Exhibit 16

FARM WATER QUALITY PLAN

Date of Preparation **Date of Latest update:**

Section 1: General Farm Information – NOI info

1. Name of Farm or Operation

2. Farm / Site Address

3. County

4. APN (Assessors Parcel Number(s)

5. Name of Farmer / Operator

   Mailing address

   Phone number (work / cell)

   Email address (if applicable)

6. Name of Land Owner if different than farmer/operator

   Contact information (address or phone number)

7. Total acres

8. Total irrigated farmed acres

9. Which crops are grown on the farm?

Section 2: Watershed/Runoff issues

10. Name of Watershed

    and subwatershed (if known)

11. What is the name of the nearest downstream waterbody (stream, river, lake, etc.).?

    How close is your farm to the waterbody ?

12. Does runoff from your irrigation or rain on the irrigated area drain to the waterbody?

    ☐ yes ☐ no

    If yes, where is your closest drainage point into that waterbody?

    ☐ adjacent? ☐ less than 250 feet? ☐ less than 1000 feet? ☐ greater than 1000 feet?

    Mark the drainage point on your map.

13. How would you characterize the flow of the waterbody?

    ☐ Perennial – flows all year long

    ☐ Intermittent – flows during and for a period following rainfall

    ☐ Ephemeral – only flows in direct response to rainfall

14. If your farm is adjacent to a waterbody, describe the condition of the riparian corridor (the vegetated area right along the stream).

    ☐ Lots of trees ☐ partly covered ☐ very few trees/bushes ☐ bare

    (attach photo as documentation).

15. Is the waterbody (stream, river, lake) listed as "impaired" on the state's list of impaired waterbodies (the "303d" list) due to agricultural sources? ☐ yes ☐ no

    If yes, what is/are the listed problem(s) attributed to ag runoff? (i.e. nitrates, toxicity, turbidity, etc.)

Note: You can look up your waterbody in the 303d list of impaired waterbodies at:
http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

16. Does the farm irrigation water runoff (tail water) drain off of your property?

☐ yes ☐ no

If yes, to where does it drain? (describe below) :

☐ to neighbor's property ☐ to ditch ☐ to creek ☐ other (explain).....

17. Does the farm have tile drains to move subsurface water? ☐ yes ☐ no

If yes, to where do they drain? (describe below) :

☐ to neighbor's property ☐ to ditch ☐ to creek ☐ other (explain).....

18. Does water from your irrigated land discharge from your property during storm events?

☐ yes ☐ no

If yes, under what conditions does water run off during storms?

☐ During most rain events

☐ Only during heavy storms

☐ Only after soil is saturated

(include map showing drainages)

If yes, to where does it drain? (describe below) :

☐ to neighbor's property ☐ to ditch ☐ to creek ☐ other (explain).....

19. Does water from other sources run on to your property? ☐ yes ☐ no

If yes, where?

Mark location on your farm map

What are you doing about it? (describe)

Note: Section 3 is awaiting approval of the new Ag Waiver. You do not need to complete it until then.

Section 3: Determination of Tiers (Decision tree should be attached) – and required elements

- ☐ Tier 1
- ☐ Tier 2 with low or moderate Potential Hazard of Nitrate Leaching
- ☐ Tier 2 with a high Potential Hazard of Nitrate Leaching
- ☐ Tier 3

Section 4: Recommended Maps (mark all that are included and attach here). **Note that the Ag Commissioner, NRCS, RCD, and Farm Bureaus can also help you get these maps at no cost.**

Necessary Maps:

- ☐ Area map (map of area showing the main local streets with farm site flagged – can be as simple as a copy of a local or Google map)
- ☐ Location map (shows closest roads and outlines borders of farm; (e.g.; pesticide permit map). This is the map that you attached to your NOI
- ☐ Farm map showing fields, drainages, wells, roads (can be hand drawn)

Useful Maps (optional)

- ☐ County Assessor's map (APN map)
- ☐ Watershed map of adjacent and downstream waterbodies (streams, rivers, etc.)
- ☐ Farm map showing Fields / Crops (can be hand drawn)
- ☐ Soil map(s) (one source is: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm)
- ☐ Maps showing major events that have affected your runoff (e.g.; historical maps, landslides, earthquake faults, area hit by a major fire, etc.)
- ☐ Other (describe)

Section 5: Irrigation System

20. Source of Irrigation Water (check all that apply)

- Ground water (well) ☐
- Surface water (creek or pond) ☐
- Recycled water (from on-site or from purple pipe) ☐
- Imported water or city water ☐
- Spring ☐

21. Describe system (check all that apply)

Drip	☐	Microsprinkler	☐
Sprinkler	☐	Furrow	☐
Hand	☐	other	☐

Sprinkler for plant establishment, then convert to drip ☐

22. Does your irrigation system have a flow meter?

☐ yes ☐ no

If no, how do you measure the amount of water that you are applying?

23. Has system been evaluated for efficiency and uniformity of distribution?

☐ yes ☐ no

If yes, attach a copy of evaluation in this section

Did you implement any of the evaluation recommendations? ☐ yes ☐ no

If yes, which ones?

If no, do you plan to implement some of the recommendations in the future? ☐ yes ☐ no

If yes, which ones do you plan to implement?

24. Does any water run off of your property during irrigation? ☐ yes ☐ no

If no, did you have to implement any practices to manage/control it? What did you do?

If yes, what are you doing to manage it? Explain and attach your documentation, if any.

25. Using the form below, record what practices you have used, where you used them and how they worked:

Irrigation Practices to Reduce Runoff	Practice currently in use (# acres)	Practice tried – Did Not work	Practice Under consideration (where)	N/A
Make your irrigations efficient				
Evaluate irrigation efficiency/distribution uniformity (e.g.; by irrigation mobile lab, UCCE, consultant)				
Upgrade/redesign irrigation equipment/system				
Upgrade Water Conveyance System (main lines, etc)				
Train irrigators				
Use catch trays/cups to evaluate amount of applied water				
Use daily CIMIS data to adjust irrigation schedule				
Calculate the field application rate of the irrigation system (in/hr)				
Adjust irrigation schedule for leaching fraction and distribution uniformity of system.				
Maintain records of irrigation schedule				
Maintain records of the amount of water applied during each irrigation				
Monitor soil moisture				
Monitor on-site rain gauges				
Install flow meters				
Improve Sprinkler Irrigation Uniformity				
Perform regularly scheduled system maintenance				
Repair leaks on main and lateral				
Maintain sprinkler heads				
Use sprinkler heads with a high uniformity rating				
Use appropriate nozzle size for lateral spacing and head pattern				

Maintain uniform nozzle size				
Use consistent riser heights and maintain risers perpendicular to ground				
Maintain appropriate system pressure				
Record system flow rate and pressures (head and tail)				
Use a closer lateral line spacing to improve overlap of pattern				
Use flow control nozzles when pressure is too high or variable				
Operate in low-wind conditions				
Minimize lateral spacing where practical				
Offset starting location of hand move lines				
Improve Drip Irrigation Uniformity				
Select drip tape/emitter with an application rate that matches system design, soil or substrate type, and crop needs				
Develop a maintenance plan appropriate for a drip system				
Use a filter appropriate for water quality				
Repair leaks on mains and laterals				
Regularly flush/clean filters				
Flush lateral lines regularly				
Use emitters that minimize pressure differences				
Use drip tape with a small emitter discharge exponent				
Use a pressure regulator for each submain				
Check and adjust pressures of submains				
Shorten lateral hose runs				
Use pressure compensating emitters.				
Manage water quality for potential clogging (high bicarbonates)				
Chlorinate lateral lines to prevent bacterial and algal build-up and root intrusion into emitters				
Keep water where you want it				
Ensure rows are aligned for proper drainage and to reduce erosion				
Improve soil infiltration through amendments				
Install engineered controls				
Convert Irrigation System to another type				
Install Structures for Water Control including:				
• Tailwater recovery system				
• Settling ponds				
• Underground pipes to redirect water				
• Surface Drains				
• Subsurface Drain				
• Recirculating sub-irrigation system				

Check your success in stopping irrigation water runoff by:

1. **Walking the property perimeter during irrigation to look for runoff areas**
2. **Taking pictures before and after you install practices**

Re-evaluate irrigation practices if you see runoff during irrigation.

Section 6: Groundwater

26. Is the farm within 1000 feet of a public well that is impaired by high nitrate contamination?

☐ yes ☐ no

27. Are there any wells currently operating on the farm?

☐ yes ☐ no

If yes, how many?

If yes, are they being used for domestic use, irrigation water, or both?

How many for domestic use?

How many for irrigation use?

If yes, do any of your wells exceed the drinking water standard (10 ppm N or 45 ppm NO3-N)?

☐ yes ☐ no ☐ don't know

28. If wells are used for irrigation, do you apply fertilizer through the irrigation system directly to the fields?

☐ yes ☐ no

If yes, do the wells have back-flow devices installed to prevent groundwater contamination?

☐ yes ☐ no ☐ don't know

29. Are there any wells on the farm which were drilled but are not in use? ☐ yes ☐ no

If yes, are they decommissioned appropriately? ☐ yes ☐ no

Note: NRCS standards for well decommissioning are available at:
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_025736.pdf

Section 7: Nutrient Management

Nutrients are primary contributors to lowered surface water quality. In areas where irrigation water runs off of the farm, excess nutrients run off too. If the land is overwatered, nutrients are leached below the root zone and, from there, can get into the groundwater. Nutrient sources associated with agricultural production practices include fertilizers and other amendments, biodegradation of crop residues, agricultural and municipal waste applied to land, and waste generated by animals. Nutrients from these sources become pollutants when they are transported offsite into nearby streams and lakes or leach to groundwater. Nitrates and phosphates in surface water bodies contribute to eutrophication. Eutrophication leads to increases in aquatic plants and algal blooms that deplete dissolved oxygen, impacting aquatic organisms. Nitrate pollution of groundwater is widespread and a serious problem statewide because of impacts to drinking water.

30. Do you apply soil amendments and/or fertilizer on your fields? ☐ yes ☐ no

31. How is the fertilizer applied?

- ☐ Surface application
- ☐ Through the irrigation system
- ☐ Combination

32. How do you determine when and how much fertilizer to apply?

- ☐ Crop advisor (CCA)
- ☐ Soil tests (i.e. Nitrate quick test or lab results)
- ☐ Tissue samples from crop
- ☐ Standard farming practice for this crop (describe)
- ☐ Other; explain

33. Do you store fertilizer on this farm? ☐ yes ☐ no Where?
mark storage and mixing sites on your farm map

34. Is your farm adjacent to or does drain towards a water body which is impaired (303d list) due to nutrients or nitrates? (see Section 2, Question 15 above)

☐ yes ☐ no

If yes, it is important that you complete this section

35. Do you plant crops that the University of California Center for Water Resources (WRC) Nitrate Groundwater Pollution Hazard Index identifies as a high risk for nitrate loading to groundwater (Beet, Broccoli, Cabbage, Cauliflower, Celery, Chinese/Napa Cabbage, Collard, Endive, Kale, Leek, Lettuce, Mustard, Onion, Spinach, Strawberry, Pepper, or Parsley)?

☐ yes ☐ no

36. Based on the completed worksheet (attached)(Note: you can use formula for either crop, irrigation system type and soils or crop, or irrigation system and irrigation water nitrate concentration), the Nitrate Loading Risk Factor for this farm is:

☐ Low ☐ Moderate ☐ High

Go to agwaterquality.org for the worksheet and instructions
What practices have you used? Fill out the form below and attach any documentation:

Practices for Managing Nutrients	Practice currently in use (# acres)	Practice tried – Did Not work	Practice Under consideration (where)	N/A
Optimize fertilizer application				
Control over watering				
Manage fertigations to avoid nutrient loss below the rootzone				
Understand how much fertilizer your crop needs				
Take Tissue samples for N and P status before applying fertilizer				
Time fertilizer application according to crop requirements				
Do not apply fertilizers when rain is expected				
Monitor your irrigation water to determine pre-existing N and P levels				
Monitor the N and P in soil amendments before				

use				
Use controlled release fertilizer alone or with a liquid feed				
Test nitrogen levels before pre-side-dressing				
Split fertilizer applications				
Use precision to place fertilizer over root zone				
Do soil quick-tests or soil analysis to check for nitrogen remaining in soil				
Store and handle nutrients properly				
Calibrate sprayers and injectors				
Mix and load fertilizer on low runoff hazard sites – over 100 feet downslope of the well on an impermeable surface				
Make sure that your fertilizer storage facility includes a concrete pad and curb to contain spills and leaks				
Monitor and maintain your septic/port-a-potty systems				
Keep nutrients from blowing away				
Plant hedgerows and/or windbreaks				
Plant cover crops				
Mulch to keep bare soil in place				
Keeping nutrients from washing away				
Plant cover crop that use nitrogen in the soil				
Manage plant residue to hold soil in place				
Ensure rows are aligned for proper drainage and to reduce erosion				
Plant filter strips at field edges and row ends				
Cover bare soil with grass, mulch				
Divert runoff to a grassed area or sediment basin on your property				
Installed engineered control systems:				
Vegetated treatment systems				
Treatment wetlands				
Convert irrigation system to reduce runoff				
Reuse tailwater				
Treat tailwater				

Check your success in stopping nutrient runoff by:

1. **Walking the property perimeter in big rainstorms to look for runoff areas**
2. **Looking for blowing soil during high winds,**

3. **Taking pictures before and after you install practices**

If you see erosion or storm runoff with sediment, go back and re-evaluate practices.

Section 8: Sediment / Erosion

Soil erosion and sediment deposition are primary contributors to lowered surface water quality from farmlands. In areas where there are steep slopes, erodible soils, and intense storm characteristics, sediment delivery from farmlands can be relatively high. Roads and other areas of disturbed ground where bare soils are susceptible to the erosive action of water and wind can also be major contributors of sediment to waterbodies.

37. Is your farm adjacent to or does drain towards a water body which is impaired (303d list) due to sediment or turbidity (cloudiness)? (see Section 2, Question 15 above)

☐ yes ☐ no

If yes, it is important that you complete this section

38. Is any sediment coming onto your property and causing a problem?

☐ yes ☐ no

You should document this with photographs. Contact the NRCS, Coalition or other conservation / technical provider for technical assistance.

39. Does any sediment run off of your property during irrigation? ☐ yes ☐ no

If no, have you had to implement any practices to control it? ☐ yes ☐ no

What did you do?

If yes, what are you doing to stop it? Explain and attach any documentation here.

40. Does any sediment run off of your property during winter storm events? ☐ yes ☐ no

If no, have you implemented any practices to control sediment runoff? ☐ yes ☐ no

What did you do? Fill out the form below and attach any documentation:

Practices for Managing Sediment	Practice currently in use (# acres)	Practice tried – Did Not work	Practice Under consideration (where)	N/A
Keeping soil on the field				
Manage prior year crop residue				
Ensure rows are aligned for proper drainage and to reduce erosion				
Plant buffer strips at field edges and row ends				
Use Polyacrylimide (PAM) in irrigation water				
Cover bare soil with grass or mulch				
Don't over water				
Practices to reduce sediment from access roads				
Grade road to reduce on road erosion				
Control concentrated drainage on road (culverts, rolling dips, etc				
Direct drainage off road (to vegetative areas, ditches, sediment basins, etc)				
Protect roads in rainy season: seed roads, rice straw, gravel, avoid use, etc)				
Reduce erosion on non-crop areas of farm				
Plant Filter/Buffer Strips				
Grass the waterways				
Establish trees/shrubs along the perimeter				
Practices to reduce wind erosion				
Plant hedgerows				
Plant windbreaks / shelterbelts				
Plant Cover Crops				
Mulch uncovered soil				
Leave residue from prior crop on soil until you are ready to plant				
Install structures for sediment control:				
Sediment Basin				
Underground Outlet pipe to redirect water				
Lined waterways				

Check your success in stopping sediment runoff by:

1. **Walking the property perimeter in big rainstorms to look for runoff areas**
2. **Being sure that drainage to ditches and streams are not concentrated so that they don't cause erosion!**
3. **Looking for blowing soil during high winds,**
4. **Taking pictures before and after you install practices**

If you see erosion or storm runoff with sediment, go back and re-evaluate practices.

Section 9: Pesticides

Pesticides that move from the application site into surface or groundwater can affect the beneficial uses of water through their potential impact on human and animal health, and on non-target organisms. Wind and water erosion of soil, or drift from pesticide applications may contribute to pesticide movement away from the target area. Pesticides may enter surface waters in irrigation return flows and tile drainage either as water-soluble residuals or adsorbed to sediments. Groundwater in agricultural areas may also be subject to pollution from pesticides when deep percolation from irrigated land carries water soluble pesticides to the groundwater.

41. Do you use pesticides on this farm? ☐ yes ☐ no

42. Which management method best describes your farming operation?

☐ Organic ☐ Conventional ☐ Both

43. Do you store pesticides on this farm? ☐ yes ☐ no Where?
Mark storage and mixing sites on your farm map

44. Do you apply Diazinon on this farm? ☐ yes ☐ no

45. Do you apply Chlorpyrifos on this farm? ☐ yes ☐ no

46. Is your farm adjacent to or does drain towards a water body which is impaired (303d list) due to toxicity or pesticides? (see Section 2, Question 15 above) ☐ yes ☐ no

If yes, it is important that you complete this section

47. Who is your pesticide crop advisor?

48. Who is the pesticide applicator (☐ in house or ☐ contracted out)
Name of applicator (or company)
Applicator number:

49. Do you keep the Pesticide Use reports on site? ☐ yes ☐ no
(Use reports may be included in the attachments)

50. Have you implemented practices to control pesticide movement off your farm (see list below for practices that you may have implemented)? Did they work? Fill out the form below and attach any documentation.

Practices to Reduce Pesticide Movement with Water, Wind, and Eroding Soil	Practice currently in use (# acres)	Practice tried – Did Not work	Practice Under consideration (where)	**N/A**
Storage and Disposal Practices				
Label instructions are followed				
Store pesticides in a facility includes a concrete pad and curb to contain spills and leaks				
Calibrate sprayers and injectors				
Train pesticide handlers and applicators yearly				
Keep equipment clean of soil and plant parts as you move between fields				
Do all mixing and loading in low runoff hazard sites or impermeable surface at least 100 feet downslope of the well				
Minimize drift by spraying pesticides during low wind conditions				
Dispose of excess pesticides per label instructions				
Application Practices				
Install hedgerows or windbreaks				
Use filter strips in erosion areas				
Consult and follow label directions				
Consider the likelihood of ditch and surface water contamination prior to pesticide application				
Consider potential impact of rain events prior to pesticide application				
Recover and treat or reuse tailwater				
Use Integrated Pest Management practices to reduce pesticide need				

Section 10: Technical Assistance

51. Have you worked with anyone to address water quality issues in the past? ☐ yes ☐ no

If yes, explain who you worked with and what your results ?

Section 11: Review of water quality goals and issues relating to this farm which can be and are being addressed

52. What are the Water Quality goals (objectives) for this farm?

53. Do you have potential water quality problems that you plan to address over the next two years? (If yes, describe. As you work on the problem, attach before and after documents/photos here.)

54. Is there anything that you have done to address these issues in the past that you haven't noted above? If so, what did you implement that worked? What did you implement that didn't work? Attach before and after documents/photos here) -

55. Are there other solutions (not noted above) that you are considering to help you achieve your goals? If so, what are they?

56. How are you assessing the effectiveness of these solutions?

Section 12: Attachments (Optional) - Check if attached

- ☐ Decision tree used to determine "Tier"
- ☐ Worksheet used to determine Nitrogen Risk Factor of crops grown
- ☐ Worksheet used to determine Nitrate Loading Risk Factor of the farm
- ☐ Photo monitoring (be sure to date!)
- ☐ Pesticide Use reports
- ☐ Soils information
- ☐ Soil Nitrate Quick Tests
- ☐ Nitrogen, Nitrate, or Phosphate test results
- ☐ Water testing: (include any results or reports in this section)
    - ☐ Irrigation water for nitrates and/or phosphates
    - ☐ Well water for multiple constituents

Exhibit 17

IRRIGATION WATER MANAGEMENT

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 449

Irrigation Water Management - Determining and controlling the rate, amount and timing of irrigation water in planned and efficient manner.

PRACTICE INFORMATION

The purpose of this practice is to effectively use available irrigation water in managing and controlling the moisture environment of crops and other vegetation. The objectives are to promote a desired response, minimize soil erosion, minimize loss of plant nutrients, and protect both the quantity and quality of water resources.

This practice is applicable to all areas that are suitable for irrigation and have a water supply of suitable quality and quantity. In addition, a suitable irrigation system must be available and the irrigator needs to have the knowledge and capability to manage irrigation water. The following knowledge is required to properly manage irrigation water:

1. How to determine when to apply water based on the rate of use by the crops at various stages of growth.
2. How to measure or estimate the amount of water required for each irrigation.
3. The time needed for the soil to absorb the required amount of water.
4. How to detect changes in intake rate.
5. How and when to adjust stream size, application rate, and irrigation time to compensate for changes in the soil or topography that effect intake rate.
6. How to recognize erosion caused by irrigation.
7. How to evaluate the uniformity of water application.

Evaluating the efficiency of applying irrigation water is expensive and time consuming. Therefore, the physical irrigation system and the technician's evaluation of the irrigators knowledge is acceptable in determining whether or not good irrigation water management is being practiced.

Additional information including standards and specifications are filed in the local NRCS Field Office Technical Guide.

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

IRRIGATION WATER MANAGEMENT

(Ac.)

CODE 449

DEFINITION

The process of determining and controlling the volume, frequency and application rate of irrigation water in a planned, efficient manner.

PURPOSE

This practice may be applied as part of a resource management system to achieve one or more of the following purposes:

- Manage soil moisture to promote desired crop response.
- Optimize use of available water supplies.
- Minimize irrigation induced soil erosion.
- Decrease non-point source pollution of surface and groundwater resources.
- Manage salts in the crop root zone.
- Manage air, soil, or plant micro-climate.
- Proper and safe chemigation or fertigation.
- Improve air quality by managing soil moisture to reduce particulate matter movement.
- Reduce energy use.

CONDITIONS WHERE PRACTICE APPLIES

This practice is applicable to all irrigated lands.

An irrigation system adapted for site conditions (soil, slope, crop grown, climate, water quantity and quality, air quality, etc.) must be available and capable of efficiently applying water to meet the intended purpose(s).

CRITERIA

General Criteria Applicable to All Purposes

Irrigation water shall be applied in accordance with federal, state, and local rules, laws, and regulations. Water shall not be applied in excess of the needs to meet the intended purpose.

Measurement and determination of flow rate is a critical component of irrigation water management and shall be a part of all irrigation water management purposes.

The irrigator or decision-maker must possess the knowledge, skills, and capabilities of management coupled with a properly designed, efficient and functioning irrigation system to reasonably achieve the purposes of irrigation water management.

An “Irrigation Water Management Plan” shall be developed to assist the irrigator or decision-maker in the proper management and application of irrigation water.

Irrigator Skills and Capabilities. Proper irrigation scheduling, in both timing and amount, control of runoff, minimizing deep percolation, and the uniform application of water are of primary concern. The irrigator or decision-maker shall possess or obtain the knowledge and capability to accomplish the purposes which include:

A. General

1. How to determine when irrigation water should be applied, based on the rate of water used by crops and on the stages of plant growth and/or soil moisture monitoring.
2. How to determine the amount of water required for each irrigation, including any leaching needs.
3. How to recognize and control erosion caused by irrigation.
4. How to measure or determine the uniformity of application of an irrigation.

5. How to perform system maintenance to assure efficient operation.
6. Knowledge of "where the water goes" after it is applied considering soil surface and subsurface conditions, soil intake rates and permeability, crop root zones, and available water holding capacity.
7. How to manage salinity and shallow water tables through water management.
8. The capability to control the irrigation delivery.

B. Surface Systems

1. The relationship between advance rate, time of opportunity, intake rate, and other aspects of distribution uniformity and the amount of water infiltrated.
2. How to determine and control the amount of irrigation runoff.
3. How to adjust stream size, adjust irrigation time, or employ techniques such as "surge irrigation" to compensate for seasonal changes in intake rate or to improve efficiency of application.

C. Subsurface Systems

1. How to balance the relationship between water tables, leaching needs, and irrigation water requirements.
2. The relationship between the location of the subsurface system to normal farming operations.
3. How to locate and space the system to achieve uniformity of water application.
4. How to accomplish crop germination in arid climates and during dry periods.

D. Pressurized Systems

1. How to adjust the application rate and/or duration to apply the required amount of water.
2. How to recognize and control runoff.
3. How to identify and improve uniformity of water application.
4. How to account for surface storage due to residue and field slope in situations where sprinkler application rate exceeds soil intake rate.
5. How to identify and manage for weather conditions that adversely impact irrigation efficiency and uniformity of application.

System Capability. The irrigation system must be capable of applying water uniformly and efficiently and must provide the irrigator with adequate control over water application.

Additional Criteria to Manage Soil Moisture to Promote Desired Crop Response

The following principles shall be applied for various crop growth stages:

- The volume of water needed for each irrigation shall be based on plant available water-holding capacity of the soil for the crop rooting depth, management allowed soil water depletion, irrigation efficiency and water table contribution.
- The irrigation frequency shall be based on the volume of irrigation water needed and/or available to the crop, the rate of crop evapotranspiration, and effective precipitation.
- The application rate shall be based on the volume of water to be applied, the frequency of irrigation applications, soil infiltration and permeability characteristics, and the capacity of the irrigation system.

Appropriate field adjustments shall be made for seasonal variations and field variability.

Additional Criteria to Optimize Use of Water Supplies

Limited irrigation water supplies shall be managed to meet critical crop growth stages.

When water supplies are estimated to be insufficient to meet even the critical crop growth stage, the irrigator or decision-maker shall modify plant populations, crop and variety selection, and/or irrigated acres to match available or anticipated water supplies.

Additional Criteria to Minimize Irrigation-Induced Soil Erosion

Application rates shall be consistent with local field conditions for long-term productivity of the soil.

Additional Criteria to Decrease Non-Point Source Pollution of Surface and Groundwater Resources

Water application shall be at rates that minimize transport of sediment, nutrients and chemicals to surface waters and that minimize transport of nutrients and chemicals to groundwater.

Additional Criteria to Manage Salts in the Crop Root Zone

The irrigation application volume shall be increased by the amount required to maintain an appropriate salt balance in the soil profile.

The requirement shall be based on the leaching procedure contained in NRCS National Engineering Handbook (NEH), Part 623, Chapter 2, Irrigation Water Requirements, and NEH, Part 652, National Irrigation Guide, Chapters 3 and 13.

Additional Criteria to Manage Air, Soil or Plant Micro-Climate

The irrigation system shall have the capacity to apply the required rate of water for cold or heat protection as determined by the methodology contained in NEH, Part 623, Chapter 2, Irrigation Water Requirements.

Additional Criteria for Proper and Safe Chemigation or Fertigation

Chemigation or fertigation shall be done in accordance with all local, state and federal laws.

The scheduling of nutrient and chemical application should coincide with the irrigation cycle in a manner that will not cause excess leaching of nutrients or chemicals below the root zone to the groundwater or to cause excess runoff to surface waters.

Chemigation or fertigation should not be applied if rainfall is imminent. Application of chemicals or nutrients will be limited to the minimum length of time required to deliver them and flush the pipelines. Irrigation application amount shall be limited to the amount necessary to apply the chemicals or nutrients to the soil depth recommended by label. The timing and rate of application shall be based on the pest, herbicide, or nutrient management plan.

The irrigation and delivery system shall be equipped with properly designed and operating valves and components to prevent backflows into the water source(s) and/or contamination of groundwater, surface water, or the soil.

Additional Criteria to Reduce Particulate Matter Movement

Sprinkler irrigation water shall be applied at a rate and frequency sufficient to reduce the wind erodibility index (I Factor) of the soil by one class.

Additional Criteria Applicable to Reduce Energy Use

Provide analysis to demonstrate reduction of energy use from practice implementation.

Reduction of energy use is calculated as average annual or seasonal energy reduction compared to previous operating conditions.

CONSIDERATIONS

The following items should be considered when planning irrigation water management:

- Consideration should be given to managing precipitation effectiveness, crop residues, and reducing system losses.
- Consider potential for spray drift and odors when applying agricultural and municipal waste waters. Timing of irrigation should be based on prevailing winds to reduce odor. In areas of high visibility, irrigating at night should be considered.
- Consider potential for overspray from end guns onto public roads.
- Equipment modifications and/or soil amendments such as polyacrylamides and mulches should be considered to decrease erosion.
- Consider the quality of water and the potential impact to crop quality and plant development.
- Quality of irrigation water should be considered relative to its potential effect on the soil's physical and chemical properties, such as soil crusting, pH, permeability, salinity, and structure.
- Avoid traffic on wet soils to minimize soil compaction.
- Consider the effects that irrigation water has on wetlands, water related wildlife

habitats, riparian areas, cultural resources, and recreation opportunities.

- Management of nutrients and pesticides.
- Schedule salt leaching events to coincide with low residual soil nutrients and pesticides.
- Water should be managed in such a manner as to not drift or come in direct contact with surrounding electrical lines, supplies, devices, controls, or components that would cause shorts in the same or the creation of an electrical safety hazard to humans or animals.
- Consideration should be given to electrical load control/interruptible power schedules, repair and maintenance downtime, and harvest downtime.
- Consider improving the irrigation system to increase distribution uniformity or application efficiency of irrigation water applications.

PLANS AND SPECIFICATIONS

Application of this standard may include job sheets or similar documents that specify the applicable requirements, system operations, and components necessary for applying and maintaining the practice to achieve its intended purpose(s).

OPERATION AND MAINTENANCE

The operation and maintenance (O&M) aspects applicable to this standard consist of evaluating available field soil moisture, changes in crop evapotranspiration rates and changes in soil intake rates and adjusting the volume, application rate, or frequency of water application to achieve the intended purpose(s). Other necessary O&M items are addressed in the physical component standards considered companions to this standard.

REFERENCES

USDA-NRCS, National Engineering Handbook, Part 623, Chapter 2, Irrigation Water Requirements.

USDA-NRCS, National Engineering Handbook, Part 652, National Irrigation Guide.

NUTRIENT MANAGEMENT

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 590

NUTRIENT MANAGEMENT
This practice involves managing the amount, placement, and timing of plant nutrients to obtain optimum yields and minimize the risk of surface and groundwater pollution.

PRACTICE INFORMATION
Nutrient management may be used on any area of land where plant nutrients are applied to enhance yields and maintain or improve chemical and biological condition of the soil. The source of plant nutrients may be from organic wastes, commercial fertilizer, legumes, or crop residue. The objective is to apply the proper amount of nutrients at the proper time to achieve the desired yield and minimize entry of nutrients into surface or groundwater supplies.

Planning Nutrient Management involves the following considerations:

1. National, state and local water quality standards
2. Sources and forms of plant nutrients available to the farmer
3. Amounts and timing of nutrients based on soil testing, planned yield and growing season of target plants
4. Evaluate use of crop rotations that enhance efficiency of nutrient utilization and improve soil tilth
5. Consider waste storage requirements and land area requirements for proper management of plant nutrients.
6. Others

Additional information including standards and specifications are filed in the local NRCS Field Office Technical Guide.

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

NUTRIENT MANAGEMENT

(Ac.)

CODE 590

DEFINITION

Managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments.

PURPOSE

- To budget, supply, and conserve nutrients for plant production.
- To minimize agricultural nonpoint source pollution of surface and groundwater resources.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To protect air quality by reducing odors, nitrogen emissions (ammonia, oxides of nitrogen), and the formation of atmospheric particulates.
- To maintain or improve the physical, chemical, and biological condition of soil.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where plant nutrients and soil amendments are applied. This standard does not apply to one-time nutrient applications to establish perennial crops.

CRITERIA

General Criteria Applicable to All Purposes

A nutrient budget for nitrogen, phosphorus, and potassium must be developed that considers all potential sources of nutrients including, but not limited to, green manures, legumes, crop residues, compost, animal manure, organic by-products, biosolids, waste water, organic matter, soil biological activity, commercial fertilizer, and irrigation water.

Enhanced efficiency fertilizers, used in the State must be defined by the Association of American Plant Food Control Officials (AAPFCO) and be accepted for use by the State fertilizer control official, or similar authority, with responsibility for verification of product guarantees, ingredients (by AAPFCO definition) and label claims.

For nutrient risk assessment policy and procedures see Title 190, General Manual (GM), Part 402, Nutrient Management, and Title 190, National Instruction (NI), Part 302, Nutrient Management Policy Implementation.

To avoid salt damage, the rate and placement of applied nitrogen and potassium in starter fertilizer must be consistent with land-grant university guidelines, or industry practice recognized by the land-grant university.

The NRCS-approved nutrient risk assessment for nitrogen must be completed on all sites unless the State NRCS, with the concurrence of State water quality control authorities, has determined specific conditions where nitrogen leaching is not a risk to water quality, including drinking water.

The NRCS-approved nutrient risk assessment for phosphorus must be completed when:

- phosphorus application rate exceeds land-grant university fertility rate guidelines for the planned crop(s), or
- the planned area is within a phosphorus- impaired watershed (contributes to 303d-listed water bodies), or
- the NRCS and State water quality control authority have not determined specific conditions where the risk of phosphorus loss is low.

A phosphorus risk assessment will not be required when the State NRCS, with concurrence of the State water quality control authority, has determined specific conditions where the risk of phosphorus loss is low. These fields must have a documented agronomic need for phosphorus; based on soil test phosphorus (STP) and land-grant university nutrient recommendations.

On organic operations, the nutrient sources and management must be consistent with the USDA's National Organic Program.

Areas contained within minimum application setbacks (e.g., sinkholes, wellheads, gullies, ditches, or surface inlets) must receive nutrients consistent with the setback restrictions.

Applications of irrigation water must minimize the risk of nutrient loss to surface and groundwater.

Soil pH must be maintained in a range that enhances an adequate level for crop nutrient availability and utilization. Refer to State land-grant university documentation for guidance.

Soil, Manure, and Tissue Sampling and Laboratory Analyses (Testing).

Nutrient planning must be based on current soil, manure, and (where used as supplemental information) tissue test results developed in accordance with land-grant university guidance, or industry practice, if recognized by the university.

Current soil tests are those that are no older than 3 years, but may be taken on an interval recommended by the land-grant university or as required by State code. The area represented by a soil test must be that acreage recommended by the land-grant university.

Where a conservation management unit (CMU) is used as the basis for a sampling unit, all acreage in the CMU must have similar soil type, cropping history, and management practice treatment.

The soil and tissue tests must include analyses pertinent to monitoring or amending the annual nutrient budget, e.g., pH, electrical conductivity (EC) and sodicity where salts are a concern, soil organic matter, phosphorus, potassium, or other nutrients and test for nitrogen where applicable. Follow land-grant university guidelines regarding required analyses.

Soil test analyses must be performed by laboratories successfully meeting the requirements and performance standards of the North American Proficiency Testing Program-Performance Assessment Program (NAPT-PAP) under the auspices of the Soil Science Society of America (SSSA) and NRCS, or other NRCS-approved program that considers laboratory performance and proficiency to assure accuracy of soil test results. Alternate proficiency testing programs must have solid stakeholder (e.g., water quality control entity, NRCS State staff, growers, and others) support and be regional in scope.

Nutrient values of manure, organic by-products and biosolids must be determined prior to land application.

Manure analyses must include, at minimum, total nitrogen (N), ammonium N, total phosphorus (P) or P_2O_5, total potassium (K) or K_2O, and percent solids, or follow land-grant university guidance regarding required analyses.

Manure, organic by-products, and biosolids samples must be collected and analyzed at least annually, or more frequently if needed to account for operational changes (feed management, animal type, manure handling strategy, etc.) impacting manure nutrient concentrations. If no operational changes occur, less frequent manure testing is allowable where operations can document a stable level of nutrient concentrations for the preceding three consecutive years, unless federal, State, or local regulations require more frequent testing.

Samples must be collected, prepared, stored, and shipped, following land-grant university guidance or industry practice.

When planning for new or modified livestock operations, acceptable "book values" recognized by the NRCS (e.g., NRCS Agricultural Waste Management Field Handbook) and the land-grant university, or analyses from similar operations in the geographical area, may be used if they accurately estimate nutrient output from the proposed operation.

Manure testing analyses must be performed by laboratories successfully meeting the requirements and performance standards of the Manure Testing Laboratory Certification program (MTLCP) under the auspices of the Minnesota Department of Agriculture, or other NRCS-approved program that considers laboratory

performance and proficiency to assure accurate manure test results.

Nutrient Application Rates.

Planned nutrient application rates for nitrogen, phosphorus, and potassium must not exceed land-grant university guidelines or industry practice when recognized by the university.

At a minimum, determination of rate must be based on crop/cropping sequence, current soil test results, realistic yield goals, and NRCS-approved nutrient risk assessments.

If the land-grant university does not provide specific guidance that meets these criteria, application rates must be based on plans that consider realistic yield goals and associated plant nutrient uptake rates.

Realistic yield goals must be established based on historical yield data, soil productivity information, climatic conditions, nutrient test results, level of management, and local research results considering comparable production conditions.

Estimates of yield response must consider factors such as poor soil quality, drainage, pH, salinity, etc., prior to assuming that nitrogen and/or phosphorus are deficient.

For new crops or varieties, industry-demonstrated yield, and nutrient utilization information may be used until land-grant university information is available.

Lower-than-recommended nutrient application rates are permissible if the grower's objectives are met.

Applications of biosolids, starter fertilizers, or pop-up fertilizers must be accounted for in the nutrient budget.

Nutrient Sources.

Nutrient sources utilized must be compatible with the application timing, tillage and planting system, soil properties, crop, crop rotation, soil organic content, and local climate to minimize risk to the environment.

Nutrient Application Timing and Placement.

Timing and placement of all nutrients must correspond as closely as practical with plant nutrient uptake (utilization by crops), and consider nutrient source, cropping system limitations, soil properties, weather conditions, drainage system, soil biology, and nutrient risk assessment results.

Nutrients must not be surface-applied if nutrient losses offsite are likely. This precludes spreading on:

- frozen and/or snow-covered soils, and
- when the top 2 inches of soil are saturated from rainfall or snow melt.

Exceptions for the above criteria can be made for surface-applied manure when specified conditions are met and adequate conservation measures are installed to prevent the offsite delivery of nutrients. The adequate treatment level and specified conditions for winter applications of manure must be defined by NRCS in concurrence with the water quality control authority in the State. At a minimum, the following site and management factors must be considered:

- slope,
- organic residue and living covers,
- amount and form of nutrients to be applied, and
- adequate setback distances to protect local water quality.

Additional Criteria to Minimize Agricultural Nonpoint Source Pollution of Surface and Groundwater

Planners must use the current NRCS-approved nitrogen, phosphorus, and soil erosion risk assessment tools to assess the risk of nutrient and soil loss. Identified resource concerns must be addressed to meet current planning criteria (quality criteria). Technical criteria for risk assessments can be found in NI-190-302.

When there is a high risk of transport of nutrients, conservation practices must be coordinated to avoid, control, or trap manure and nutrients before they can leave the field by surface or subsurface drainage (e.g., tile). The number of applications and the application rates must also be considered to limit the transport of nutrients to tile.

Nutrients must be applied with the right placement, in the right amount, at the right time, and from the right source to minimize nutrient losses to surface and groundwater. The

following nutrient use efficiency strategies or technologies must be considered:

- slow and controlled release fertilizers
- nitrification and urease inhibitors
- enhanced efficiency fertilizers
- incorporation or injection
- timing and number of applications
- soil nitrate and organic N testing
- coordinate nutrient applications with optimum crop nutrient uptake
- Corn Stalk Nitrate Test (CSNT), Pre-Sidedress Nitrate Test (PSNT), and Pre-Plant Soil Nitrate Test (PPSN)
- tissue testing, chlorophyll meters, and spectral analysis technologies
- other land-grant university recommended technologies that improve nutrient use efficiency and minimize surface or groundwater resource concerns.

Additional Criteria Applicable to Properly Utilize Manure or Organic By-Products as a Plant Nutrient Source

When manures are applied, and soil salinity is a concern, salt concentrations must be monitored to prevent potential crop damage and/or reduced soil quality.

The total single application of liquid manure:

- must not exceed the soil's infiltration or water holding capacity
- be based on crop rooting depth
- must be adjusted to avoid runoff or loss to subsurface tile drains.

Crop production activities and nutrient use efficiency technologies must be coordinated to take advantage of mineralized plant-available nitrogen to minimize the potential for nitrogen losses due to denitrification or ammonia volatilization.

Nitrogen and phosphorus application rates must be planned based on risk assessment results as determined by NRCS-approved nitrogen and phosphorus risk assessment tools.

For fields receiving manure, where phosphorus risk assessment results equate to LOW risk, additional phosphorus and potassium can be applied at rates greater than crop requirement not to exceed the nitrogen requirement for the succeeding crop. For fields receiving manure, where phosphorus risk assessment results equate to MODERATE risk, additional phosphorus and potassium may be applied at a phosphorus crop requirement rate for the planned crops in the rotation. When phosphorus risk assessment results equate to HIGH risk, additional phosphorus and potassium may be applied at phosphorus crop removal rates if the following requirements are met:

- a soil phosphorus drawdown strategy has been implemented, and
- a site assessment for nutrients and soil loss has been conducted to determine if mitigation practices are required to protect water quality.
- any deviation from these high risk requirements must have the approval of the Chief of the NRCS.

Manure or organic by-products may be applied on legumes at rates equal to the estimated removal of nitrogen in harvested plant biomass, not to exceed land grant university recommendations.

Manure may be applied at a rate equal to the recommended phosphorus application, or estimated phosphorus removal in harvested plant biomass for the crop rotation, or multiple years in the crop sequence at one time. When such applications are made, the application rate must not exceed the acceptable phosphorus risk assessment criteria, must not exceed the recommended nitrogen application rate during the year of application or harvest cycle, and no additional phosphorus must be applied in the current year and any additional years for which the single application of phosphorus is supplying nutrients.

Additional Criteria to Protect Air Quality by Reducing Odors, Nitrogen Emissions and the Formation of Atmospheric Particulates

To address air quality concerns caused by odor, nitrogen, sulfur, and/or particulate emissions; the source, timing, amount, and placement of nutrients must be adjusted to minimize the

negative impact of these emissions on the environment and human health. One or more of the following may be used:

- slow or controlled release fertilizers
- nitrification inhibitors
- urease inhibitors
- nutrient enhancement technologies
- incorporation
- injection
- stabilized nitrogen fertilizers
- residue and tillage management
- no-till or strip-till
- other technologies that minimize the impact of these emissions

Do not apply poultry litter, manure, or organic by-products of similar dryness/density when there is a high probability that wind will blow the material offsite.

Additional Criteria to Improve or Maintain the Physical, Chemical, and Biological Condition of the Soil to Enhance Soil Quality for Crop Production and Environmental Protection

Time the application of nutrients to avoid periods when field activities will result in soil compaction.

In areas where salinity is a concern, select nutrient sources that minimize the buildup of soil salts.

CONSIDERATIONS

Elevated soil test phosphorus levels are detrimental to soil biota. Soil test phosphorus levels should not exceed State-approved soil test thresholds established to protect the environment.

Use no-till/strip-till in combination with cover crops to sequester nutrients, increase soil organic matter, increase aggregate stability, reduce compaction, improve infiltration, and enhance soil biological activity to improve nutrient use efficiency.

Use nutrient management strategies such as cover crops, crop rotations, and crop rotations with perennials to improve nutrient cycling and reduce energy inputs.

Use variable-rate nitrogen application based on expected crop yields, soil variability, soil nitrate or organic N supply levels, or chlorophyll concentration.

Use variable-rate nitrogen, phosphorus, and potassium application rates based on site-specific variability in crop yield, soil characteristics, soil test values, and other soil productivity factors.

Develop site-specific yield maps using a yield monitoring system. Use the data to further diagnose low- and high- yield areas, or zones, and make the necessary management changes. See Title 190, Agronomy Technical Note (TN) 190.AGR.3, Precision Nutrient Management Planning.

Use manure management conservation practices to manage manure nutrients to limit losses prior to nutrient utilization.

Apply manure at a rate that will result in an “improving” Soil Conditioning Index (SCI) without exceeding acceptable risk of nitrogen or phosphorus loss.

Use legume crops and cover crops to provide nitrogen through biological fixation and nutrient recycling.

Modify animal feed diets to reduce the nutrient content of manure following guidance contained in Conservation Practice Standard (CPS) Code 592, Feed Management.

Soil test information should be no older than 1 year when developing new plans.

Excessive levels of some nutrients can cause induced deficiencies of other nutrients, e.g., high soil test phosphorus levels can result in zinc deficiency in corn.

Use soil tests, plant tissue analyses, and field observations to check for secondary plant nutrient deficiencies or toxicity that may impact plant growth or availability of the primary nutrients.

Use the adaptive nutrient management learning process to improve nutrient use efficiency on farms as outlined in the NRCS’ National Nutrient Policy in GM 190, Part 402, Nutrient Management.

Potassium should not be applied in situations where an excess (greater than soil test potassium recommendation) causes nutrient imbalances in crops or forages.

Workers should be protected from and avoid unnecessary contact with plant nutrient sources. Extra caution must be taken when handling anhydrous ammonia or when dealing with organic wastes stored in unventilated enclosures.

Material generated from cleaning nutrient application equipment should be utilized in an environmentally safe manner. Excess material should be collected and stored or field applied in an appropriate manner.

Nutrient containers should be recycled in compliance with State and local guidelines or regulations.

Considerations to Minimize Agricultural Nonpoint Source Pollution of Surface and Groundwater.

Use conservation practices that slow runoff, reduce erosion, and increase infiltration, e.g., filter strip, contour farming, or contour buffer strips. These practices can also reduce the loss of nitrates or soluble phosphorus.

Use application methods and timing strategies that reduce the risk of nutrient transport by ground and surface waters, such as:

- split applications of nitrogen to deliver nutrients during periods of maximum crop utilization,
- banded applications of nitrogen and/or phosphorus to improve nutrient availability,
- drainage water management to reduce nutrient discharge through drainage systems, and
- incorporation of surface-applied manures or organic by-products if precipitation capable of producing runoff or erosion is forecast within the time of planned application.

Use the agricultural chemical storage facility conservation practice to protect air, soil, and water quality.

Use bioreactors and multistage drainage strategies when approved by the land-grant university.

Considerations to Protect Air Quality by Reducing Nitrogen and/or Particulate Emissions to the Atmosphere.

Avoid applying manure and other by-products upwind of inhabited areas.

Use high-efficiency irrigation technologies (e.g., reduced-pressure drop nozzles for center pivots) to reduce the potential for nutrient losses.

PLANS AND SPECIFICATIONS

The following components must be included in the nutrient management plan:

- aerial site photograph(s)/imagery or site map(s), and a soil survey map of the site,
- soil information including: soil type surface texture, pH, drainage class, permeability, available water capacity, depth to water table, restrictive features, and flooding and/or ponding frequency,
- location of designated sensitive areas and the associated nutrient application restrictions and setbacks,
- for manure applications, location of nearby residences, or other locations where humans may be present on a regular basis, and any identified meteorological (e.g., prevailing winds at different times of the year), or topographical influences that may affect the transport of odors to those locations,
- results of approved risk assessment tools for nitrogen, phosphorus, and erosion losses,
- documentation establishing that the application site presents low risk for phosphorus transport to local water when phosphorus is applied in excess of crop requirement.
- current and/or planned plant production sequence or crop rotation,
- soil, water, compost, manure, organic by-product, and plant tissue sample analyses applicable to the plan,
- when soil phosphorus levels are increasing, include a discussion of the risk associated with phosphorus accumulation and a proposed phosphorus draw-down strategy,
- realistic yield goals for the crops,
- complete nutrient budget for nitrogen, phosphorus, and potassium for the plant production sequence or crop rotation,
- listing and quantification of all nutrient sources and form,

- all enhanced efficiency fertilizer products that are planned for use,
- in accordance with the nitrogen and phosphorus risk assessment tool(s), specify the recommended nutrient application source, timing, amount (except for precision/variable rate applications specify method used to determine rate), and placement of plant nutrients for each field or management unit, and
- guidance for implementation, operation and maintenance, and recordkeeping.

In addition, the following components must be included in a precision/variable rate nutrient management plan:

- Document the geo-referenced field boundary and data collected that was processed and analyzed as a GIS layer or layers to generate nutrient or soil amendment recommendations.
- Document the nutrient recommendation guidance and recommendation equations used to convert the GIS base data layer or layers to a nutrient source material recommendation GIS layer or layers.
- Document if a variable rate nutrient or soil amendment application was made.
- Provide application records per management zone or as applied map within individual field boundaries (or electronic records) documenting source, timing, method, and rate of all applications that resulted from use of the precision agriculture process for nutrient or soil amendment applications.
- Maintain the electronic records of the GIS data layers and nutrient applications for at least 5 years.

If increases in soil phosphorus levels are expected (i.e., when N-based rates are used), the nutrient management plan must document:

- the soil phosphorus levels at which it is desirable to convert to phosphorus based planning,
- the potential plan for soil test phosphorus drawdown from the production and harvesting of crops, and
- management activities or techniques used to reduce the potential for phosphorus transport and loss,
- for AFOs, a quantification of manure produced in excess of crop nutrient requirements, and
- a long-term strategy and proposed implementation timeline for reducing soil P to levels that protect water quality,

OPERATION AND MAINTENANCE

Conduct periodic plan reviews to determine if adjustments or modifications to the plan are needed. At a minimum, plans must be reviewed and revised, as needed with each soil test cycle, changes in manure volume or analysis, crops, or crop management.

Fields receiving animal manures and/or biosolids must be monitored for the accumulation of heavy metals and phosphorus in accordance with land- grant university guidance and State law.

Significant changes in animal numbers, management, and feed management will necessitate additional manure analyses to establish a revised average nutrient content.

Calibrate application equipment to ensure accurate distribution of material at planned rates.

Document the nutrient application rate. When the applied rate differs from the planned rate, provide appropriate documentation for the change.

Records must be maintained for at least 5 years to document plan implementation and maintenance. As applicable, records include:

- soil, plant tissue, water, manure, and organic by-product analyses resulting in recommendations for nutrient application,
- quantities, analyses and sources of nutrients applied,
- dates, and method(s) of nutrient applications, source of nutrients, and rates of application,

- weather conditions and soil moisture at the time of application; lapsed time to manure incorporation; rainfall or irrigation event,
- crops planted, planting and harvest dates, yields, nutrient analyses of harvested biomass, and crop residues removed,
- dates of plan review, name of reviewer, and recommended changes resulting from the review, and
- all enhanced efficiency fertilizer products used.

Additional records for precision/variable rate sites must include:

- maps identifying the variable application source, timing, amount, and placement of all plant nutrients applied, and
- GPS-based yield maps for crops where yields can be digitally collected.

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NRCS, NHCP

January 2012

Exhibit 18

Successful on-farm practices to reduce water and fertilizer losses to groundwater

Presentation to the California State Water Board
SBX 2 1 Committee May 23, 2012

Bob Martin, General Manager,
Rio Farms, King City, CA

Drip Irrigation & Fertigation

- Onions need sprinkler + drip
- 4 lines/40” beds vs. 10 lines/80” beds
- Drip has less fertilizer and water lost due to
  - Wind erosion
  - Surface runoff
  - Leaching to groundwater
- Can result in higher quality crop due to more uniform applications
- Cannot use drip on every crop but it is useful tool

Drip: a growing trend in Monterey County

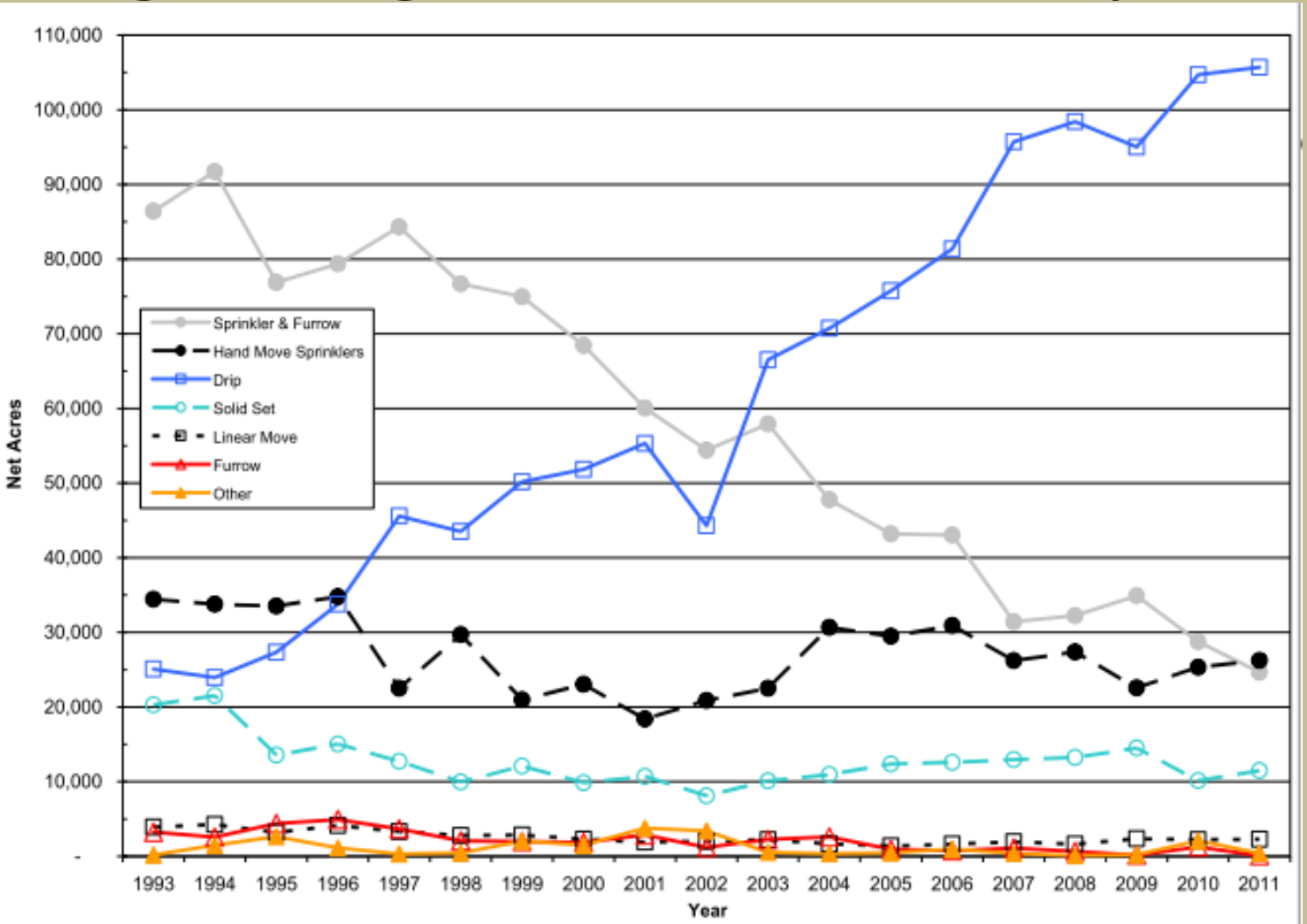


Figure 5. Types of irrigation methods used in the Salinas Valley based on companies reported

NOTE: Reported net acres vary from year to year

Monterey Water Resources Agency, 2010 Report.
http://www.mcwra.co.monterey.ca.us/Agency_data/ GEMS_Reports/2010%20Summary%20Report.pdf

Split applications of fertilizer

- "Spoon feeding" of fertilizer at key growing periods
- Take the time to understand when your crop wants to be fed!

Nitrogen Fertilizer Requirements of Cool-Season Vegetable Crops Grown Under California Conditions[ii]				
Crop	Approximate Nitrogen Requirements (lb/acre-week)			
Broccoli[1]	Early Growth 5-15[2]	Mid Season 10-20	Button Formation 15-30	Head Development 10-20
Cabbage	Early Growth 5	Mid Season 35	Curling 40	Heading 55
Celery	Early Growth 5	Mid Season 15	Late Season 25	
Garlic	Early Growth 5	Mid Season 10	Bulbing 15	
Lettuce[1]	Early Growth 5-10	Cupping 10-20	Head Filling 15-30	
Onion	Early Growth 5	Mid Season 15	Bulbing 10	

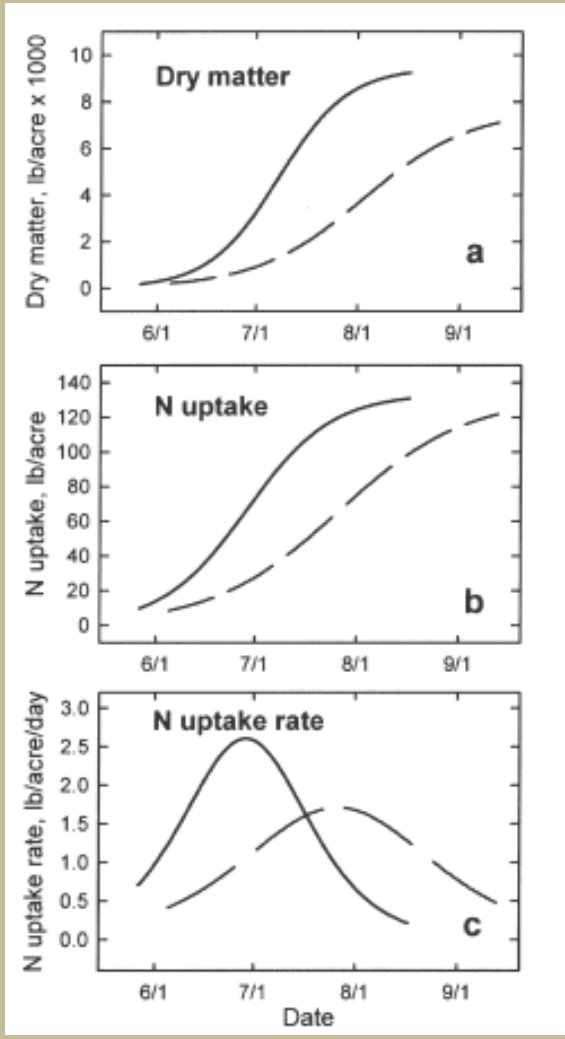
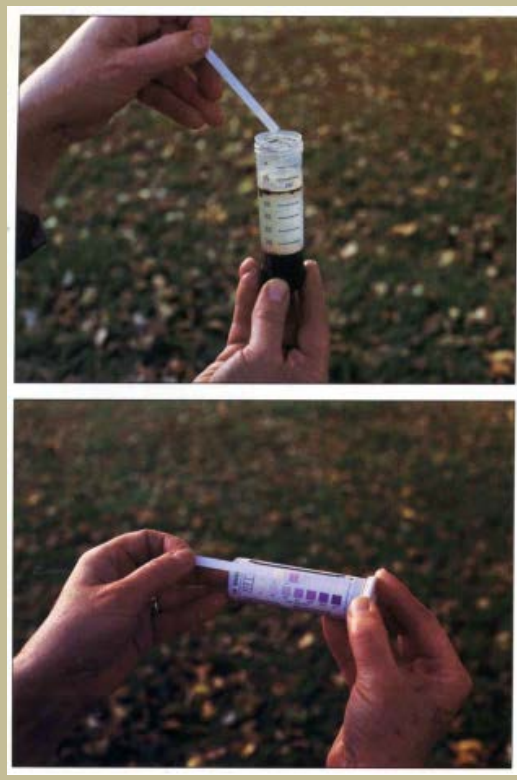


Table from: Monterey Water Resources Agency and Santa Clara Valley Water District. Using the Nitrate Present in Soil and Water in Your Fertilizer Calculations. Fact Sheet 4. http://www.pvwma.dst.ca.us/water_conservation_agr/assests/FactSheet%204-nitrate_fertilizer_calcs.pdf
Nutrient Graphs from : Brown, Brad. Southern Idaho Fertilizer Guide. University of Idaho Cooperative Extension System. CIS 1081. http://www.extension.uidaho.edu/nutrient/pdf/Specialty/OnionFertGuide.pdf

Composting

Quick Nitrate Soil Tests

- June-August testing, every year since 1997, over 300 samples
- Focus is between first and second crop
- Make & follow recommendation of fertilizer application
- Summer intern project



On-farm nitrogen tests improve fertilizer efficiency, protect groundwater

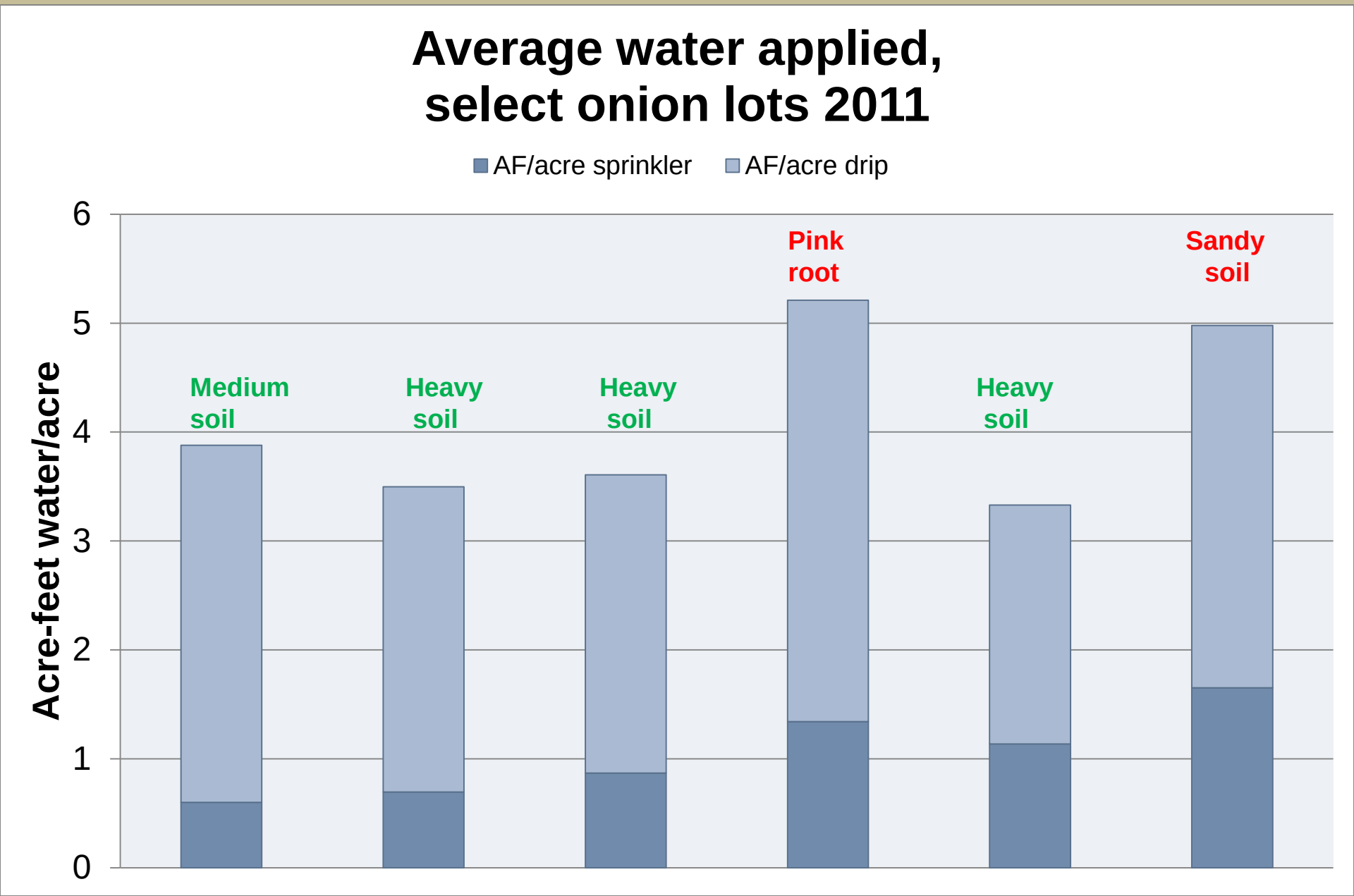
Timothy K. Hartz ❑ Richard F. Smith ❑ Kurt F. Schulbach ❑ Michelle LeStrange

Water Meters

"You can't manage what you don't measure"

- Installed in 6 fields with different soils
- Brand: SeaMetrics AG 2000
- Investment (6 meters): $7,500

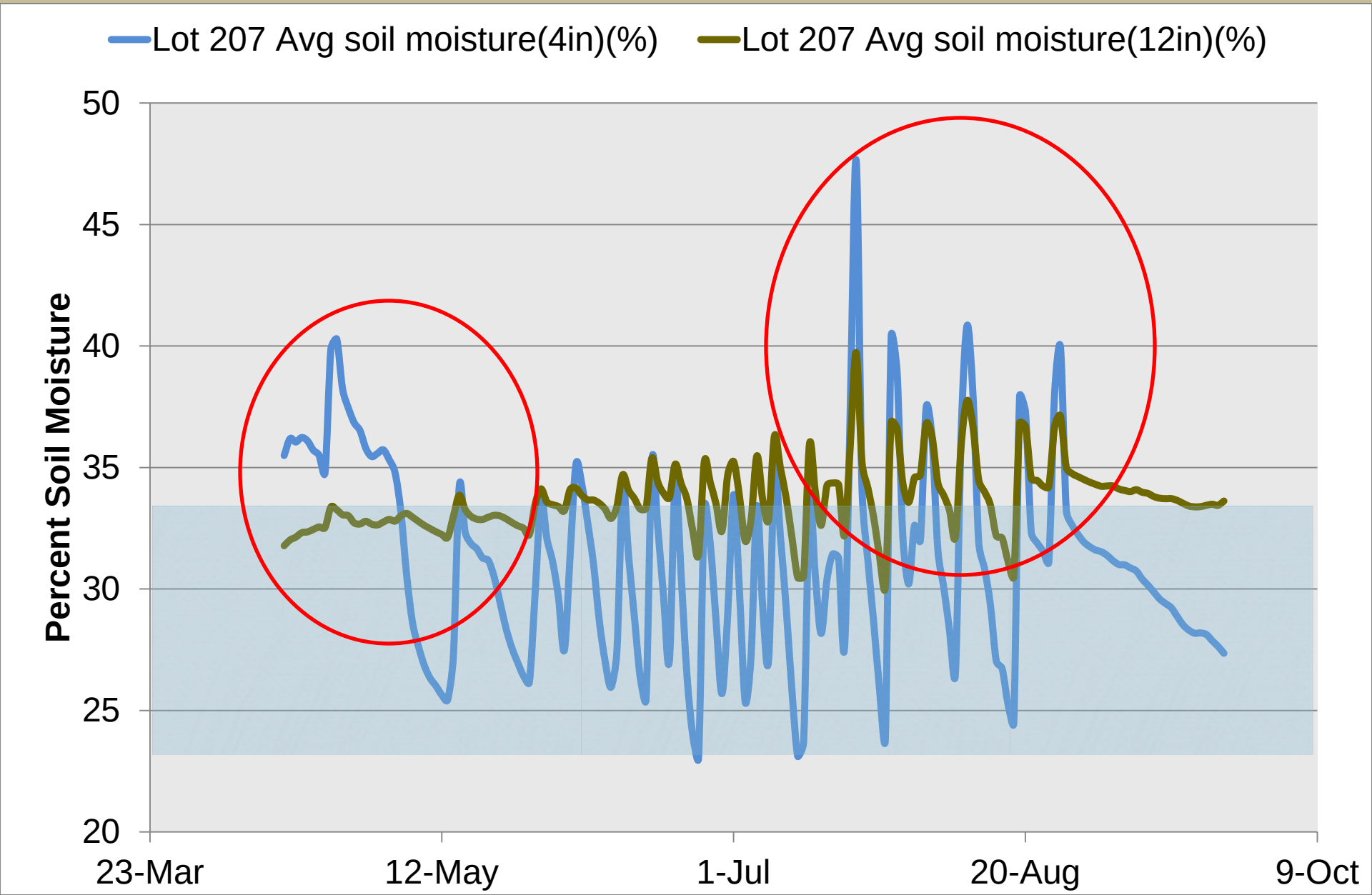
Water meter results



Soil Moisture Sensors

- 3 sensors + 1 base weather station (Solar Powered)
- 4 and 12 inch depths
- 2 inch soil temperature –bolting info
- Ideal moisture zone set based on science = soil test and crop characteristics
- Internet data access + automatic e-mails or text messages
- Pressure switch to give accurate # hours of irrigation
- Brands: Climate Minder (King City) and Pure Sense (other regions) used
- Investment (3 meters, 1 base): $11,000

Soil Moisture Sensor Results



Educational Partnerships

- Working with UC-Cooperative Extension, Resource Conservation District and other partners
- Irrigation Uniformity Testing (planned summer 2012)
- Water quality meetings and trainings
- Incorporating information in publications into growing practices

RCDMC Conservation Connections
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY

UC CE University of California Cooperative Extension Monterey County

Last thoughts

- Farmers know there is a water quality problem.
- Regulators should work towards solutions that fix the problem, not create expensive paperwork.
- Promote the obvious and easy fixes –irrigation efficiency and uniformity testing, split applications of fertilizer, other grower education
- Encourage the use of expensive technology such as soil moisture sensors through incentive programs, collective purchase agreements etc.
- Let's encourage and fund research and grower assistance with people farmers respect – UCCE, RCDs etc.

Questions?

Bob Martin, Rio Farms

chilibob@RioFarms.com

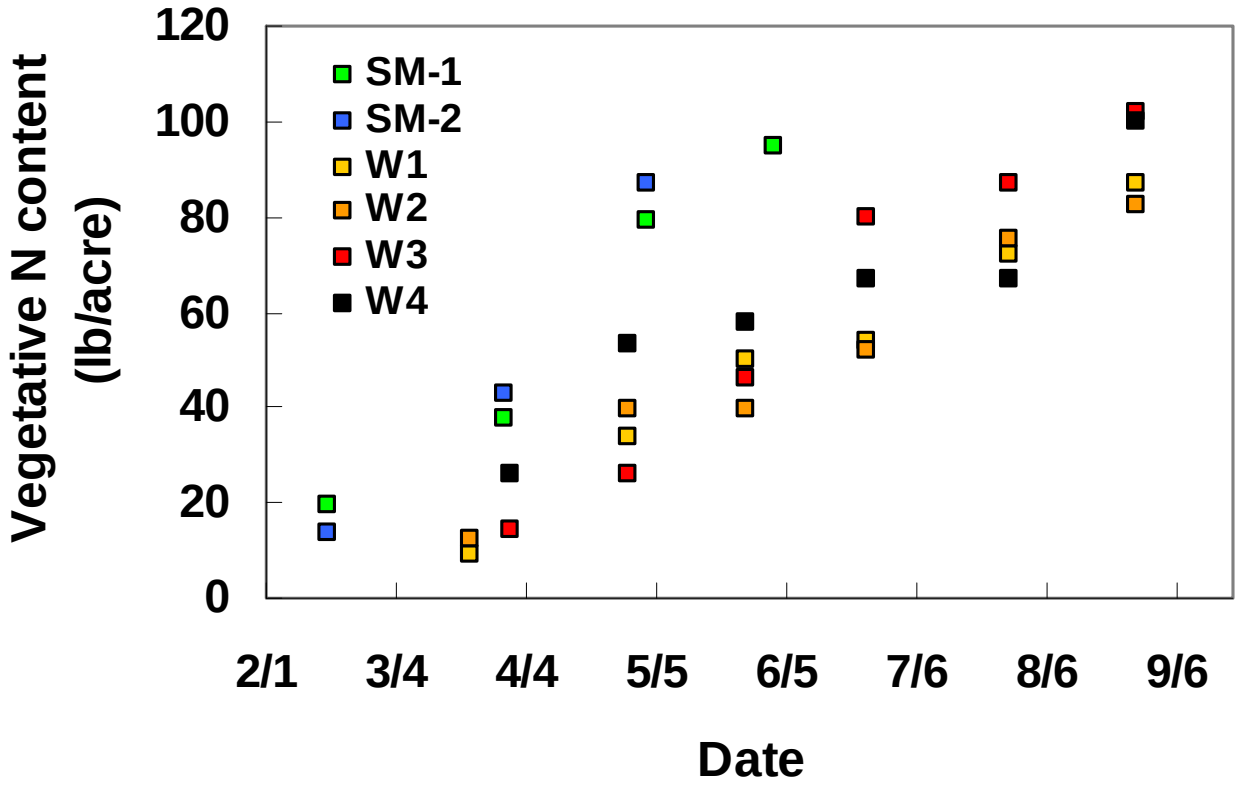
Determination of nutrient uptake by strawberry

Exhibit 19

- monthly whole plant samples

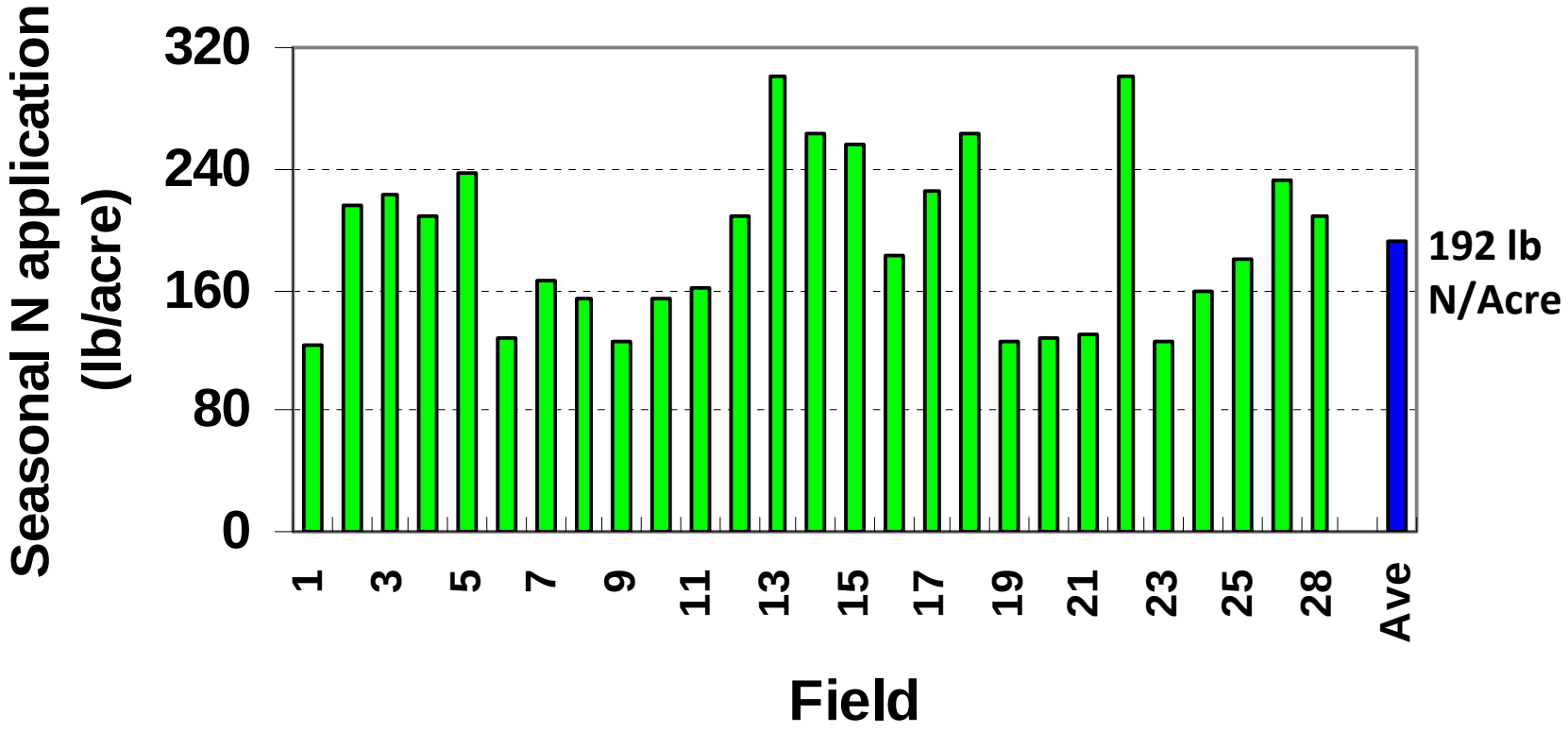
- plant and fruit measured separately

Average seasonal nitrogen uptake of strawberries: 200 lb N/acre

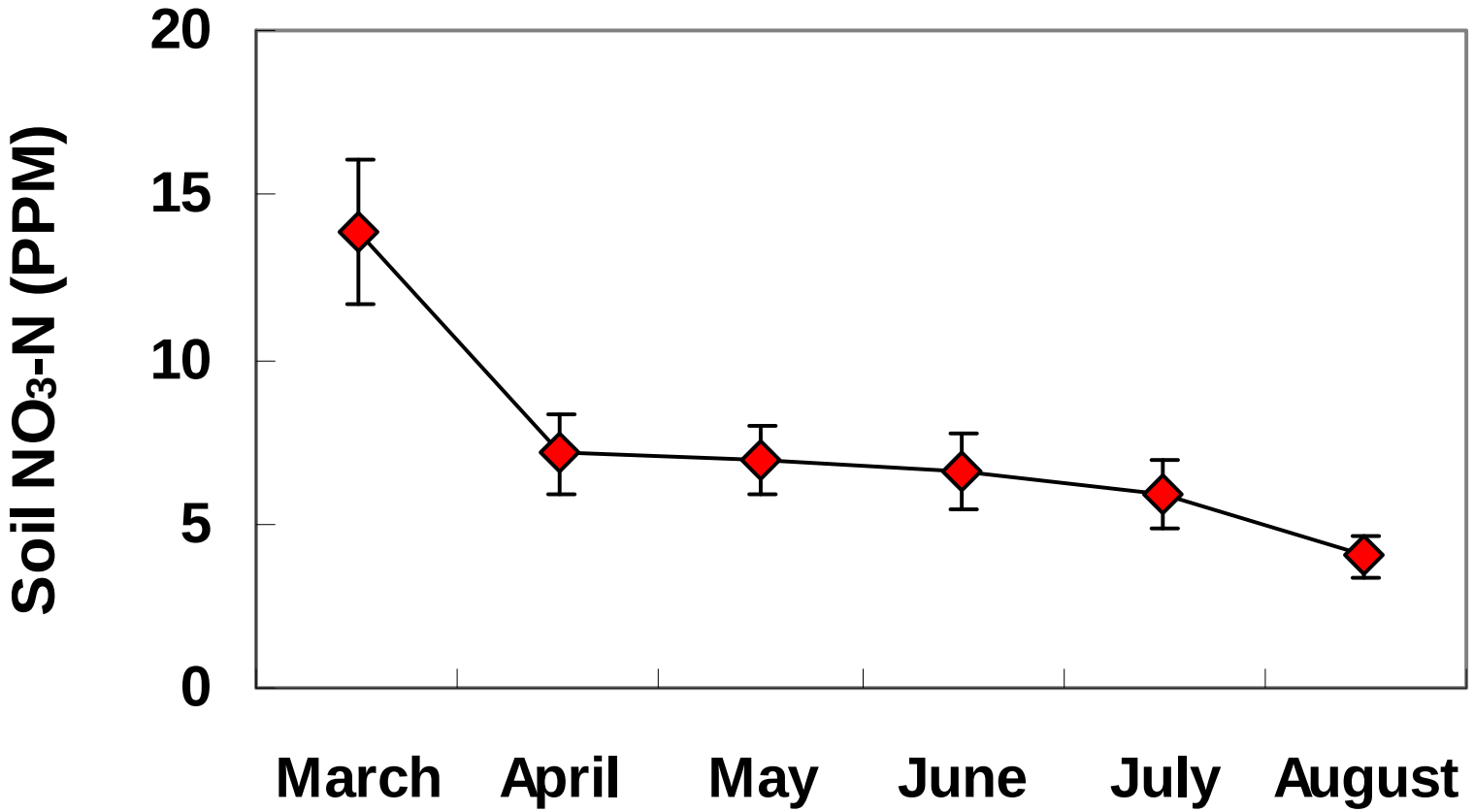


Nitrogen in fruit averaged 92 lbs of N per acre

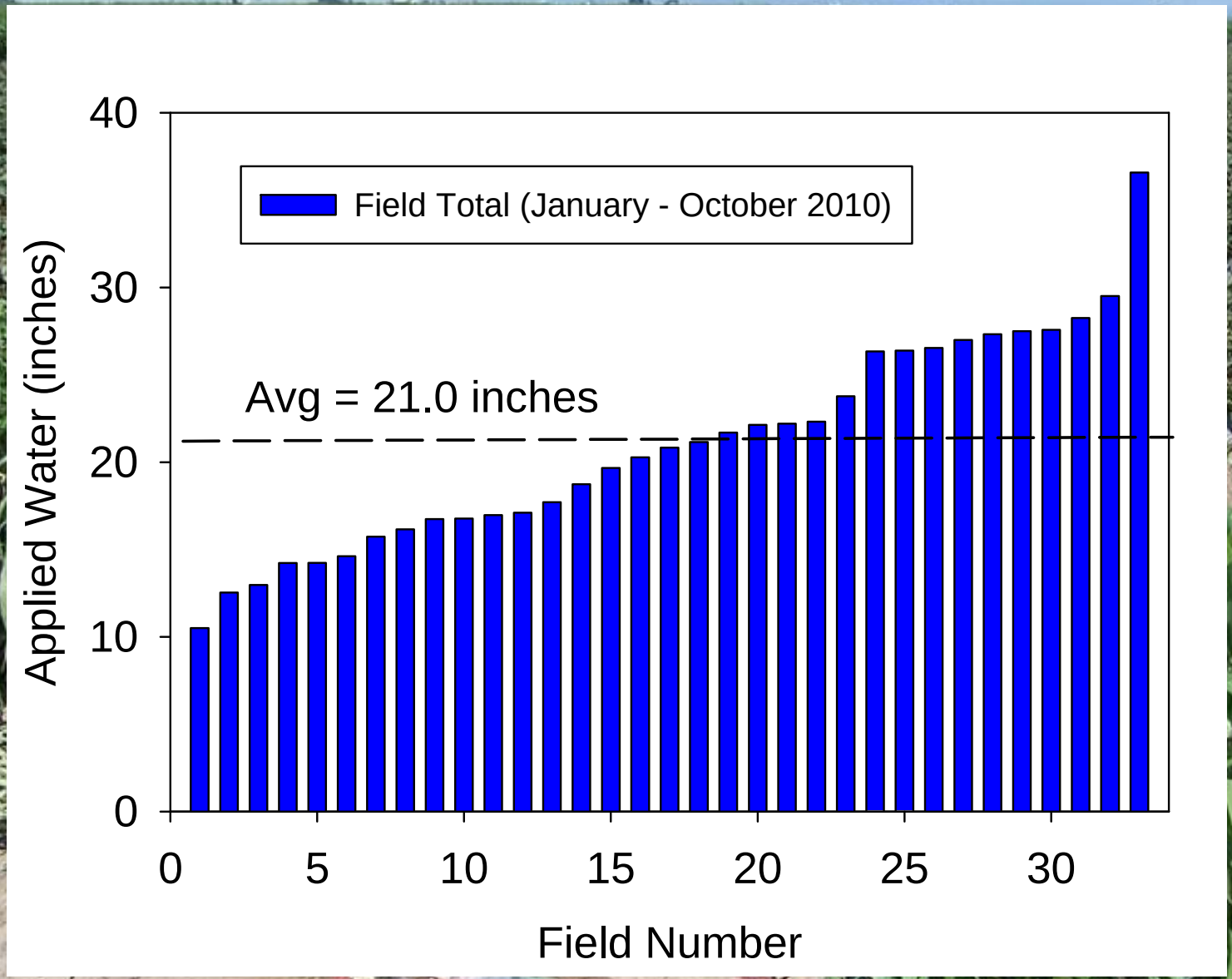
Average rate of N fertilizer applied to strawberries is currently below the 1.2 ratio



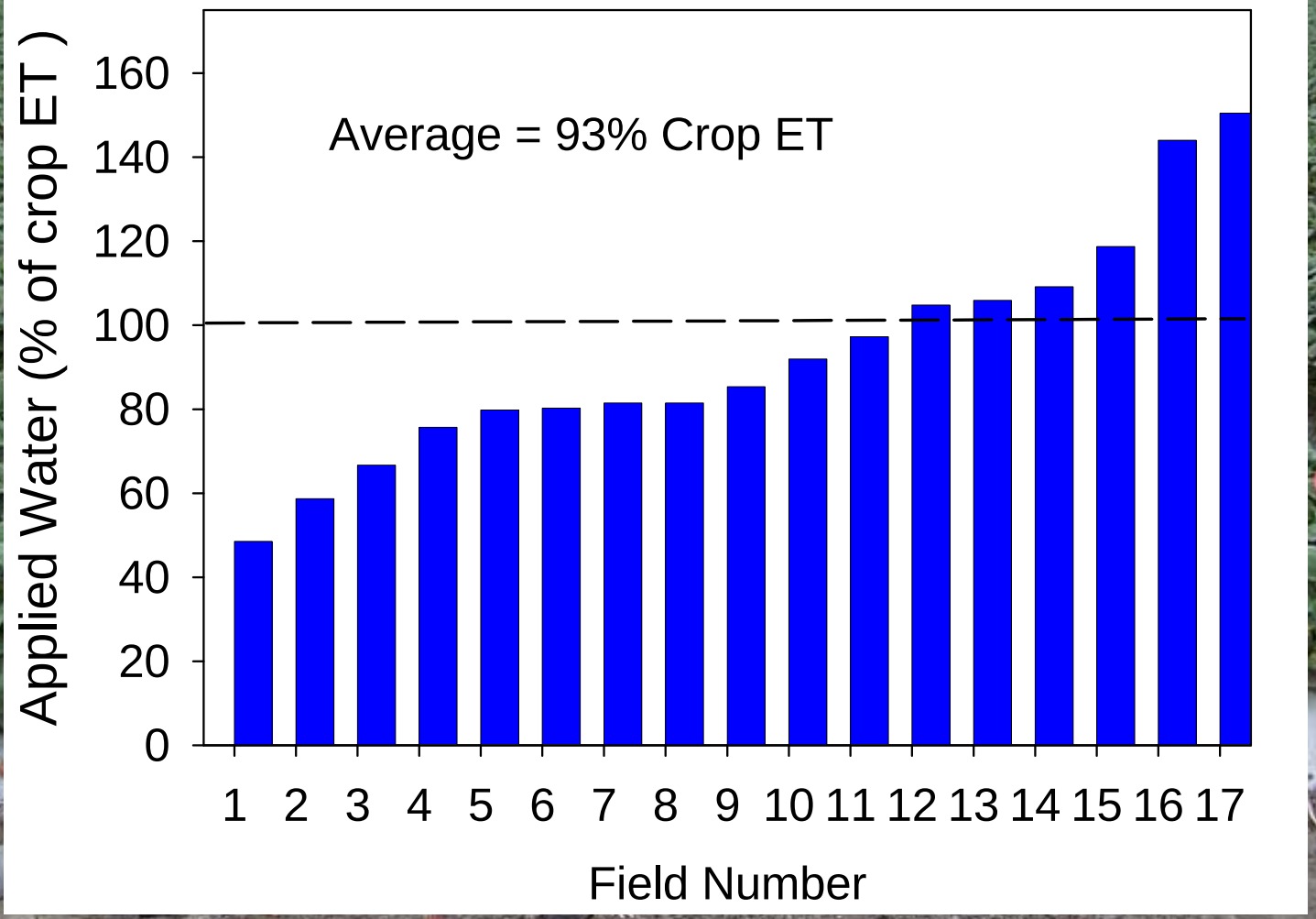
Average soil nitrate-N levels were < 10 ppm during the production season



Average seasonal applied water was 21 inches



Average amount of water applied to the crop was below crop ET requirement



Project Summary

1. Nitrogen uptake of strawberries and applied fertilizer N were in balance on a majority of fields

2. Average soil nitrate levels were < 10 ppm nitrate-N during the production season

3. Applied water volumes were in balance with crop ET requirements

4. Results indicated that a majority of strawberry acres are currently managed in a manner that minimizes nitrate leaching

Exhibit 20

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WELL WATER TESTING

(No.)

CODE 355

DEFINITION

Testing for physical, biological, and chemical characteristics of groundwater in wells or spring developments.

PURPOSE

This practice may be applied as part of a conservation management system to determine the quality of a groundwater supply for the following intended uses: irrigation, livestock, fish and wildlife habitat, aquaculture enterprises, or other agricultural uses.

CONDITIONS WHERE PRACTICE APPLIES

This standard applies to water supplies that are used or have potential to be used on farms or ranches.

This practice does not apply to groundwater for human consumption, nor wells for monitoring groundwater hydrology or contamination associated with animal waste storage or treatment installations.

CRITERIA

The specific use of the water and the water quality concerns shall be identified.

The required tests and applicable standards shall be determined based on the planned use of the water.

Water samples shall be collected and analyzed in accordance with established procedures. Specific parameters, sampling procedures, and laboratory analyses may be specifically required by local, State, Tribal, or Federal laws and regulations. Contact the testing entity for specific guidance.

Interpretation of test results and recommendations for remedial actions, as necessary, shall be obtained from a source knowledgeable of the testing procedures and objectives.

CONSIDERATIONS

The following items should be considered in planning water supply testing:

- Location and depth of supply, aquifer characteristics, geology, and history of site in relationship to sources of potential contamination, such as surface water, septic systems, chemical storage facilities, landfills, roads, animal waste storage or treatment facilities, or naturally occurring sources of contamination
- Water supply construction practices used such as dug, drilled, or cased well, or spring development
- Using a computerized total farm record keeping system for ease of data input, analysis, and retrieval
- Using a State certified laboratory

PLANS AND SPECIFICATIONS

Plans and specifications for water testing shall be consistent with this standard to achieve the desired results.

Plans and specifications shall include a description of processes for collecting, storing, transporting, and testing samples; and reporting test results.

OPERATION AND MAINTENANCE

Water testing records that shall be maintained will include:

- Sample site, location, and depth
- Remotely-sensed or in-situ records of water quality conditions within the well (pH,

conductivity, turbidity, etc.)

- Date and time water sample taken
- Name and title of person who collected sample
- Type of sampler and sample taken
- Standard collection procedure followed
- Water test analysis date
- Laboratory performing the analysis
- Tested Contaminants
- Schedule of additional testing at required frequency according to applicable standard
- Records to evaluate trends and the effects of any remedial actions to produce water of sufficient quality for the intended purpose
- Rainfall data
- Observations on well condition
- Other records as required

Exhibit 21

DELLAVALLE®
Laboratory, Inc.
Chemists and Consultants

Well Water Testing & Reporting Requirements
Central Coast Regional Water Quality Control Board (Region 3)

The groundwater monitoring required by the Central Coast Regional Water Quality Control Board (RWQCB) includes analysis of well water samples plus use of the GeoTracker system to input data into the RWQCB database.

Required analysis: pH, specific conductance (EC), total dissolved solids, total alkalinity, calcium, magnesium, sodium, potassium, sulfate, chloride, nitrate and boron.*

*Although boron is not required and would not be submitted to Board, it is so important for plant growth in small quantities (but so toxic at slightly higher levels), we are including it at no additional charge.

Region 3: Water analysis (with GeoTraker electronic data transmission):	$120.00
Well sampling, analysis, + GeoTraker input:	$155.00

For more information or to discuss your specific needs, please call Dellavalle Lab at **800-228-9896**

For Salinas, Pajaro Valleys and surrounding areas, call Danyal Kasapligil 831-750-4509

Other services available include:

- Well sampling & handling
- Sampling & protocol training
- Well depth sounding
- Soil and plant tissue analysis
- Complete nutrient management for your farming needs
- Irrigation management
- And more . . .

Established in 1978 Dellavalle Laboratory personnel have more than 150 years combined experience providing technical assistance with irrigation and fertility management to California agriculture. Our 10 Certified Crop Advisors all have experience with Nutrient Management.

The laboratory facility is designed specifically to meet agricultural needs and match the stringent environmental standards for this project (ELAP Certification #1595). We excel at rapid turnaround and have high standards for quality.

Please call Dellavalle Laboratory to discuss your specific needs.

FRUIT GROWERS LABORATORY, INC.
Analytical Chemists

Central Coast Grape Growers

Groundwater testing for compliance with the Central Coast Ag Waiver

Introduction
Central Coast Regional Water Quality Control Board recently adopted an updated Irrigated Lands Order (Ag Waiver) to reduce nitrate contamination in drinking water. This order is effective immediately. In this new order, growers are required to sample the groundwater from the primary irrigation well and any drinking water wells in their vineyards.

Fruit Growers Laboratory, Inc. dba FGL Environmental (FGL), is a state certified laboratory providing services to drinking water purveyors and wastewater generators throughout the State of California. FGL is also the largest provider of leaf/ petiole, soils and irrigation water analyses to the grape growing industry throughout California.

For the Central Coast Ag Waiver, ***as it relates to groundwater sampling and analysis only***, FGL provides a turnkey operation to growers (Tiers 1, 2 & 3) to comply with the Water Board's requirements.

Pricing
The following outlines pricing for groundwater sampling and analyses for the current Ag Waiver:

Sampling	$35.00 per well
Depth to water*	$15.00 per well
Field pH	$15.00 per sample
General Chemical analyses	$95.00 per sample

Sampling and analysis cost per well: $160.00

GeoTracker reporting to the State -- $45.00 per chain of custody. (If there are multiple samples on the same chain of custody, only one GeoTracker fee will apply).

Pricing contd.....

* For deeper wells, the charge for depth to water will be $40.00 per well. Depth to water will be conducted only on those wells where construction (of the well) provides for this measurement to be taken.

The above charges include substantial discounts from regular pricing.

Chains of Custody

FGL will upload all well details (irrigation and drinking water wells) into our computer system. This enables us to generate the required documentation to comply with the Waiver. This includes preprinted chains of custody, bottle labels, bottle orders and sampling supplies. Bottles and sampling supplies will be provided by FGL, if the grower decides to collect his/her own samples.

Monitoring schedules

- After the first two rounds of monitoring (Fall 2012 and Spring 2013), Tier 1 & 2 growers will repeat this testing (two rounds) every 5 years.
- After the first two rounds of monitoring (Fall 2012 and Spring 2013), Tier 3 growers will conduct testing annually.

Sampling scheduling

Sampling will be scheduled in advance by FGL. Timing of the sampling will coincide with the general timetables outlined in the Waiver. When FGL is required to conduct depth to water measurements, the grower or his agent will shut down the pump and remove the well cap or other access terminals to the well. Once the well depth is recorded, the well will be run for an appropriate period to allow for a representative sample to be collected.

Laboratory Analyses

General chemical analyses, required for each ground water well, will be conducted in our laboratory:

EC, TDS, Alkalinity, Calcium, Magnesium, Sodium,
Potassium, Sulfate, Chloride and Nitrate as NO3.

These do not include the field tests (pH and depth to water) outlined above.

Denis Barry
April 19, 2012

LINDA - 831-238-6876

MBAS
MONTEREY BAY ANALYTICAL SERVICES
PRECISION ◎ ACCURACY ◎ DEPENDABILITY
4 Justin Court Suite D Monterey, CA 93940
831-375-6227
www.mbasinc.com
montereybayanalytical@usa.net

Central Coast Ag Waiver
Groundwater Monitoring and Reporting Program

The California Regional Water Quality Contol Board, Central Coast Region recently adopted an updated Irrigated Lands Order (Ag Waiver) that requires groundwater monitoring and reporting.

Monterey Bay Analytical Services (MBAS) can provide sampling and laboratory analyses to help growers comply with the Ag Waiver requirements. MBAS is a State Certified Environmental Laboratory (ELAP # 2385) providing laboratory testing since 1999. The staff of MBAS takes pride in producing data that is scientifically sound and legally defensible, as well as offering support and technical advice to our clients. MBAS is located in the Ryan Ranch Business Park in Monterey just off Hwy 68. Clients are encouraged to visit our facility and meet our staff.

MBAS is pleased to offer the following services:

Individual Groundwater Monitoring

Sampling	$35.00 per sample
Groundwater analyses (Table 3 requirements) *	$90 per well
Depth to water (as needed)	$15.00 per well
Total Sampling and analyses cost per well	$140.00

*Panel includes: pH, Conductivity, TDS, Alkalinity. Calcium, Magnesium, Sodium,Potassium, Sulfate, Chloride, Nitrate+Nitrite as N, Nitrates as NO3

Additional services include electronic reporting to GeoTracker database $40.00

Our staff is available to assist with preparation of the monitoring results and well information report as described in part 2B of the monitoring order (Request Quote)

David Holland
Laboratory Director
Monterey Bay Analytical Services

MBAS
MONTEREY BAY ANALYTICAL SERVICES
PRECISION ACCURACY DEPENDABILITY
4 Justin Court Ste D, Monterey, CA 93940
831.375.MBAS (6227), 831.641.0734 (Fax)
MontereyBayAnalytical@usa.net
http://www.MBASinc.com

****Samples with analysis needing to be completed after normal working hours (M-F, 830-530) may be charged double****

2012 Fee Schedule

Chemistry Panels	Analysis	Fee	Containers
Title 22 Primary & Secondary	*Color, odor, turbidity, carbonate, bicarbonate, alkalinity, calcium, chloride, copper, foaming agents, iron, magnesium, manganese, pH, sodium, sulfates, conductivity, TDS, hardness, zinc, corrositivity, silver). Aluminum, arsenic, barium, cadmium, chromium, fluoride, lead, mercury, nitrate, nitrite, selenium, silver, antimony, beryllium, nickel, thallium, cyanide.*	*289.00*	*250mL glass* *1 liter plastic* *250ml plastic w/ NaOH* *125ml plastic w/ HNO_3* ***(24-hr Hold Time)***
Trihalomethanes (EPA 524)	*Chloroform, bromodichloromethane, dibromochloromethane, bromoform*	*95 .00*	*3 ea. 40 mL VOH s w/Thio*
HAA-5**	*Haloacetic Acids*	*170.00*	*250 ml Amber Glass w/ NH_4Cl*
CCR Title 22 Synthetic Organic Compounds**	*Ethylenedibromide & dibromochloropropane (EPA 504.1), Pesticides & PCBs (EPA 505), Herbicides (EPA 515.1, Regulated Organics by GC/MS (EPA 525.2), Carbamates (EPA 531.1), Glyphosate (EPA 547), Endothall (EPA 548.1), Diquat (EPA 549.1), & Diuron (EPA632).* ***Dioxin must be ordered separately if needed.***	*1270.00*	*EPA 504 3 x 40 mL VOHs Thio* *EPA 505 3 x 40 mL VOHs Thio* *EPA 515 250-ml Glass Thio* *EPA 525 2 x 1-L Glass NaSO3* *EPA 531 250-mL Glass Thio+MCAA* *EPA 547 250-ml Glass Thio* *EPA 548 1-L Glass Thio* *EPA 549 1-L Plastic H2SO4+Thio* *EPA 632 1-L Glass*
VOC's	*Volatile Organic Compounds; EPA 524, EPA 8260*	*125.00*	*3 ea. 40 ml VOHs w/ HCl*
SOCs for Monterey County**	*Alachlor, Atrazine & Simazine (EPA525), Bentazon & 2,4-D (EPA 515.3), Carbofuran (EPA 531.1), Diquat (EPA 549)*	*735.00*	*EPA 525 2 x 1-L Glass Thio* *EPA 515.3 250-ml Glass* *EPA 531.1 125-ml Glass MCAA* *EPA 549 1-L Plastic H2so4 + Thio*
Title 22 Radiological**	*Gross Alpha* *Gross Beta* *Radium 226* *Radium 228* *Uranium by ICPMS* *Uranium EPA 908.0*	*70.00* *70.00* *160.00* *265.00* *100.00* *120.00*	*1 liter plastic* *1 liter plastic* *1 liter plastic w/ HNO3* *2 liter plastic w/HNO3* *125 ml plastic* *1 liter plastic*
CRC Title 22 Asbestos**		*210.00*	*1 liter plastic* ***(Short Hold Time)***
General Water Quality Panel	*pH, alkalinity, conductivity, TDS, calcium, magnesium, sodium, potassium, chloride, fluoride, nitrate, sulfate, corrositivity, hardness, iron & manganese*	*125.00*	*1 liter plastic* *125ml plastic w/ HNO3*
Irrigation Suitability	*pH, alkalinity, bicarbonate, carbonate, conductivity, total dissolved solids, calcium, magnesium, sodium, potassium, boron, chloride, sulfate, nitrate, SAR and adjusted SAR.*	*90.00*	*1 liter plastic*
Storm Drain Analysis	*Total suspended solids, pH, Oil and Grease, conductivity.*	*90.00*	*1 L plastic* *1 L glass*
Coliforms	***Drinking Water;*** *Total & E. coli; present/absent.*	*26.00*	*120 ml sterile*
Enterococcus	*Enterococcus by Quantitray*	*30.00*	*120 ml sterile*
Coliforms	***Source Water,*** *Total & E. Coli by Quantitray*	*30.00*	*120 ml sterile*
Coliforms	***Waste water and source water;*** *total ; 15 tube MTF* *Fecal Coliform added to above analysis*	*35.00* *15.00*	*120 ml sterile*

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MontereyBayAnalytical@usa.net
http://www.MBASinc.com

****Samples with analysis needing to be completed after normal working hours (M-F, 830-530) may be charged double****

2012 Fee Schedule for Individual Parameters

Alkalinity	*25.00*	*500 ml plastic*
Aluminum	*25.00*	*125 ml plastic*
Ammonia	*27.00*	*500 ml plastic*
Anions (Chloride, Fluoride, Nitrate, Nitrite, Sulfate, o-Phosphate)	*55.00*	*250 ml plastic*
Arsenic	*25.00*	*125 ml plastic*
Barium	*25.00*	*125 ml plastic*
Biological Oxygen Demand (BOD)	*42.00*	*1 L plastic*
Boron	*25.00*	*125 ml plastic*
Bromide	*25.00*	*250 ml plastic*
Cadmium	*25.00*	*125 ml plastic*
Calcium	*25.00*	*125 ml plastic*
Carbonaceous Biological Oxygen Demand	*44.00*	*1 L plastic*
Corrositivity (Langelier Index)	*55.00*	*1 L plastic*
Chemical Oxygen Demand (COD)	*35.00*	*500 ml plastic*
Chloride	*25.00*	*125 ml plastic*
Chlorine Residual	*20.00*	*250 ml plastic*
Chromium (total)	*25.00*	*125 ml plastic*
Chromium VI*	*90.00*	*250 ml plastic w/$(NH_4)_2SO_4$*
Color	*15.00*	*250ml glass*
Conductivity	*20.00*	*250 ml plastic*
Copper	*25.00*	*125 ml plastic*
Cyanide	*45.00*	*250 ml plastic w/ NaOH*
Fluoride	*25.00*	*250 ml plastic*
General Physical (Color, Odor, Turbidity, pH)	*40.00*	*250 ml glass*
Hardness	*40.00*	*250 ml plastic*
Hydrogen Sulfide	*40.00*	*250 ml plastic w/ preserve.*
Iron	*25.00*	*125 ml plastic*
Lead	*25.00*	*125 ml plastic*
Lead & Copper Rule (Lead, Copper, Turbidity)	*40.00*	*1 L plastic*
Manganese	*25.00*	*125 ml plastic*
Magnesium	*25.00*	*125 ml plastic*
MBAS (Detergents)	*45.00*	*500 ml plastic*
Mercury	*35.00*	*125 ml plastic*
Nickel	*25.00*	*125 ml plastic*
Nitrate	*25.00*	*250 ml plastic*
Nitrite	*25.00*	*250 ml plastic*
Odor	*18.00*	*250 ml plastic*
Oil & Grease	*50.00*	*1 L glass*
Oxygen, Dissolved	*15.00*	*500 ml plastic*
Perchlorate**	*85.00*	*250 ml plastic*
PH	*15.00*	*250 ml plastic*
Phosphate (ortho)	*25.00*	*250 ml plastic*
Phosphorus, Total	*35.00*	*250 ml plastic*
Potassium	*25.00*	*250 ml plastic*
Selenium	*25.00*	*250 ml plastic*
Silica	*25.00*	*250 ml plastic*
Silver	*25.00*	*125 ml plastic*
Sodium	*25.00*	*250 ml plastic*
Sodium Absorption Ratio (SAR & adj SAR)	*60.00*	*250 ml plastic*
Sulfate	*25.00*	*250 ml plastic*
Settleable Solids	*17.00*	*1 L plastic*
Suspended Solids	*22.00*	*1 L plastic*

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****Samples with analysis needing to be completed after normal working hours (M-F, 830-530) may be charged double****

Total Dissolved Solids	*22.00*	*500 ml plastic*
Total Kjeldahl Nitrogen	*36.00*	*500 ml plastic*
Total Nitrogen (Includes NO3, NO2 & TKN)	*70.00*	*500 ml plastic*
Total Organic Carbon**	*65.00*	*3 x VOA w/ H3PO4*
Total Plate Count	*32.00*	*120 ml sterile*
Turbidity	*20.00*	*250 ml plastic*
Urea	*35.00*	*50 ml plastic (freeze)*
Volatile Solids	*32.00*	*500 ml plastic*
Zinc	*25.00*	*125 ml plastic*

** Samples are subcontracted to another certified laboratory for analysis.

Volume Discounts and Pricing - *Discounts are available based on a specific project or total volume over time.*

Sample Pickup - *Courier Service may be available– call for quotation*

Archived Report - *A $25 fee will be charged for retrieval of archived reports*

QA data package – *Call for quotation*

Sample Containers - *Sample containers are available at no charge*

Payment Terms

Our standard credit terms are Net 30 Days, *and are independent of when clients are reimbursed. Monterey Bay Analytical reserves the right to require payment in advance until a credit application has been approved. A client's initial credit limit may later be increased or decreased, based upon payment history. Accounts over 30 days are subject to 1.5% per month interest. Delinquent accounts are liable for legal costs and collection agency fees incurred by Monterey Bay Analytical Services in its efforts to eliminate the overdue balance. Prices are subject to change without notice.*

Limits of Liability

Monterey Bay Analytical Services performs all of its services in a professional manner using generally accepted analytical methods. These methods are published by recognized sources such as the U.S. Environmental Protection Agency, the American Water Works Association, and the Water Environment Federation. In selecting Monterey Bay Analytical Services to perform analysis, our clients recognize that all samples and sampling events are unique, and that not all samples can be successfully analyzed by generally accepted methods. If analysis proves unsuccessful, the total liability of Monterey Bay Analytical Services shall not exceed the invoiced amount for the services provided. This Limit of Liability shall supersede all clauses to the contrary, implied or otherwise, in any client purchase order or contract, unless different terms are authorized in advance in writing by the director of the Laboratory.

OILFIELD ENVIRONMENTAL AND COMPLIANCE, INC.

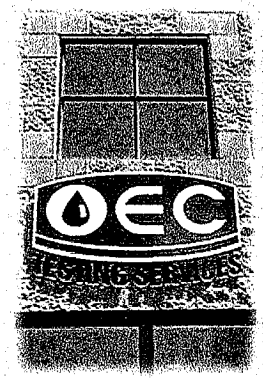
Complete Field, Laboratory and Regulatory Compliance

Irrigated Lands Order (Ag Waiver) Ground Water Sampling, Analysis, and Reporting Services

OEC will offers all Tier 1, 2, and 3 agriculture operations a complete turnkey program to comply with Water Boards requirements for ground water sampling, analysis, and reporting.

All services offered by OEC are structured to provide each client with specific, legally defensible solutions to their individual requirements and objectives, utilizing methods and procedures adopted by the Water Board.

- ***Oilfield Environmental & Compliance (OEC) is the ONLY full-service environmental laboratory located on the Central Coast of California***
- ***CALDHS ELAP Certification #2438***
- ***10,000+ sq ft facility in Santa Maria, CA***
- ***Over 40 full-time staff***
- ***Senior Management averages 15+ years of experience***
- ***Trained and OSHA Certified Field Service Technicians***



Pricing of Services:

- ***Sampling*** ***$ 35.00 per well***
- ***Depth to water*** ***$ 15.00 per well (construction of well permitting)***
- ***Field pH*** ***$ 10.00 per well***
- ***Analysis of well water $ 85.00 per well (EC, TDS, Alkalinity, Ca, Mg, K, Na, Sodium, Chloride, and Nitrate as NO3)***
- ***GeoTracker reporting $ 25.00 per well***
- ***Preparation of Report $ 180.00/max per well (As described in part 2 of the monitoring order)***

See back of handout for information included in Discharger Report

Please feel free to contact OEC with and questions regarding our program or to schedule sampling.

307 Roemer Way, Suite 300 Santa Maria, CA 93454
(805) 922-4772 Phone (805) 925-3376 Fax
WWW.oecusa.com

individual groundwater monitoring provisions shall apply and the Discharger shall have one (1) year to comply with the provisions identified in Part 2.

B. Individual Groundwater Reporting

1. **By October 1, 2013**, Dischargers must submit groundwater monitoring results and information, electronically, in a format specified by the Executive Officer. Dischargers must include the following information:
   a. Signed transmittal letter;
   b. Number of groundwater wells present at each farm/ranch;
   c. Identification of any groundwater wells abandoned or destroyed (including method destroyed) in compliance with the Order;
   d. Owner-assigned well identification;
   e. State identification number, if available;
   f. Well location (latitude and longitude);
   g. Water-use category (e.g., domestic drinking water, agricultural);
   h. Identification of primary irrigation well;
   i. Well construction information (e.g., total depth, screened intervals, depth to water), as available;
   j. Use for fertigation or chemigation;
   k. Presence and type of back flow prevention devices;
   l. Photo-documentation of well condition and back flow prevention device;
   m. Identification of wells sampled to comply with the Order and MRP;
   n. Laboratory data must be compatible with the Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) Program, and GeoTracker electronic deliverable format (EDF).

Exhibit 22

J) Farm Water Quality Management Practices Form

Farm Operation/Business Name_____ AW #:_____

Pesticide Use Permit #:_____

Key

3 – YES
2 – NO, but planned within 3 years
1 – NO and not planned
N/A – Not applicable

- *Use the Key to determine your level of implementation and planning for the individual management practices.*
- *Circle the corresponding number next to the management practice.*

PESTICIDE MANAGEMENT

3 2 1 N/A P.1) Is an Integrated Pest Management program established?

3 2 1 N/A P.2) Are pest populations assessed and pesticides applied based on scouting data, threshoids and/or risk assessment models?

3 2 1 N/A P.3) Are introduced or managed biological control agents utilized?

3 2 1 N/A P.4) Does pesticide selection consider runoff or leaching potential?

3 2 1 N/A P.5) Does pesticide selection consider toxicity to non-target organisms?

3 2 1 N/A P.6) Is pesticide application equipment regularly inspected, maintained and calibrated to ensure appropriate application rates and distribution?

3 2 1 N/A P.7) Is yearly pesticide training provided for all pesticide handlers who apply, load, mix, transport, clean and repair pesticide application equipment?

3 2 1 N/A P.8) Do pesticide storage facilities have concrete pads and curbs for containment of spills?

3 2 1 N/A P.9) Are pesticide mixing and loading areas located in such a manner to reduce the likelihood of a spill or overflow contaminating a water source?

3 2 1 N/A P.10) Are production wells on elevated concrete bases upslope of pesticide storage and handling facilities?

3 2 1 N/A P.11) Does wellhead protection consist of an elevated concrete seal, sump, or buffer area of 100' around the wellhead and a backflow prevention device?

IRRIGATION WATER MANAGEMENT

3 2 1 N/A I.1) Is drip irrigation distribution uniformity maximized and maintained through regular system equipment and system pressure maintenance?

3 2 1 N/A I.2) Is sprinkler and micro-sprinkler irrigation distribution uniformity maximized and maintained through regular system pressure maintenance and water application during low wind conditions?

3 2 1 N/A I.3) Is furrow and flood irrigation distribution uniformity maximized and maintained by either managing furrow lengths, installing surge irrigation valves, installing irrigation field ditches, or using alternate row irrigation?

3 2 1 N/A I.4) Is your irrigation system design optimized by matching sprinkler nozzle/drip applicator flow rates to the infiltration rate of the soil?

3 2 1 N/A I.5) Are measured or published evapo-transpiration data (CIMIS) used to determine crop water use?

3 2 1 N/A I.6) Is the soil water-holding capacity known?

3 2 1 N/A I.7) Are records kept for each crop irrigated? (Records include the date, amount of each irrigation water applied and the source of water used).

3 2 1 N/A I.8) Have all irrigators who apply irrigation water and maintain irrigation systems received training?

3 2 1 N/A I.9) Has an irrigation mobile lab system evaluation been completed and the system been adjusted accordingly?

Key
3 – YES
2 – NO, but planned within 3 years
1 – NO and not planned
N/A – Not applicable

- *Use the Key to determine your level of implementation and planning for the individual management practices.*
- *Circle the corresponding number next to the management practice.*

EROSION AND SEDIMENT CONTROL MANAGEMENT

3 2 1 N/A	E.1) Are cover crops used to protect bare soil from erosion during fallow cycles and to build up soil organic matter as a crop rotation?
3 2 1 N/A	E.2) Are hedgerows, trees, and shrubs established along field margins or between field blocks to reduce wind effects and protect slopes from erosion?
3 2 1 N/A	E.3) Are farm access roads located and graded to minimize erosion potential?
3 2 1 N/A	E.4) Are farm access roads protected from concentrated runoff through the use of vegetative material, gravel, and/or mulch?
3 2 1 N/A	E.5) Are ditches and channel banks protected from concentrated flow through the use of grassed waterways, lined channels, and/or diversions?
3 2 1 N/A	E.6) Are field layout and row length designed to minimize erosion potential?
3 2 1 N/A	E.7) Are sediment basins constructed to intercept sediment-laden runoff in locations where erosion is expected and sediment is known to leave the farm?
3 2 1 N/A	E.8) Are water and sediment control basins used in locations where sediment and excess runoff may cause gullies or flooding problems downstream?
3 2 1 N/A	E.9) Are vegetative buffers implemented between cropped areas, along the lower edge of the farm, and along roadways? *(This practice is also effective in removing nutrients and pesticides from runoff)*
3 2 1 N/A	E.10) Where streams cross or border property are riparian buffers established and maintained?
3 2 1 N/A	E.11) Are culverts properly sized and maintained?
3 2 1 N/A	E.12) Are implemented management practices evaluated for effectiveness (i.e photo-point monitoring, water quality testing)?

NUTRIENT MANAGEMENT

3 2 1 N/A	N.1) Are the crop's nutrient requirements known and are nutrient budgets established and recorded?
3 2 1 N/A	N.2) Do you test irrigation water for nitrogen content and incorporate that information into your fertilization program?
3 2 1 N/A	N.3) Is plant tissue analysis used to aid in fertilizer decisions?
3 2 1 N/A	N.4) Do you test your soil for residual nitrogen and incorporate that information into your fertilization program?
3 2 1 N/A	N.5) If fertigation is used are measures in place to ensure that there is no backflow into wells or other water sources?
3 2 1 N/A	N.6) Do you regularly maintain and calibrate your fertilizer equipment?
3 2 1 N/A	N.7) Do field personnel receive nutrient management training?
3 2 1 N/A	N.8) Do fertilizer storage facilities include concrete pads and curbs for containment of spills and are they protected from weather?
3 2 1 N/A	N.9) Is mixing and loading performed on sites with low runoff hazard, over 100' downslope of wells?

ADDITIONAL MANAGEMENT PRACTICES

Are any management practices implemented and/or planned for this farm operation that are not listed above? YES NO

If YES, please list below.

_____

_____

_____

Exhibit 23

GROWER REQUIREMENTS | HELP / INSTRUCTIONS

AGRICULTURAL REGULATORY PROGRAM - ANNUAL COMPLIANCE INFO

Name of Operation: **Test Operation (AW9999) -** VIEW OPERATION FORM

Ranch / Farm Name: **Test Farm 3 (Global ID: AGL020013962)**

Section A: General Requirements

Is the information reported in the electronic Notice of Intent (eNOI) accurate and up to date for this ranch/farm? ○ YES ○ NO

Section B: Irrigation Water

What are the primary source(s) of irrigation water on this ranch/farm?:
(check all that apply)

- ☐ Groundwater (Well on Farm)
- ☐ Groundwater (Well off Site)
- ☐ Surface water (Creek or Pond)
- ☐ Recycled water (From On-site or from Purple Pipe)
- ☐ Imported Water (Agency Delivered Water)
- ☐ City Water
- ☑ Spring

What is the maximum Nitrate Concentration (Nitrate as NO3 in mg/L) of the primary irrigation water source on this ranch/farm?

What method was used to determine the maximum Nitrate Concentration (Nitrate as NO3 in mg/L)?

Section C: Groundwater Nitrate Loading Risk Determination

State if the the nitrate loading risk was determined for the ranch/farm or individual units? * For Individual Risk Units, you must upload a spreadsheet to report results

Which method was used to determine the nitrate loading risk for this ranch/farm? (see instructions for Individual Risk Unit reporting)

For BOTH Method 1 and Method 2, identify the crop type used for the determination

For Method 2 ONLY, identify the soil series used for the determination

Report Results of the Nitrate Loading Risk Determination for this ranch/farm:

- Method 1 Results
- Method 2 Results

Section D: Stormwater Discharge Characteristics

Does stormwater leave this ranch / farm? ○ YES ○ NO

If YES, under what conditions does stormwater leave this ranch/farm during storm events?

Section E: Irrigation Discharge Characteristics

Does irrigation runoff leave this ranch / farm? ○ YES ○ NO

If YES provide the following information:

- Where is the closest drainage point from this ranch/farm to any surface water body (e.g., Stream, Lake, Bay, and/or Ocean)?
- State the estimated total number of days/year when irrigation runs off/leaves this ranch / farm at any location(s).
- State the primary season when irrigation runoff leaves this ranch / farm.
- State the estimated maximum total volume of irrigation runoff leaving from your ranch / farm on the highest flow day of the year. Report in gallons per day.

Section F: Tile Drain Discharge Characteristics

Does tile drain water leave this ranch / farm? ○ YES ○ NO

If YES provide the following information:

- Where is the closest drainage point from this ranch/farm to any surface water body (e.g., Stream, Lake, Bay, and/or Ocean)?
- State the estimated total number of days/year when tile drain water leaves this ranch / farm at any location(s).
- State the primary season when tile drain water leaves this ranch / farm.
- State the total estimated maximum volume of tile drain water leaving from your ranch / farm on the highest flow day of the year. Report in gallons per day.

Section G: Water Containment Characteristics

Are there water containment structure(s) (i.e., ponds, reservoirs) on this ranch/farm? ○ YES ○ NO

If YES, state the type of treatment or control that is used to minimize and/or prevent the percolation of waste to groundwater.

Section H: Water Quality Management Practices (select all that apply)

Nutrient Management - Practice Implementation

Identify nutrient management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- ☐ None
- ☐ Evaluated how much fertilizer crop needs and timing of application.
- ☐ Scheduled fertilizer applications to match crop requirements.
- ☐ Measured nitrogen concentration in irrigation water and adjusted fertilizer nitrogen applications accordingly.
- ☐ Measured soil nitrate or soil solution nitrate and adjusted fertilizer nitrogen applications accordingly.
- ☐ Measured nitrogen in plant tissue and adjusted fertilizer phosphorus applications.
- ☐ Measured phosphorus in soil and adjusted fertilizer phosphorus applications.
- ☐ Measured nitrogen and phosphorous content of applied manures and other organic amendments.
- ☐ Used urease inhibitors and/or nitrification inhibitors.
- ☐ Modified crop rotation to use cover crops, deep rooted species, or perennials to utilize nitrogen.
- ☐ Used treatment systems to remove nitrogen from irrigation runoff or drainage water (e.g. wood chip bioreactor).
- ☐ Mixed and loaded fertilizers on low runoff hazard sites (e.g. away from creeks and wells)
- ☐ Other, describe in Farm Plan and submit upon request.

Nutrient Management - Practice Assessment

Identify methods used to assess the effectiveness of the implemented management measure(s) / practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- ☐ Not Assessed
- ☐ Compared amount of nitrogen applied in fertilizer and in irrigation water to crop need.
- ☐ Measured nitrate concentration below the root zone.
- ☐ Measured nitrate concentration in irrigation runoff.
- ☐ Estimated/measured nitrate load in irrigation runoff.
- ☐ Measured nitrate concentration in surface receiving water.
- ☐ Estimated/measured nitrate load in surface receiving water.
- ☐ Estimated/measured nitrate loading to groundwater.
- ☐ Measured nitrate concentration in groundwater.
- ☐ Modeled or studied nitrate in surface water or groundwater.
- ☐ Consulted Certified Crop Advisor (CCA), UCCE specialist, agronomist, or other similarly qualified professional.
- ☐ Other, describe in Farm Plan and submit upon request.

Nutrient Management - Practice Outcome(s)

Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- ☐ None
- ☐ Annual fertilizer nitrogen application reduced.
- ☐ Total nitrogen applied as fertilizer and in irrigation water matches crop need.
- ☐ Reduction in nitrate concentration or load, in irrigation runoff.
- ☐ Reduction in nitrate concentration or load, in surface receiving water.
- ☐ Reduction in nitrate loading to groundwater.
- ☐ Reduction in nitrate concentration in groundwater.
- ☐ Water quality standards achieved.
- ☐ Other, describe in Farm Plan and submit upon request.

Irrigation Management - Practice Implementation

Identify irrigation management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- ☐ None
- ☐ Determined amount of crop water uptake and applied irrigation water accordingly.
- ☐ Installed more efficient irrigation system (e.g. microirrigation).
- ☐ Improved irrigation distribution uniformity (DU) based on results of mobile lab or similar assessment.
- ☐ Scheduled irrigation events using soil moisture measurements.

- [ ] Scheduled irrigation events using weather information.
- [ ] Maintained irrigation system to maximize efficiency and minimize losses (e.g. system components are replaced and/or flushed/cleaned).
- [ ] Selected sprinkler heads,nozzles, and drip tape/emitter with application rate(s) that match system layout, system pressure, and infiltration rates.
- [ ] Recycled or reused excess irrigation water.
- [ ] Contained and/or treated irrigation water runoff prior to discharge off the farm/ranch.
- [ ] Other, describe in Farm Plan and submit upon request.

Irrigation Management - Practice Assessment
Identify methods used to assess the effectiveness of the implemented management measure(s)/practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not Assessed
- [ ] Walked the perimeter of the property and cropped areas to verify irrigation runoff has been reduced or eliminated.
- [ ] Recorded amount of irrigation water applied.
- [ ] Recorded and reduced number of tailwater days/year.
- [ ] Compared amount of irrigation water applied to crop water uptake
- [ ] Estimated/measured volume of irrigation runoff.
- [ ] Conducted field quick tests or used handheld meters to determine pollutant concentrations in irrigation runoff or tile drain water.
- [ ] Conducted laboratory analysis to determine pollutant concentrations in irrigation runoff.
- [ ] Modeled or studied amount of irrigation water losses (runoff or percolation).
- [ ] Conducted photo monitoring before and after practice implementation.
- [ ] Consulted Certified Crop Advisor (CCA), UCCE specialist, agronomist, or other similarly qualified professional.
- [ ] Other, describe in Farm Plan and submit upon request.

Irrigation Management - Practice Outcome(s)
Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [ ] Volume of water applied matches crop needs.
- [ ] Annual volume of irrigation water applied reduced.
- [ ] Number of tailwater days/year reduced.
- [ ] Reduction in volume of irrigation runoff.
- [ ] Elimination of irrigation runoff.
- [ ] Reduction in volume of tile drain discharge.
- [ ] Reduction in water infiltration/percolation losses.
- [ ] Reduction in pollutant concentration in irrigation runoff and/or tile drain discharge.
- [ ] Water quality standards achieved.
- [ ] Other, describe in Farm Plan and submit upon request.

Pesticide Management - Practice Implementation
Identify pesticide management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- [ ] None
- [ ] Utilized Integrated Pest Management practices to reduce pesticide use (e.g., pest scouting, other).
- [ ] Applied only organic pesticides.
- [ ] Selected lower risk pesticides to minimize risk to water quality (e.g. based on toxicity, runoff potential, leaching potential).
- [ ] Followed specific label instructions and any local use restrictions.
- [ ] Avoided pesticide applications prior to rain events to prevent runoff.
- [ ] Avoided pesticide applications during windy conditions to prevent drift.
- [ ] Avoided pesticide application in areas adjacent to streams, creeks, or other surface water bodies.
- [ ] Eliminated or controlled irrigation runoff during and after pesticide applications.
- [ ] Eliminated or controlled sediment erosion and movement to avoid transport of pesticides.
- [ ] Treated irrigation runoff with enzymes or other products to breakdown pesticides.
- [ ] Used filter strips, vegetated treatment or other systems to remove pesticides and pollutants from irrigation runoff or tile drain water.
- [ ] Mixed and loaded pesticides on low runoff hazard sites (e.g. away from creeks and wells)
- [ ] Other, describe in Farm Plan and submit upon request.

Pesticide Management - Practice Assessment
Identify methods used to assess the effectiveness of the implemented management measure(s)/practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not assessed
- [ ] Conducted field quick tests or used handheld meters to determine pesticide concentrations or toxicity in irrigation runoff or tile drain water.
- [ ] Conducted laboratory analysis to determine pesticide concentrations or toxicity in irrigation runoff.
- [ ] Measured pesticide concentrations or toxicity in surface receiving water.
- [ ] Measured pesticide concentrations or toxicity in tile drain water
- [ ] Modeled or studied pesticides or toxicity in surface water or groundwater.
- [ ] Conducted photo monitoring before and after practice implementation.
- [ ] Consulted Pesticide Control Advisor (PCA), Certified Crop Advisor (CCA), UCCE specialist, agronomist, or other similarly qualified professional.
- [ ] Other, describe in farm plan and submit upon request.

Pesticide Management - Practice Outcome(s)
Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [ ] Annual pesticide application reduced.
- [ ] Reduction in pesticide concentration or toxicity in irrigation runoff.
- [ ] Reduction in pesticide concentration or toxicity in surface receiving water.
- [ ] Water quality standards achieved.
- [ ] Other, describe in farm plan and submit upon request.

Sediment Management - Practice Implementation
Identify pesticide management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- [ ] None
- [ ] Avoided disturbance of soils adjacent to streams, creeks, and other surface water bodies.
- [ ] Minimized presence of bare soil in non-cropped areas.
- [ ] Minimized presence of bare soil in cropped areas.
- [ ] Minimized tillage to protect soil structure and cover soil.
- [ ] Used soil amendments to protect soil structure.
- [ ] Planted cover crops.
- [ ] Aligned rows for proper drainage and to reduce erosion.
- [ ] Diverted runoff and concentrated flows to grassed areas.
- [ ] Controlled concentrated drainage on roads by grading to reduce erosion or installing culverts, rolling dips, underground outlet pipe(s).
- [ ] Installed filter strips, vegetated treatment or other systems to remove sediment and other pollutants from runoff.
- [ ] Installed sediment basin(s), pond(s), reservoir(s) or other sediment trapping structures to remove sediments from discharge
- [ ] Applied Polyacrylamide (PAM) in irrigation water
- [ ] Other, describe in farm plan and submit upon request.

Sediment Management - Practice Assessment
Identify methods used to assess the effectiveness of the implemented management measure(s)/practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not Assessed
- [ ] Walked the perimeter of the property to verify erosion controls and that sediment doesn't leave the ranch/farm during irrigation events and/or storm events.
- [ ] Conducted laboratory analysis, field quick tests or used handheld meters to measure turbidity in irrigation runoff.
- [ ] Estimated sediment load in irrigation and.or stormwater runoff.
- [ ] Conducted laboratory analysis, field quick tests or used handheld meters to measure turbidity in stormwater runoff.
- [ ] Modeled or studied sediment load in surface water.
- [ ] Conducted photo monitoring before and after practice implementation.
- [ ] Consulted Natural Resource Conservation Service (NRCS), Resource Conservation District (RCD), UCCE specialist, or other similarly qualified professional.
- [ ] Other, describe in farm plan and submit upon request.

Sediment Management - Practice Outcome(s)
Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [ ] Soil coverage increased and amount of bare soil reduced.
- [ ] Reduction in turbidity or sediment load in irrigation runoff.
- [ ] Reduction in turbidity or sediment load in stormwater runoff.

- [ ] Reduction in turbidity or sediment load in surface receiving water.
- [ ] Reduction in stormwater flow and/or volume.
- [ ] Water quality standards achieved.
- [ ] Other, describe in farm plan and submit upon request.

Section I: Cooperative Projects

Is this ranch/farm participating in a specific cooperative water quality improvement project? ○ YES ○ NO

If YES provide the following information:

Identify the type of project. _____

Describe the scale of the project. _____

Section J: Related Permits

Has any work activity been completed in or near a river, stream, or lake that flows at least intermittently through a bed or channel, within the last 12 months on this ranch / farm, ? (includes water diversions and routine maintenance of canals, channels, culverts, and ditches) ○ YES ○ NO

If YES, was a Lake or Streambed Alteration Agreement obtained from the California Department of Fish and Game? ○ YES ○ NO

Section K: Photo Monitoring

Photo monitoring is required for Tier 2 and Tier 3 ranches/farms that contain or are adjacent to a waterbody impaired for temperature, turbidity, or sediment (applies to this ranch/farm if the words Monitoring Required are seen next to the title). Photos must be maintained in the Farm Plan and submitted to the Water Board, upon request. Refer to Photo Monitoring protocols at the following website: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/ag_waivers/index.shtml

If required, has photo monitoring been conducted for this ranch or farm? ○ YES ○ NO

Proprietary Information

Information related to trade secrets or secret processes are exempt from public disclosure pursuant to Water Code §13267. If the Discharger asserts that all or a portion of a report submitted is exempt from public disclosure the Discharger must provide an explanation of how those portions of the reports are exempt from public disclosure.

Does this Annual Compliance Form contain information related to trade secrets or secret processes)? ○ YES ○ NO

Authorization and Certification

By submitting this Annual Compliance Form, in compliance with Water Code section 13267, I certify under penalty of perjury that this document and all attachments were prepared by me, or under my direction or supervision, following a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, this document and all attachments are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Save Changes

GROWER REQUIREMENTS | HELP / INSTRUCTIONS

AGRICULTURAL REGULATORY PROGRAM - ANNUAL COMPLIANCE INFO

Name of Operation: **Test Operation (AW9999) -** VIEW OPERATION FORM

Ranch / Farm Name: **Test Farm 1 (Global ID: AGL020006840)**

Section A: General Requirements

Is the information reported in the electronic Notice of Intent (eNOI) accurate and up to date for this ranch/farm? (●) YES ( ) NO

Section B: Irrigation Water

What are the primary source(s) of irrigation water on this ranch/farm?:
(check all that apply)

- [x] Groundwater (Well on Farm)
- [ ] Groundwater (Well off Site)
- [ ] Surface water (Creek or Pond)
- [ ] Recycled water (From On-site or from Purple Pipe)
- [ ] Imported Water (Agency Delivered Water)
- [ ] City Water
- [ ] Spring

What is the maximum Nitrate Concentration (Nitrate as NO3 in mg/L) of the primary irrigation water source on this ranch/farm?	0 - 45 mg/L Nitrate NO3
What method was used to determine the maximum Nitrate Concentration (Nitrate as NO3 in mg/L)?	Laboratory Analysis

Section C: Groundwater Nitrate Loading Risk Determination

State if the the nitrate loading risk was determined for the ranch/farm or individual units? * For Individual Risk Units, you must upload a spreadsheet to report results	Ranch / Farm
Which method was used to determine the nitrate loading risk for this ranch/farm? (see instructions for Individual Risk Unit reporting)	2 - Nitrate Groundwater Pollution Hazard Index (HI)
For BOTH Method 1 and Method 2, identify the crop type used for the determination	Alfalfa Hay
For Method 2 ONLY, identify the soil series used for the determination	Abra
Report Results of the Nitrate Loading Risk Determination for this ranch/farm:	
Method 1 Results	
Method 2 Results	Low (<= 20)

Section D: Stormwater Discharge Characteristics

Does stormwater leave this ranch / farm?	(●) YES ( ) NO
If YES, under what conditions does stormwater leave this ranch/farm during storm events?	During most rain events

Section E: Irrigation Discharge Characteristics

Does irrigation runoff leave this ranch / farm?	(●) YES ( ) NO
If YES provide the following information:	
Where is the closest drainage point from this ranch/farm to any surface water body (e.g., Stream, Lake, Bay, and/or Ocean)?	Not applicable
State the estimated total number of days/year when irrigation runs off/leaves this ranch / farm at any location(s).	<30
State the primary season when irrigation runoff leaves this ranch / farm.	Summer (June 21 - September 20)
State the estimated maximum total volume of irrigation runoff leaving from your ranch / farm on the highest flow day of the year. Report in gallons per day.	<500

Section F: Tile Drain Discharge Characteristics

Does tile drain water leave this ranch / farm?	(●) YES ( ) NO
If YES provide the following information:	
Where is the closest drainage point from this ranch/farm to any surface water body (e.g., Stream, Lake, Bay, and/or Ocean)?	Not applicable
State the estimated total number of days/year when tile drain water leaves this ranch / farm at any location(s).	<30
State the primary season when tile drain water leaves this ranch / farm.	Summer (June 21 - September 20)
State the total estimated maximum volume of tile drain water leaving from your ranch / farm on the highest flow day of the year. Report in gallons per day.	<500

Section G: Water Containment Characteristics

Are there water containment structure(s) (i.e., ponds, reservoirs) on this ranch/farm? (●) YES ( ) NO

If YES, state the type of treatment or control that is used to minimize and/or prevent the percolation of waste to groundwater.

Not applicable (water quality data indicates no wastes present)

Section H: Water Quality Management Practices (select all that apply)

Nutrient Management - Practice Implementation

Identify nutrient management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- [ ] None
- [x] Evaluated how much fertilizer crop needs and timing of application.
- [x] Scheduled fertilizer applications to match crop requirements.
- [x] Measured nitrogen concentration in irrigation water and adjusted fertilizer nitrogen applications accordingly.
- [ ] Measured soil nitrate or soil solution nitrate and adjusted fertilizer nitrogen applications accordingly.
- [ ] Measured nitrogen in plant tissue and adjusted fertilizer phosphorus applications.
- [ ] Measured phosphorus in soil and adjusted fertilizer phosphorus applications.
- [ ] Measured nitrogen and phosphorous content of applied manures and other organic amendments.
- [ ] Used urease inhibitors and/or nitrification inhibitors.
- [ ] Modified crop rotation to use cover crops, deep rooted species, or perennials to utilize nitrogen.
- [ ] Used treatment systems to remove nitrogen from irrigation runoff or drainage water (e.g. wood chip bioreactor).
- [ ] Mixed and loaded fertilizers on low runoff hazard sites (e.g. away from creeks and wells)
- [ ] Other, describe in Farm Plan and submit upon request.

Nutrient Management - Practice Assessment

Identify methods used to assess the effectiveness of the implemented management measure(s) / practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not Assessed
- [x] Compared amount of nitrogen applied in fertilizer and in irrigation water to crop need.
- [x] Measured nitrate concentration below the root zone.
- [x] Measured nitrate concentration in irrigation runoff.
- [ ] Estimated/measured nitrate load in irrigation runoff.
- [ ] Measured nitrate concentration in surface receiving water.
- [ ] Estimated/measured nitrate load in surface receiving water.
- [ ] Estimated/measured nitrate loading to groundwater.
- [ ] Measured nitrate concentration in groundwater.
- [ ] Modeled or studied nitrate in surface water or groundwater.
- [ ] Consulted Certified Crop Advisor (CCA), UCCE specialist, agronomist, or other similarly qualified professional.
- [ ] Other, describe in Farm Plan and submit upon request.

Nutrient Management - Practice Outcome(s)

Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [x] Annual fertilizer nitrogen application reduced.
- [x] Total nitrogen applied as fertilizer and in irrigation water matches crop need.
- [x] Reduction in nitrate concentration or load, in irrigation runoff.
- [ ] Reduction in nitrate concentration or load, in surface receiving water.
- [ ] Reduction in nitrate loading to groundwater.
- [ ] Reduction in nitrate concentration in groundwater.
- [ ] Water quality standards achieved.
- [ ] Other, describe in Farm Plan and submit upon request.

Irrigation Management - Practice Implementation

Identify irrigation management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- [ ] None
- [x] Determined amount of crop water uptake and applied irrigation water accordingly.
- [x] Installed more efficient irrigation system (e.g. microirrigation).
- [x] Improved irrigation distribution uniformity (DU) based on results of mobile lab or similar assessment.
- [ ] Scheduled irrigation events using soil moisture measurements.

- [ ] Scheduled irrigation events using weather information.
- [ ] Maintained irrigation system to maximize efficiency and minimize losses (e.g. system components are replaced and/or flushed/cleaned).
- [ ] Selected sprinkler heads,nozzles, and drip tape/emitter with application rate(s) that match system layout, system pressure, and infiltration rates.
- [ ] Recycled or reused excess irrigation water.
- [ ] Contained and/or treated irrigation water runoff prior to discharge off the farm/ranch.
- [ ] Other, describe in Farm Plan and submit upon request.

Irrigation Management - Practice Assessment
Identify methods used to assess the effectiveness of the implemented management measure(s)/practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not Assessed
- [x] Walked the perimeter of the property and cropped areas to verify irrigation runoff has been reduced or eliminated.
- [x] Recorded amount of irrigation water applied.
- [x] Recorded and reduced number of tailwater days/year.
- [ ] Compared amount of irrigation water applied to crop water uptake
- [ ] Estimated/measured volume of irrigation runoff.
- [ ] Conducted field quick tests or used handheld meters to determine pollutant concentrations in irrigation runoff or tile drain water.
- [ ] Conducted laboratory analysis to determine pollutant concentrations in irrigation runoff.
- [ ] Modeled or studied amount of irrigation water losses (runoff or percolation).
- [ ] Conducted photo monitoring before and after practice implementation.
- [ ] Consulted Certified Crop Advisor (CCA), UCCE specialist, agronomist, or other similarly qualified professional.
- [ ] Other, describe in Farm Plan and submit upon request.

Irrigation Management - Practice Outcome(s)
Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [x] Volume of water applied matches crop needs.
- [x] Annual volume of irrigation water applied reduced.
- [x] Number of tailwater days/year reduced.
- [ ] Reduction in volume of irrigation runoff.
- [ ] Elimination of irrigation runoff.
- [ ] Reduction in volume of tile drain discharge.
- [ ] Reduction in water infiltration/percolation losses.
- [ ] Reduction in pollutant concentration in irrigation runoff and/or tile drain discharge.
- [ ] Water quality standards achieved.
- [ ] Other, describe in Farm Plan and submit upon request.

Pesticide Management - Practice Implementation
Identify pesticide management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- [ ] None
- [x] Utilized Integrated Pest Management practices to reduce pesticide use (e.g., pest scouting, other).
- [x] Applied only organic pesticides.
- [x] Selected lower risk pesticides to minimize risk to water quality (e.g. based on toxicity, runoff potential, leaching potential).
- [ ] Followed specific label instructions and any local use restrictions.
- [ ] Avoided pesticide applications prior to rain events to prevent runoff.
- [ ] Avoided pesticide applications during windy conditions to prevent drift.
- [ ] Avoided pesticide application in areas adjacent to streams, creeks, or other surface water bodies.
- [ ] Eliminated or controlled irrigation runoff during and after pesticide applications.
- [ ] Eliminated or controlled sediment erosion and movement to avoid transport of pesticides.
- [ ] Treated irrigation runoff with enzymes or other products to breakdown pesticides.
- [ ] Used filter strips, vegetated treatment or other systems to remove pesticides and pollutants from irrigation runoff or tile drain water.
- [ ] Mixed and loaded pesticides on low runoff hazard sites (e.g. away from creeks and wells)
- [ ] Other, describe in Farm Plan and submit upon request.

Pesticide Management - Practice Assessment
Identify methods used to assess the effectiveness of the implemented management measure(s)/practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not assessed
- [x] Conducted field quick tests or used handheld meters to determine pesticide concentrations or toxicity in irrigation runoff or tile drain water.
- [x] Conducted laboratory analysis to determine pesticide concentrations or toxicity in irrigation runoff.
- [x] Measured pesticide concentrations or toxicity in surface receiving water.
- [ ] Measured pesticide concentrations or toxicity in tile drain water
- [ ] Modeled or studied pesticides or toxicity in surface water or groundwater.
- [ ] Conducted photo monitoring before and after practice implementation.
- [ ] Consulted Pesticide Control Advisor (PCA), Certified Crop Advisor (CCA), UCCE specialist, agronomist, or other similarly qualified professional.
- [ ] Other, describe in farm plan and submit upon request.

Pesticide Management - Practice Outcome(s)
Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [x] Annual pesticide application reduced.
- [x] Reduction in pesticide concentration or toxicity in irrigation runoff.
- [x] Reduction in pesticide concentration or toxicity in surface receiving water.
- [ ] Water quality standards achieved.
- [ ] Other, describe in farm plan and submit upon request.

Sediment Management - Practice Implementation
Identify pesticide management measure(s)/practice(s) implemented on this ranch / farm to protect water quality in the last 12 months.

- [ ] None
- [x] Avoided disturbance of soils adjacent to streams, creeks, and other surface water bodies.
- [x] Minimized presence of bare soil in non-cropped areas.
- [x] Minimized presence of bare soil in cropped areas.
- [ ] Minimized tillage to protect soil structure and cover soil.
- [ ] Used soil amendments to protect soil structure.
- [ ] Planted cover crops.
- [ ] Aligned rows for proper drainage and to reduce erosion.
- [ ] Diverted runoff and concentrated flows to grassed areas.
- [ ] Controlled concentrated drainage on roads by grading to reduce erosion or installing culverts, rolling dips, underground outlet pipe(s).
- [ ] Installed filter strips, vegetated treatment or other systems to remove sediment and other pollutants from runoff.
- [ ] Installed sediment basin(s), pond(s), reservoir(s) or other sediment trapping structures to remove sediments from discharge
- [ ] Applied Polyacrylamide (PAM) in irrigation water
- [ ] Other, describe in farm plan and submit upon request.

Sediment Management - Practice Assessment
Identify methods used to assess the effectiveness of the implemented management measure(s)/practice(s), to reduce or eliminate the discharge of pollutants from this ranch / farm in the last 12 months.

- [ ] Not Assessed
- [x] Walked the perimeter of the property to verify erosion controls and that sediment doesn't leave the ranch/farm during irrigation events and/or storm events.
- [x] Conducted laboratory analysis, field quick tests or used handheld meters to measure turbidity in irrigation runoff.
- [x] Estimated sediment load in irrigation and.or stormwater runoff.
- [ ] Conducted laboratory analysis, field quick tests or used handheld meters to measure turbidity in stormwater runoff.
- [ ] Modeled or studied sediment load in surface water.
- [ ] Conducted photo monitoring before and after practice implementation.
- [ ] Consulted Natural Resource Conservation Service (NRCS), Resource Conservation District (RCD), UCCE specialist, or other similarly qualified professional.
- [ ] Other, describe in farm plan and submit upon request.

Sediment Management - Practice Outcome(s)
Identify outcomes that demonstrate progress towards reducing or eliminating the discharge of pollutants off this ranch / farm in the last 12 months.

- [ ] None
- [x] Soil coverage increased and amount of bare soil reduced.
- [x] Reduction in turbidity or sediment load in irrigation runoff.
- [x] Reduction in turbidity or sediment load in stormwater runoff.

- [ ] Reduction in turbidity or sediment load in surface receiving water.
- [ ] Reduction in stormwater flow and/or volume.
- [ ] Water quality standards achieved.
- [ ] Other, describe in farm plan and submit upon request.

Section I: Cooperative Projects

Is this ranch/farm participating in a specific cooperative water quality improvement project? (●) YES ( ) NO

If YES provide the following information:

Identify the type of project.	Treatment
Describe the scale of the project.	Local area

Section J: Related Permits

Has any work activity been completed in or near a river, stream, or lake that flows at least intermittently through a bed or channel, within the last 12 months on this ranch / farm, ? (includes water diversions and routine maintenance of canals, channels, culverts, and ditches) (●) YES ( ) NO

If YES, was a Lake or Streambed Alteration Agreement obtained from the California Department of Fish and Game? (●) YES ( ) NO

Section K: Photo Monitoring

Photo monitoring is required for Tier 2 and Tier 3 ranches/farms that contain or are adjacent to a waterbody impaired for temperature, turbidity, or sediment (applies to this ranch/farm if the words Monitoring Required are seen next to the title). Photos must be maintained in the Farm Plan and submitted to the Water Board, upon request. Refer to Photo Monitoring protocols at the following website: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/ag_waivers/index.shtml

If required, has photo monitoring been conducted for this ranch or farm? (●) YES ( ) NO

Proprietary Information

Information related to trade secrets or secret processes are exempt from public disclosure pursuant to Water Code §13267. If the Discharger asserts that all or a portion of a report submitted is exempt from public disclosure the Discharger must provide an explanation of how those portions of the reports are exempt from public disclosure.

Does this Annual Compliance Form contain information related to trade secrets or secret processes)? (●) YES ( ) NO

If YES, identify the specific section in this Annual Compliance Form where this exempt information is contained and provide a brief justification:

Section - Brief justification

Authorization and Certification

By submitting this Annual Compliance Form, in compliance with Water Code section 13267, I certify under penalty of perjury that this document and all attachments were prepared by me, or under my direction or supervision, following a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, this document and all attachments are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Save Changes

Exhibit 24

CALIFORNIA FARM BUREAU FEDERATION
NATURAL RESOURCES AND ENVIRONMENTAL DIVISION
2300 RIVER PLAZA DRIVE, SACRAMENTO, CA 95833-3293 · PHONE (916) 561-5665 · FAX (916) 561-5691

Via US Mail and Email
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December 3, 2010

Jeffrey S. Young, Chairman of the Board
Roger Briggs, Executive Officer
California Regional Water Quality Control Board
Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

Re: ***Draft Central Coast Agriculture's Alternative Proposal for the Regulation of Discharges from Irrigated Agricultural Lands***

Dear Mr. Young and Mr. Briggs,

Please find the attached Draft Central Coast Agriculture's Alternative Proposal for the Regulation of Discharges from Irrigated Agricultural Lands submitted in response to the Central Coast Regional Water Quality Control Board's "Draft Agricultural Order, Draft Monitoring and Reporting Program, Staff Report, and Subsequent Environmental Impact Report for the Regulation of Waste Discharge from Irrigated Lands" released on November 15, 2010. This Draft Agricultural Proposal is submitted on behalf of 7 County Farm Bureaus, as well as numerous additional entities listed at the conclusion of the proposal. Given the draft nature of this agricultural proposal, the agricultural community respectfully requests future and continuing collaboration with Regional Board staff and Board members as a new discharge program is developed.

Sincerely,

Kari E. Fisher
Associate Counsel

cc w/attachments: John H. Hayashi, Board Member
David T. Hodgin, Board Member
Dr. Monica S. Hunter, Board Member
Russell M. Jeffries, Vice Chairman of the Board
Gary C. Shallcross, Board Member
Tom P. O'Malley, Board Member
Roger Briggs, Executive Director

Draft Central Coast Agriculture's Alternative Proposal for the Regulation of Discharges from Irrigated Agricultural Lands
December 3, 2010

Purpose of the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Agriculture Lands:

This Alternative Proposal presents an approach for regulating discharges from irrigated agricultural lands through the adoption of a Conditional Waiver of Waste Discharge Requirements, as authorized by Water Code section 13269, which requires dischargers who obtain coverage under the waiver to, in part,

> (1) Participate in a region-wide monitoring program that will conduct monitoring and report annually on monitoring results, including the identification of water quality benchmark exceedances;
> (2) Develop a confidential, proprietary farm water quality management plan (Farm Plan), which identifies management practices that will address water quality benchmark exceedances that stays on the farm;
> (3) Complete a Farm Water Quality Survey and submit it to the Regional Board;
> (4) Verification review of a statistically significant sample of Farm Water Quality Surveys per year by a third-party entity or the Regional Board to determine where educational and management practice implementation efforts should be focused;
> (4) Implement the Farm Plan and management practices to improve water quality; and
> (5) Assess the effectiveness of implemented agricultural management practices in attaining water quality benchmarks and, when necessary to attain water quality benchmarks, and identify, implement, or upgrade management practices.
> (6) Participate in the Ag Water Quality Coalition or conduct individual on-farm monitoring, if applicable.

This Proposal sets forth conditions that apply to discharges of waste from irrigated agricultural lands. This conditional waiver of waste discharge requirements constitutes the Central Coast Region Irrigated Lands Regulatory Program.

Legal and Regulatory Considerations:

Water Code section 13260(a)(1) requires that any person discharging waste or proposing to discharge waste within the Regional Board's jurisdiction that could affect the quality of the waters of the state, shall file a Report of Waste Discharge (ROWD) with the Regional Board. The Regional Board may, in its discretion, issue Waste Discharge Requirements (WDRs) pursuant to Water Code section 13263(a). Water Code section 13269 authorizes the Regional Board to conditionally waive provisions of Water Code sections 13260(a)(1) and 13263(a) as to a specific discharge or type of discharge.

Water Code section 13269 requires that any waiver of ROWDs and/or WDRs (Conditional Waiver) must (i) be consistent with any applicable water quality control plans (basin

plans); (ii) be "in the public interest;" (iii) contain conditions; (iv) expire after a five year term, but may be renewed in five-year increments; and (v) include monitoring provisions. In addition, Water Code section 13269(a)(4)(A) authorizes the State Water Resources Control Board (State Water Board) to adopt annual fees for recipients of waivers. Water Code section 13269(e) mandates that the Regional Water Boards shall require compliance with the conditions of a waiver of waste discharge requirements.

All requirements for monitoring and reporting are established pursuant to Water Code sections 13267 and 13269. These monitoring and reporting requirements are necessary to evaluate the following: (1) compliance with the terms and conditions of this Conditional Waiver of waste discharge requirements for discharges from irrigated agriculture lands; (2) the effectiveness of any measures or actions taken pursuant to this Conditional Waiver (including water quality management plans); and (3) whether revisions to this Conditional Waiver and/or additional regulatory programs or enforcement actions are warranted. Pursuant to Water Code section 13267, the Regional Board's request for a monitoring program and reports shall bear a reasonable relationship to the burden and need for the report and the benefits to be obtained from the reports. The burden for providing the reports includes costs. Further, when requiring such reports, the Regional Board is required to provide a written explanation with regard to the need and shall identify the evidence that supports the requirement.

Water Code section 13141 states that prior to the implementation of any agricultural water quality control program, an estimate of the total cost of such a program and potential sources of financing must be indicated in any regional water quality control plan. To assist the Regional Board in considering the economic impacts of this action, the Regional Board will consider the estimated costs to Growers to implement this agricultural water quality control program in order to protect water quality consistent with section 13141 of the California Water Code. The Regional Board will also identify potential sources of funding in the Basin Plan.

Legal and Regulatory Rationale for Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Agriculture Lands:

Agricultural discharges, in conjunction with additional sources, contribute to some impaired water quality water segments, which may impact beneficial uses such as, drinking water supplies, aquatic life, agricultural use, and water resources. If additional steps to protect water quality and beneficial uses are not taken, costs and further impacts associated with these resources are likely to increase. Addressing agricultural water quality issues will likely benefit public health, present and future drinking water supplies, aquatic life, aesthetic, recreational, agricultural, and other beneficial uses. Addressing agricultural water quality issues may require changes in certain farming practices, may impose increased costs to individual farmers and the agricultural industry during a time of competing demands on farm income, regulatory compliance efforts, and food safety challenges, therefore potentially impacting the local economy.

Protecting water quality and the environment while protecting agricultural benefits and interests will require reasoned regulation, and increased farm management to achieve reasonable water quality benefits. These regulatory impacts can be reduced through the use of thorough analysis of relevant data, the establishment of reasonable requirements and time schedules, collective group actions and by providing flexibility with respect to how individual farmers can work towards meeting water quality standards through implementation of their individual Farm Plans. To prevent further water quality impairment and impact to beneficial uses, the Central Coast Water Board adopts this feasible, achievable, and reasonable regulatory waiver, which will result in measurable improvements in agricultural water quality discharges on the Central Coast by directly addressing the major water quality issues of toxicity, nitrates, pesticides, and sediment in irrigation runoff and/or leaching to groundwater. The terms of this conditional waiver are consistent with the Water Quality Control Plan for the Central Coast, and are in the public interest.

Background on Irrigated Agricultural Program Implementation (2004 – 2009):

On July 9, 2004, the Central Coast Regional Water Quality Control Board unanimously adopted the 2004 Conditional Waiver, and the associated Monitoring and Reporting Program, with the support of an Agricultural Advisory Panel (including agricultural and environmental interest group representatives), and overall public support. The goal of the 2004 Conditional Waiver was to improve agricultural water quality through the implementation of appropriate management practices. The requirements of the 2004 Conditional Waiver focused on enrollment, education and outreach, development of Farm Water Quality Management Plans (Farm Plans), and cooperative water quality monitoring.

During the term of the 2004 Conditional Waiver, Regional Board staff worked collaboratively with the agriculture community to develop and implement an Irrigated Agricultural Program which would progress to protect and restore surface water quality and groundwater quality to conditions that meet all designated beneficial uses of water in areas with irrigated agricultural lands. Major programmatic accomplishments of the first five years include the following:

- Enrollment of approximately 93 percent of the Central Coast Region's total irrigated agricultural acreage under the 2004 Conditional Waiver;
- Development, implementation, and funding of a region-wide monitoring program (CMP) to assess water quality conditions at the watershed-scale;
- Tracking program implementation for more than 1,700 farming operations (including inspections at 59 farming operations, and various enforcement actions: more than 200 Notices of Violation, more than 20 water quality enforcement actions, and five Administrative Civil Liability complaints);
- Discharger development of Farm Water Quality Management Plans for more than 1,528 operations;
- Discharger completion of water quality education courses (in total, more than 18,000 hours completed);
- Reduction in the use of organophosphates believed to be a source of impairment in surface waters of the state.

- Statistically significant reduction in surface water flow resulting in a reduction in loading of waste in surface waters within the region; and
- Agricultural applications of chlorpyrifos and diazinon decreased by 23 percent (77,986 pounds of active ingredient) from 2004 – 2008 (DPR Pesticide Use Records for Santa Barbara, San Luis Obispo, Monterey, Santa Cruz, and San Benito Counties).

The initial outreach and educational efforts of the Irrigated Agricultural Program were significant. To further address actual water quality impairments, the renewal of the Conditional Waiver can be improved. Thus, progress towards desired water quality outcomes is in need of enhancement. The Central Coast Regional Board must determine how to improve the current program while encouraging agricultural dischargers on the Central Coast to directly address the major water quality issues of toxicity, nitrates, pesticides, and sediment in agricultural surface runoff, and commence to focus on leaching nitrate to groundwater so as to achieve desired water quality outcomes that support all beneficial uses.

This alternative enhanced waiver proposed herein was developed by considering 1) the February 2010 Staff Draft Waiver, 2) the original 2004 Agricultural Alternative, 3) numerous meetings between agriculture representatives and the Regional Board staff, 4) numerous meetings among the diverse agricultural interests on the Central Coast, and 5) consultations with water quality and legal experts throughout the region.

This alternative waiver proposal calls for individual farms to submit new notices of intent (NOIs) to participate in the agricultural waiver, and to identify which of their lands have the potential of irrigation run off to waters of the state. It advances a representative surface water monitoring program to further characterize the water quality in the region's principal water courses, and enable parties to evaluate improved water quality. The watershed monitoring plan would be conducted by a third party monitoring group in accordance with an agreed monitoring protocol. Over time, monitoring locations may need to be readjusted to respond to problems, identify sources, or to respond to data gaps. Monitoring will focus on water quality constituents that have shown to be most prevalent in the region with particular focus on organophosphate and pyretheroid pesticide classes, and nitrates.

The alternative waiver also calls for each farm to craft and maintain an individualized Farm Plan which would identify their farm lands' associated water courses and outline relevant management practices to reduce irrigation return flows and the runoff of contaminants. It would also contain components on grower training/education. Farm Plans may be required to include as components: pesticide management practices and nutrient management practices, both of which would indicate management considerations to reduce discharges of problematic pesticides, and in addition to balancing the application of fertilizers to crop needs. Farm Plans may also include, but are not required to include, SMART (Simple Methods to Achieve Reasonable Targets) Sampling. SMART Sampling is a management practice that includes on-farm sampling of surface irrigation water that allows individual farmers to establish a baseline of farm practices to determine effectiveness of individual farm measures. SMART Sampling data is confidential to the

grower and a grower is not required to share SMART Sampling results to the Regional Board during an on-farm review of a Farm Plan.

In promulgating this conditional waiver, the Regional Board recognizes the importance of agriculture as the dominant and most important economic engine and community support basis throughout the region and that these extensive regulatory efforts to control irrigation and drain water constitutes a major undertaking. The Board further recognizes these stated initiatives that requires reasonable phase-in periods and a high level of coordination and cooperation between the agriculture community and the Regional Board to facilitate effective waiver implementation.

The Regional Board also recognizes that farm operators only have the capacity to deal with their own operational inputs or influences on water. Agriculture receives its irrigation water from different sources, some of which enter farm properties with impairments. It would be inappropriate to require a particular farm operator to clean up water to higher quality than what is received, although that often is the situation. The Regional Board further recognizes the importance of tile drainage, particularly in certain areas of this region with historically high water tables, salt build-up, or salt water intrusion and the landmark efforts which have been employed around the mouth of the Salinas River where agriculture has effectively taken urban reclaimed water and, through irrigation, improves that water quality from the point at which it is received to the point that it is discharged.

The Regional Board recognizes the diversity of agriculture throughout the Central Coast Region. The Regional Board further recognizes that crops, irrigation systems, soil type, pesticide and nutrient uses vary widely over the region, which as a result may or may not affect the waters of the State.

This conditional waiver also calls for the exploration into alternative ways to improve water quality through the use of effective management practices, which need to be implemented to the maximum extent practicable. The Regional Board recognizes that agricultural non-point source discharges are best controlled through the implementation of management practices, which will lead to improvement in water quality and move towards compliance with water quality objectives. Whereas in some cases the most effective management practices for protecting water quality are not yet specifically identified, the waiver encourages agriculture to coordinate with the Regional Board to explore these alternatives which might involve different mechanisms for improving water quality in certain areas of the region, such as collective treatment systems.

By the promulgation of this new enhanced waiver, this region's regulatory effort is far beyond any other program to protect water quality developed anywhere else in this state or country.

Scope and Description of Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Agriculture Lands:

A. Eligibility[1]

1. Existing and future discharges from irrigated agricultural lands to waters of the state are potentially eligible for coverage under this Conditional Waiver.

2. Growers eligible under this Conditional Waiver bear the responsibility of complying with the provisions and conditions contained in this Conditional Waiver and others related thereto.

3. Growers eligible under this Conditional Waiver shall comply with the terms and conditions of the Conditional Waiver and take action to improve and protect waters of the State.

B. Enrollment

1. All growers and landowners with discharges from irrigated agricultural lands must complete the following to obtain coverage under the waiver (unless the individual farm has been specifically exempted by the Regional Board, e.g. WDR):
   a. Complete a Notice of Intent (NOI) to Enroll. All growers who are currently enrolled in the 2004 Conditional Waiver must re-enroll by completing a new NOI;
   b. Update Farm Water Quality Management Plan (Farm Plan) to meet additional requirements of the 2011 Conditional Waiver;
   c. Participate in a region-wide monitoring program that will conduct monitoring and report results annually, or obtain an individual MRP from the Regional Board and conduct individual monitoring;
   d. Complete the Farm Water Quality Survey (FWQS) and submit it to the Regional Board;
   e. Participate in a Farm Water Quality Survey verification program administered by a third-party entity that conducts randomized verifications of Farm Water Quality Surveys or elect to have the Regional Board conduct randomized verifications of Farm Water Quality Surveys. Both the third-party entity and the Regional Board will be responsible for reviewing and verifying FWQSs and reporting annually on aggregated results from the verification reviews.
   f. Continuing Education: Operators need to complete 5 hours of water quality continuing education (which can include, but is not limited to: workshops,

[1] This Conditional Waiver does not waive WDRs for commercial nurseries, nursery stock production, and greenhouse operations that have point-source type discharges, and fully contained greenhouse operations (those with no groundwater discharge due to impervious floors). These operations must eliminate all such discharges of waste or submit an ROWD to apply for individual WDRs as set forth in Water Code section 13260. However, if such operations have no discharge or no potential to discharge, there is no need to apply for either WDRs or a Conditional Waiver.

field days, and technical assistance), as long as resources are available, over the term of the Conditional Waiver. Documentation for completing continuing education should be retained in the Farm Plan.

g. Participate in a Water Quality Coalition for Agriculture or conduct individual on-farm monitoring, if applicable (see Section D, infra).[2]

Notice of Intent

2. Components of the Notice of Intent include:
   a. Completed application form which includes the Assessor's Parcel Number of the enrolled ranch/ranch operation;
   b. Copy of the map of operation;
   c. Statement of commitment to complete a Farm Plan;
   d. Completed Farm Water Quality Survey;
   e. Election of participation in the Cooperative Monitoring Program or an Individual MRP;
   f. Statement of participation in the FWQS verification program administered by a third-party entity or election to have FWQS verifications completed by the Regional Board;
   g. Election of participation in an Water Quality Coalition for Agriculture or election to conduct individual on-farm monitoring, if applicable (see Section D(1) and (2));
   h. Identification of the Landowner; and
   i. Grower identification of the net irrigated acres.

3. The completed NOI must be submitted to the Regional Board within 4 months after adoption of this Conditional Waiver.

4. *Exemptions from Notice of Intent and Other Waiver Requirements:*
   a. A Certificate of Sustainability[3] from a State of California government entity approved program may be submitted in lieu of the NOI as long as the Certificate of Sustainability is submitted by the time when a NOI must be submitted.
   b. A Certificate of Sustainability from a State of California government entity approved program may also be considered to meet all requirements pertaining to Farm Water Quality Management Plans (Section B(5)), Water Quality Assessments (Section B(6)), and Water Quality Coalition for Agriculture requirements or individual on-farm monitoring requirements (Section D) as long as the approved program issuing the Certificate of Sustainability includes evaluation of irrigation efficiency, pesticide management, sediment management, fertilization management, and documents efficiency of

[2] If a grower is subject to the provisions in Section D below and elects to participate in a Water Quality Coalition for Agriculture, then the grower need not participate in a FWQS verification program as the Water Quality Coalition for Agriculture audit provisions shall substitute for the third-party entity verification provisions identified here

[3] A Certificate of Sustainability includes, but is not limited to, some form of documentation or verification of performance, stewardship index, and/or implementation of state certified good agricultural practices that are protective of water quality.

associated best management practices for the protection of water quality through university research or a representative sample of individual farm verifications once every five years.

c. A Certificate of Sustainability from a State of California government entity does not exempt the individual from participating in a region-wide monitoring program.
d. A Certificate of Sustainability must include the Assessor's Parcel Number of the enrolled ranch/ranch operation, election of participation in the Cooperative Monitoring Program or an Individual MRP, and identification of the Landowner.

Farm Water Quality Management Plan

5. Except as specified in section 4, all Growers must complete a Farm Plan. The various components of the Farm Plan will help identify which water quality improvement actions are to be required in the Conditional Ag Waiver.
   a. The Farm Plan is a flexible detailed plan outlining a grower's management practices as they pertain to water quality.
   b. The Farm Plan contains proprietary information and is not intended to be public information. The original shall remain on the farm and shall be made available to Regional Board staff upon adequate notice of inspection for on site review. Contents of the Farm Plan shall not be made or discussed during any open, public session of the Regional Board even if being reviewed for regulatory and/or enforcement activities. Should it be necessary for the Regional Board to discuss the contents of an individual Farm Plan, all such discussions shall be conducted in closed session and the Regional Board Counsel shall only report publicly a summary of any action taken by the Regional Board in closed session that pertains to the Farm Plan.
   c. This Plan should include, at a minimum, a description and/or discussion of current farm water quality conditions and challenges.
   d. Specific components that address known impairments or identified farm water quality conditions or challenges shall be included in the Farm Plan. Examples of such components shall include the following when applicable to the specific farm:
      i. Irrigation Management Practices
         - A grower will have to plan to address and improve (where appropriate) irrigation efficiency by addressing the irrigation delivery (distribution uniformity) and/or irrigation scheduling (matching irrigation application to crop ET demand using various tools involving soil, plant, and/or weather assessments).
         - Irrigation efficiency of applied irrigation water should be known and a plan for improvement should be included, if applicable.
         - A grower will have to plan to address efficient irrigation practices by addressing the irrigation delivery and/or irrigation scheduling, whichever is appropriate, if applicable.

ii. Pesticide Management Practices
- Pesticides used by the grower that may contribute to water quality toxicity should be identified, if applicable.
- Management practices for controlling off-site discharge of irrigation water with pesticides should be identified, if applicable.
- Demonstration of compliance with Pesticide Surface Water Regulations adopted by the California Department of Pesticide Regulations (DPR) when such regulations become effective and applicable.
- Demonstration that the grower is implementing pesticide management practices that have become generally accepted standard practices in California (e.g. spray equipment calibration, proper pesticide storage, well-head protection, drift management, pest scouting techniques, and use of treatment thresholds), if applicable.

iii. Sediment Management Practices
- Address sediment discharges through source controls (e.g. Landguard, PAM, etc.), pollution prevention practices, or technical mitigations that are feasible in a commercial agricultural production system, if applicable.
- Control of sediment shall be consistent with Food Safety requirements as applicable to individual growers.

iv. Fertilizer Management Practices
- Growers shall develop a Proprietary Nutrient Management Plan (NMP) that includes soil analysis, well water analysis and/or plant tissue analysis, as applicable. This will allow the grower to account for nutrients that have been "banked" in the soil profile.
- A grower will efficiently use fertilizer while maintaining an adequate margin of error as necessitated for commercial agricultural production.
- Growers will prepare a Proprietary Nutrient Management Plan, if applicable, which needs to identify individual-management practices, taking into consideration the level of nitrate in the irrigation source water when calculating the amount of fertilizer needed. This will be the mechanism by which growers implement practices to address both irrigation water runoff and groundwater nitrate impairments.
- The NMP may not be reported on, referenced or otherwise referred to, in any further manner, than through the proprietary Farm Plan; or, as an aggregated report on a sub-watershed.

e. This Plan may include, but is not required to include, on farm verification sampling of surface irrigation water run-off to assist an individual grower to understand potential contributions to water quality impairments. Individual

on-farm sampling (e.g., SMART Sampling to establish a baseline of farm practices, to determine effectiveness of individual farm measures, etc.) is a voluntary management practice. Data collected from SMART Sampling is confidential, part of the management practice itself, and not subject to review and inspection by Regional Board staff upon review of the Farm Plan.

Farm Water Quality Survey

6. Except as specified in section 4, all Growers must complete a Farm Water Quality Survey (FWQS). The FWQS is to be used as an educational tool for the Grower. The FWQS replaces the current management practices checklist and is a self-assessment tool individually completed by each grower. The FWQS is a short questionnaire that identifies and demonstrates farm water quality management practices and aids the grower in determining where educational and management practice implementation efforts should be focused.

7. Upon enrollment, growers are required to submit the FWQS to the Regional Board.

8. Depending on Grower election in the NOI, a third-party entity, such as the entity conducting the Cooperative Monitoring Program, or the Regional Board shall randomly verify FWQSs on an annual basis, beginning in year 2 of the Waiver.[4] For third-party entities conducting the verifications, randomized FWQS verifications shall include twenty percent of the enrollees over the course of the Waiver, which represents a statistically significant sample size, that have elected to participate in the third party entity. Likewise, the Regional Board shall conduct randomized FWQS verifications of twenty percent of the enrollees over the course of the Waiver that have elected to have the Regional Board conduct the verifications. The third-party entity shall submit an annual report that summarizes the results of its review of FWQSs. The annual report shall include the number of enrollee FWQSs evaluated, the percent of FWQSs that properly reflected operations for which the FWQS applied, and identify aggregate areas in which educational and management practice implementation efforts should be focused. The annual report shall not include the names of the enrollees evaluated or proprietary information. The Regional Board shall prepare a similar annual report summarizing its FWQS verifications and make the report available to the public.

C. Monitoring

Surface Water

1. Surface water quality monitoring shall be conducted in receiving waters with sufficient frequency and at a sufficient number of locations to a) characterize water quality conditions and b) understand long-term water quality trends.

[4] For Growers and/or landowners subject to the requirements of Section D of this waiver, if the grower and/or landowner elects to participate in an Water Quality Coalition for Agriculture, the audit provisions in Section D shall substitute for the third-party entity verification provisions required here.

Receiving waters monitored should reflect agricultural inputs, and information from the program should clarify sources of impairment and provide feedback to growers in areas of concern.

2. Growers shall participate in a region-wide Cooperative Monitoring Program (CMP) or obtain an individual Monitoring and Reporting Program.

3. Water quality data shall be collected as per the attached Monitoring and Reporting Program (MRP).
   a. An improved CMP/MRP plan will support stated objectives.
   b. The purpose of the Monitoring and Reporting Program Requirements is to assess the impacts of waste discharges from irrigated lands on waters of the state, and, where necessary, to track progress in reducing the amount of waste discharged that affects the quality of the waters of the state and their beneficial uses.
   c. The entity in charge of the Cooperative Monitoring Program shall submit the results of the water quality monitoring to the Regional Board annually in accordance with the Monitoring and Reporting Program Requirements.

Water Quality Improvement Actions:

4. Based on information obtained from annual monitoring reports, Regional Board reviews of submitted FWQSs, and Regional Board review of Farm Plans, the Regional Board shall work with the local agricultural community to identify further water quality improvement actions for growers in areas where water quality is highly impaired and schedule meetings with groups of growers to discuss management practices that should be implemented to address specific impairments.

5. The Regional Board may conduct follow-up inspections to verify that growers in highly impaired areas are implementing practices discussed during group grower meetings.

Water Quality Implementation Verification:

6. In order to assess implementation of management practices that are designed to protect water quality, seven methods of implementation verification and measurement will occur:
   a. Farm Water Quality Surveys;
   b. Randomized verification of FWQSs throughout the Region;
   c. Reported grower group meetings;
   d. Focused Regional Board inspections on farms most likely to be causing impairments;
   e. CMP receiving water quality monitoring;
   f. CMP Follow Up Monitoring; and
   g. Compliance with Milestones.

7. If the implementation verifications and receiving monitoring results indicate that irrigation return flow discharges from a grower's operation may cause an exceedance of a water quality benchmark in a water of the state, then the Individual Discharger shall, in accordance with an approved Farm Plan, implement additional targeted management practices that are intended to further work toward attaining water quality benchmarks.

Groundwater

8. Groundwater in many areas of the region shows nitrate levels exceeding drinking water standards. Groundwater nitrate problems may have resulted from many sources and over many years. Growers will not be held liable for historical conditions. Since high nitrate groundwater in agricultural areas is often used for irrigation, Farm Plans should include a Proprietary Nutrient Management Plan to ensure that current discharges to groundwater do not further degrade groundwater. Plans also should account for specific nitrate concentrations in irrigation water in determining agronomic nitrogen application rates. (See Section B(5)(iv).)

9. A review of groundwater quality data in the Central Coast Region reveals that groundwater may be contaminated with pollutants, such as nitrate, that can be contained in irrigated agriculture discharges. Such data demonstrates that groundwater basins underlying areas with irrigated agriculture lands may contain levels of nitrate that exceed applicable water quality objectives, which are based on state drinking water standards. It is expected that source control management practices, such as improved irrigation efficiency and fertilizer management, employed by Growers to attain surface water quality benchmarks will reduce loading to groundwater as well. The number of existing groundwater wells in the Central Coast Region is adequate to assess broad changes in groundwater quality as a result of implementation of management practices under the Conditional Waiver.

10. Dischargers must conduct annual groundwater sampling of one primary groundwater well on their operation for nitrates, TDS or EC, and pH. Groundwater sampling must be conducted in the same months each year, as determined by the grower. All results are to be kept in the Farm Plan. Such sampling requirements do not apply to delivered water. If a grower's delivered water sources provide at least annual testing reports for nitrates, TDS, and pH, a grower does not have to conduct individual tests. However, copies of those reports provided by the delivered water sources must be included in the Farm Plan.

11. Agriculture will commit to work with other stakeholder groups on the SWRCB Ground Water Basin Management Planning process (plans are due in 2017).

12. The Regional Board shall use existing historical data collected by other agencies and recent groundwater nitrate projects (e.g., UCD Nitrate Assessment project or the SBS2X 1 project) and current groundwater monitoring data (e.g., Groundwater Ambient Monitoring & Assessment Program, Department of Pesticide Regulation, Department of Public Health, Department of Toxic Substances Control, and data

compiled by local groundwater management agencies and Integrated Regional Water Management Plans) to ground truth and quantify present conclusions regarding groundwater impairment trends.

13. Specifically, the Regional Board shall utilize existing monitoring programs and shall expand on its partnership opportunities to rely on the appropriate local entities and state agencies involved in groundwater monitoring and protection, including but not limited to the Department of Water Resources, Department of Pesticide Regulation, Department of Public Health, etc., to compile, analyze, and utilize existing groundwater data and protection programs, and identify gaps, prior to proceeding with the adoption, regulation, and enforcement upon potential dischargers within the Central Coast. The appropriate local entities will vary throughout the Central Coast and may include local public agencies and integrated regional water management planning agencies.

14. During the term of the Waiver, existing county resource agencies or a third-party may develop groundwater quality management plans (GQMPs) designed to minimize waste discharge to groundwater from irrigated agricultural lands. As part of GQMP development, they may collect and evaluate available groundwater data, identify groundwater management areas (GMAs) of concern, identify constituents of concern within the GMAs, prioritize the GMAs and constituents of concern, identify agricultural practices that may be causing or contributing to the problem, and identify agricultural management practices that should be employed by local growers to address the constituents of concern. Where local agencies have developed local groundwater management plans (e.g., AB 3030, SB 1938, Integrated Regional Water Management plans), the local groundwater management plan may be an appropriate GQMP. However, the Waiver does not require the development of GQMPs at this time.

D. Region 3 Water Quality Coalition for Agriculture

Enrollment Criteria

1. Unless otherwise exempted pursuant to the provisions in section D(2) below, all growers and landowners with irrigated lands in Region 3 meeting any of the following criteria below must also either join a region-wide Water Quality Coalition for Agriculture, or conduct individual on-farm monitoring of irrigation return flows leaving the property:[5]
    a. Operations with an acre of row crops with high nitrate loading potential; or
        i. Row Crops with High Nitrate Loading Potential include, but are not limited to: Crops in the Brassica family with high nitrate loading potential, Leafy Greens with high nitrate loading potential, Artichokes, Beans, Beets, Corn, Cucumber, Daikon, Leek, Onion,

[5] If a grower/landowner does not meet any of the enrollment criteria in Section D(1), the grower/landowner is not required to join a region-wide Water Quality Coalition for Agriculture, or conduct individual on-farm monitoring of irrigation return flows leaving the property.

Peas, Pepper, Pumpkin, Potato, Radishes, Squash (including Summer), Strawberries, and Tomatoes.[6]

ii. Crop types may be identified using the Code of Federal Regulations, Title 40, Part 180.

iii. Nitrate Loading Risk Factors may be identified by using the UC Riverside Nitrate Hazard Index.

b. Operation has irrigated land that discharges tail-water; or

c. Operation has irrigated land that discharges sediment during irrigation.

2. ***Exemptions from Requirements to Join a Coalition***: Growers and/or landowners meeting the criteria in section D(1) above may further be exempted from Section D under the following circumstances:

   a. The grower or landowner submits a Certificate of Sustainability pursuant to section B(4) above; or

   b. Growers/Landowners who assert that their nitrate loading risk calculation is valued less than 15 points may apply to the Executive Officer or the Coalition for an exemption. (See Table 1 for Nitrate Loading Risk Factor Criteria.) If the grower/landowner can prove an index of less than 15 points and is provided certification of this by the Regional Board or the Coalition, the grower/landowner may be exempted from participation in the Coalition. This certification is valid for the coming two years and will need to be renewed during the life of the waiver.

Additional Requirements for Coalition Members

3. If a grower and/or landowner elects to participate in an Water Quality Coalition for Agriculture in lieu of on-farm monitoring requirements, Coalition participants may be subject to various levels of audits described in section(s) below as conducted by the Water Quality Coalition for Agriculture.

4. Coalition audits may be used to determine, including but not limited to, the following:

   a. Chlorpyrifos – If a grower uses chlorpyrifos and has irrigated water runoff, a Coalition audit would focus on whether they are:

      i. Using BMPs that are focused on the remediation of this material.

      ii. Reducing the use of these products in acreage areas where the grower has irrigation water runoff.

      iii. Operating with authority to use these materials by complying with a special use permit restriction from their County Agricultural Commissioner or the Department of Pesticide Regulations (i.e. pending surface water regulations by DPR).

   b. Diazinon – If a grower uses diazinon and has irrigated water runoff, a Coalition audit would focus on whether they are:

      i. Using BMPs that are focused on the remediation of this material.

      ii. Reducing the use of these products in acreage areas where the grower has irrigation water runoff.

[6] The Coalition may revise and expand this list as appropriate.

iii. Operating with authority to use these materials by complying with a special use permit restriction from their County Agricultural Commissioner or the Department of Pesticide Regulations (e.g., pending surface water regulations by DPR).

Audit Provisions

5. Coalition participants may be subject to the following audit provisions as described below. At a minimum, the Water Quality Coalition for Agriculture must conduct pre-audit evaluations of at least 20% of the Coalition participants during the term of the Waiver. The Water Quality Coalition for Agriculture may choose to conduct additional pre-audit evaluations at its discretion.

6. ***Pre-Audit Evaluation:*** The pre-audit evaluation will include review of the FWQS, sub-watershed monitoring data, and/or conduct field visits to identify priority sub-watersheds. Within identified priority sub-watersheds, the following pre-audit actions will be taken:
   a. If a nearby CMP site shows that OPs and pyrethroids are present, a grower's pesticide management plan as well as the grower's BMPs for pesticide use will be reviewed and recommendations of technical resources and/or services will be made.
   b. The Coalition will verify if there is or is not irrigation water runoff present as reported on the FWQS.
      i. If the FWQS incorrectly reports the presence or non-presence of irrigation water run-off, the Water Quality Coalition for Agriculture will report the discrepancy to the Regional Board within 30 days. The entity responsible for the Cooperative Monitoring Program will also be provided a copy of that list.
      ii. When reporting the presence or non-presence of irrigation water run-off as reported on the FWQS, an auditor will provide a narrative for observed anomalies or exceptions. For example, when documenting irrigated water runoff in cases where the presence of water leaving the field is in dispute, the water runoff is an aberration, or there was general confusion, the auditor will include such explanation in his/her report. This narrative will not define the geographic location at which water was leaving the field or identify the grower any more than they are identified in the NOI. Neither of these will be reported to the Regional Board unless the dispute in question is resolved and it is found that the grower has incorrectly reported the presence of irrigation water runoff on his/her FWQS.

7. ***Primary Audit:*** If a Coalition participant has irrigated water runoff, they may be subject to a primary audit conducted by the Water Quality Coalition for Agriculture. A primary audit may include all of the following:
   a. Be conducted for contiguous parcels of land;

b. Include review of the NOI, Farm Plan, Nutrient Management Plan, and Pesticide Management Plan; Review of the pesticide management plan will consider what a grower will do if they have certain pests, disease and weeds, and will take into account pressures from weather, pest infestation, etc.
c. Verify BMP implementation.
d. Promote the adoption of SMART Sampling.
    i. The goal of SMART Sampling is two-fold:
        - Identify water quality issues in a farm's discharge(s);
        - Assess the impacts/effectiveness of specific practices that the farmer is trying to improve the quality of the discharge(s).
    ii. SMART Sampling is confidential to the grower. A majority of the tests can be performed on the farm, and the data will always be left with the grower. The tests that need to be done by a laboratory (pesticides) are returned to the grower as a hard copy report, and no other report is sent out by the lab.
e. Primary Audit scoring will be a point-value process created by technical service providers and agricultural stakeholders.
f. The Primary Audit score will:
    i. Provide a basis for differentiating proactive growers from those who are less proactive.
    ii. Indicate where BMP efforts are needed.

8. ***Secondary Audit***: Coalition participants that are subject to primary audits may be subject to secondary audits if the primary audit score is considered to warrant the need for further action as identified by technical service provisions and agricultural stakeholders. Secondary audits may consist of, but is not limited to, the following:
    a. Assess effectiveness of BMP Implementation;
    b. Determine trend line by comparing initial audit and second BMP audit; Verify nutrient management program implementation;
    c. Include training regarding use of devices that monitor how water moves through the root zone; and
    d. Include training on nutrient management.

9. ***Audit Reporting***: Audit results, which includes pre-audit evaluations, primary audits and secondary audits, will be reported to the Regional Board in aggregate, based on priority sub-watersheds or priority reaches on a main-stem tributary on an annual basis.

10. Prior to reporting audit results, auditors will review the audit results with growers before a final score is tallied. This will provide growers the opportunity to learn from the audit process, as well as answer any questions posed by the auditor. The auditor will have the final say on the audit report and score. The Water Quality Coalition for Agriculture may establish a grower appeal process within the Coalition structure to address circumstances where there is disagreement between

the auditor and the grower. All appeals must be resolved prior to any aggregated scores being reported to the Regional Board.

Coalition Function and Structure

11. A qualifying Water Quality Coalition for Agriculture must:
    a. Provide a Bridge between growers and technical resources and technical service providers;
    b. Conduct pre-audit evaluations of at least 20% of operations enrolled in the Water Quality Coalition for Agriculture during the term of the waiver, conduct primary audits of farms with irrigation water run-off in priority sub-watersheds of the Coalition, focusing on most impaired sub-watersheds as first priority, and conduct secondary audits of those farms identified as needing additional assistance;
    c. Rank priority watershed areas;
    d. Notify the Regional Board if a Coalition participant fails to participate in good faith (e.g., fails to pay required fees to maintain Coalition operations); and
    e. Identify audit timelines by priority sub-watershed.

12. To be a qualifying Water Quality Coalition for Agriculture, the Coalition must submit a Notice of Intent to the Regional Board within 90 days of adoption of the Waiver. The Notice of Intent shall include the name of the Water Quality Coalition for Agriculture, the geographic area and/or commodity for which the Water Quality Coalition for Agriculture intends to cover, contact information and an explanation as to how the Water Quality Coalition for Agriculture intends to operate and conduct the functions identified above. The Executive Officer of the Regional Board shall approve any Water Quality Coalition for Agriculture that meets the requirements specified here. If a Water Quality Coalition for Agriculture fails to provide the required reports in a timely manner, the Executive Officer may terminate the Water Quality Coalition for Agriculture. If termination of a Water Quality Coalition for Agriculture occurs, the Coalition participants may join another Water Quality Coalition for Agriculture, or form a new Water Quality Coalition for Agriculture within 60 days. If a Coalition participant does not join another existing Water Quality Coalition for Agriculture or participate in a newly formed Water Quality Coalition for Agriculture, then the Coalition Participant may be subject to individual on-farm monitoring requirements for the remainder of the term of the Waiver.

13. To conduct the activities specified in provisions 5 – 12 above, the Regional Board shall provide to qualifying Water Quality Coalitions for Agriculture the NOI and FWQS information for growers and/or landowners that elect participation in a Water Quality Coalition for Agriculture. The information shall be provided to applicable Water Quality Coalitions for Agriculture within 60 days after the deadline for submittal of grower/landowner NOIs has expired.

14. Qualifying Water Quality Coalitions for Agriculture should focus their priorities on irrigation water runoff and nutrient management plans.

15. A qualifying Water Quality Coalition for Agriculture may:
    a. Coordinate receiving water monitoring and data management as required in Section F of this Order;
    b. Provide assistance to growers and landowners in updating Farm Water Quality Plans and assist with preparation of Nutrient Management Plans;
    c. Develop sub-committees to assist in the efficient administration of the Coalition activities; and
    d. Provide assistance for the development of a Collective Treatment Systems where growers have expressed an interest.
        i. Collective Treatment Systems may be used in watersheds and sub-watersheds where appropriate and applicable. These systems will require engineering that is specific, and should include best available research and technical support along with collaboration from public agencies, academic, and the landowners/operators in the watershed. Consideration by grower(s) to participate is that irrigated water runoff can reasonably be expected to contribute to the collective treatment system and that it is practical to expect that the investment would lead to improvement in water quality. Grower(s) participation in such a system will be considered a significant BMP mitigation to improve water quality in Coalition audits. Participating grower(s') fee schedule within the Coalition will be adjusted as appropriate to provide the public/private funding needed.

E. General Timelines for Implementation

- March 2011: New Waiver Adopted.

- April 2011: Outreach to Growing Communities begins to implement new waiver and file paperwork.

- June 2011: CCWQP, Inc. organization is updated to gain capacity to manage updated program including FWQS verifications or, if CCWQP, Inc. is unable, a new organization (or organizations) is established to manage multiple objectives and facilitate monitoring, conduct FWQS verification reviews, and assist in completion of nutrient management programs.

- June 2011: Deadline for Water Quality Coalition for Agriculture to submit NOI

- July 2011: Deadline for growers and/or landowners to submit NOI and completed FWQS to Regional Board.

- October 2011: Deadline to submit Statement of Completion of completed Farm Plan to Regional Board (Farm Plan shall remain on farm).

- October 2011: Deadline for Regional Board to provide qualifying Water Quality Coalitions for Agriculture NOI and FWQS information.

- October 2011 – September 2012: 5% of FWQSs will be verified by a third-party entity or the Regional Board, and annually thereafter.

- July 2012 – July 2013: Nutrient Management Plan outreach conducted.

- October 2013: All growers must update their farm plan to show that they have a nutrient management plan in place, if applicable, along with any other updates.

- November 2014: Growers make any updates to their farm plan.

F. Milestones

Table 1. All Dischargers with discharges from irrigated agricultural lands must comply with the following time schedule.

Task	Compliance Date
Submit completed Notice of Intent and Farm Water Quality Survey	**For existing Dischargers enrolled under the 2004 Conditional Waiver** – Within 4 months after Board adoption of the Order; For any **Discharger** acquiring control or ownership of an existing operation – Within 30 days of acquiring control or ownership of an operation; For any **new proposed Discharger** – Prior to any discharge.
Update and Implement Revised Farm Plan	Within 1 year of adoption of the Order.
Complete 5 hours of Farm Water Quality Education.	Within 2 years of adoption of the Order.
The third-party entity conducting the Cooperative Monitoring Program shall submit an updated Quality Assurance Project Plan (QAPP) and Sampling and Analysis Plan for Coordinated Monitoring Program for Executive Officer approval.	Within 6 months from adoption of this Order.
State Date for Implementing Coordinated Monitoring Program.	Within 3 months of Executive Officer approval of QAPP.
Submit Receiving Water Quality data.	Within 3 months after start of monitoring, and quarterly thereafter.

Submit Receiving Water Quality Annual Monitoring Report.	Within one year, and annually thereafter.

Table 2. Surface waters must meet the following time schedule and milestones.

Milestone	Compliance Date
Using current CMP data, reduce chlorpyrifos and diazinon toxic units at current CMP sites.	Within 4 year of adoption of the Order, reduce chlorpyrifos and diazinon toxic units by 50%. Within 8 years of adoption of the Order, meet water quality objectives for chlorpyrifos and diazinon.
Decrease sediment loads from current CMP sites by 20%.[7]	Within 5 years of adoption of the Order.
Decrease nitrate loads from current CMP sites by 10%.	Within 10 years of adoption of the Order.

Compliance with the milestones contained in Table 2 of this Order may be demonstrated by showing improvement in relevant water quality concentrations in the surface waters, by showing that there is a reduction in pollutant loading to the surface water, or by showing that there is a reduction in irrigation return flow discharges to the surface water. Current CMP data, or other appropriate data, may be used to set the baseline for showing a decrease in relevant pollutant loadings. If failure to meet these milestones in surface water by the compliance date can be attributed to previously used legacy materials (e.g., nitrates) present in the source water, the milestone will be considered "achieved." Failure to comply with the milestones identified in Table 2 by the compliance date will trigger the need to further update Farm Plans and require implementation of more effective management practices by dischargers who discharge to the surface water in question. Implementation of management practices identified in an updated Farm Plan shall constitute individual discharger compliance with the milestones in Table 2.

Table 3. All Dischargers must comply with the following time schedule and milestones related to nutrients in groundwater.

Milestone	Compliance Date
Implement a proprietary Nutrient Management Plan that is intended to reduce nutrient impacts to groundwater.	Within 1 year from adoption of the Order.
Conduct annual groundwater sampling of one primary groundwater well for nitrates, TDS or EC, and pH. Groundwater	Within 1 year from adoption of the Order, and annually thereafter.

[7] This footnote applies to all three blocks in Table 2, milestones for toxicity, sediment, and nitrates: Reduction in impairment shall be determined by comparing the average of irrigation season (May through September) CMP monitoring results at each CMP site for the year in question to the average base year irrigation season CMP monitoring results for the same site during the CMP monitoring year (e.g., 2009).

sampling must be conducted in the same months each year, as determined by the grower. All results are to be kept in the Farm Plan. Such sampling requirements do not apply to delivered water. If a grower's delivered water sources provide at least annual testing reports for nitrates, TDS, and pH, a grower does not have to conduct individual tests. However, copies of those reports provided by the delivered water sources must be included in the Farm Plan.	

Implementation of a proprietary nutrient management plan identified in an updated Farm Plan, where applicable, shall constitute individual discharger compliance with the milestone in table 3.

G. Schedule

1. Existing Growers seeking to discharge under this Conditional Waiver shall submit an NOI and all corresponding documents within 4 months after adoption of this Order.

2. New Growers not previously enrolled shall file a complete NOI at least 30 days before commencement of the discharge.

H. Definitions

1. Irrigated Lands – lands where water is applied for the purpose of producing commercial crops. For the purpose of this Conditional Waiver, irrigated lands include, but are not limited to, land planted in row, vineyard, field and tree crops, commercial nurseries, nursery stock production, and greenhouse operations with soil floors.

2. Irrigation return flow – surface water which leaves the property following application of irrigation water.

3. Tailwater – the runoff of irrigation water from the lower end of an irrigated field.

4. Stormwater runoff – the runoff of precipitation from the lower end of an irrigated field.

5. Subsurface drainage –water generated by installing drainage systems to lower the water table below irrigated lands. The drainage can be generated by subsurface drainage systems, deep open drainage ditches or drainage wells.

6. Discharge – a release of a waste to waters of the State, either directly to surface waters or through percolation to groundwater. Wastes from irrigated agriculture include earthen materials (soil, silt, sand, clay, rock), inorganic materials (metals, salts, boron, selenium, potassium, nitrogen, phosphorus, etc.), and organic materials such as pesticides.

7. Discharger – the owner and/or operator of irrigated cropland on or from which there are discharges of waste that could affect the quality of any water of the state.

8. Third-Party Entity – Any group of Dischargers, participants, and/or organizations that form to comply with the Conditional Waiver. Coalition Groups can be organized on a geographic basis or can be groups with other factors in common such as commodity groups.

9. Requirement of applicable water quality control plans – a water quality objective, prohibition, Total Maximum Daily Load (TMDL) implementation plan, or other requirement contained in water quality control plans adopted by the Regional Board and approved according to applicable law.

10. Monitoring – refers to all types of monitoring undertaken in connection with determining water quality conditions and factors that may affect water quality conditions, including but not limited to in-stream water quality monitoring undertaken in connection with agricultural activities, monitoring to identify short and long-term trends in water quality, inspections of operations, management practice implementation and effectiveness monitoring, maintenance of on-site records and management practice reporting.

11. Farm Water Quality Management Plan (Farm Plan) – a document that contains, at a minimum, identification of practices that are currently being or will be implemented to address irrigation management, pesticide management, nutrient management and erosion control to protect water quality. Plans will contain a schedule for implementation of practices. Lists of water quality protection practices are available from several sources, including the University of California farm plan template available from the University of California and on-line at http://anrcatalogue.ucdavis.edu/merchant.ihtml?pid=5604&step=4.

12. All other terms shall have the same definitions as prescribed by the California Water Code Division 7, unless specified otherwise.

I. Compliance and Enforcement

1. Growers are the responsible parties for meeting the conditions of this Conditional Waiver. Failure by an Individual Grower to maintain compliance with conditions of this Conditional Waiver may result in enforcement actions including imposition of civil liability under Water Code 13268 or 13350, and/or withdrawal of the

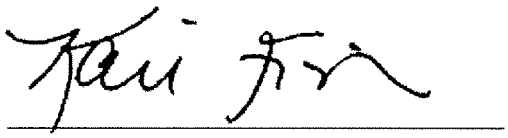
Conditional Waiver and issuance of waste discharge requirements by the Regional Board (Water Code sections 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350).

2. Under the terms of this Conditional Waiver, both owners and operators of irrigated lands have responsibility for compliance with the conditions of this Conditional Waiver. Many management practices will be operational in nature and under the direct control of the operator, while structural practices which remain in place through changes in leaseholders will more likely be the responsibility of the landowner. In the event that the Regional Board undertakes enforcement action, the owner and the operator may be held accountable. Owners and operators may consider delineating these responsibilities in lease agreements; however both the owner and operator will retain full legal responsibility for complying with all provisions of this Conditional Waiver.

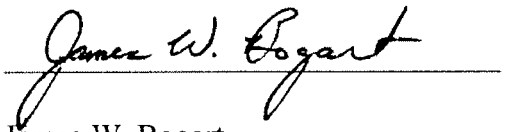
3. The conditions of this Conditional Waiver require the identification and implementation of targeted actions that will lead to achieving water quality benchmarks. To satisfy the conditions of this Conditional Waiver, an Individual Grower or entity conducting the Cooperative Monitoring Program must submit technical reports, and conduct required monitoring programs. In addition to the foregoing, a Grower must, where necessary to further work toward attaining water quality benchmarks, implement management practices, evaluate the effectiveness of those practices, and, refine and/or supplement those practices to improve their effectiveness, as necessary to attain water quality benchmarks.

4. Individual Growers in compliance with the conditions of this Conditional Waiver will not be required to file ROWDs or be subject to WDRs during the term of this Conditional Waiver.

Submitted on behalf of the following entities that support this proposal:

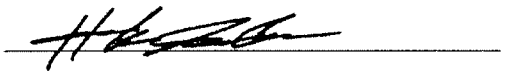


Kari E. Fisher
Associate Counsel
California Farm Bureau Federation
Monterey County Farm Bureau
San Benito County Farm Bureau
San Luis Obispo County Farm Bureau
San Mateo County Farm Bureau
Santa Clara County Farm Bureau
Santa Cruz County Farm Bureau
Santa Barbara County Farm Bureau

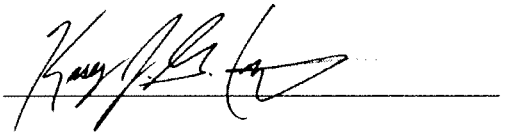


James W. Bogart
President & General Counsel
Grower-Shipper Association of Central California

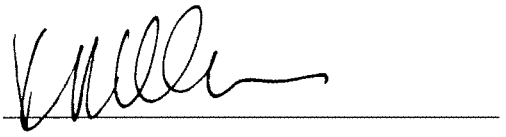
Richard Quandt
President
Grower-Shipper Association of Santa Barbara
and San Luis Obispo Counties



Hank Giclas
Senior Vice President
Science, Technology & Strategic Planning
Western Growers



Kasey Cronquist
CEO/Ambassador
California Cut Flower Commission



Kris O'Connor
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Central Coast Vineyard Team

Chris Zanobini
President
California Association of Nurseries and Garden Centers

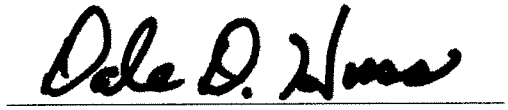
Rick Tomlinson
Director of Government Affairs
California Strawberry Commission

Daniel Rodrigues
President
Central Coast Wine Growers Association

Michael Scattini
California Artichoke Advisory Board

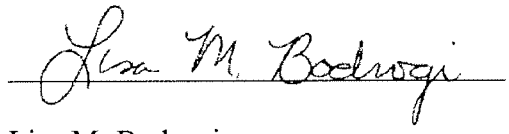
April Mackie
Farm Programs Manager
Martin Jefferson & Sons

Martin Jefferson
Chair
Central Coast Young Farms and Ranchers



Dale Huss
Vice President of Artichoke Production
Ocean Mist Farms

Michael Scattini
Luis Scattini & Sons



Lisa M. Bodrogi
Government Affairs Coordinator
Paso Robles Wine Country Alliance

Table 1. Nitrate Loading Risk Factor Criteria

A. Crop Type Nitrate Hazard Index Rating
1 - Bean, Grapes, Olive.
2 - Apple, Avocado, Barley, Blackberry, Blueberry, Carrot, Chicory, Citrus, Lemon Oat, Orange, Peach, Pear, Pistachio, Raspberry, Walnut, Wheat.
3 - Artichoke, Bean, Brussel Sprout, Corn, Cucumber, Daikon, Peas, Radish, Squash, Summer, Tomato, Turnip, Squash, Rutabaga, Pumpkin, Potato.
4 - Beet, Broccoli, Cabbage, Cauliflower, Celery, Chinese Cabbage (Napa),Collard, Endive, Kale, Leek, Lettuce, Mustard, Onion, Parsley, Pepper, Spinach, Strawberry.
(Based on UC Riverside Nitrate Hazard Index)

B. Irrigation System Type Rating
1 - Micro-irrigation year round (drip and micro-sprinklers) and no pre-irrigation;
2 - Sprinklers used for pre-irrigation only and then micro-irrigation;
3 - Sprinklers used for germination or at any time during growing season;
4 - Surface irrigation systems (furrow or flood) at any, and/or in combination with any other irrigation system type;
(Based on UC Riverside Nitrate Hazard Index, Adapted for the Central Coast Region)

C. Irrigation Water Nitrate Concentration Rating
1 - Nitrate concentration 0 to 45 mg/liter Nitrate NO3
2 - Nitrate concentration 46 to 60 mg/liter Nitrate NO3
3 - Nitrate concentration 61 to 100 mg/liter Nitrate NO3
4 - Nitrate concentration > 100 mg/liter Nitrate NO3

D. Nitrate Loading Risk Calculation = A x B x C
LOW - Nitrate loading risk is less than 10;
MODERATE - Nitrate loading risk is between 10 and 15;
HIGH - Nitrate loading risk is more than 15.
Note: Dischargers must determine the nitrate loading risk factor for each ranch/farm, based on the criteria associated with the highest risk activity existing at each ranch/farm. For example, the ranch/farm is assigned the highest risk factor, based on the single highest risk crop in the rotation, on one block under furrow irrigation, or on one well with high nitrate concentration.

{Draft} Farm Water Quality Survey

Grower Evaluation of Water Quality

Introduction:

All Growers must complete a Farm Water Quality Survey (FWQS).* The FWQS is to be used as an educational tool for the Grower. The FWQS replaces the current management practices checklist and is a self assessment tool to be completed by each grower. The FWQS is a questionnaire that identifies and demonstrates farm water quality management practices and aids the grower in determining where management practice implementation and educational efforts should be focused.

Upon enrollment, growers are required to submit the FWQS to the Regional Board. In addition, growers may submit an update of the FWQS during the five-year term of the conditional waiver if requested by the Central Coast Regional Water Quality Control Board.

Directions:

Read through the following assessment questions and check the appropriate line to indicate your answer as it pertains to your farm operation. Fill out one questionnaire per contiguous (i.e. adjoining parcels) ranch.

Name of Operation: _____

Operator AW #: _____

Contact Name: _____

Contact Address: _____

Contact Phone: _____ Contact Fax: _____

Contact E-mail: _____

Ranch Name: _____

Ranch Location: _____

Number of Irrigated Acres: _____

1) Do you have Irrigation Water Runoff on this/these ranch(es)?

Yes _____

No _____

2) Number of Acres on Ranch with Irrigation Water Runoff: _____

* Except as exempted with an approved Certificate of Sustainability.

Check Applicable Line

Nutrient Management

1) Annual Crops: Do you know soil residual levels for nitrogen through soil sampling and your crop nitrogen needs?

Yes _____
No _____
N/A _____

2) Perennial Crops: Do you know soil residual levels for nitrogen through soil sampling and your crop nitrogen needs?

Yes _____
No _____
N/A _____

3) Do you know how much nitrogen is in your well or delivered water?

Yes _____
No _____
N/A _____

4) Do you know the total nitrogen required by your crops systems?

Yes _____
No _____
N/A _____

5) Do you incorporate nitrogen quick tests for water and soil into your nutrient management program when appropriate?

Yes _____
No _____

6) Do you use backflow devices on all operating wells?

Yes _____
No _____

7) Do you take into account crop maturation and weather changes when making nitrate application decisions?

Yes _____
No _____

Optional Narrative for Nutrient Management

Please list the question number you are referring to:

_____

_____

_____

_____

_____

_____

Pesticide Management

1) Do you have irrigation return flow (surface water which leaves the property following application of irrigation water)?

Yes _____

No _____

Note: If your answer is yes, please answer questions 2-4 in this section. If your answer is no, please skip questions 2-4 in this section.

2) Do you use organophosphate pesticides?

Yes _____

No _____

a) Are you in compliance with pesticide label requirements?

Yes _____

No _____

N/A _____

b) Do you have irrigation water run-off that leaves your property where you use these pesticides?

Yes _____

No _____

N/A _____

i. If yes, do you use an enzymatic product such as Landguard to remediate the organophosphate pesticide in water runoff?

Yes _____

No _____

N/A _____

ii. Do you use any other mitigation measures?

Yes _____
No _____
N/A _____

If yes, please describe here:

_____
_____
_____
_____
_____
_____

3) Do you use pyrethroid pesticides?

See sediment management for mitigation answers

Yes _____
No _____
N/A _____

a) Are you in compliance with pesticide label requirements?

Yes _____
No _____

4) If you have irrigation water run-off, have you utilized SMART SAMPLING, or conducted your own sampling to determine if management practices result in water quality improvements?

Yes _____
No _____
N/A _____

5) Are you a licensed Pesticide Crop Advisor or do you hold a Qualified Applicator License?

Yes _____
No _____
N/A _____

If N/A, please explain:

_____
_____

Optional Narrative for Pesticide Management

Please list the question number you are referring to:

_____

_____

_____

_____

_____

_____

Sediment Management

1) Do you have irrigation water run-off that leaves your property?

Yes _____

No _____

N/A _____

2) Do you have soil sediment leaving your fields from irrigation?

Yes _____

No _____

N/A _____

3) If yes, do you use a sediment basin to retain and settle sediments prior to discharging irrigation water run-off?

Yes _____

No _____

N/A _____

4) Do you use PAM to control sediment?

Yes _____

No _____

N/A _____

5) Do you control sediment from leaving fields with any of the following management practices? *Please check the methods you use.*

- ☐ Cover Crops
- ☐ Mulching
- ☐ Filter Strips

- ☐ Vegetated buffers
- ☐ Vegetated Ditches
- ☐ Sediment Basins
- ☐ Other (please describe in narrative)

Optional Narrative for Sediment Management

Please list the question number you are referring to.

_____
_____
_____
_____
_____
_____

Groundwater & Irrigation Management

8) Do you have irrigation water run-off?

Yes _____
No _____

9) Are you monitoring your soil moisture level?

Yes _____
No _____

10) Have you taken steps toward determining and understanding your irrigation distribution uniformity?

Yes _____
No _____

11) Are there back-flow devices on your wells?

Yes _____
No _____

Optional Narrative for Irrigation & Groundwater Management

Please list the question number you are referring to:

_____
_____
_____
_____

Draft Central Coast Agriculture's Alternative Proposal for the Regulation of Discharges from Irrigated Agricultural Lands
Draft Monitoring and Reporting Program for the Cooperative Monitoring Program
December 3, 2010

Water Code section 13267 and 13269 authorizes the Central Coast Regional Water Quality Control Board to require preparation and submittal of technical and monitoring reports. This draft Monitoring and Reporting Program (MRP) sets forth monitoring and reporting requirements for the third-party entity conducting the Cooperative Monitoring Program under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (see Draft Central Coast Agriculture's Alternative Proposal for the Regulation of Discharges from Irrigated Agricultural Lands).

Monitoring and Reporting Requirements

Table 1. Receiving Water Quality Monitoring Parameters

Parameters and Tests	RL[1]	Monitoring Frequency[2]
Photo Monitoring		
Photograph of monitoring location		With every monitoring event
WATER COLUMN SAMPLING		
Physical Parameters and General Chemistry		
Flow (field measure (CFS)	.25	Monthly, plus 2 stormwater events
pH (field measure)	0.1	"
Electrical Conductivity (field measure) (uS/cm)	2.5	"
Dissolved Oxygen (field measure) (mg/L)	0.1	"
Temperature (field measure) (^{0}C)	0.1	"
Turbidity (NTU)	0.5	"
Total Dissolved Solids (mg/L)	10	"
Total Suspended Solids (mg/L)	0.5	"
Hardness (mg/L as CaCO3)	1	"
Total Organic Carbon (ug/L)	0.6	"
Nutrients		
Total Kjeldahl Nitrogen (mg/L)	0.5	Monthly, plus 2 stormwater events
Nitrate + Nitrite (as N) (mg/L)	0.1	"
Total Ammonia (mg/L)	0.1	"

[1] Reporting Limit, taken from SWAMP where applicable.
[2] Monitoring is ongoing through all five years of the Order, unless otherwise specified. Monitoring frequency may be used as a guide for developing alternative MRP Plan.

Parameters and Tests	**RL**[3]	**Monitoring Frequency**[4]
Unionized Ammonia (calculated value, mg/L))		
Total Phosphorous (as P) (mg/L)	-	"
Soluble Orthophosphate (mg/L)	0.01	"
Water column chlorophyll a (ug/L)	0.002	Monthly only
Floating Algal Mats, % coverage	-	Monthly only
Pathogens		
Fecal coliform (MPN/100 ml)	2	Quarterly, plus 2 stormwater events
E. coli (MPN/100 ml)	2	"
Water Column Toxicity Test		
Algae – *Selenastrum capricornutum*, 4 day	-	Twice in dry season, twice in wet season
Water Flea – *Ceriodaphnia (7-day chronic)*	-	"
Fathead Minnow – *Pimephales promelas (7-day chronic)*	-	Twice in dry season, twice in wet season
Pesticides[5] **(ug/L)**		
Carbamates		
Aldicarb	0.05	4 times, concurrent with water toxicity monitoring, in second year of Order term
Carbaryl	0.05	"
Carbofuran	0.05	
Methiocarb	0.05	"
Methomyl	0.05	"
Oxamyl	0.05	"
Organophosphate		
Pesticides		
Azinphos-methyl	0.05	"
Chlorpyrifos	0.05	"
Diazinon	0.05	"
Dichlorvos	0.05	"
Dimethoate	0.05	"
Dimeton-s	0.05	"
Disulfoton (Disyton)	0.05	"

[3] Reporting Limit, taken from SWAMP where applicable.
[4] Monitoring is ongoing through all five years of the Order, unless otherwise specified. Monitoring frequency may be used as a guide for developing alternative MRP Plan.
[5] Pesticide list may be modified based on specific pesticide use in Central Coast Region.

Parameters and Tests	**RL**[6]	**Monitoring Frequency**[7]
Malathion	0.05	"
Methamidophos	0.05	"
Methidathion	0.05	"
Parathion-methyl	0.05	"
Phorate	0.05	"
Phosmet	0.05	"
Herbicides		
Altrazine	0.05	"
Cyanazine	0.20	"
Diuron	0.05	"
Glyphosate	2.0	"
Linuron	0.1	"
Paraquat dichloride	4	"
Simazine	0.05	"
Trifluralin	0.05	"
Other (ug/L)		
Phenol	10	4 times, concurrent with water toxicity monitoring, in second year of Order term
SEDIMENT SAMPLING		
Sediment Toxicity – Hyalella azteca 10-day		Annually
Benthic invertebrate Assessment	SWAMP SOP	Once during the second year of Order concurrent with sediment toxicity sampling
Pyrethroid Pesticides in Sediment (ug/kg)		
Gamma-cyhalothrin	25	Once during second year of Order, concurrent with sediment toxicity sampling
Lambda-cyhalothrin	25	"
Bifenthrin	25	"
Delta-Methrin	25	"
Beta-cyfluthrin	25	"
Cyfluthrin	25	"
Esfenvalerate	25	"

[6] Reporting Limit, taken from SWAMP where applicable.
[7] Monitoring is ongoing through all five years of the Order, unless otherwise specified. Monitoring frequency may be used as a guide for developing alternative MRP Plan.

Parameters and Tests	**RL**[8]	**Monitoring Frequency**[9]
Permethrin	25	"
Cypermethrin	25	"
Organochlorine Pesticides in Sediment		
DDD	2	"
DDE	2	"
DDT	5	"
Dicofol	2	"
Dieldrin	2	"
Endrin	2	"
Methoxychlor	5	"
Other		
Chlorpyrifos (ug/L)	2	"
Total Organic Carbon	0.01%	"
Sediment Grain Size Analysis	1%	Once during second year of Order, concurrent with sediment toxicity sampling

Table 2. Groundwater Sampling Parameter

Parameter	**RL**	**Analytical Method**	**Units**
pH	0.1	Field or Laboratory Measurement EPA General Methods	pH Units
Specific Conductance	2.5		µS/cm
Total Dissolved Solids	10		mg/L
Nitrate + Nitrite (as N)	0.1	General Anions EPA Method 300	mg/L

[8] Reporting Limit, taken from SWAMP where applicable.
[9] Monitoring is ongoing through all five years of the Order, unless otherwise specified. Monitoring frequency may be used as a guide for developing alternative MRP Plan.

Table 3. Individual Discharge Monitoring for Tailwater and Stormwater Discharges

Parameter	Analytical Method[10]	Maximum PQL	Units	Min Sampling Frequency
Discharge Flow or Volume	Field Measure	---	CFS	(a) (d)
Approximate Duration of Flow	Calculation	---	hours/month	
Temperature (water)	Field measure	0.1	^{0}Celsius	
pH	Field Measure	0.1	pH units	
Turbidity	SM 2130B, EPA 180.1	1	NTUs	
Nitrate + Nitrite (as N)	EPA 300.1, EPA 353.2	0.1	mg/L	
Ammonia	SM 4500 NH3, EPA 350.3	0.1	mg/L	
Chlorpyrifos[11]	EPA 8141A, EPA 614	0.02	ug/L	(b) (c) (d)
Diazinon[12]				
Algae Toxicity (Selanastrum)	EPA-821-R-02-013	NA	% Survival	
Ceriodaphnia Toxicity (96-hr acute)	EPA-821-R-02-012			
Chlorpyrifos[11]	EPA 8141A, EPA 614	0.02	ug/L	
Diazinon[12]				
Algae Toxicity (Selanastrum)	EPA-821-R-02-013	NA	% Survival	

[10] "Quick test strips" and handheld water quality meters may be used if method or device is approved by EPA and appropriate sampling methodology and quality assurance protocols are used to ensure accuracy of the test.

[11] If chlorpyrifos or diazinon is used at the farm/ranch, otherwise does not apply.

(a) Two times per year during primary irrigation season for operations greater than 1000 acres but less than 5000 acres, and four times per year during primary irrigation season for operations grater than 5000 acres.

(b) Once per year during primary irrigation season for operations greater than 1000 acres but less than 5000 acres, and two times per year during primary irrigation season for operations greater than 5000 acres.

(c) Sample must be collected within one week of chemical application, if chemical is applied on farm/ranch.

(d) Once per year during wet season (October – March) for operations greater than 1000 acres but less than 5000 acres, and two times per year during wet season for operations greater than 5000 acres, within 18 hours of major storm events.

[12] If chlorpyrifos or diazinon is used at the farm/ranch, otherwise does not apply.

Exhibit 25

University of California
Center for Water Resources

Nitrate Groundwater Pollution Hazard Index

Water Quality Program - Nitrate Groundwater Pollution Hazard Index

Find your index number

Purpose: To provide information for farmers to voluntarily target resources for management practices that will yield the greatest level of reduced nitrogen contamination potential for groundwater by identifying the fields of highest intrinsic vulnerability.

How it Works: The index works with an overlay of soil, crop, and irrigation information. Based on the three components, an overall potential hazard number is assigned and management practices are suggested where necessary. If you don't know what soil type you have, try this online soil survey with detailed soil survey data for much of California, Arizona, and Nevada.

More Information:

- Hazard Index Concept (background information & process) (pdf, 54kb)
- Supporting Evidence for the Nitrate Groundwater Pollution Hazard Index Concept (pdf, 49kb)
- Concentration versus Mass Flow (pdf, 61kb)
- Irrigation Principles (pdf, 49kb)
- Dynamics of Nitrogen Availability and Uptake (pdf, 124kb)
- Basic Factors Affecting N Transport through Soils (pdf, 107kb)
- Interpretation of Nitrate Groundwater Pollution Hazard Index Number (pdf, 42kb)
- Workshop Presentations:
  - Background Information and Supporting Evidence for the Hazard Index (pdf, 154kb)
  - Basic Factors Affecting N Transport through Soils (pdf, 263kb)
  - Hazard Index Ratings for Soils: Methodology and Examples (pdf, 78kb)
  - Hazard Index Ratings for Crops: Methodology and Examples (pdf, 381kb)
  - Hazard Index Ratings for Irrigation Systems (pdf, 168kb)

Webmaster Email: djkrause@ucdavis.edu

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HI for Irrigated Agriculture in the Southwest

Admin

Home Find Your Index Number

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Notice: Undefined index: submit in **E:\Websites\hazardindex\wrc\search2.php** on line **100**

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Crop: Strawberries

Soil *: salinas

Irrigation: micro-irrigation system w/fertigation

Deep Rip: None

Search

* Lookup your Soil Type

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HI for Irrigated Agriculture in the Southwest

Notice: Undefined index: logged_in in E:\Websites\hazardindex\wrc\header.php on line 22

Your Hazard Index (HI) is 12.
Please see table below to assess your relative risk of contaminating groundwater.

An HI of 1 to 20 is of relatively minor concern. The grower should use sound management practices but extraordinary procedures are not required. However, an HI greater than 20 should receive careful attention.

As can be seen in the table on the right, agricultural fields with soils rated 4 or 5 often have HI's of greater than 20 and should be managed to reduce the risk of groundwater contamination. Soils rated 1 or 2 generally have HI's that range between 1 and 20 and can be cultivated with more latitude in the choice of crop and irrigation system.

To view other crops with your rating (4) click here.

	Soil					
Crop	1	2	3	4	5	Irrigation
1	1	2	3	4	5	1
1	2	4	6	8	10	2
1	3	6	9	12	15	3
1	4	8	12	16	20	4
2	2	4	6	8	10	1
2	4	8	12	16	20	2
2	6	12	18	24	30	3
2	8	16	24	32	40	4
3	3	6	9	12	15	1
3	6	12	18	24	30	2
3	9	18	27	36	45	3
3	12	24	36	48	60	4
4	4	8	12	16	20	1
4	8	16	24	32	40	2
4	12	24	36	48	60	3
4	16	32	48	64	80	4

The hazard rating for the production of Strawberries is high ('4') because

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- nitrate is likely to quickly move beneath the shallow roots of this crop

Notice: Use of undefined constant Moderate - assumed 'Moderate' in **E:\Websites\hazardindex\wrc\search2.php** on line **226**

Notice: Use of undefined constant Deep - assumed 'Deep' in **E:\Websites\hazardindex\wrc\search2.php** on line **228**

Notice: Use of undefined constant Low -

assumed 'Low' in **E:\Websites\hazardindex\wrc\search2.php** on line **230**

Notice: Use of undefined constant Medium - assumed 'Medium' in **E:\Websites\hazardindex\wrc\search2.php** on line **232**

Notice: Use of undefined constant High - assumed 'High' in **E:\Websites\hazardindex\wrc\search2.php** on line **234**

Notice: Use of undefined constant Low - assumed 'Low' in **E:\Websites\hazardindex\wrc\search2.php** on line **236**

Click here for suggested practices to mitigate problematic crop characteristics.

Notice: Use of undefined constant Medium - assumed 'Medium' in **E:\Websites\hazardindex\wrc\search2.php** on line **238**

- a moderate proportion of the N concentrated within plant tissues is removed during harvest, leaving some atop the soil in crop residue and available for leaching

Notice: Use of undefined constant High - assumed 'High' in **E:\Websites\hazardindex\wrc\search2.php** on line **240**

Hazard rating for your soil type (Salinas): 3.

Click here for soil characteristics associated with this rating

Hazard rating for Micro-irrigation system w/fertigation: 1.

Click here to see a description of this irrigation method.

THE HAZARD INDEX CONCEPT

A supporting document for the
UC Center for Water Resources (http://www.waterresources.ucr.edu)
Nitrate Groundwater Pollution Hazard Index

The United States Congress appropriated funds to the US Geological Survey (USGS) to begin the National-Water Quality Assessment (NWQA) Program in 1991. As part of the NWQA Program the USGS works with other federal, state and local agencies to understand the spatial extent of water quality, how water quality changes with time and how human activities and natural factors affect water quality across the nation. The USGS published a report (USGS 1999) entitled, "The Quality of Our Nation's Waters" with specific reference to nutrients and pesticides. For the purposes of our report, we will only address nitrogen issues.

Some of the highest levels of nitrogen were reported to occur in streams and groundwater in agricultural areas. However, concentrations were found to vary considerably from season to season as well as among watersheds. A graphical plot of nitrogen inputs to agricultural land versus median nitrate concentrations in underlying shallow groundwater produced a complete scatter of points (USGS 1999, p 47). The range of nitrate concentrations was the same for all levels of nitrogen input. Differences in natural features and land management practices make some areas more vulnerable to contamination than other areas. Recognition of differences in vulnerability to contamination can help target the appropriate level of protection and monitoring to major aquifers at greatest risk. The most extensive control strategies should be considered in the more vulnerable settings.

Nolan (2001) used multi variant logistic regression models based on more than 900 sampled wells to predict the probability of exceeding 4 mg/L of nitrate in ground water in the United States. The model consisted of 6 variables: nitrogen fertilizer loading, percent crop land-pasture, natural log of population density, percent well-drained soils, depth to seasonally high water table, and presence or absence of a fracture zone within an aquifer. Although valuable at the large landscape scale, the results are not useful on a farm level scale where management decisions are made which could affect ground water degradation from nitrogen. Nevertheless, the concept of establishing vulnerability to groundwater contamination is valid and even more appropriate on a farm scale.

Estimates of groundwater vulnerability can be separated into intrinsic vulnerability and specific vulnerability (National Research Council, 1993). Intrinsic vulnerability is related to factors of which the farmer has no control such as the hydrologic properties of the soil and hydrogeologic factors

such as proximity of an aquifer to land surface, etc. Although the farmer can choose the crop to grow, the choice is usually made on economic factors. Once a crop is chosen, each crop has an intrinsic vulnerability for groundwater contamination from nitrates. Likewise, irrigation systems may be selected, but each irrigation system has an intrinsic vulnerability. Specific vulnerability is a function of management factors such as quantity, rate, timing, and methods of nitrogen and water application and other agricultural management practices. Therefore, the farmer has some level of control over the specific vulnerability with little or no control over the intrinsic vulnerability.

The National Academy of Science Water Science and Technology Board appointed a committee on Techniques for Assessing Groundwater Vulnerability. The committee defined groundwater vulnerability as: "The tendency or likelihood for contaminants to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer." They pointed out that this definition of groundwater vulnerability is flawed, as is any other, by a fundamental principle that they stated as the First Law of Groundwater Vulnerability: "All groundwater is vulnerable." They also proposed a Second Law of Groundwater Vulnerability: "Uncertainty is inherent in all vulnerability assessments."

The committee suggested a vulnerability assessment process. The first step is to identify the purpose of the assessment. The next step is to select a suitable approach for conducting the assessment. They listed three methods of assessment: 1) overlay and index methods, 2) methods using process-based simulation models, and, 3) statistical methods. The report elaborated on each of these methods. We will follow the proposed steps by stating the purpose and then describing the assessment method.

PURPOSE: To provide information for farmers to voluntarily target resources for management practices that will yield the greatest level of reduced nitrogen contamination potential for groundwater by identifying the fields of highest intrinsic vulnerability.

ASSESSMENT METHOD: We used the overlay and index method. Although process-based simulation models were not specifically used, the basic physical and chemical factors that are incorporated into these models were used in deriving an index number. The overlay consists of soil maps, crop and irrigation system distributions. The soils, crops and irrigation systems were each indexed by an approach described below.

This approach is consistent with the recommendations of a Nutrient Technical Advisory Committee (TAC) appointed by the California State Water Resources Control Board. The TAC was assigned to propose a nutrient management approach in California that would meet the varied interests of those who have a stake in the quality of California's waters. The TAC proposed that farmers complete a hazard index for each field on their farm based on the soil, crop and irrigation systems. The TAC proposed that the soil be assigned a hazard value of 1, 2 or 3. Soils classified as 1 are those that have textural or profile characteristics that inhibit the flow of water and create an environment conducive to denitrification. Both denitrification and restrictive water flow decrease the migration of nitrate to groundwater. Conversely those soils classified as 3 are most sensitive to groundwater degradation by nitrate because of the high water infiltration rates, high transmission rates through their profile, and

low denitrification potential. In our case, we expanded the hazard values to 1 through 5, but used the same criteria as proposed by TAC for assigning higher or lower hazard values.

The TAC proposed that crops be classified into three hazard indices based on their degree of potential for nitrate leaching. They suggested that those with the highest potential for nitrate leaching, which would have a hazard index of 3, are those with the following characteristics: (1) The nitrogen uptake in the crop is a small fraction of the total nitrogen applied to the crop; (2) the crop requires high nitrogen input and frequent irrigation to ensure rapid vegetative growth; (3) the value of the crop is such that there is a tendency to add excess nitrogen to ensure no nitrogen deficiencies; (4) the crop is not adversely affected when more than adequate amounts of nitrogen are applied; and (5) the crop has a shallow root system where a small amount of water movement could carry nitrate below the root system. Crops with the opposite characteristics of those listed would have a low potential for nitrate leaching and have a hazard index of 1. Crops with intermediate characteristics would be classified with a hazard index of 2.

The criteria that we used in assigning a hazard index for crops were consistent with those suggested by TAC, but differed in detail. We also expanded the crop hazard index to 1 through 4. The factors considered in establishing a hazard index for field crops and vegetables were as follows: 1) rooting depth, 2) ratio of N in the crop tops to the recommended N application, 3) fraction of the crop top N that is removed from the field in the marketed product, 4) the magnitude of the peak N uptake rate, and 5) whether the crop is harvested at a time when N uptake rate is high. A slightly modified set of criteria was used for tree and vine crops. The rooting depth is quite great in all cases and none is harvested at the time of peak N uptake rate. Therefore, these criteria were eliminated and replaced by the magnitude of leaf N deposit for trees and vines.

The crops with a shallower rooting depth have a higher potential for N leaching than deep-rooted crops. Crops that take up a high percentage of the recommended N application provide for a lower hazard for N leaching than those which take up a low percentage, thus leaving much N in the soil. Furthermore, removal of much of the N in the crop tops with the harvested product creates a lower hazard than when the crop residues containing much N are left on the field. Crops that have a very high peak N uptake rate over a short period are considered to be more hazardous than those with low peak N uptake rate because they require large quantities of mineral N to be available for that time period.

A matrix was constructed for each crop and the criteria used to establish the hazard index. The hazard index number that was chosen for each crop was based on an overall consideration of all the criteria. For example, lettuce has a hazard index of 4 because it is shallow rooted, is harvested at the time of peak uptake rate, and much of the N in the tops remains in the field. Conversely, alfalfa has a hazard index of 1 because it is deep rooted and nitrogen fertilizer application is not required. The matrix, as well as the hazard index number, will be reported for each crop.

The TAC recommended that the irrigation system be classified into a hazard index of 0 through 3. The “0” hazard index is a micro-irrigation system accompanied by fertigation. Small amounts of

water and nutrients can be frequently applied in quantities to match the crop need. A micro irrigation system without fertigation is assigned a hazard index of 1. Sprinklers used throughout the irrigation season or for pre-irrigation for crop establishment is assigned a hazard index of 2. Entire surface irrigation systems such as furrow are assigned a hazard index of 3. We used the same criteria for indexing irrigation systems except that our range was 1 through 4 rather than 0 through 3.

In our case, the overlay and index method consists of having an overlay of the soil, crop and irrigation system maps and multiplying the hazard index numbers for each. The intrinsic hazard index number can range from 1 through 80. The TAC suggested adding the index numbers. Adding the numbers would provide a much smaller range between 3 and 13, which would consequently make it more difficult to distinguish the relative hazards among combinations of soils, crops, and irrigation systems.

Although the TAC proposed that farmers complete a hazard index for each field, the proposal has never been implemented. A major impediment to the implementation is that soils and crops have not been assigned hazard rating values. We have developed tables of hazard rating numbers for the major irrigated soils and crops in Arizona, California, and Nevada that can be used by farmers to assess the relative hazard for groundwater degradation by nitrate for each of their fields.

References:

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USGS. 1999. The Quality of our Nation's Waters. U.S. Geological Survey Circular 1225.