

ATTACHMENT G

Definitions For Dairy with Manure Anaerobic Digesters or Co-Digester Facilities

1. *25-year, 24-hour rainfall event* A precipitation event with a probable recurrence interval of once in twenty five years with a duration of twenty four hours, as defined by the National Weather Service in Technical Paper No. 40, "Rainfall Frequency Atlas of the United States," May, 1961, or equivalent regional or State rainfall probability information developed from this source.
2. *Agronomic rates* The land application of irrigation water and nutrients (which may include animal manure, bedding, digester solids (digestate) waste feed or codigester feedstocks, or process wastewater) at rates of application in accordance with a plan for nutrient management that will enhance soil productivity and provide the crop or forage growth with needed nutrients for optimum health and growth.
3. *Anaerobic digester* A device for optimizing the anaerobic digestion of biomass and/or animal manure, often used to recover biogas for energy production. Commercial digester types include complete mix, continuous flow (horizontal or vertical plug-flow, multiple-tank, and single tank) and covered lagoon.
4. *Anaerobic digestion* A naturally occurring biological process in which organic material is broken down by bacteria in a low-oxygen environment resulting in the generation of methane gas and carbon dioxide as its two primary products.
5. *Aquifer* Ground water that occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs.
6. *Biofuel* Technically, any biomass derived substance used for energy (heat, power, or motive). The term 'biofuel' usually is used to describe liquid transportation fuels derived from biomass.

7. *Biogas* A naturally occurring gas formed as a by-product of the breakdown of organic waste materials in a low-oxygen (e.g., anaerobic) environment. Biogas is composed primarily of methane (typically 55% – 70% by volume) and carbon dioxide (typically 30% – 45%). Biogas may also include smaller amounts of hydrogen sulfide (typically 50 – 2000 parts per million [ppm]), water vapor (saturated), oxygen, and various trace hydrocarbons. Due to its lower methane content (and therefore lower heating value) compared to natural gas, biogas use is generally limited to engine-generator sets and boilers adapted to combust biogas as fuel. Biogas includes landfill gas, digester gas (from wastewater treatment plants) and biogas from the decomposition of animal waste or food processing waste. As used by this Order, the word biogas usually refers to biogas created by the anaerobic digestion of animal manure and co-digestion materials.
8. *Biomass* Biomass is any organic matter that is available on a renewable or recurring basis, including agricultural crops and trees, wood and wood wastes and residues, plants (including aquatic plants), grasses, residues, fibers, and animal wastes, municipal wastes, and other waste materials.
9. *Central Valley Water Board* The California Regional Water Quality Control Board, Central Valley Region.
10. *Certified Nutrient Management Plan* A nutrient management plan that is prepared and signed by a specialist who is certified in developing nutrient management plans. A certified specialist is: a Professional Soil Scientist, Professional Agronomist, Professional Crop Scientist, or Crop Advisor certified by the American Society of Agronomy; a Technical Service Provider certified in nutrient management in California by the Natural Resources Conservation Service; or other specialist approved by the Executive Officer.
11. *Co-digestion* Co-digestion is the simultaneous digestion of a mixture of manure and one or more feedstocks to increase the production of biogas. The expression co-digestion is applied independently to the ratio of the respective substrates.
12. *Co-digester* An anaerobic digester located at a dairy that uses imported feedstocks in the co-digestion process.
13. *Confined animal facility* Is defined in Title 27 CCR Section 20164 as “... any place where cattle, calves, sheep, swine, horses, mules, goats, fowl, or other domestic animals are corralled, penned, tethered, or otherwise enclosed or held and where feeding is by means other than grazing.”

14. *Confined area* The area where cows are confined within the production area.
15. *Cropland* The land application area where dry or solid manure and/or process wastewater is recycled for the purpose of beneficially using the nutrient value of the manure and/or process wastewater for crop production.
16. *Degradation* Any measurable adverse change in water quality.
17. *Digestate* Any solid or semi-solid residual of the dairy digestion or co-digestion process that has not been confirmed through chemical analysis to meet the criteria required to be defined as a soil amendment.
18. *Discharge* The discharge or release of waste to land, surface water, or ground water.
19. *Discharger* The owner of real property where a dairy with a dairy digester or dairy co-digester is located; the owner and/or operator of a dairy with a dairy digester or dairy co-digester; and the owner and/or operator of the dairy digester or co-digester at a dairy facility subject to Waste Discharge Requirements General Order No. R5-2010-XXXX.
20. *Expansion* Any increase in the existing herd size (i.e., by more than the mature dairy cows in the herd as authorized by the local permitting authority, and/or as documented in the NOI).
21. *Facility* The property identified as such in Waste Discharge Requirements General Order No. R5-2010-XXXX. It includes the dairy production area, the digester production area, land application area controlled by the Discharger.
22. *Feedstock* The principal input for the digestion or co-digestion process (e.g., manure).
23. *Field moisture capacity* The upper limit of storable water in the soil once free drainage has occurred after irrigation or precipitation.
24. *Freeboard* The elevation difference between the process wastewater (liquid) level in a pond and the lowest point of the pond embankment before it can overflow.
25. *Incorporation into soil* The complete infiltration of process wastewater into the soil, the disking or rotary tiller mixing of manure into the soil, shank injection of slurries into soil, or other equally effective methods
26. *Irrigation return flow* Surface and subsurface water that leaves a field following application of irrigation water.

27. *Land application area* Land under control of the owner or operator of a dairy with a dairy digester, or a dairy co-digester, whether it is owned, rented, or leased, to which manure, or digestate as a soil amendment, or process wastewater from the production area is or may be applied for nutrient recycling.
28. *Manure* The fecal and urinary excretion of livestock and other commingled materials. Manure may include bedding, compost, and waste feed.
29. *Manured solids* Manure that has a sufficient solids content such that it will stack with little or no seepage.
30. *Mature dairy cow* A dairy cow that has produced milk at any time during her life.
31. *Mesophilic* Conditions in a biological reactor where temperatures are around 95° F (35° C).
32. *Methane* Methane is the main component of natural gas and biogas. It is a natural hydrocarbon consisting of one carbon atom and four hydrogen atoms (CH₄). The heat content of methane is approximately 1,000 Btu/scf (standard cubic feet). Methane is a greenhouse gas with 21 times the global warming potential of carbon dioxide on a weight basis.
33. *Methanogenic* Methane-forming; In the anaerobic digestion process, methanogenic bacteria consume the hydrogen and acetate (from the hydrolysis and the acid forming stages) to produce methane and carbon dioxide
34. *Normal precipitation* The long-term average precipitation based on monthly averages over the time that data has been collected at a particular weather station. Normal precipitation is usually taken from data averaged over a 30-year period (e.g. 1971 to 2000) if such data is available.
35. *Non-nutrient salt* Include but are not limited to sodium, calcium, magnesium, carbonate, bicarbonate, chloride, sulfate, and unused nutrient salts.
36. *Nuisance* Is defined in the Porter-Cologne Water Quality Control Act as "...anything which meets all of the following requirements: a-Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. b-Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. c-Occur during, or as a result of, the treatment or disposal of wastes."

37. *Nutrient* Any element taken in by a plant which is essential to its growth and which is used by the plant in elaboration of its food and tissue.
38. *Nutrient recycling* The application of nutrients at agronomic rates for crop production.
39. *Off-property discharge* The discharge or release of waste beyond the boundaries of the property of the dairy's production area or the land application area or to water bodies that run through the production area or land application area.
40. *Order* The general waste discharge requirements order for discharges of dairy and dairy digester or co-digester waste from dairy facilities with anaerobic digesters or co-digesters.
41. *Overflow* The intentional or unintentional diversion of flow from the collection, treatment, land application, and conveyance systems, including pumping facilities.
42. *Pollutant* Is defined in Title 40 Code of Federal Regulations Section 122.2 as "...dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."
43. *Pollution* Is defined in Section 13050(l)(1) of the Porter-Cologne Water Quality Control Act as "...an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses. (B) Facilities which serve these beneficial uses."
44. *Pond* Retention ponds, storage ponds, settling ponds, or any structures used for the treatment, storage, disposal, and recycling of process wastewater. Ponds are differentiated from sumps, which are structures in a conveyance system used for the installation and operation of a pump.
45. *Process wastewater* Water directly or indirectly used in the operation of a dairy and dairy digester or co-digester for any or all of the following: spillage or overflow from animal watering systems; washing, cleaning, or flushing pens, barns, manure pits, or other dairy facilities; washing or spray cooling of animals; or dust control...and includes any water or precipitation and precipitation runoff which comes into contact with any raw materials, products, or byproducts including manure, feed, milk, or bedding.

46. *Production area* That part of a dairy and dairy digester or co-digester that includes the animal confinement area, the manure storage area, the raw materials storage area, and the waste containment areas. The production area includes, but is not limited to, barns, corrals, flushed or scraped corrals, feed-lanes, milking parlor, feed storage area, waste management components such as solids separators, wastewater retention ponds, stormwater retention ponds, and pumps and piping.
47. *Rainy season* The period of time when rainfall can exceed crop water demand.
48. *Regional Board* One of the nine California Regional Water Quality Control Boards.
49. *Salt* The products, other than water, of the reaction of an acid with a base. Salts commonly break up into cations (sodium, calcium, etc.) and anions (chloride, sulfate, etc.) when dissolved in water. Total dissolved solids is generally measured as an indication of the amount of salts in a water or wastewater.
50. *Salt in animal rations* The sodium chloride and any added minerals (such as calcium, phosphorus, potassium, sulfur, iron, selenium, copper, zinc, or manganese) in the animal ration.
51. *Scrubbing* Cleaning emission gases from a chemical reactor, generally with sprays of solutions that will absorb gases.
52. *Significant storm event* A precipitation event that results in continuous runoff of storm water for a minimum of one hour, or intermittent discharge of runoff for a minimum of three hours in a 12-hour period.
53. *Sole-source aquifer* An aquifer that supplies 50 percent or more of the drinking water of an area.
54. *State* The State of California.
55. *State Water Board* The State Water Resources Control Board.
56. *Storm water* Storm water runoff, snowmelt runoff, and surface runoff and drainage.
57. *Subsurface (tile) drainage* Water generated by installing and operating drainage systems to lower the water table below irrigated lands. Subsurface drainage systems, deep open drainage ditches, or drainage wells can generate this drainage.

58. *Surface water* Water that includes essentially all surface waters such as navigable waters and their tributaries, interstate waters and their tributaries, intrastate waters, all wetlands and all impoundments of these waters. Surface waters include irrigation and flood control channels.
59. *Tailwater* The runoff of irrigation water from an irrigated field.
60. *Thermophilic* Conditions in a biological reactor where temperatures are around 130° F (55° C) or higher.
61. *Total Solids* Used to characterize digester systems input feedstock. Total solids (TS) means the dry matter content, usually expressed as % of total weight, of the prepared feedstock. By definition, TS = 100% – moisture content % of a sample. Also, TS = VS plus ash content.
62. *Waste* Is defined as set forth in Water Code Section 13050(d) and includes, but is not limited to, manure, leachate, digester solids (solids produced by the digestion process), gas scrubber waste (produced during the cleaning of the biogas), dairy, dairy digester or co-digester process wastewater and any water, precipitation or rainfall runoff, that contacts raw materials, digester feedstocks, products, or byproducts such as manure, compost piles, feed, silage, animal bedding, or soil amendments.
63. *Waters of the State* Defined in Section 13050 of the California Water Code as “...any surface water or groundwater, including saline waters, within the boundaries of the state.”
64. *Wet Season* Is defined as the period of time between 1 October to 30 April of each year