



CCHAB Mitigation Subcommittee Meeting August 24, 2017



Algaecides and the NPDES Permit

CCHAB
Mitigation Subcommittee
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Today's Talk

- NPDES Permit
 - WOTUS
- Pesticide Labels
- Algaecides



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Why Control Algae?

- Taste & Odor
- Irrigation efficiency
- Aesthetics
- Recreation
- Flood control
- And...HAB






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NPDES Program Framework

- “Discharge of pollutants”
- From a “point source”
- Into “waters of the US”




Must obtain an NPDES permit from EPA or an approved* state

*Delegated State program
(CA is authorized to issue NPDES permits)

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What is NPDES?


- **N**ational **P**ollutant **D**ischarge **E**limination **S**ystem
- Part of the Federal Clean Water Act
- Typical Uses: stormwater, construction, industrial discharges
- Benefits:
 - Protect water quality
 - Allows discharge
 - Provides legal protection



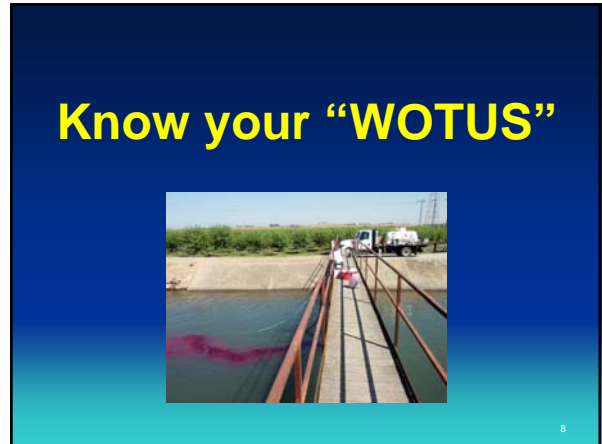
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How Do I Know if I Need an NPDES Permit?

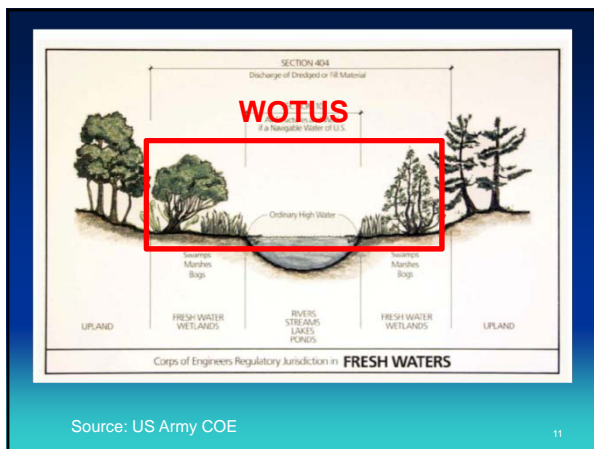
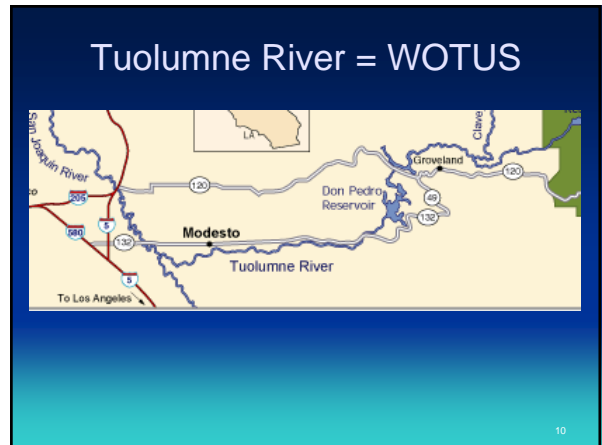
- “Discharge” a “pollutant” to “Waters of the U.S” (WOTUS)
- Leave a pesticide “residue”
- Apply to, over or near water
- Hate being sued



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- Examples of "WOTUS"**
- Traditional Navigable Waters
 - Interstate Waters
 - Impoundments
 - Tributaries
 - Adjacent Waters
 - Waters in the 100 year floodplain



Source: US Army COE

- What is NOT a "WOTUS" ?**
- Artificial lakes created in dry land
 - stock watering & irrigation ponds
 - settling basins
 - Rice fields
 - Ditches disconnected from WOTUS
 - Stormwater features

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“Aquatic Weed” NPDES Permit

- Allows discharge to WOTUS
- Prepare APAP and NOI
- Pay fee
- Water quality monitoring before, during and after
- Keep and maintain records
- Annual report

http://www.waterboards.ca.gov/water_issues/programs/npdes/pesticides/weed_control.shtml#currentpermit

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Approved Aquatic Herbicides

- Currently only 14 registered for Use in CA



- Acrolein *
- Copper *
- 2,4-D
- Chlorine
- Diquat
- Endothall
- Flumioxazin
- Fluridone
- Glyphosate
- Imazamox
- Imazapyr
- Penoxsulam
- Sodium Carbonate Peroxyhydrate
- Triclopyr

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Special Cases: Copper & Acrolein

- Copper and Acrolein = USEPA Priority Pollutants (PPs)
- Discharge of PPs > Receiving Water Limit (RWL) is prohibited:
 - into receiving waters; or
 - in treatment area after treatment is complete



Active Ingredient	Receiving Water Limit (RWL) (ppb)	Typical Rate (ppb)
Copper	3-50*	500 to 1,000
Acrolein	21-780**	1,000 to 15,000

Notes:

* Hardness Dependent

** Beneficial Use Dependent



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- Can't meet these limits?
- Apply for a State Implementation Policy (SIP) Section 5.3 Exception
 - Allows short-term or seasonal exception from meeting RWL
 - CEQA Process
 - Apply to SWRCB
 - Monitoring Plan

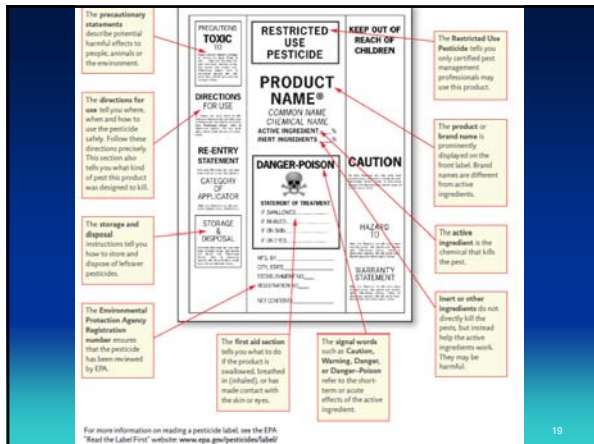


Pesticide Labels

- Legal document - **“The label is the law”**
- Information includes:
 - Ingredients
 - Restrictions/conditions of use (e.g. wind)
 - Environmental hazards
 - PPE
 - How to mix and apply; retreatment interval
 - How to store
 - Disposal

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Limitations

- The following slides and discussion do not constitute an oral or written PCA recommendation.
- The information is based on a review of a few select product labels, and should not be considered endorsements nor exhaustive.

Acrolein (Magnacide-H)

<p>Pros</p> <ul style="list-style-type: none"> Very effective Fast acting Short half-life 	<p>Cons</p> <ul style="list-style-type: none"> Effective → Biocide Kills fish at very low conc. Very limited applicability to non-irrigation settings Applicator safety concerns Restricted Use Material Priority Pollutant <ul style="list-style-type: none"> SIP likely required
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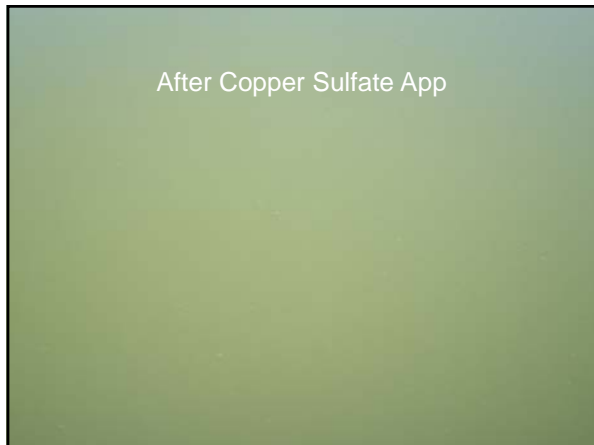
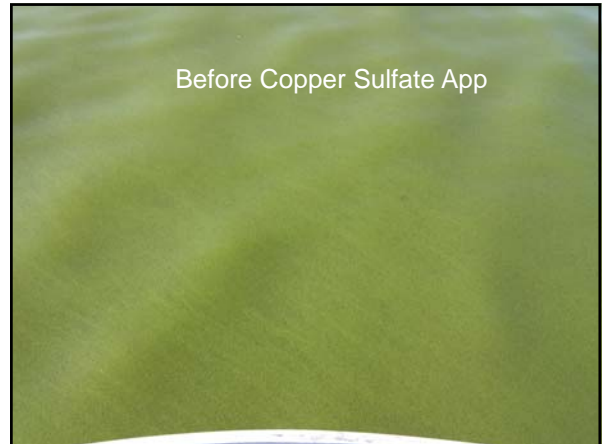
Copper

Formulations: copper sulfate or chelated copper
Example products: Cutrine-Plus, Captain XTR, Copper Sulfate

<p>Pros</p> <ul style="list-style-type: none"> Effective at range of application rates Wide range of algae species controlled Some products NSF certified for drinking water Good duration of control Easy to apply Cost 	<p>Cons</p> <ul style="list-style-type: none"> Persistent Priority pollutant (MS4, stormwater, SSO issues?) <ul style="list-style-type: none"> SIP likely required Aquatic organism toxicity Accumulation in sediment
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Chlorine

Formulations: Calcium or sodium hypochlorite
Example products: Agrichlor

<p>Pros</p> <ul style="list-style-type: none"> • Wide range of algae species controlled • Short duration of control • Short half-life (no bioaccumulation) 	<p>Cons</p> <ul style="list-style-type: none"> • Strong oxidizer, highly reactive • Broad spectrum • Aquatic organism toxicity • Specialty application equipment required or applied by distributor
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Diquat

Example products: Reward, Diquat

<p>Pros</p> <ul style="list-style-type: none"> • Controls <i>Spirogyra</i> spp. and <i>Pithophora</i> spp. (green algae species) • Fast acting • Short half-life (no bioaccumulation) • Easy to apply • Controls submersed aquatic plants • Cost 	<p>Cons</p> <ul style="list-style-type: none"> • Suppression only per label • Controls submersed aquatic plants • Potable water restrictions
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Endothall

Algaecide Formulation: Monoamine salt of endothall
Example products: Teton, Hydrothol 191

<p>Pros</p> <ul style="list-style-type: none"> • Effective • Fast acting • Short half-life (no bioaccumulation) • Easy to apply (if diluted) • Can mix with sodium carbonate peroxyhydrate 	<p>Cons</p> <ul style="list-style-type: none"> • Acute fish tox > 0.3 PPM • Potable water restrictions
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Sodium Carbonate Peroxyhydrate (SCP)

Example products: PAK 27, GreenClean Liquid, Phycomycin

Pros

- Effective
- Fast acting
- Short half-life
- Breakdown products:
H₂O, O₂
- Easy to apply (liquid)
- No acute fish toxicity

Cons

- Short duration of control
- May require special app equipment (granular)
- Cost



Today's Talk

- NPDES Permit
- Pesticide Labels
- Algaecides



Useful Resources:

- Weed Control NPDES Permit Page (http://www.waterboards.ca.gov/water_issues/programs/npdes/pesticides/weed_control.shtml)
- The Safe and Effective Use of Pesticides (<http://anrcatalog.ucanr.edu/Details.aspx?itemNo=3324>)
- CDMS - pesticide labels and SDSs (<http://www.cdms.net/Label-Database>)
- Recent B&A NPDES Permit Presentations (<http://www.h2osci.com/meetings.html>)

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