

## Challenges in Regulating Industrial Food Processing Waste Discharges to Land

Lessons Learned from California  
Jo Anne Kipps, PE

State of Idaho  
Department of Environmental Quality  
2011 Annual Water Reuse Conference  
Boise - 24 May 2011

## California Ag Ranks #1

### Agriculture sector top 10 states in 2008

Rank	State	GDP (B\$)	% of U.S.
1	California	27.3	17.3
2	Texas	9.8	6.2
3	Iowa	8.7	5.5
4	Washington	7	4.5
5	Illinois	6.3	4
6	Florida	6.2	3.9
7	Minnesota	5.7	3.6
8	Nebraska	5.6	3.6
9	Wisconsin	4.5	2.9
10	Oregon	4	2.5

## Crop Diversity

Top Ten includes: milk & cream, grapes, lettuce, cattle, hay, strawberries, tomatoes, and almonds

Other crops: apples, apricots, citrus, cotton, eggs, corn, melons, nectarines, peaches, pears, pistachios, prunes, rice, poultry, walnuts, etc.

3

## Processing Waste Streams

- Rinsing product (fresh pack)
- Conveyance (tomato flumes)
- Sanitation (caustics & acids)
- Condensate (lactose, tomato paste)
- Processing (distillation, ion exchange, caustic peel)
- Solids & sludges

4

## Waste or Resource?

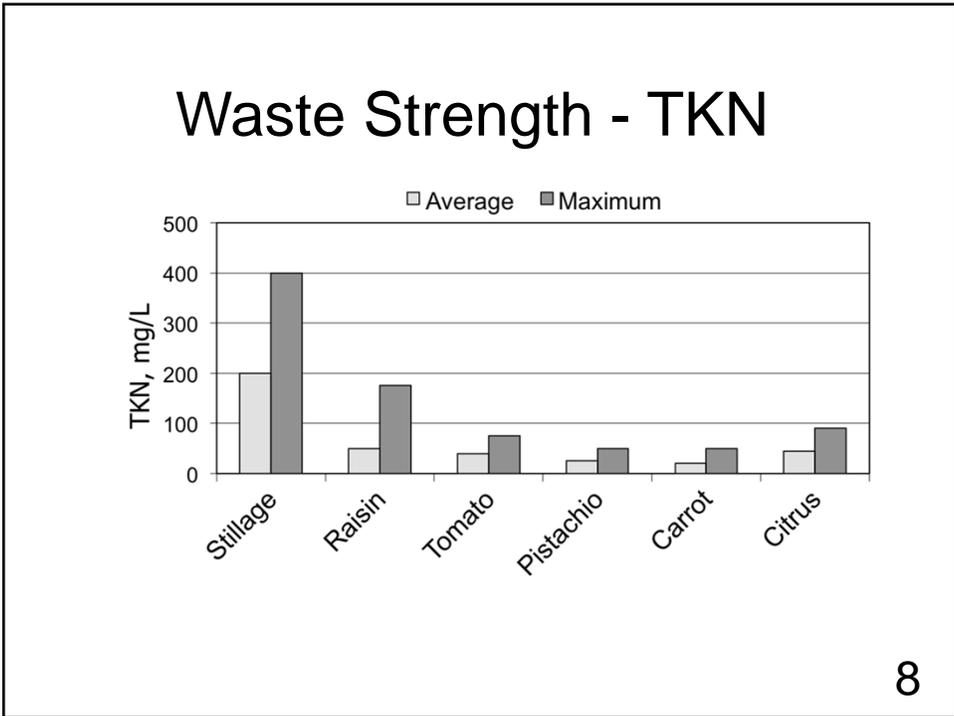
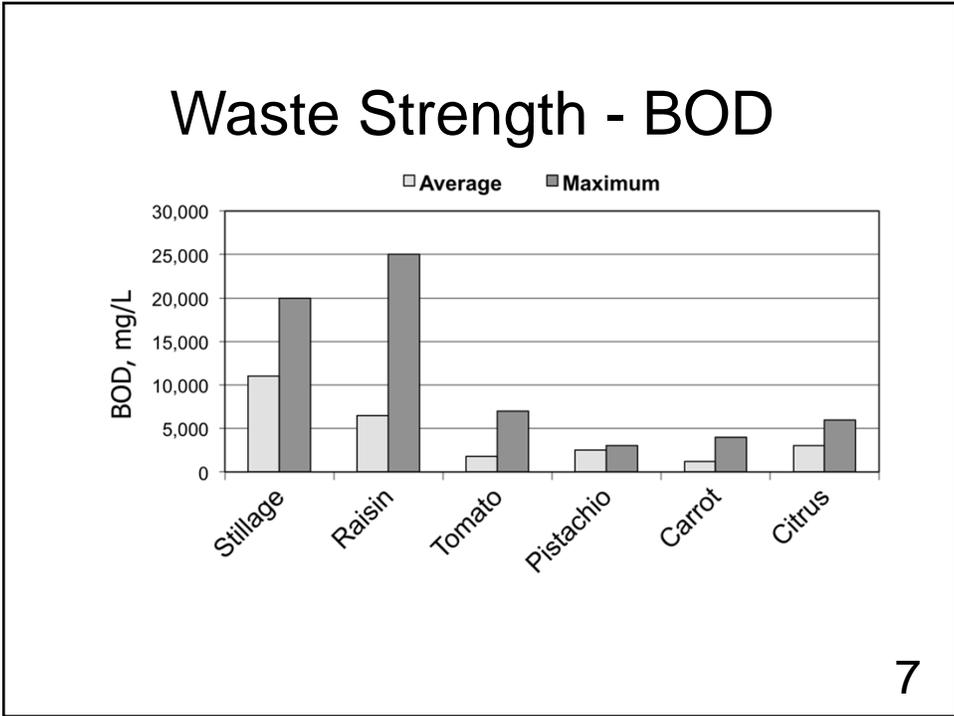


5

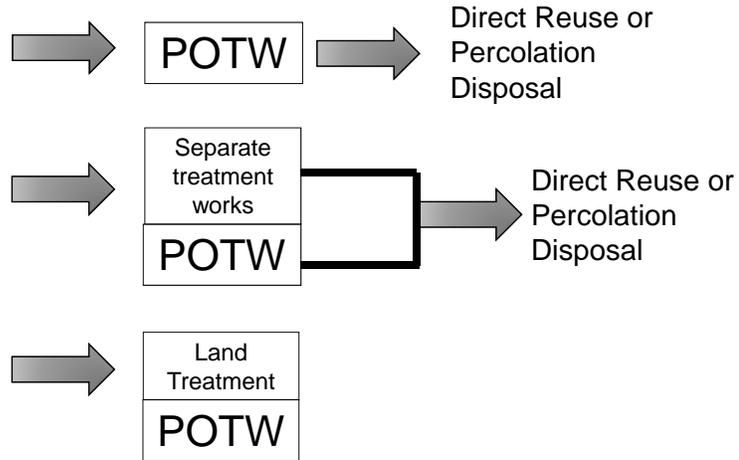
## Wastewater Characteristics



6



## Discharge Options – POTWs



9

## Discharge Options - LAA



10

## Land Treatment Premises

- Decomposition by soil bacteria
- Particulate BOD stays on surface
- Soluble BOD infiltrates into soil
- Nitrogen forms transformed
- Aerobic v. Anaerobic zones
- Crops uptake residual nitrogen

11

## Land Treatment Concerns

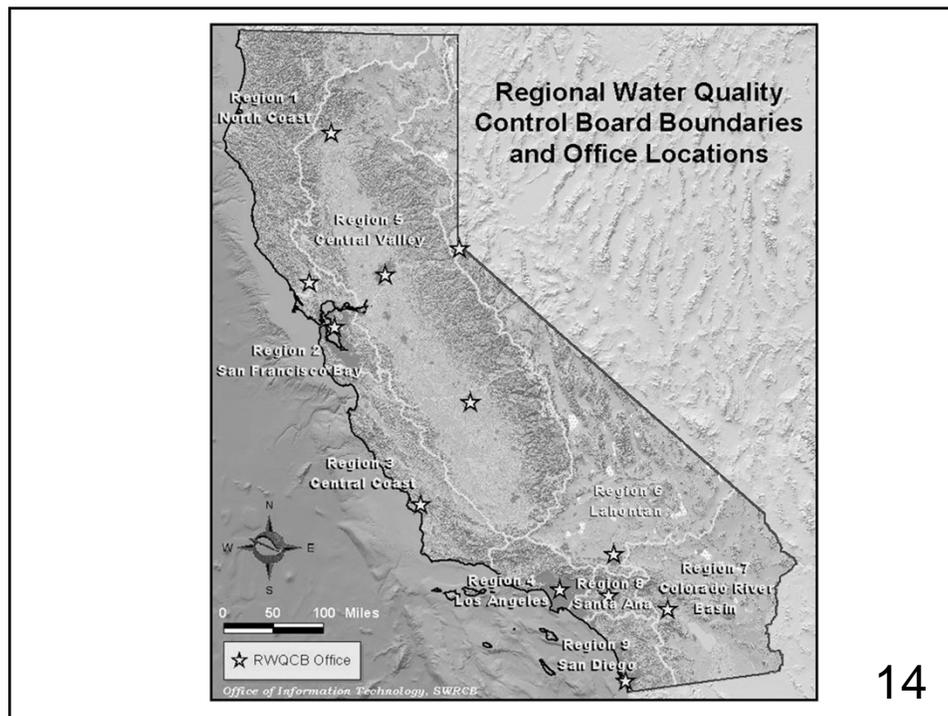
- Lack of scientific evidence to justify typical BOD loading rates
- Many Central Valley discharges with groundwater monitoring show degradation & pollution
- Groundwater degraded from organic carbon, nitrate, salts, and decomposition by-products (alkalinity, hardness, Fe, Mn, As)

12

## Water Quality Regulation

- Federal Clean Water Act – for discharges to waters of the United States
- CA Water Code (CWC)
- CA Code of Regulations (CCR)
- Regional Boards
- Basin Plans

13



14

## Central Valley Basin Plans

- Many common features
- Sacramento River and San Joaquin River Basin Plan
- Tulare Lake Basin Plan
  - Addresses salinity issues unique to closed basin

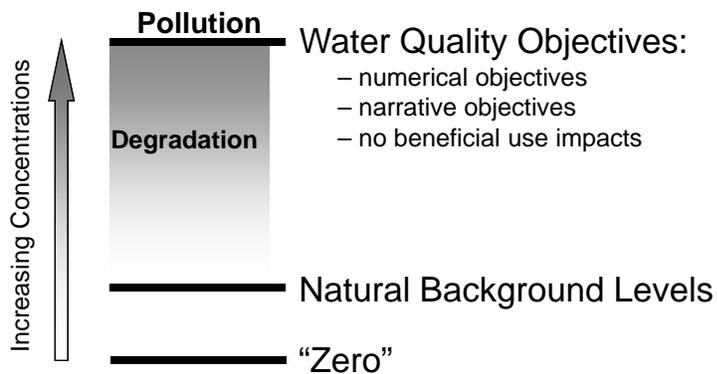
15

## Antidegradation Policy

- State Board Resolution No. 68-16 incorporated in all State basin plans
- Maintain “high” quality waters
- Degradation allowed, provided consistent with policy

16

## Degradation vs. Pollution



17

## Best Practicable Treatment or Control

- Board deliberative process
- Considers (in theory):
  - Proper O&M
  - Salinity source control & reduction
  - Waste treatability
  - Effectiveness of similar facilities

18

## Discharge Regulations

- Waste Discharge Requirements Orders (WDRs)
- Enforcement Orders
- Waivers of WDRs

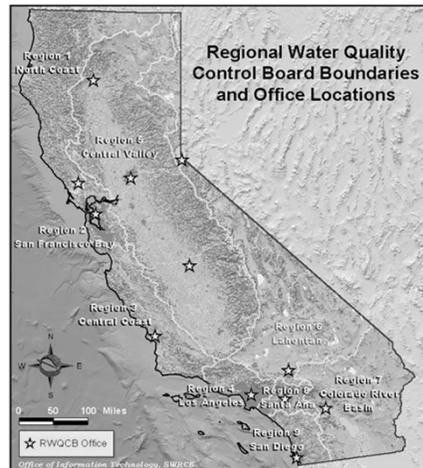
19

## Two Types of WDRs

- WDRs for “designated waste” that require compliance with prescriptive standards for waste containment
- WDRs for designated waste, as well as non-designated waste, that authorize discharge to groundwater and require compliance with the basin plan

20

## Regulated Facilities



Region	No.
1	75
2	11
3	298
4	11
5	253
6	0
7	8
8	1
9	0
Total	657

21

## WDRs Components

- Findings of Fact
- Discharge Prohibitions
- Discharge Specifications

22

## WDRs Components

- Receiving Water Limitations
- Provisions
- Monitoring & Reporting Requirements

23

## Stillage Guidelines



- Based on seasonal discharges
- Maximum recommended discharge becomes SOP
- Difficult to evaluate effectiveness

24

## Houston, We Have A Problem

- Monitoring usually insufficient to assess compliance with WDRs
- Less than 20% WDRs have groundwater monitoring
- Excessive degradation evident in over 95% of discharges with groundwater monitoring

25

## How did we get here?

- Stillage Guidelines and EPA-recommended BOD limits designed for nuisance control
- Loading rates not scientifically evaluated for groundwater impacts
- Compliance by dischargers not uniform or consistent

26

## Discharge Deficiencies

- Non-existent or inadequate
  - Salinity source control
  - Waste pretreatment
  - Waste management plans
- All above result in excessive loadings of waste constituents

27

## March 2000 Info Item

- Described widespread groundwater impacts from ineffective regulation of food processing waste discharges
- Recommended Board adopt WDRs that increase discharger accountability
- Questioned Title 27 exemption

28

## Two Draft Revised WDRs

- Draft WDRs circulated in 2002 for:
  - E. & J. Gallo Winery, Fresno Winery
  - Sun-Maid Growers of California, Kingsburg Plant
- Draft WDRs characterize discharge as “Land Treatment Unit”
- Discharger response prompts industry effort to evaluate discharge practices

29

## CLFP Manual

- Manual of Good Practices
- Advocates use of theoretical oxygen-diffusion model to determine site-specific BOD loadings and drying intervals

30

## WI Field Study



- Highly instrumented field test plots
- Two seasons of data gathering
- Proposed revised guidelines

31

## WI Field Study

- Staff critical of report & revised guidelines
- WI requests State Board convene a peer review panel
- Panel concurs with staff

32

## Staff Response

- Staff increased scrutiny of discharge applications and
  - Requested technical evidence to justify proposed pollutant loadings
  - Determined almost all applications incomplete
- “Chilling Effect” on industry

33

## Staff Reorganization

- Most staff historically performed both permitting and enforcement work
- Permitting work separated from enforcement work
- Major staff reassignment follows
- Industry outreach assigned to permitting staff

34

## Recent Developments

- No substantive staff interaction with industry to improve waste discharge practices since 2007
- Only 12 individual WDRs have been issued to food processors and wineries since January 2008

35

## What's Next?

- Continued chronic underfunding
- Streamline procedures for application review
- WDRs template
- General WDRs for similar discharges (e.g., tomatoes, wineries)

36

## Challenges

- Treatment & disposal of high-strength waste
- Limitations of regulations for high-strength waste discharges to land
- Political influence of California's agricultural industries

37

## Lessons Learned

- Question underlying assumptions of land treatment
- Application review is essential first step in effective regulation
- Determine applications incomplete unless they provide all required information

38

## Lessons Learned

- Semantics matter
- Be prepared for industry end runs
- Challenges by environmental groups to inadequate draft WDRs balance industry's demands for the status quo
- In the end, the court will decide

39