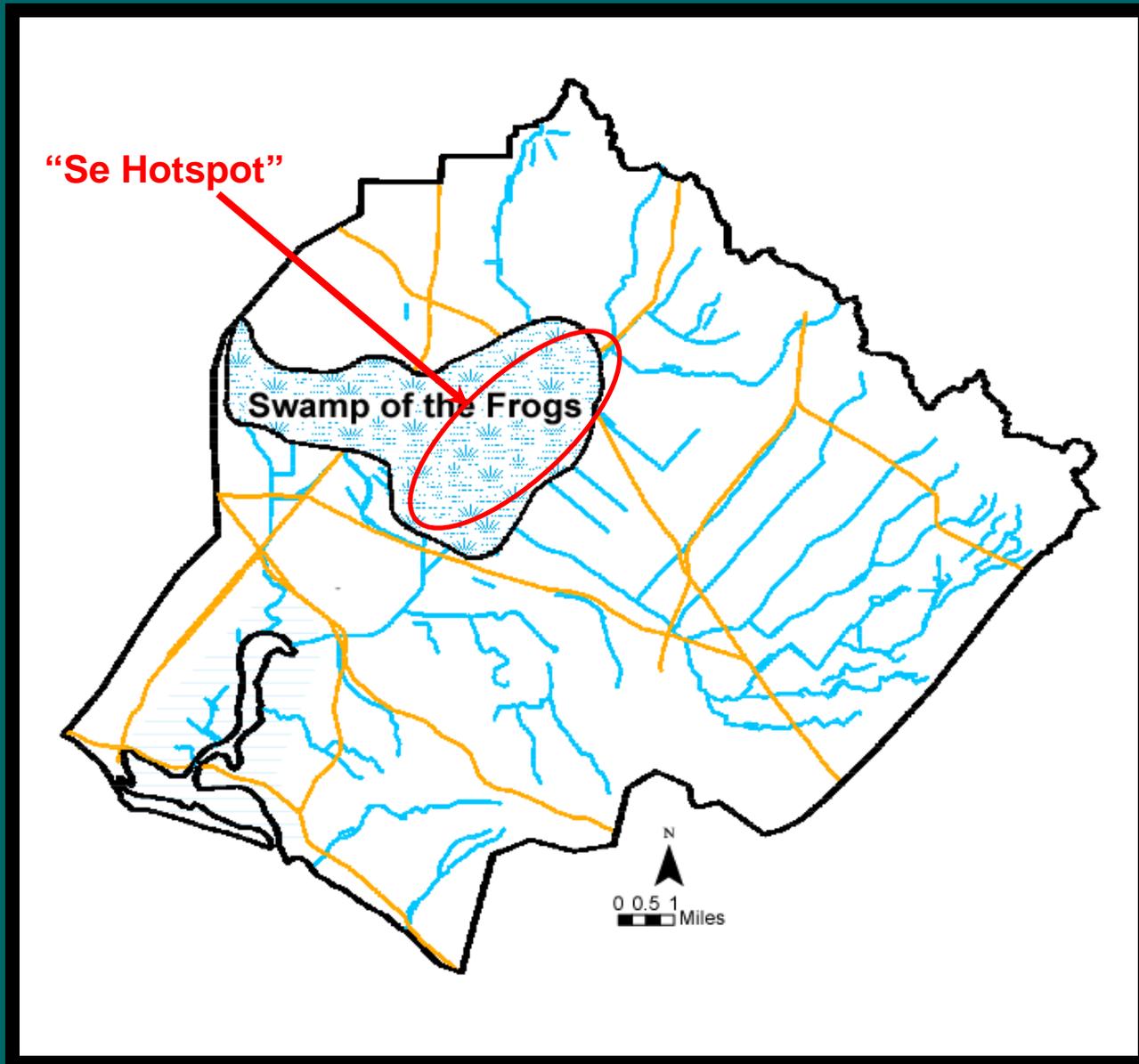




Southern California



Orange County

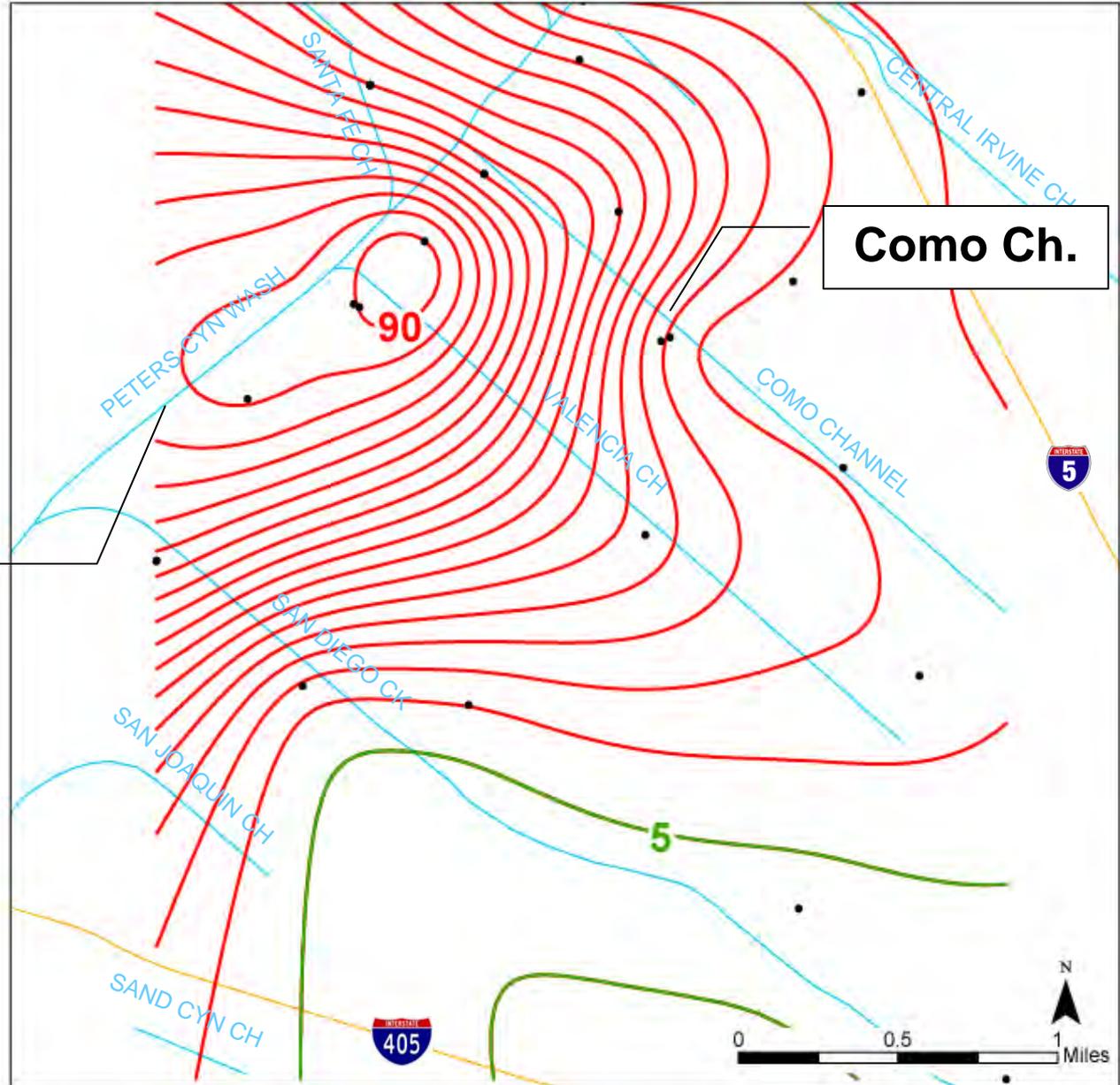


Upper Newport Bay / San Diego Creek Watershed

Selenium Concentrations in Groundwater ($\mu\text{g/L}$)



Peters Canyon Ch.



Como Ch.

90

5

5

405

0 0.5 1 Miles

N

Big Canyon Wash





**Upper Newport Bay
Ecological Preserve**

**Big Canyon Creek
Nature Park**



LEGEND
 ● Sampling Location

Selenium in Biota
 (mg Se/kg dry weight)

mFish = Mosquito fish
 FHM = Fat head minnow
 drgfly = dragonfly larvae
 acFrog = African clawed frog

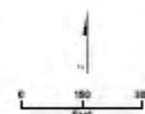
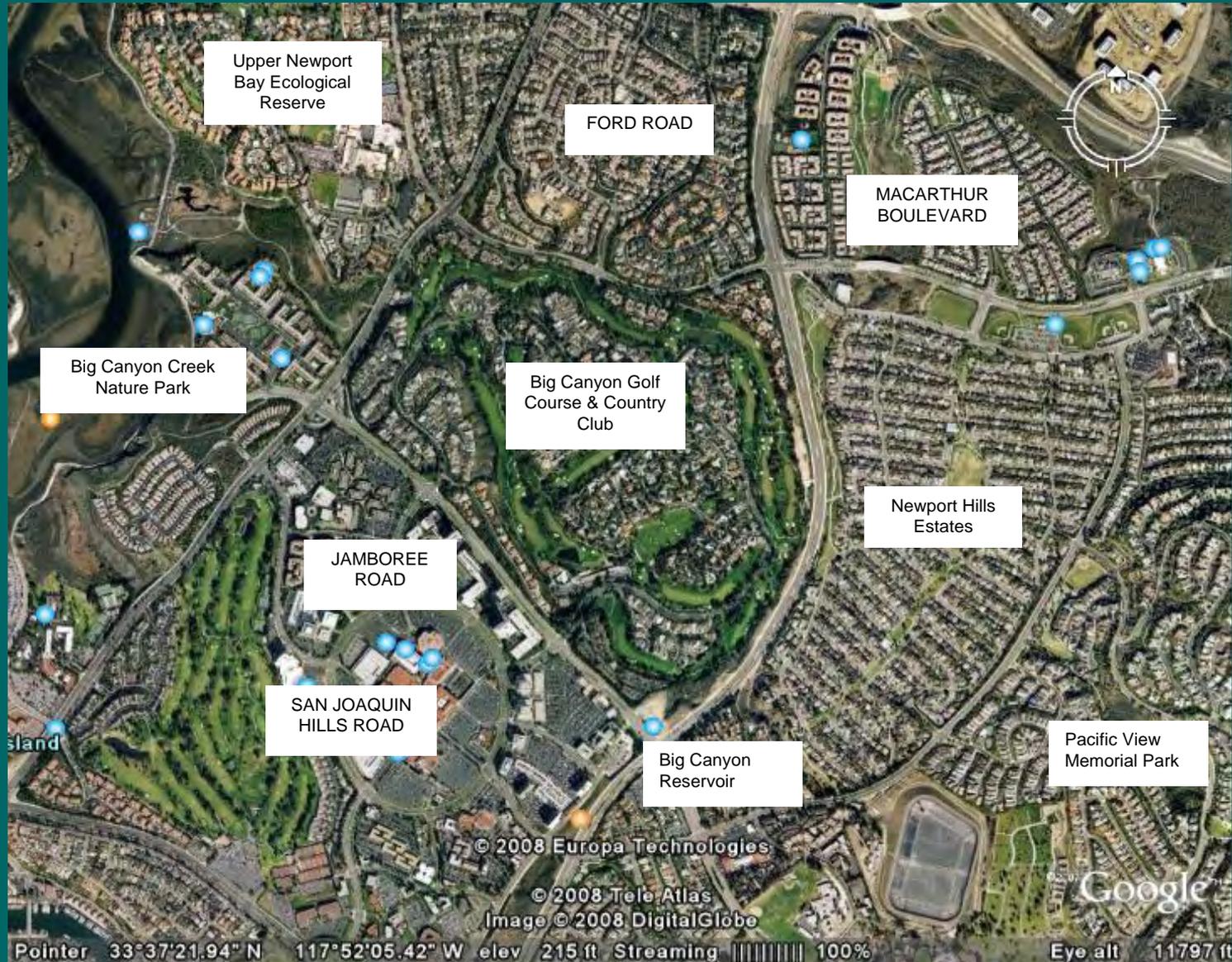


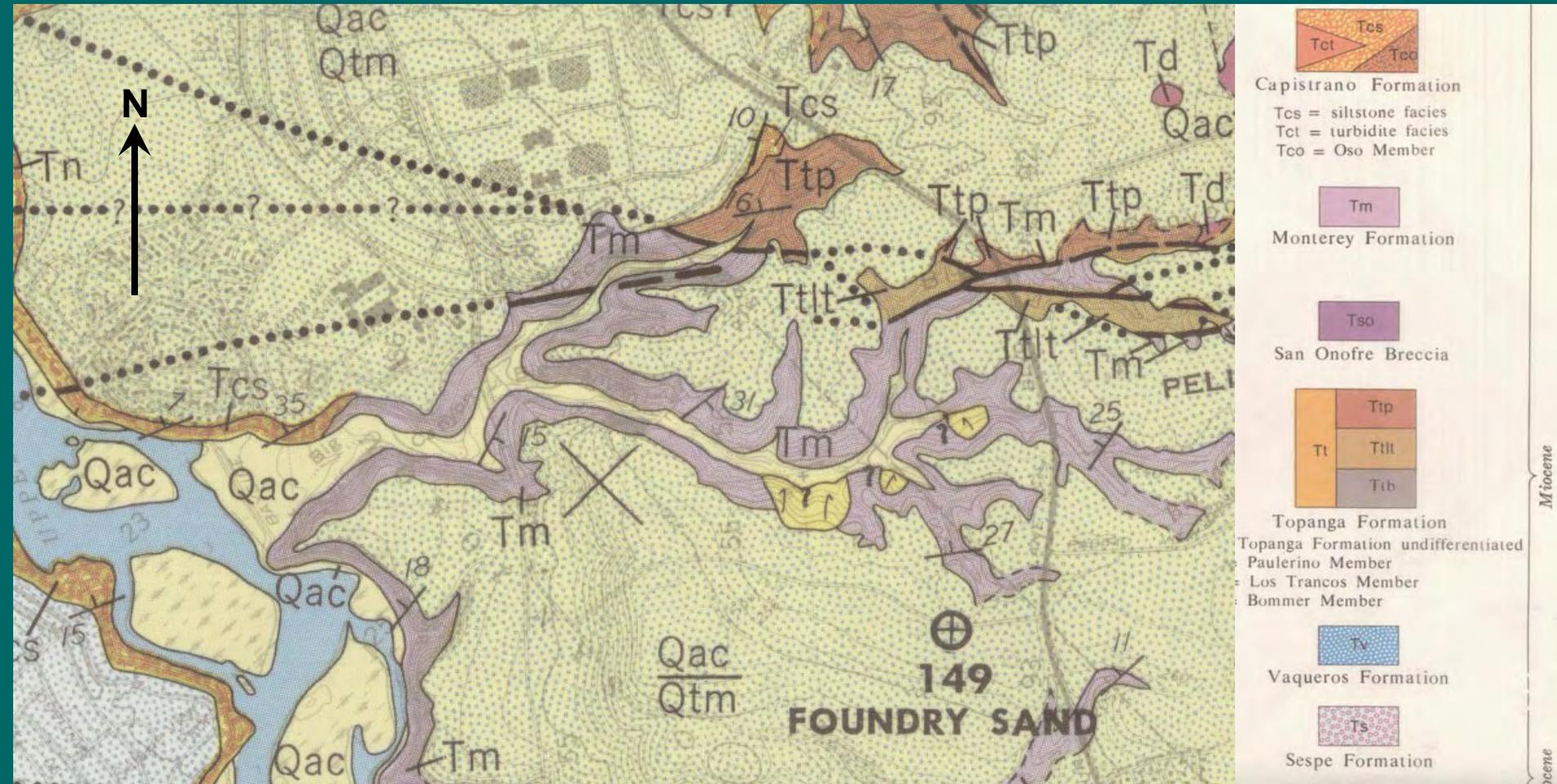
FIGURE 1
 Big Canyon Wash Sampling Sites
 June, 2008

Selenium Concentrations in Algae, Invertebrates and Fish Tissue in Big Canyon Nature Park

Big Canyon Wash Watershed & Vicinity



Geologic Map of Big Canyon Wash



(After Morton and Miller, 1981)

Non-Point Sources of Selenium in the Watershed

Rising Groundwater



Rising Groundwater



Atmospheric Deposition

A landscape photograph showing rolling green hills, a large blue lake, and a sky with scattered white and grey clouds. The hills are covered in dense green vegetation, and the lake is a deep blue color. The sky is a mix of light blue and white clouds, with some darker grey clouds in the upper right.

Open Space Runoff

Point Sources of Selenium in the Watershed

Urban Runoff



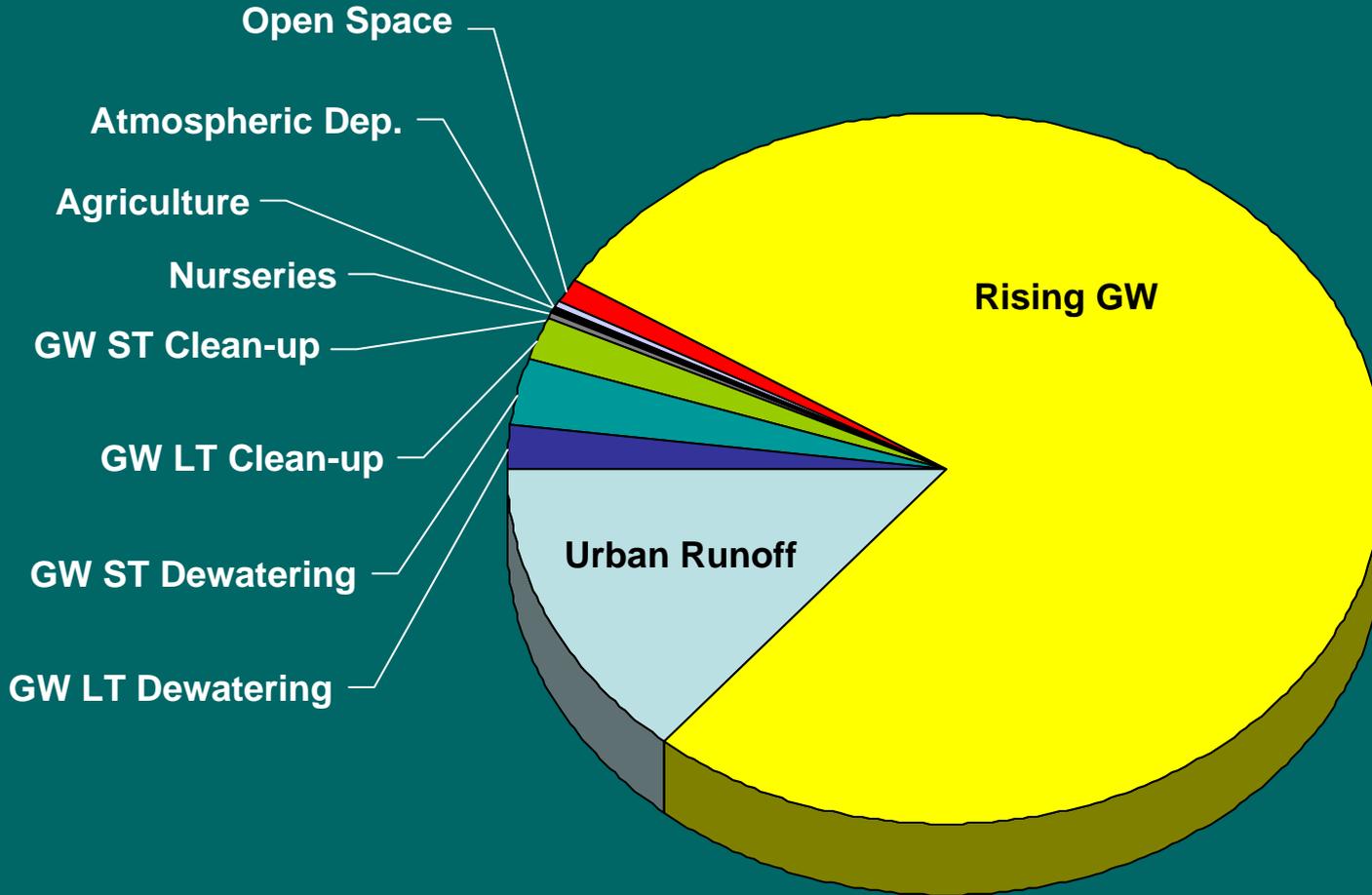


Construction Dewatering



Groundwater Cleanup

Estimated % Load for Selenium in the Newport Bay Watershed



- Urban Runoff
- GW LT Dewatering
- GW ST Dewatering
- GW Clean-up LT
- GW Clean-up ST
- Nursery Operations
- Agriculture
- Atmo. Deposition
- Open Space
- Rising GW

Summary of Guidelines Used in Impairment Assessment

Table 3.3-5

GUIDELINES USED TO ASSESS IMPAIRMENT DUE TO SELENIUM IN THE SAN DIEGO CREEK AND NEWPORT BAY WATERSHEDS				
Media	CTR Ambient Water Quality Chronic Criteria		Human Health ¹	Ecological Risk ²
	Freshwater	Saltwater		
Water (µg/L)	5	71		
Fish tissue (mg/kg)			30 ^a	5
Egg tissue (mg/kg)				8

Note: tissue guidelines are dry weight values

¹ Klasing and Brodberg, 2008

² Presser et al., 2004

^a OEHHA Fish Contaminant Goal (FCG) of 7400 ppb Se wet weight at a consumption rate of 32 g/day converted to a dry weight basis by using an average fish tissue moisture content of 75%.

Waterbodies Needing TMDLs for Selenium

Freshwater Drainages	Freshwater Wetlands	Saltwater-Estuarine
Hicks Canyon Wash	IRWD Treatment Wetlands	Upper Newport Bay
Lower Peters Canyon Wash	San Joaquin Freshwater Marsh Reserve	
Central Irvine Channel	Big Canyon Nature Park Freshwater Wetlands	
El Modena-Irvine Channel		
Como Storm Channel		
Santa Ana-Santa Fe Channel		
Warner Channel		
Barranca Channel		
San Diego Creek Reach 1		
Lane Channel		
Santa Ana Delhi Channel		

Proposed Numeric Targets

- Primary numeric targets will be tissue-based numbers (based on SSOs)
 - Selenium is accumulated through diet, not ingestion of water
 - Better linkage of cause and effect
- Water column target will be secondary
 - Target will be back-calculated from tissue target (\Rightarrow SSO process)



Selenium SSOs

- Multiple meetings held with resource agencies to discuss SSOs for Se
 - USGS
 - SWRCB
 - USFWS
 - RWQCB
 - USEPA
- USEPA and USFWS to determine appropriate SSOs
- Presser-Luoma model to be used to calculate water column concentrations



TMDL Targets Based on Selenium SSOs

USEPA and USFWS agreement for the San Diego Ck & Newport Bay watersheds:

- 5 ppm selenium is protective of fish and birds that eat fish
- 8 ppm selenium is protective of birds - most sensitive and most exposed (including T&E species)



Proposed Numeric Targets

- Two primary numeric targets for Se
 - Fish Tissue
 - Bird Egg Tissue
 - Secondary numeric targets for Se
 - Water column concentrations
- *For lower SDC, target ranges from 6-12 $\mu\text{g/L}$*



Proposed TMDL Implementation

- Phased implementation with a 15-year compliance schedule
 - Specific milestones and interim targets
- Implementation schedule tied to
 - EPA approval of Se SSO
 - NSMP BMP strategic plan



Proposed TMDL Implementation

- **Monitoring and Compliance**
 - Water column targets may need to be adjusted to ensure compliance with tissue targets
 - Compliance obtained when tissue targets are met

15-year compliance period proposed, but compliance to be achieved as soon as possible...



Proposed TMDL Implementation

- Adaptive, phased approach
 - Includes source control and treatment
- Implementation through watershed cooperative agreement
 - Regulatory fallback -
WDRs/Conditional Waiver of WDRs
- References BMP Strategic Plan

Phased BMP Implementation

- High priority areas treated first to
 - Protect sensitive habitat
 - Target high selenium areas
- BMP selection dependent on
 - Site characteristics
 - Nearby infrastructure
 - Needed reductions in selenium & nitrate

➤ ***Iterative approach to BMP implementation will be necessary***

NSMP BMP Pilot Testing 2007



Pilot Test Report for Nitrogen and Selenium Removal Technologies

Newport Bay Watershed

INTERIM REPORT



February 28, 2007

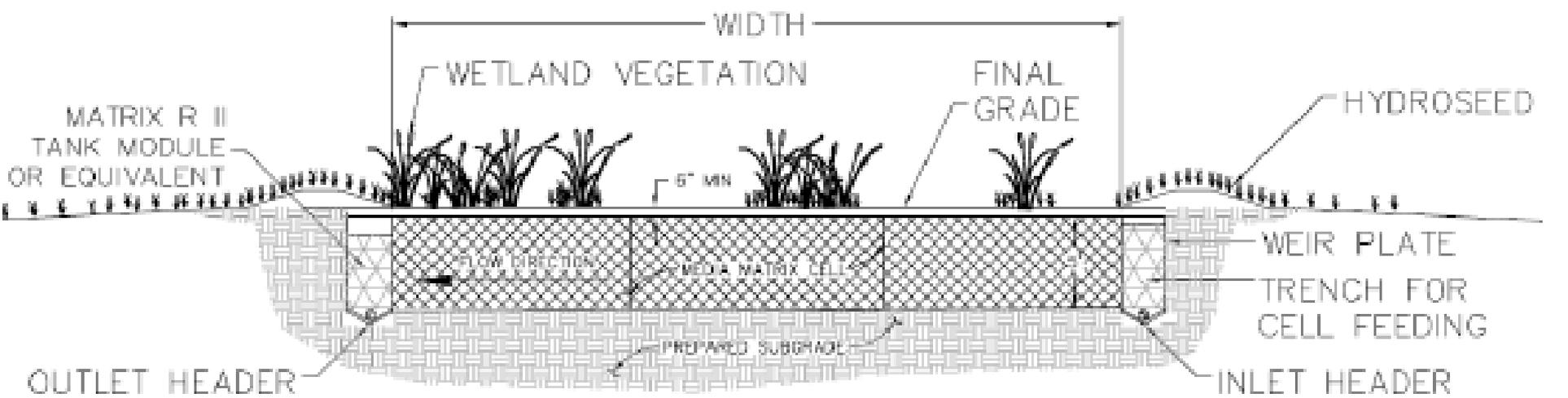
Prepared for the
Nitrogen and Selenium Management Program (NSMP) Working Group

Available at

<http://www.ocnsmp.com/library.asp>



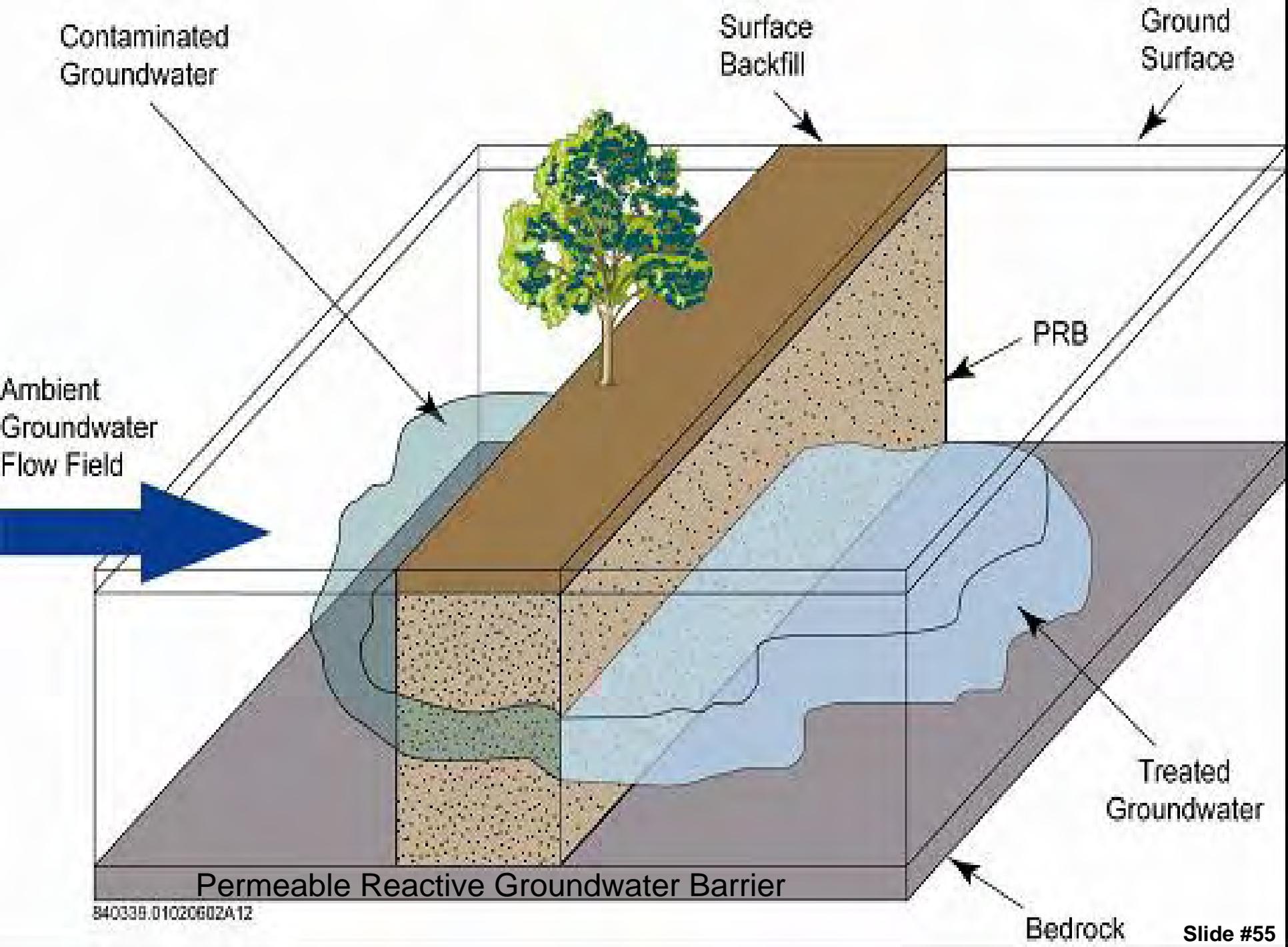
AbMet System



Subsurface Wetlands



Groundwater Pump and Treat



Location of the Cienega Filtration Facility Field Demonstration Project



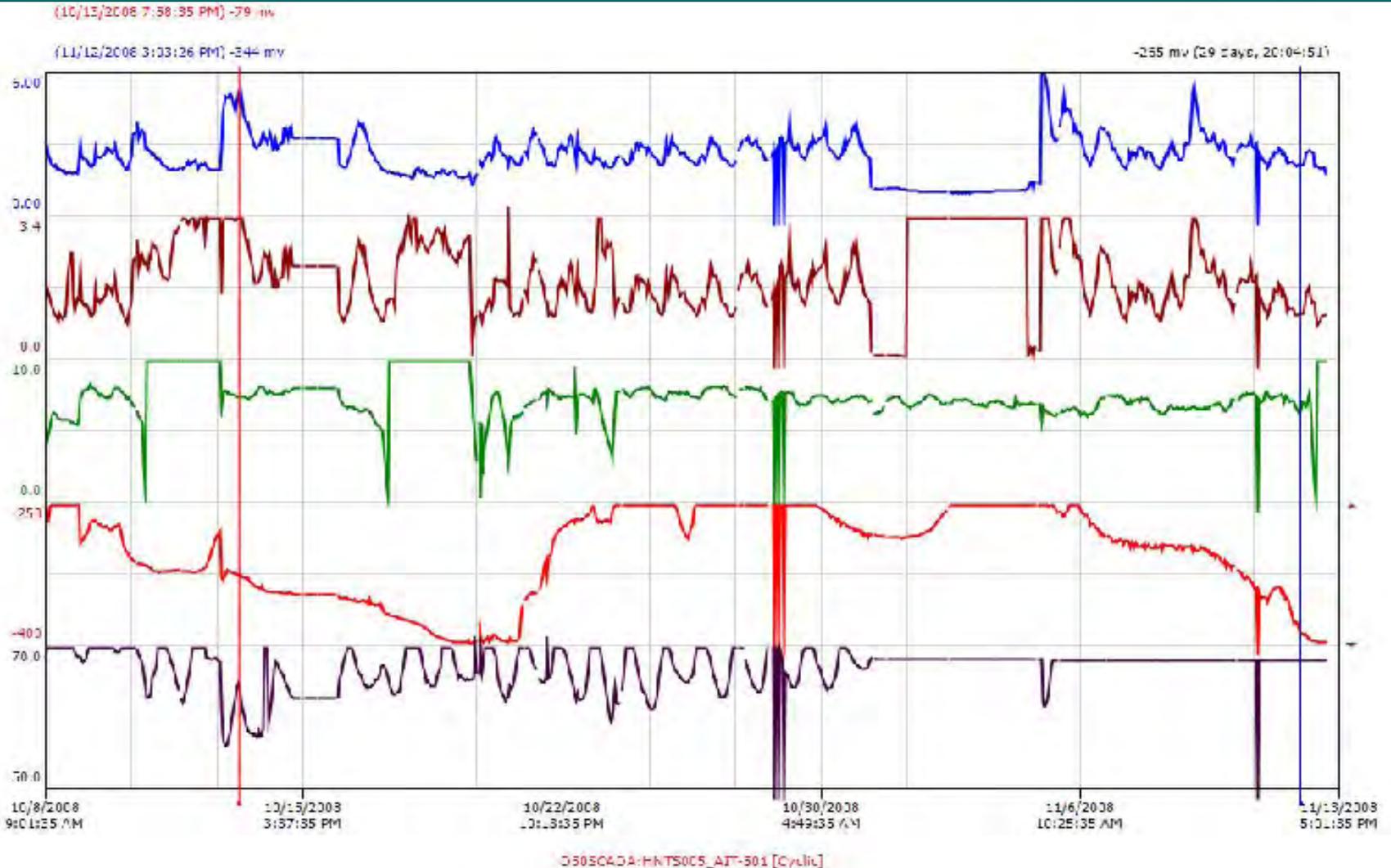
Field Demonstration Cell Construction



Cienega Filtration Project

It's running!

Cienega Telemetry – Analytical 10/8 to 11/13



Issues with BMP Implementation

- Have not yet identified a BMP that
 - Has been tested at full-scale
 - Is economically feasible
- Groundwater-surface water model needed
 - To identify where in the watershed BMPs should be placed
 - To identify where groundwater can be diverted or pumped

NSMP BMP Strategic Plan

- Phase I
 - Technology validation stage
 - Phase II
 - Full scale implementation
- *Ultimate goal is compliance with the numeric targets for fish and birds*

understanding
CEQA



California Environmental Quality Act (CEQA)

What is CEQA?

- A process designed to reveal potential environmental impacts of a project
- A vehicle that empowers citizens to influence environmental decision-making
- A *process* not a *permit*
- A legal requirement that can ensure
 - Real public participation
 - Mitigation of adverse impacts, whenever feasible



Who Must Comply with CEQA?

- CEQA requirements apply to California public agencies (state and local)
- Projects proposed by private entities come under CEQA when state or local permits are required



How CEQA Works

- “CEQA is intended to be interpreted in a manner that affords the fullest possible protection of the environment”
(Friends of Mammoth v. Board of Supervisors 8 Cal.3d 247)
- Relies on strict adherence to process as a way to ensure public participation in government decision making



How CEQA Works

- Environmental analysis must include:
 - A description of project
 - Potential significant impacts
 - Review of mitigation and alternatives that will avoid impacts
 - Review of cumulative impacts
- All environmental documents are subject to both public and public agency review and comment



What is a “Project?”

- The “whole of an action” that may cause either
 - A direct physical change in the environment
 - A reasonably foreseeable indirect physical change in the environment
- Public agency issuance of a grant, loan, or other financing of a project
 - Categorical exemption for studies (Guidelines §15306)

What is a “Project?”

- Adoption of a plan or policy that may result in a significant environmental impact
- Issuance of a permit, license, or entitlement
 - NPDES permits are exempt from CEQA

What are Significant Impacts?

- A “significant impact” causes a substantial or potentially substantial adverse change in physical conditions in the project area
- Environmental review must consider:
 - Direct impacts
 - Reasonably foreseeable indirect impacts
 - Impacts to the environment including impacts not regulated by the lead agency

CEQA Levels of Analysis

- If the project has no potential for significant adverse impacts:
Negative Declaration
- If significant impacts can be mitigated to insignificance:
Mitigated Negative Declaration
- If potential remains for significant impacts:
Environmental Impact Report



Certified Regulatory Programs

- Agency programs designed to protect the environment and ensure public participation
 - Certified by Secretary of the Resources Agency
- Exempt from document formatting requirements of standard CEQA process (similar content)
 - Examples:
 - Basin Planning and policies including TMDLs (Water Boards)
 - Timber Harvest Plans (Dept of Forestry and Fire Protection)
 - Coastal Development Permits (California Coastal Commission)



Certified Regulatory Programs

- Subject to most standard CEQA requirements
 - Cross-agency consultation
 - Public disclosure and review
 - Notice, scoping, reasonable range of compliance methods, alternatives analysis, mitigation, cumulative impacts analysis, findings (resolution)



CRP Requirements

- Project documents constitute a “substitute environmental document” (SED)
 - Basin Plan amendment
 - Supporting Staff Report
 - Checklist/environmental analysis
 - Comments
 - Responses
 - Resolution



SED Levels of Analysis

- Neg Dec-level SED
- Mitigated Neg Dec-level SED
- EIR-level SED



➤ *The Selenium TMDLs will require an EIR-level SED*

Substitute Environmental Document

- SED not required to conduct project-level analysis
 - Regional Board cannot dictate method of compliance
 - Project-specific CEQA analysis must occur as required



Environmental Analysis

- Reasonably foreseeable methods of compliance with the TMDLs
 - Reasonably foreseeable environmental impacts
 - Reasonably foreseeable mitigation measures
 - Reasonably foreseeable alternative methods of compliance¹
- Analysis must address a reasonable range of environmental, economic, technical and other factors²

¹ California Code of Regulations, Title 14, §15187(c)

² California Code of Regulations, Title 14, §15187(d)



Environmental Analysis

- Meets CEQA objectives:
 - Considers potential impacts
 - Considers range of compliance methods
 - Evaluates mitigation, alternatives to the project, cumulative impacts



Potential Reasonably Foreseeable Methods of Compliance

- Source Controls:
 - Reduce Urban Runoff
 - Reduce irrigation and other water use
 - Reduce Discharge of Groundwater
 - Diversion to sewer
 - Use for dust control
 - Truck offsite
 - Elevate construction grades
 - Minimize underground structures
- Surface Water Treatment
 - Subsurface Wetlands
 - Subsurface Bioreactor (IRWD Cienega Facility)
 - AbMet System
 - Reverse Osmosis
- Groundwater Treatment
 - Pump and Treat
 - Permeable Reactive Groundwater Barrier
 - Reduce Local Infiltration

understanding
CEQA



CEQA Checklist

Potential Outcomes of CEQA Analysis

- ✓ Potentially Significant Impact
- ✓ Less than Significant w/ Mitigation Incorporated
- ✓ Less than Significant Impact
- ✓ No Impact



CEQA Checklist Categories

- I. Aesthetics
- II. Agriculture Resources
- III. Air Quality
- IV. Biological Resources
- V. Cultural Resources
- VI. Geology & Soils
- VII. Hazards & Hazardous Materials
- VIII. Hydrology & Water Quality
- IX. Land Use & Planning
- X. Mineral Resources
- XI. Noise
- XII. Population & Housing
- XIII. Public Services
- XIV. Recreation
- XV. Transportation/Traffic
- XVI. Utilities & Service Systems



III Air Quality

- a) Conflict w/ applicable Air Quality Plan?
- b) Violate air quality standard and/or contribute to a violation?
- c) Increase in a “Criteria” pollutant?
- d) Expose sensitive receptors to substantial pollutant concentrations?
- e) Objectionable odors?



XI Noise

- a) Exposure to excessive noise?
- b) Exposure to excessive groundborne vibrations or noise?
- c) Permanent increase in ambient noise levels in the project vicinity?
- d) Temporary increase in ambient noise levels?
- e) Increase in noise near public airport facilities?
- f) Increase noise near private airstrip/airport?



TMDL/SSOs Current Schedule

- March: Interim Technical Staff Report
 - Peer Review
 - Public Release
- March-May: Peer Review
- May: Draft SED and Economic Analysis
- Mid-May: Regional Board Workshop
- Mar-Aug: 1st Public Comment Period
 - On technical report, economic analysis, & SED
- Aug: Draft Final Technical Report, BPA & Resolution
- Aug-Oct: 2nd Public Comment Period
- Oct: RWQCB Public Hearing on Se TMDLs/BPA

Comments on CEQA Scoping Meeting

- Please send to Regional Board Staff by January 20, 2009
- Attention:
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Finding CEQA

- CEQA statute: Public Resources Code §21000 et seq. (California Environmental Quality Act)
- CEQA Guidelines: 14 CCR §15000 et seq.
- SWRCB implementation regulations: 23 CCR §3720 et seq.
- Updated statute, guidelines, caselaw, other info: <http://www.ceres.ca.gov/ceqa>

Thank you for your time and participation!

