



The Public Interest Alternative

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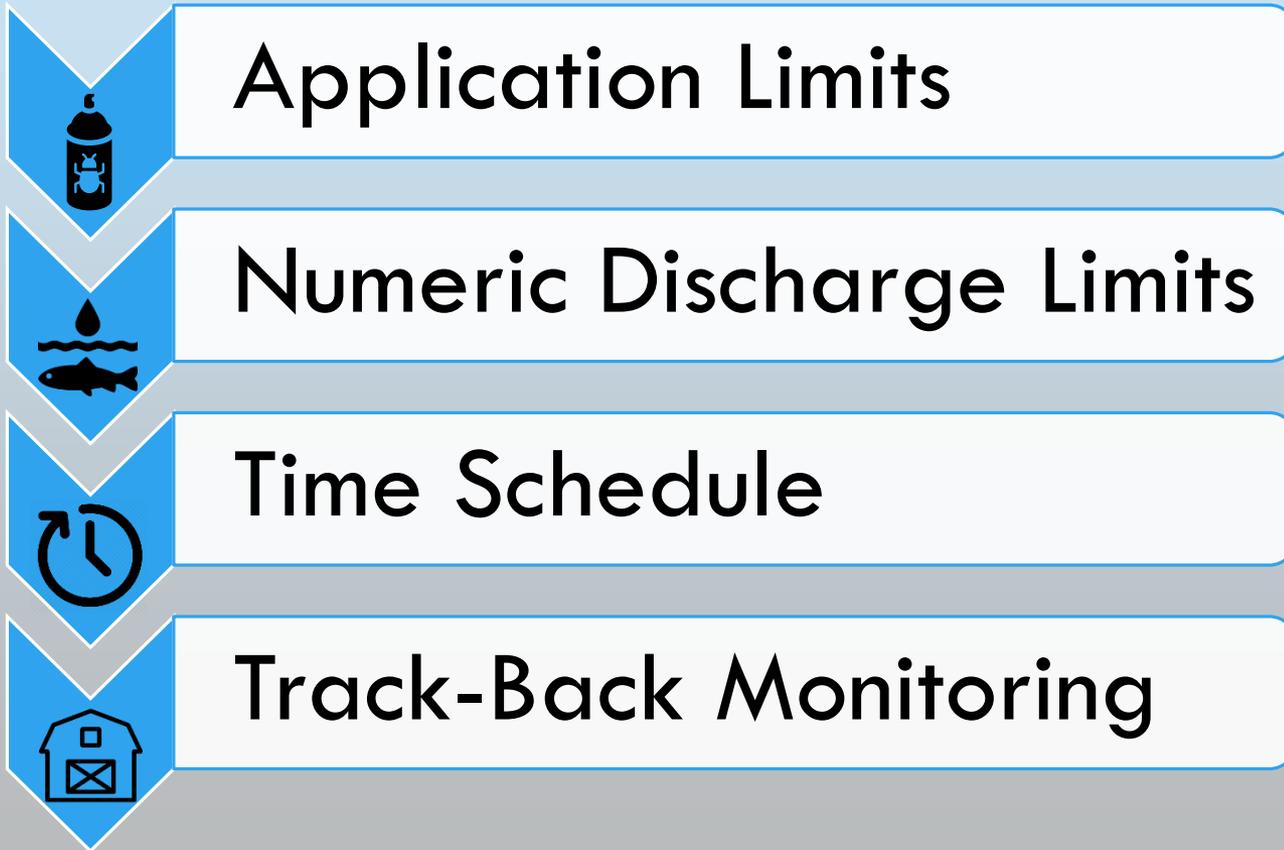


1. Ready to Implement: minimal unknowns or uncertainties that will delay or derail implementation;
2. Must have quantifiable means and limits to determine if the Order achieves and maintains water quality objectives, and to trigger further action and enforcement. Achieved through application and numeric limits and water quality monitoring;
3. Ramps DOWN (RB staff ramps UP)
 - NOV to problematic subwatershed catalyzing peer pressure
 - Relaxed monitoring and reporting for “clean” subwatersheds
4. Some growers must learn and apply more WQ protective techniques
 - Understanding of Irrigation and Nutrient Management Planning
 - Evapotranspiration
 - Crop Nutrient Need / Uptake
 - N in Irrigation Water, N in Soil
 - How much N amendment to apply
 - Understanding of Fate, Transport, and Consequence of Pesticide Application

5. Monitoring must be adequate to show compliance and trends (CCAMP/CMP does not).
 - “While the available data show trends in some areas for some water quality parameters, such as nitrate concentrations or turbidity, in most cases staff cannot assign a cause to these trends or conclude that overall water quality conditions are changing in such a way that water quality objectives will be achieved or beneficial uses will be protected. Where water quality problems are detected at CCAMP or CMP sites, a higher resolution network of monitoring sites would be needed to determine causality.”
 - Adequate monitoring is required by Non Point Source Policy.
 - The Public Interest Alternative supplements the CCAMP/CMP program with an aggressive real-time, track-back effort in the first year or two.

6. Need to establish clear incentives for meeting water quality objectives.
7. Need to establish clear consequences for not meeting water quality objectives.
8. Timelines must be clear and tethered to objective criteria / science.
 - Surface water < Groundwater;
 - [current use] Toxics < Nutrients;
 - For N, human health standards < aquatic life;
 - We can expect SOME improvements within a year if we start addressing the problems.
9. Incorporate sediment and erosion management plan using same guidelines;
10. Need to protect, preserve and enhance natural water quality treatments (e.g., riparian buffers, wetlands...)

MINIMUM REGULATORY FRAMEWORK



Irrigation and Nutrient Management for Groundwater Protection
**Order should be ready to implement
(no unknowns or uncertainties)**

Staff Conceptual Order

- Uncertainty of Third Party implementation.
- Uncertainties and delays associated with determination of Discharge Limits.

Public Interest Alternative

- Designed to avoid uncertainties and time delays.
- Clear priorities and milestones.

Irrigation and Nutrient Management for Groundwater Protection

Quantifiable means to determine if Order achieves GW water quality objectives

Staff Conceptual Order

- Numeric limits only for Application/Discharge Limits.
- No numeric limits listed in Order for groundwater quality.
- Is compliance with drinking water MCLs and Basin Plan water quality objectives implied?
- Recommend listing numeric water quality objectives in Order.

Public Interest Alternative

- Numeric limits for both application limits and water quality.
- Numeric limits serve two primary purposes.
 - 1) Means to determine if water quality objectives met and beneficial uses protected.
 - 2) Means to evaluate and refine the effectiveness of nutrient Application Limits (i.e., water quality monitoring provides feedback mechanism to assess and refine numeric Application Limits).

Irrigation and Nutrient Management for Groundwater Protection

Ramp Down Approach to Phasing or Prioritization Areas

Staff Conceptual Order

- Phasing or Prioritization driven by impairment – unclear how decided.
- Unclear if designated priority areas are consistent between GW and SW areas.
- Total GW monitoring areas/costs increase over time.

Public Interest Alternative

- Start by addressing all subwatersheds.
- Compliance reduces management/monitoring requirements.
- Total GW monitoring areas/costs decrease over time.
- As problem areas are identified, reduces burden on Board and growers.

Irrigation and Nutrient Management for Groundwater Protection

Need to reduce over-application of nutrients

- Fully support integration of Application Limits in the Order.
- In theory, Discharge Targets/Limits are reasonable approach for addressing nutrient application limits.
- Acknowledge that lack of R-values for various crops delays use of Discharge Limits in Order and requires use of Interim Application Limits.
- Staff Conceptual Order and Public Interest Alternative propose differing methods to determine appropriate Interim Application Limits.
- Prefer Public Interest Alternative approach as it considers all sources of N (A_{FER} , A_{IRR} , N_{SOIL}) not just A_{FER} .
- Confident that this technical issue will get resolved.

Irrigation and Nutrient Management for Groundwater Protection
**Establish clear incentives for meeting water
quality objectives**

Staff Conceptual Order

- Compliance reduces monitoring and reporting requirements and costs.

Public Interest Alternative

- Compliance reduces monitoring and reporting requirements and costs.

Irrigation and Nutrient Management for Groundwater Protection

Establish meaningful consequences for violations to water quality objectives

Staff Conceptual Order

- Consequences triggered for exceedances to numeric Discharge Target or Limit.
- Increased monitoring and reporting requirements for exceedances.
- Limit nutrient application (A_{FER}).

Public Interest Alternative

- Consequences triggered for exceedances to either numeric Application Limit or GW quality limits.
- Increased monitoring and reporting requirements for exceedances.
- Use of NOVs to underscore importance of meeting WQ objectives.

Sediment and Erosion Management for Surface Water Protection

Need to protect and enhance water quality

Staff Conceptual Order

- Priority areas based on presence of nutrient and/or pesticide toxicity issues.
- Consequences for exceedances include additional monitoring (more of same).

Public Interest Alternative

- Priority areas recognize that on-site erosion and non-toxic sediment is a potential pollutant in itself.
- Consequences for exceedances include additional monitoring, toxicity testing, and erosion source investigation.

Riparian Habitat Management for Water Quality Protection

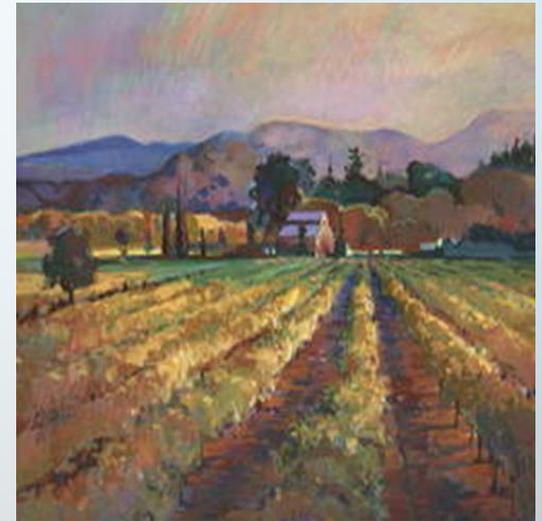
**Need to protect, preserve and enhance
natural water quality treatments**

Staff Conceptual Order

- Table 5 improves on original Conceptual Order and Public Interest Alternative.

How Public Interest Plan addresses key surface water issues

- Compliant with *nonpoint source (NPS) policy* key elements (purpose and process for achieving WQOs, milestone schedule, feedback, consequences)
- Built-in *incentives* for growers to implement BMPs and reduce monitoring costs by demonstrating consistent compliance
- *Consequences & accountability*; “track-back” feature is *triggered* by monitoring results, which allows for identifying causal agents for water quality violations and potential enforcement actions (e.g. NOVs)
- *Regulating nutrients and pesticides both front- and back- end* (numeric limits for both application and discharge)
- Surface water recovery from both nutrient and pesticide-based impairments expected to be much more rapid than groundwater; amenable to faster recovery and real-time monitoring (esp. for nutrients)



Sample Monitoring and Reporting Plan (MRP)

Sample MRP includes useful guidance for:

- Groundwater and surface water monitoring and reporting, including designing Sampling & Analysis and Quality Assurance project plans (SAPs & QAPPs)
- Proposed frequency for monitoring groundwater & surface water
- Proposed Irrigation and Nutrient Management Plan (INMP) and Water Quality Buffer Plan
- Proposed benchmarks for receiving water and edge-of-field compliance
- Toxicity-based (both ecological and human health-based) numeric benchmarks and chemical reporting limits for analysis of current-use pesticides, nutrients, and turbidity in surface water, groundwater, and sediments
- Benchmarks proposed for:
 - pyrethroid insecticides
 - carbamate insecticides
 - phenylpyrazole insecticides
 - neonicotinoid insecticides
 - organophosphate insecticides
 - herbicides
 - Specific nutrients (nitrate, nitrite, total N, orthophosphate)
 - Turbidity (NTU for cold and warm water, plus total suspended solids)

Numeric Limits of current use pesticides – label specifications

Pesticide label requirements help to regulate application quantity and frequency:

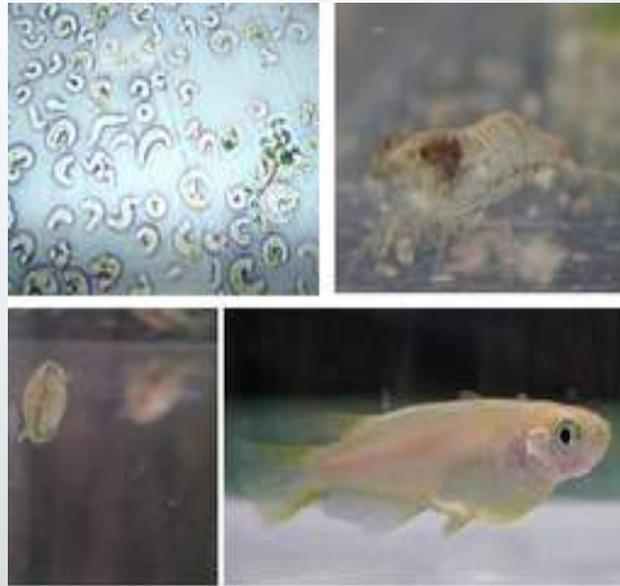
- Specifications are science-based, peer-reviewed, and set by EPA OPP/CA DPR
- Labels represent a balance between need for effective pest control, reducing non-target toxicity, and protecting water quality
- Standard exposure and toxicity parameters are incorporated to assure that non-target species are adequately protected, including T&E species under ESA
- FIFRA requires that short- and longer-term (acute/chronic) toxicity be evaluated for a wide range of test species (e.g. fish, avian, invertebrates, mammalian)
- If labelled specs are exceeded, then downstream water quality violations and potential toxicity to non-target species may be expected

Key characteristics of pesticides considered in selecting appropriate tests

- Although current use pesticides are emphasized, past-use (legacy) pesticides, (especially organochlorine compounds such as dieldrin, DDT, etc.), are still present in toxic concentrations in Central Coast river sediments and need to be considered in toxicity testing
- Numerous chemical and environmental fate-related characteristics considered in selecting toxicity test protocols and organisms in water and sediment. These include:
 - Acute/chronic toxicity to fish, invertebrates, etc.
 - Environmental persistence and stability
 - Bioaccumulation potential
 - Water solubility & mobility
 - Stickiness to sediment (K_{ow} , K_{oc})
 - Toxicological modes of action and potential for interaction (additivity, synergy, antagonism)

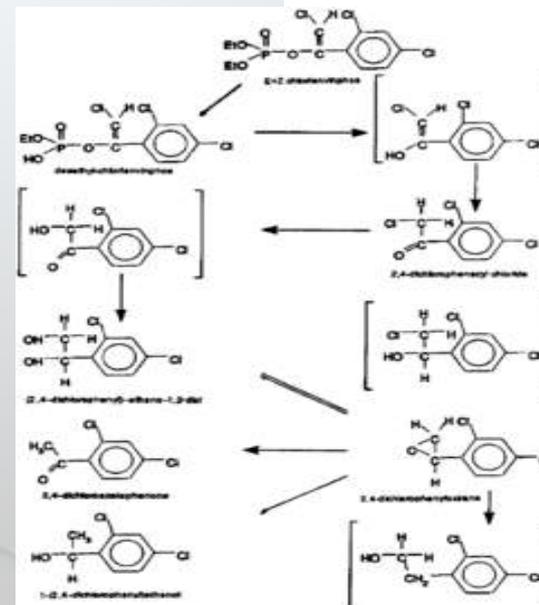
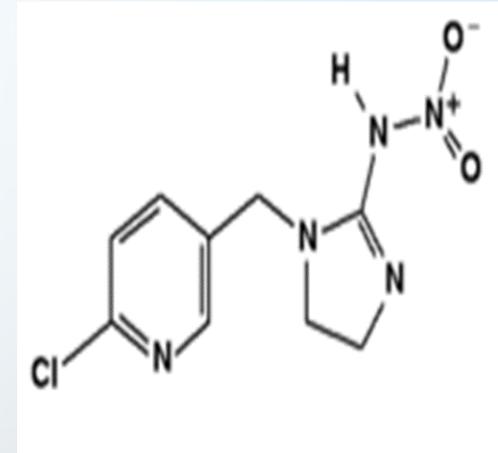
Bioassays measure site-specific ecotoxicity in effluent or receiving water

- Bioassays are especially valuable when analogous compounds (e.g. pesticides) are additive or interactive within complex mixtures
- Site-specific, widely accepted, and represent a direct measure of acute and chronic effects
- Site-specific toxicity units (TU's) are valuable in assessing toxicity of complex mixtures in receiving waters and sediments
- Bioassays are standard part of Toxicity Identification Evaluation (TIE) protocols for identifying individual toxicants or causal agents



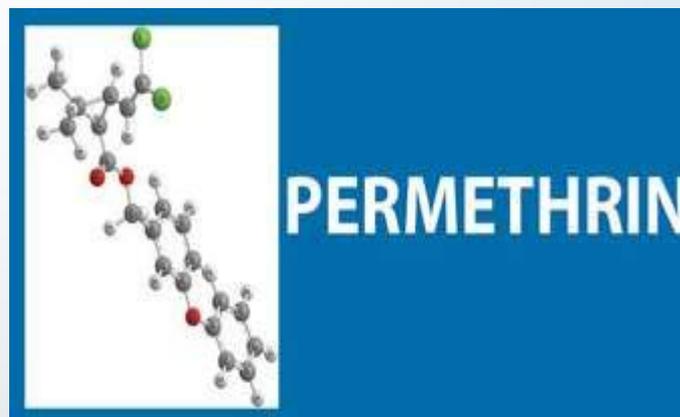
Imidacloprid – overview and regulatory update

- Widely used insecticide in Central Coast; applied to numerous crops, wine grapes, garden plants, animals, soils, and structures for insect pest control
- UC Davis researchers (Bower & Tjeerdema 2018) currently deriving freshwater aquatic life criteria for imidacloprid
- Highly soluble and mobile, known to infiltrate groundwater in toxic concentrations
- Both parent compound and metabolites may be persistent and toxic
- Highly toxic to benthic invertebrates; proposed ecotoxicity-based benchmark of 0.01 µg/L may be difficult to attain
- Proposed program would require monthly monitoring for neonicotinoids where they are used



Pyrethroid insecticides in sediments

- Widely used persistent insecticides along Central Coast caused numerous 303(d) list impairments in 2010
- Generally toxic to aquatic invertebrates in sediment
- TMDL established for Lower Salinas watershed for pyrethroids in sediment (Res. R3-2016-0003) based on toxicity to *Hyaella azteca*
- Examples of Commonly used pyrethroid compounds:
 - Bifenthrin – strawberries, artichokes
 - Cypermethrin – lettuce, spinach, broccoli, peas
 - Esfenvalerate – artichokes, broccoli, lettuce
 - Lambda-cyhalothrin - lettuce
- Numeric benchmarks are based on compound-specific toxicity



○ Toxicity-based benchmarks and TMDLs

- TMDLs are not always a satisfactory replacement for compound-specific, ecotoxicity-based benchmark values
- TMDLs are a valuable watershed protection tool but are often too general to assure attainment of WQOs and must be supplemented with monitoring requirements
- Use of Toxic Unit method for regulating toxicity (e.g. as part of a TMDL) assesses direct toxicity to test organisms, but does not measure individual compounds within a complex mixture
- Pyrethroids are the only pesticide for which TMDLs have been developed in Region 3 and do not address the wide variety of current use pesticides used along the Central Coast
- Timelines for attainment of TMDL goals are often longer term and WQOs could be met more quickly using toxicity-based benchmarks and more specific monitoring tools and approaches

Surface water INMP and nutrient issues

- Surface water recovery from nutrient-based impairments expected to be much more rapid than groundwater; amenable to real-time monitoring and reporting requirements
- Irrigation and Nutrient Management Plan (INMP) essential for surface water as well as groundwater
 - requires measurement & reporting N use in soil, irrigation water, and all soil amendments
 - Requires understanding of evapotranspiration and proper irrigation practices
 - Nutrients in surface water require compliance with numerical benchmark values
 - Consistent with INMP for groundwater
- Sediment and erosion management – every farming operation is responsible for erosion control, and monitoring follows the same program as nutrients and toxics

Remarks on Order 4.0

**Stanford Environmental Law Clinic
and
Environmental Law and Justice Clinic, Golden Gate
University School of Law
on behalf of**

The Public Interest Alliance

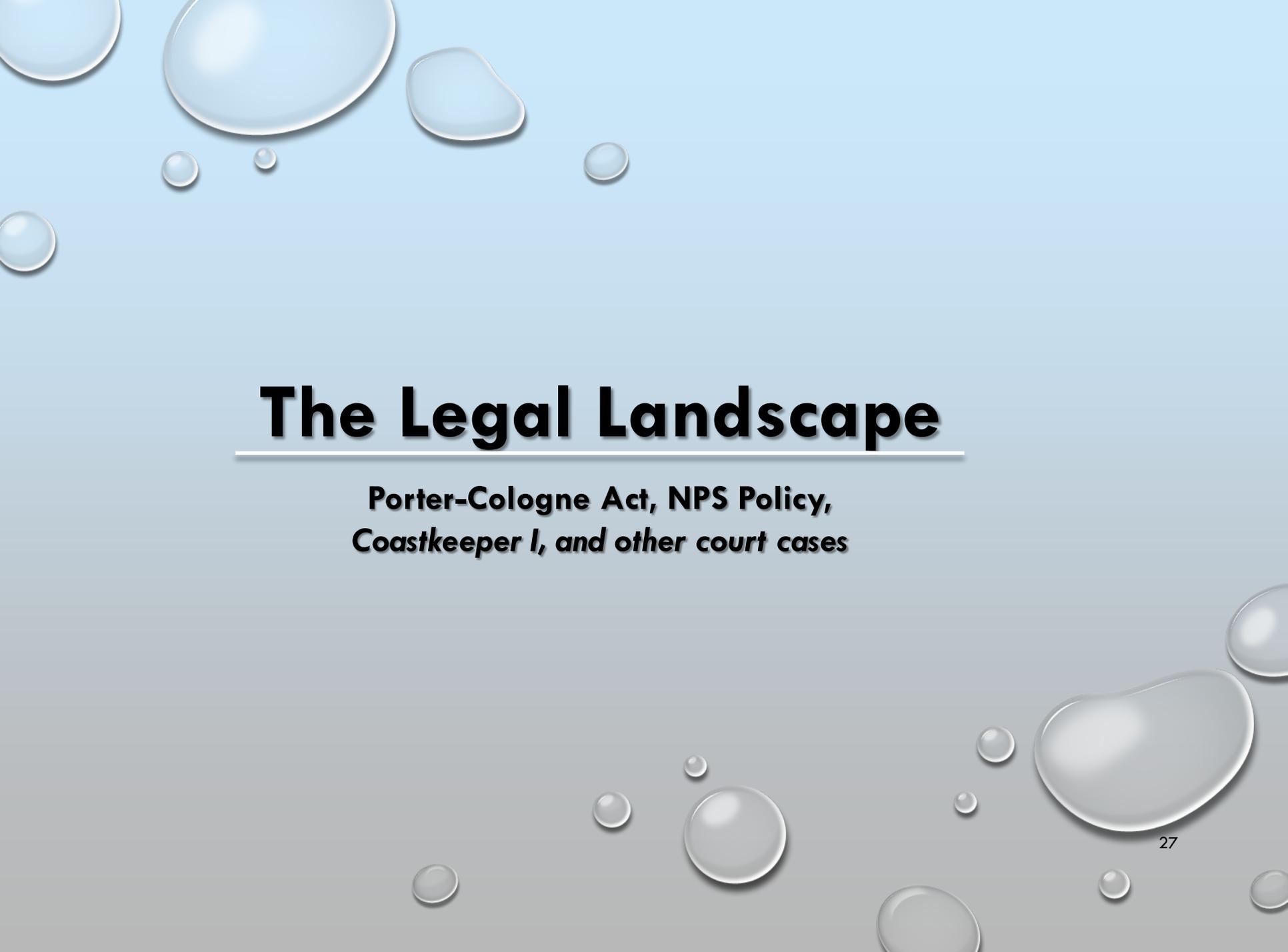
March 21, 2019

TAKEAWAYS FOR THE REGIONAL BOARD

1. The Water Code requires the Regional Board to regulate agricultural pollution.
2. The Regional Board must develop an order that has a high likelihood of achieving Water Quality Objectives.

To meet this goal:

- The Regional Board must set numeric discharge limits.
- The Regional Board is empowered to set numeric application limits.

The background of the slide is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

The Legal Landscape

**Porter-Cologne Act, NPS Policy,
Coastkeeper I, and other court cases**

THE WATER CODE REQUIRES THE REGIONAL BOARD TO REGULATE AGRICULTURAL POLLUTION

1. The Regional Board must issue either WDRs or waivers to anyone whose discharges of waste “could affect” water quality. [WC 13260, 13263, 13269]
2. Ag discharge is a “waste substance” from a “producing operation.” [WC 13050]
3. A Regional Board . . . may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted. [WC 13243]
4. The Regional Board can [WC 13300] and must [WC 13263] enforce compliance with waste discharge requirements.

**THE NONPOINT SOURCE POLICY
REQUIRES THE REGIONAL BOARD TO
DEVELOP AN ORDER THAT HAS A HIGH
LIKELIHOOD OF MEETING WQOs**

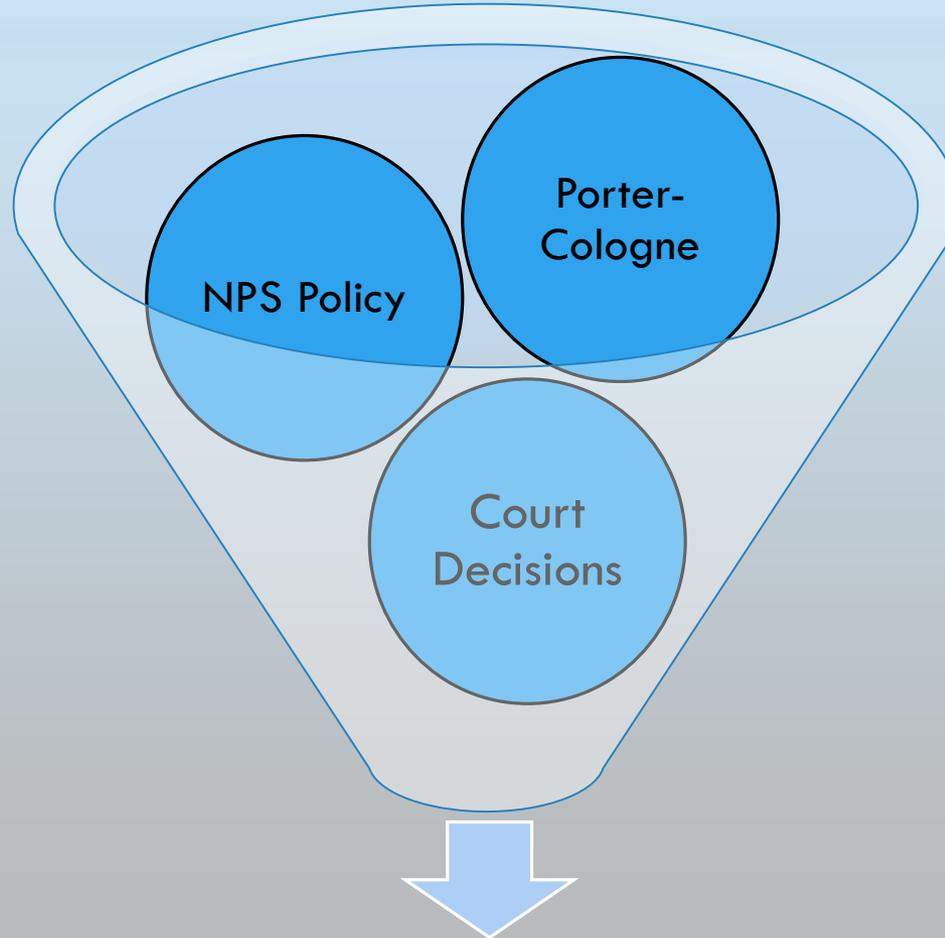
TAKEAWAYS FROM COASTKEEPER I: ORDER 4.0 MUST HAVE A HIGH LIKELIHOOD OF ATTAINING WATER QUALITY OBJECTIVES

“[T]he NPS Policy *expressly* requires time schedules and quantifiable milestones; the purpose is to assure that the water quality objectives are eventually met.”

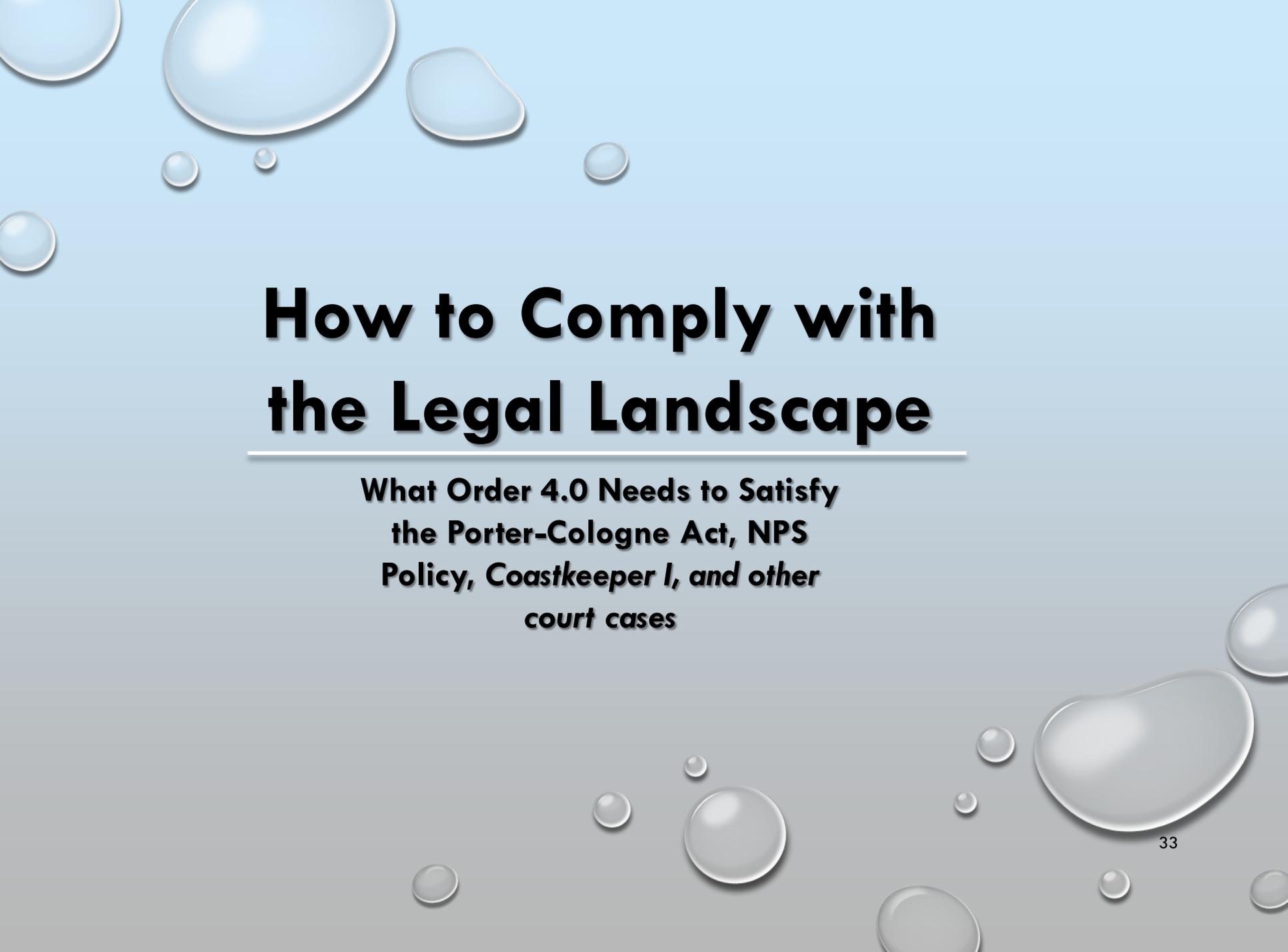
TAKEAWAYS FROM COASTKEEPER I: MANAGEMENT PRACTICES ARE NOT ENOUGH

**“Management practice implementation never
may be a substitute for meeting water quality
requirements.”**

LEGAL AUTHORITY COURTS WILL USE IN EVALUATING ORDER 4.0



Order 4.0

The background of the slide is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

How to Comply with the Legal Landscape

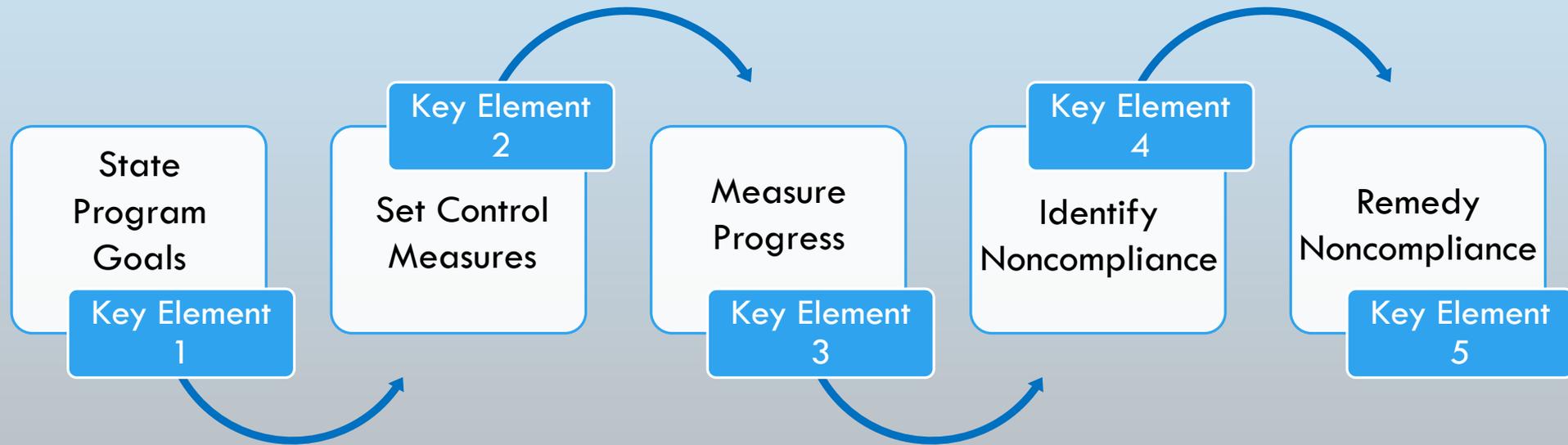
**What Order 4.0 Needs to Satisfy
the Porter-Cologne Act, NPS
Policy, *Coastkeeper I*, and other
court cases**

**THE REGIONAL BOARD MUST
DETERMINE THAT ORDER 4.0 HAS A
HIGH LIKELIHOOD OF ACHIEVING
WATER QUALITY OBJECTIVES**

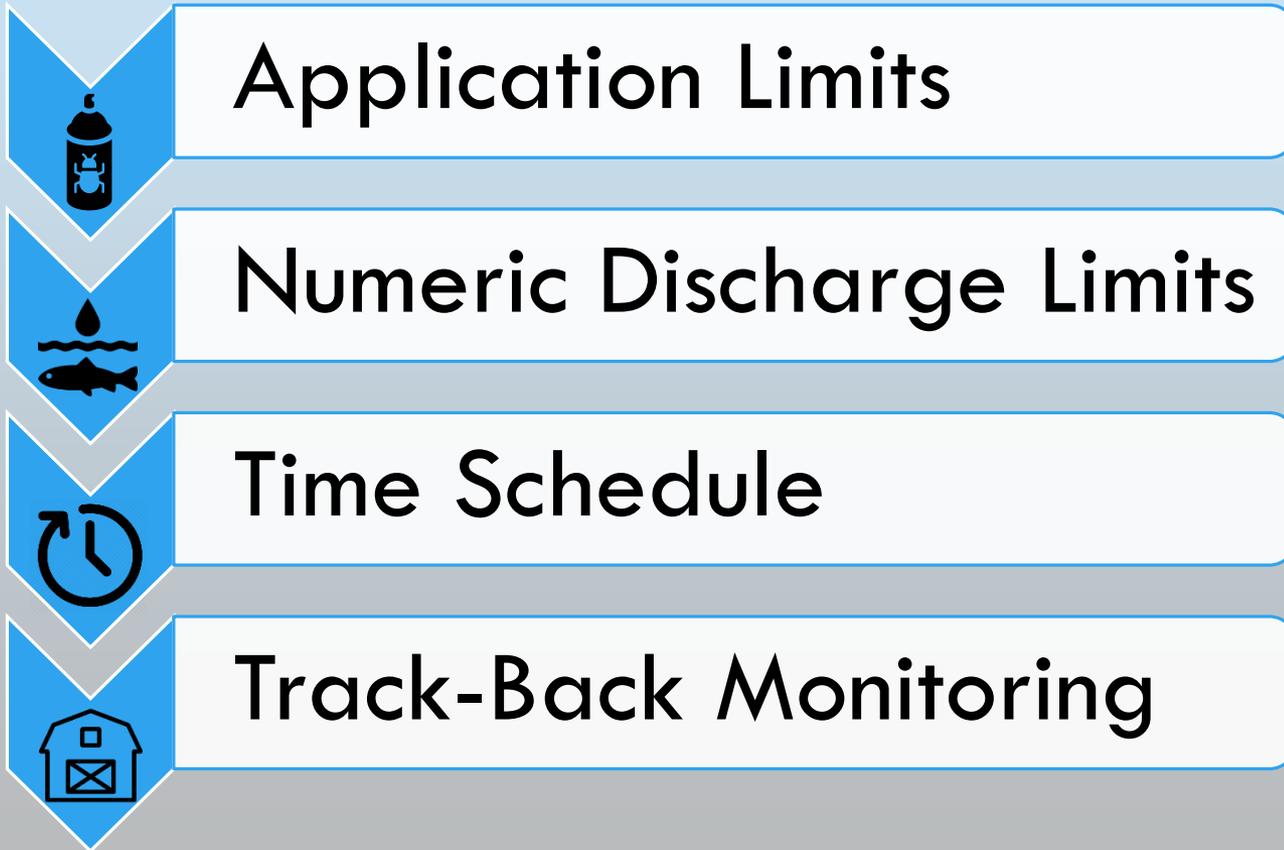
CONTROL MEASURES MUST BE HIGHLY LIKELY TO ACHIEVE WQOS

- 65% of growers must implement unspecified MPs by March 2024.
- All growers must implement 4 MPs by March 2024.
- Growers must have discharges with less than 3 mg/l of Nitrate by March 2024.

A GUIDE TO HIGH LIKELIHOOD



MINIMUM REGULATORY FRAMEWORK



**SPECIFIC, QUANTIFIABLE
REQUIREMENTS ARE STANDARD IN
AGRICULTURAL WDRs**

Central Valley Dairies*

Public Interest Proposal from Coastkeeper et al.

Application rates shall not result in total nitrogen applied to the land application areas exceeding 1.4 times the nitrogen that will be removed from the field in the harvested portion of the crop.

No grower shall apply more total nitrogen than best available crop-specific nitrogen uptake rate in lbs/ac/per crop cycle times a multiplier of 1.4.

* CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD CENTRAL VALLEY REGION ORDER R5-2013-0122 REISSUED WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR EXISTING MILK COW DAIRIES, (p. C-11).

Statewide Cannabis Cultivators*

Cannabis cultivators shall not apply nitrogen at a rate . . . greater than **319 pounds/acre/year** unless plant tissue analysis performed by a qualified individual demonstrates the need for additional nitrogen application.

Public Interest Proposal from Coastkeeper et al.

If there is no best available crop-specific nitrogen uptake rate for growers crop, grower shall not exceed an application rate ($N_{TOT} \times 1.4$) of **250 lbs/ac**/per crop cycle.

* STATE WATER RESOURCES CONTROL BOARD ORDER WQ 2017-0023-DWQ GENERAL WASTE DISCHARGE REQUIREMENTS AND WAIVER OF WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF WASTE ASSOCIATED WITH CANNABIS CULTIVATION ACTIVITIES, (p.45)

FURTHER CONSIDERATIONS FOR ENSURING THE ORDER'S LEGALITY

- The Water Code requires the Board to include riparian habitat management provisions.
- To ensure that the Order has a high likelihood of achieving Water Quality Objectives,
 - The Board must clearly specify in the Order itself the consequences for failing to achieve the conditions and discharge limits.
 - The Board must rely on mechanisms that are enforceable.
 - The Board itself must act and not depend on other agencies.

THE BOARD MUST SET LIMITS FOR RIPARIAN HABITAT MANAGEMENT

- The Board has authority to set such limits.
WC § 13263 and § 13241
- The Regional Board must prohibit damaging or removing riparian habitats.
- Riparian setbacks and vegetative coverage requirements are typical to meet water quality objectives.

RIPARIAN SETBACKS AND VEGETATIVE COVERAGE REQUIREMENTS ARE TYPICAL IN BOARD ORDERS

Statewide Cannabis General Order	San Francisco Bay Regional Board General WDR for Vineyard Properties
<p>Establishes riparian setbacks that range from 50 to 100 feet. (p. 24-25)</p>	<p>Vineyards must establish and maintain stream setbacks that are on average 1.5 times the bankfull width. (p. A-6)</p>

THE BOARD MUST SPECIFY CLEAR CONSEQUENCES WHEN PERMITTEES FAIL TO COMPLY WITH THE ORDER OR DO NOT MEET WATER QUALITY OBJECTIVES

Legal Authority:

1. NPS Policy, Key Element 5

The Board “shall make clear, in advance, the potential consequences” for failure to achieve the Order’s stated purposes.

2. The Regional Board can prohibit discharges in certain conditions.

WC § 13243

3. The Regional Board can specify what happens when application and discharge limits are not met because exceedances affect water quality.

WC § 13263

EXAMPLES OF CONSEQUENCES

- Prohibitions
- Enforceable schedule of compliance
 - schedule of remedial measures
 - sequence of actions that lead to compliance

Legal



Violations trigger consequences:

E.g., Notice being provided to permittees to consult with the Board to determine appropriate application rates.

Meeting standards trigger incentives:

E.g., reduced monitoring.

Not Legal



Incentives exist but information is missing as to consequences when violations occur.

“HIGH LIKELIHOOD” MEANS THE ORDER MUST CONTAIN CONDITIONS THE BOARD ITSELF CAN ENFORCE

- ✗ “Coordination” with Dep’t of Pesticide Regulation is not sufficient to reduce pesticides
- ✗ Certification programs without standards that relate to Water Quality Objectives that the Board itself cannot enforce do not lead to a “high likelihood” of success

“HIGH LIKELIHOOD” MEANS
THE CONDITIONS ARE DIRECTED TO PERMITTEES
SO THAT THE BOARD CAN ENFORCE:
THIRD PARTIES

Acceptable	Not High Likelihood – Not Enforceable/Accountable
<p>Using a third party to collect monitoring data for cost savings</p>	<p>Third-party watershed restoration programs without standards and enforceability on permittees</p> <ul style="list-style-type: none">•

TAKEAWAY FROM OTHER COURT DECISIONS

A high likelihood of success cannot be based on hope or speculation.

The Board must demonstrate the connection between the evidence and the choices made.

The basin plan targets 2025 as the date for cleaning up 80% of the groundwater. How do we get there? Courts require a showing that the Order relies on evidence.

E.g., Topanga Assoc. for a Scenic Comm. v. County of Los Angeles,
11 Cal.3d 506 (1974)

EXAMPLE 1

Evidence: “Over half of the nitrogen applied as fertilizer ends up as a waste discharge to the environment. The current average discharge of waste nitrogen from irrigated agriculture today, based on Total Nitrogen Applied reporting, is approximately ten times the discharge level identified by the 2012 UC Davis Nitrate Report as being protective of water quality and beneficial uses.”

Nitrate loading “Must be reduced to the maximum extent practicable.”

(May 2018 Staff Report)

Decision: Numeric application limits 

EXAMPLE 2

Evidence:

“To prevent further water quality impairment and impact to beneficial uses, we must take action now.”

“If we do not..., these costs and other impacts are likely to increase significantly.”

“The high levels of nitrate and significant amount of toxicity we see at many sites, along with habitat degradation and the documented removal of vegetation that can protect water quality, make it imperative that we aggressively address these problems.”

(2010 PRELIMINARY DRAFT STAFF REC. FOR AG. ORDER, 02/01/10; CENTRAL COAST REGIONAL BOARD LETTER TO AG. ADVISORY PANEL PARTICIPANT, 12/12/08)

Decision (Updated Staff Concept): Deferral of action and lack of standards

- **✗** Priority ranches, watersheds or sub-watersheds will be identified, and implementation work plans will be developed.
- **✗** Compliance assistance from Third Parties without time schedules
- **✗** Not inserting a term limit in a WDR so that there's no enforceable plan to revisit the permit

Community Water Systems That Rely on a Contaminated Groundwater Source

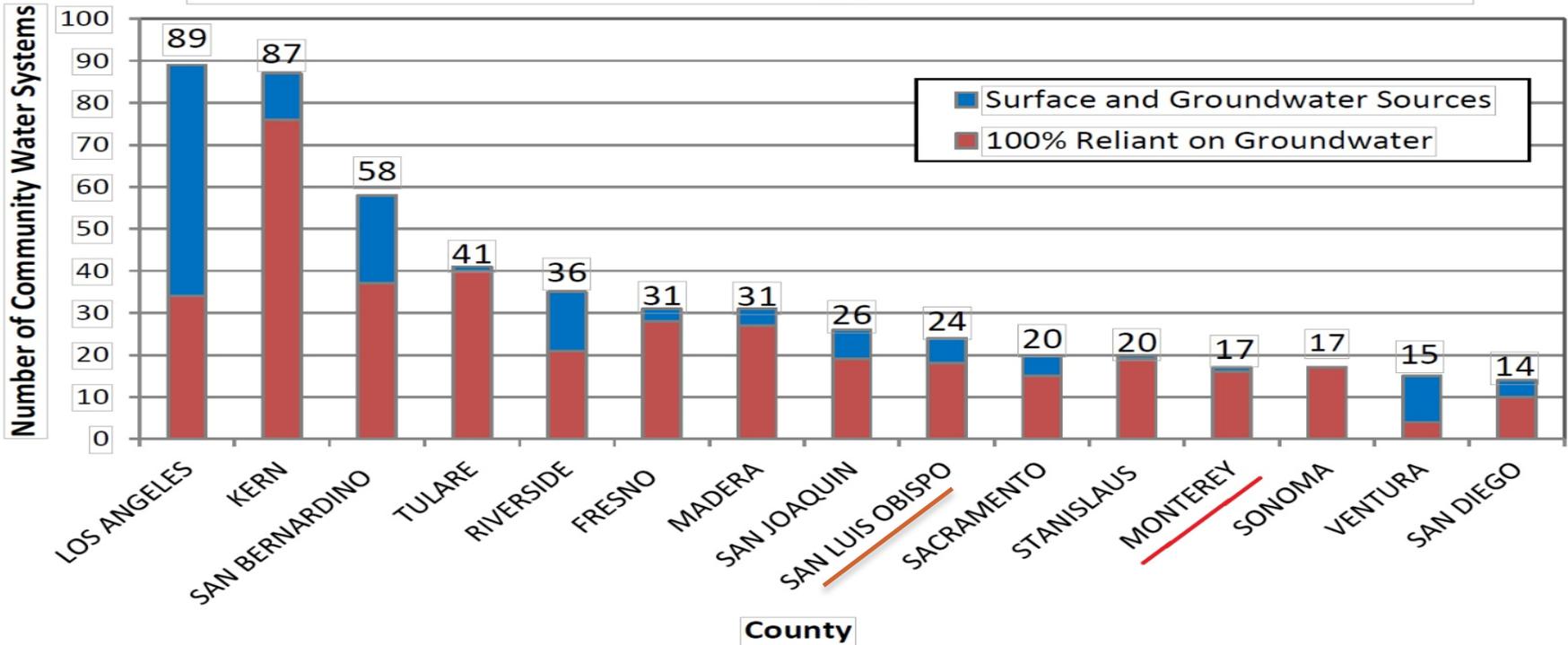


Figure 1: Top 15 Counties with the Greatest Number of Community Water Systems that Rely on a Contaminated Groundwater Source for Drinking Water

Source: January 2013 State Water Control Board Report to the Legislature

THANK YOU.

We can and must achieve Water Quality Objectives
by taking aggressive action now.



Irrigation and Nutrient Management for GW Protection

Numeric Application/Discharge Limits

- No grower shall apply more total nitrogen (N_{TOT}) than best available crop-specific nitrogen uptake rate in lbs/ac/per crop cycle times a multiplier of 1.4 as specified in Time Schedule below, where:

$$(N_{TOT}) = A_{FER} + A_{IRR} + N_{SOIL} \text{ (lbs/ac/ranch/per crop cycle).}$$

- Numeric values for the variables from the UC Davis / CDFA Fertilization Guidelines:
 - Best available crop-specific nitrogen uptake rates;
 - A_{FER} and A_{IRR} application rates; and
 - N_{SOIL} testing methods and protocols, including in-field testing methods.
- Application Limit Time Schedule
 - $N_{TOT} \times 1.4 \times 2.0$ (lbs/ac/ranch/per crop cycle) by 2020
 - $N_{TOT} \times 1.4 \times 1.5$ (lbs/ac/ranch/per crop cycle) by 2023
 - $N_{TOT} \times 1.4$ (lbs/ac/ranch/per crop cycle) by 2025
 - N_{TOT} (lbs/ac/ranch/per crop cycle) by 2050