



CDQAP - WDR General  
Order Reference Binder  
TAB 5.4  
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## Soil Sampling Protocol

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In May, 2007 the Central Valley Regional Water Quality Control Board (Regional Board) adopted Waste Discharge Requirements General Order R5-2007-0035 for Existing Milk Cow Dairies (the General Order)<sup>1</sup>. The Monitoring and Reporting Program of the General Order requires analyses of various types of materials to define baseline conditions, develop and implement a Nutrient Management Plan, and describe potential pollutant load in illegal discharges. This Monitoring and Reporting Program was revised in February, 2011<sup>2</sup> and describes minimum **soil sampling** requirements to obtain data for use in the site specific Nutrient Management Plan. Results must be submitted to the Central Valley Regional Water Quality Control Board as part of the appropriate annual reporting activities (due July 1 of the following calendar year).

### Part I –Laboratory Selection and Identification of Sampling and Analytical Requirements

1. Table 1 outlines the minimum constituents and frequency of sampling and analysis requirements specified under the revised MRP. For agronomic purposes, additional analyses may be needed.
2. Select a laboratory that utilizes methods utilized by the North American Proficiency Testing (NAPT) Program or accepted by the University of California ([http://anlab.ucdavis.edu/docs/uc\\_analytical\\_methods.pdf](http://anlab.ucdavis.edu/docs/uc_analytical_methods.pdf)) or other programs whose tests are accepted by the University of California.
3. Contact your analytical laboratory to obtain sample bags, labels and chain of custody forms.

**Table 1.** Nutrient Monitoring for Soil Analysis (minimum regulatory requirements).

**Once every 5 years from each land application area (may be distributed over a 5-year period by sampling 20% of the land application areas annually):**

Laboratory analyses for: Soluble Phosphorus

**The following soil tests are recommended, but not required:**

Spring pre-plant for each crop:

Laboratory analyses for:

0 to 1 foot depth: Nitrate-nitrogen and organic matter

1 to 2 foot depth: Nitrate-nitrogen

Fall pre-plant for each crop:

Laboratory analyses for:

0 to 1 foot depth: Electric conductivity, nitrate-nitrogen, soluble phosphorus, potassium and organic matter.

1 to 2 foot depth: Nitrate-nitrogen

<sup>1</sup> Central Valley Regional Water Quality Control Board. 2007. Order No. R5-2007-0035. Waste Discharge Requirements for General Order for Existing Milk Cow Dairies. May 3, 2007. Available at [http://www.waterboards.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/general\\_orders/r5-2007-0035.pdf](http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2007-0035.pdf).

<sup>2</sup> Central Valley Regional Water Quality Control Board. 2011. Revised Monitoring And Reporting Program Order No. R5-2007-0035. General Order For Existing Milk Cow Dairies Available at [http://www.waterboards.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/general\\_orders/r5-2007-0035\\_mrp\\_rev.pdf](http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2007-0035_mrp_rev.pdf)

## Part II – Sampling Considerations

1. **Soil Sampling Planning:** An individual with specialized training (such as a Certified Crop Adviser or trained agronomist) should be consulted to determine when, where and how soil samples will be collected and which specific soil tests are needed to meet agronomic and regulatory objectives. Regional Board-approved sampling procedures require a minimum of “... 1 composite sample for every 40 acres for dischargers with less than 400 acres of land application area and 1 composite sample for every 80 acres for dischargers with more than 400 acres of land application area ...”.
2. **Sampling Pattern:** Work with your crop consultant/adviser to decide how to delineate sampling zones within fields. This may involve establishment of sampling areas even smaller than the 40 or 80-acre minimum required by the Regional Board. These sampling zones could consist of areas that have similar soil texture, crop yield, or manure application history and may exclude small areas of different texture, drainage, etc. Over time, the results of sampling “by zone” will provide a far more useful record of the impact of farming practices on soil fertility than a composite sample of a large heterogeneous field.
3. **Recordkeeping:** Develop a consistent method for labeling soil samples so there will be no future confusion on location of sampling zones, sampling depth, etc. Incorporate soil sampling and analysis information into your regular crop production records for each field.
4. **Soil Sampling Tools:** Sampling supplies and equipment include a push-type soil sampling probe, bucket style auger (for gravelly or claypan soils), permanent marker, plastic bags, chain of custody form, notebook, field map, and dishpan or bucket for subsampling.

## Part III – Sample Collection

1. Label sample bag with field identification (consistent with identification used in the Nutrient Management Plan), sampling zone, sampler’s name, the date and time of sampling, and depth of sampling.
2. Using a soil probe (push tube) or bucket style auger, collect 10 to 30 soil cores from each sampling zone and place together in a bucket or dishpan. The number of cores included in the composite will depend on the size and variability of the sampling zone as well as the analyses needed. Generally, more cores are needed for nitrate, fewer for pH, P and K. Shovels should usually not be used for sample collection as they do not allow for the collection of a uniform representation of the sampled depth.
3. Thoroughly crumble and mix material in the bucket or dishpan.
4. Remove a 1 pint subsample and place in sample bag for submittal to the laboratory.
5. Preserve sample as needed. For nitrate analysis, either dry samples immediately (maximum 120° F) or keep refrigerated.
6. Complete a chain of custody form.
7. Deliver to laboratory as soon as possible.
8. Keep a copy of the chain of custody form and sample identification records at the facility.

### Additional information

Contact your analytical laboratory for additional information on sample collection, handling, preservation, and delivery. Contact the Central Valley Regional Water Quality Control Board for any other information requests

[http://www.waterboards.ca.gov/centralvalley/water\\_issues/dairies/general\\_order\\_guidance/sampling\\_analysis/sampling\\_procedures\\_rev\\_30jan09.pdf](http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/general_order_guidance/sampling_analysis/sampling_procedures_rev_30jan09.pdf).

*Information in this document was compiled by CDQAP to assist dairy producers in understanding and complying with the General Order Waste Discharge Requirements for Existing Milk Cow Dairies (Central Valley Regional Water Quality Control Board Order R5-2007-0035). Effort has been made to ensure accuracy, but these summaries are not official regulatory guidance and are not legal advice. Producers are advised that these summaries are not intended to be a substitute for producers reading the complete order and consulting their own legal counsel to ensure compliance with the waste discharge requirements. Should any information here conflict with the General Order and/or official information provided by the Regional Board, Board-provided information takes precedence.*

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