

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

ORDER R5-2017-0058

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
CONFINED BOVINE FEEDING OPERATIONS**

The California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board or Board), finds that:

SCOPE OF COVERAGE OF THIS ORDER

1. This Order (hereinafter referred to as the Bovine General Order, or Order) serves as general waste discharge requirements for discharges of waste from Confined Bovine Feeding Operations, as defined in Finding 2. This Order incorporates provisions requiring the monitoring of surface water and groundwater to identify discharges associated with Confined Bovine Feeding Operations resulting from runoff or leaching of irrigation water and/or storm water from cropland, and from drift of chemicals applied to cropland. For Confined Bovine Feeding Operations that include or propose to include a composting operation, the Notice of Applicability (NOA) issued by the Executive Officer pursuant to this Order will confirm the Discharger's tier and timeline for compliance for the composting operation.
2. For the purposes of this Order, "Confined Bovine Feeding Operations" means commercial operations where cattle (cows, bulls, steers, heifers, or calves) representing 6 or more Animal Units (AU)¹ are confined and fed or maintained for a total of 45 days or more in any 12-month period, and where vegetation is not sustained over a majority of the confinement area during the normal growing season.

Confined Bovine Feeding Operations include, but are not limited to: beef cattle stockyards, finishing yards, and/or auction yards; calf ranches; dairy heifer operations; and veal calf facilities. Confined Bovine Feeding Operations do not include operations where animals primarily graze on pasture or rangeland, including any corrals that are an integral part of the grazing or pasture operation. However, corrals or other confinement areas used to finish cattle for slaughter at a grazing operation are considered Confined Bovine Feeding Operations requiring coverage under this Order.

3. This Order classifies facilities as "existing", "new", or "expanded". Existing facilities are those that were operating as of 10 February 2017. New facilities are those that were not yet operating as of 10 February 2017. Expanded facilities are those that

¹ For the purposes of this Order, 1 Animal Unit equals 1000 pounds of animal weight.

increase their herd size from the maximum number reported in a previous Notice of Intent (NOI). This Order applies to owners and operators of Confined Bovine Feeding Operations (hereinafter referred to as “Dischargers”) that:

- a. Either:
 - i. Qualify as “existing”; or
 - ii. Qualify as “new” or “expanded” and demonstrate compliance with the provisions of the California Environmental Quality Act (CEQA) in the form of a certified Environmental Impact Report (EIR), Mitigated Negative Declaration, or Negative Declaration; and
 - b. Submitted a complete Notice of Intent (NOI) to the Central Valley Water Board and the appropriate fee to the State Water Resources Control Board; and
 - c. Have received a formal Notice of Applicability (NOA) from the Central Valley Water Board indicating that they are required to comply with the terms and conditions of this Order.
4. This Order includes a separate tier for Limited Time Operations. A facility is deemed to pose a low threat to water quality and therefore qualifies as a Limited Time Operation if it meets all of the following criteria:
- a. Houses bovine animals for fewer than 24 days per calendar month. Animals, up to 10% of the existing herd size, may be housed during the remaining days of the month, provided that the animals are moved or rotated around the facility so that cleanup and maintenance are not hindered;
 - b. Exports all manure or, if manure is applied to Discharger’s cropland, the cropland is enrolled under the Irrigated Lands Regulatory Program. Application of corral runoff to the Discharger’s cropland may be permitted if the Discharger demonstrates that, due either to the limited volume of corral runoff to be applied or the low concentration of waste constituents in the corral runoff, application of the corral runoff to crops poses a minimal threat to water quality and the cropland is enrolled under the Irrigated Lands Regulatory Program;
 - c. Collects manure from pens and stores manure in either:
 - i. A roofed structure with features to limit the entrance of precipitation, or
 - ii. A storage area that has a low permeability surface and features to control run-on of water onto the pad and run-off of liquid from the pad, and throughout the wet season when necessary (and at a minimum one day prior to any forecasted major storm event, which is one inch of precipitation within 24 hours), manure is either removed from the site or covered with a weatherproof covering such that runoff leaving the storage area will not have contacted manure;
 - d. Conducts any composting either under separate coverage under the General Waste Discharge Requirements for Composting Operations, Order WQ 2015-

- 0121-DWQ or in a roofed structure with features to limit the entrance of precipitation, and on concrete or an equivalent low permeability surface, and free liquids are not released during the composting process; and
- e. Stores storm water runoff from corrals in pond(s) that only contain water following precipitation events and are otherwise dry, and that do not receive wastewater from any source other than corral runoff and de minimus amounts of water necessary for sanitization
5. This Order includes a separate tier for Limited Population Operations. A facility is deemed a Limited Population Operation if it meets all of the following criteria:
- a. Houses between 6 and 99 AUs;
 - b. Exports all manure or, if manure is applied to Discharger's cropland, the cropland is enrolled under the Irrigated Lands Regulatory Program. Application of corral runoff to the Discharger's cropland may be permitted if the Discharger demonstrates that, due either to the limited volume of corral runoff to be applied or the low concentration of waste constituents in the corral runoff, application of the corral runoff to crops poses a minimal threat to water quality and the cropland is enrolled under the Irrigated Lands Regulatory Program;
 - c. Stores storm water runoff from corrals in pond(s) that only contain water following precipitation events and are otherwise dry, and that do not receive wastewater from any source other than corral runoff;
 - d. Prepares and follows an Operation and Maintenance Plan designed to ensure that maintenance measures are taken prior to the wet season to minimize the threat to water quality posed by the facility; and
 - e. Conducts any composting either under separate coverage under the General Waste Discharge Requirements for Composting Operations, Order WQ 2015-0121-DWQ or in a roofed structure with features to limit the entrance of precipitation, and on concrete or an equivalent low permeability surface, and free liquids are not released during the composting process.
 - f. Has not been artificially divided from what is essentially one operation (e.g., contiguous border and/or common ownership) to avoid the requirements applicable to Full General Order Coverage Operations.
6. Staff will review the NOI and notify the Discharger if they meet the criteria for a Limited Time or Limited Population Operation. A facility that otherwise meets the definition of a Limited Time or Limited Population Operation may be required to comply with all or some of the requirements of this Order as a Full General Order Coverage Operation if the Executive Officer determines that the Operation poses a threat to water quality that is not consistent with the Limited Time or Limited Population tiers.

REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

7. Under the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code), the Central Valley Water Board has the authority to regulate waste discharges that could affect the quality of the waters of the State. Under Water Code section 13050(e), “waters of the state” includes any surface or groundwater within the boundaries of the State.
8. Water Code section 13260 requires that any person discharging waste, or proposing to discharge waste, within the Central Valley Region, that could affect the quality of the waters of the State shall file a report of waste discharge with the Central Valley Water Board.
9. Waste discharge requirements are one method available to the Central Valley Water Board to ensure that a discharge of waste does not threaten beneficial uses or otherwise impair water quality. Water Code section 13263 requires that waste discharge requirements implement the relevant water quality control plan, including any applicable water quality objectives. Pursuant to Water Code section 13263(i), the Central Valley Water Board may prescribe general waste discharge requirements for a category of discharges if all the following criteria apply:
 - a. The discharges are produced by the same or similar operations;
 - b. The discharges involve the same or similar types of waste;
 - c. The discharges require the same or similar treatment standards; and
 - d. The discharges are more appropriately regulated under general requirements than individual requirements.
10. In regulating waste discharges, the Central Valley Water Board implements State laws and regulations. California regulations governing discharges from confined animal facilities are contained in title 27 of the California Code of Regulations (“title 27”)², at sections 22560 et seq.
11. A facility that otherwise meets the definition of a Confined Bovine Feeding Operation but which has fewer than 6 AUs on site nonetheless may be required to comply with the provisions of this Order if the Executive Officer determines that the operation poses a significant threat to water quality. When directed by the Executive Officer, the Operation shall submit a Notice of Intent to the Central Valley Water Board and, based on Board staff’s review of the data submitted, may be required by the Executive Officer to comply with this Order.

² All subsequent references to “title 27” shall refer to California Code of Regulations, title 27.

12. Confined Bovine Feeding Operations that are conducted as part of a dairy currently regulated under the Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies, Order No. R5-2013-0122 (Reissued Dairy General Order), or its successor orders, shall continue to be regulated under the Reissued Dairy General Order and will not require coverage under this Order, provided that the bovine feeding operation is included in the dairy's Waste and Nutrient Management Plans and is:

- a. Located within the dairy production area; or
- b. Is immediately adjacent to the dairy production area, land application area, or both.

If a Confined Bovine Feeding Operation does not meet a or b above but shares the same land application area with a dairy, the Confined Bovine Feeding Operation can request that the bovine operation be covered by the Reissued Dairy General Order as part of the dairy operation.

13. For "existing" facilities, the NOI shall document an existing herd size which is defined as the maximum number of bovine animals (beef cattle, bulls, heifers, and calves) housed at the facility in a single month period that occurred in the three years immediately prior to the issuance of the tentative Order, 10 February 2017, or the maximum herd size identified in an approved CEQA document or other regulatory document that has gone through CEQA review or a CEQA-equivalent process. Any increase in the herd size beyond this number constitutes an expansion requiring a CEQA evaluation as outlined in Finding 14. The use of the three previous years' monthly animal numbers for determining the maximum number of animals has been stipulated to account for normal fluctuations in the on-site animal numbers due to changes in economic conditions.

14. For "new" or "expanded" operations, the herd size for the General Order will be the herd size described in the CEQA document or other regulatory document that has gone through CEQA review or a CEQA-equivalent process and been adopted by the lead agency for the new or expanded operation. Prior to either populating a new Confined Bovine Feeding Operation or expansion of an existing Confined Bovine Feeding Operation, the Discharger is required to file an NOI, including proof of CEQA compliance, in order to obtain regulatory coverage under this Order.

15. There are an estimated 800 bovine feeding operations within the Central Valley Region that will be required to operate under the requirements of this Order. Each facility represents a source of waste discharge that, if not properly managed, has the potential to affect the quality of waters of the State.

16. For the purposes of this Order, "waste" shall have the meaning provided under Water Code section 13050(d). Waste includes, but is not limited to, manure, leachate, wastewater and any water, precipitation or rainfall runoff that contacts

raw materials, products, or byproducts such as manure, compost piles, feed, silage, or bedding.

17. This Order implements the requirements of State Water Resources Control Board Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*, referred to hereafter as the *State Anti-Degradation Policy*), the sections of title 27 of California Code of Regulations related to confined animal facilities, the Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed., revised June 2015) and the Tulare Lake Basin (2nd Ed., revised January 2015) (collectively, the Basin Plans), and other applicable plans and policies of the State Water Resources Control Board (State Water Board) and the Central Valley Water Board described in the Information Sheet, which is attached to and hereby made part of this Order by this reference.
18. For Confined Bovine Feeding Operations with on-site composting operations that do not meet 4.d or 5.e, above, this Order incorporates by reference the requirements of the General Waste Discharge Requirements for Composting Operations, Order WQ 2015-0121-DWQ as applicable. Confined Bovine Feeding Operations that satisfy said requirements do not require separate coverage under the Composting General Order.
19. This Order recognizes that some Dischargers will need to make improvements at their facilities to meet the Order's requirements. The Discharger may be able to make some of these improvements relatively quickly while some improvements may require more time to implement. It is reasonable to allow Dischargers time to phase in elements of the required Waste Management Plan and Nutrient Management Plan in order to adequately design and construct major infrastructure changes needed to comply with the requirements of this Order.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

20. The Central Valley Water Board is the lead agency with respect to the issuance of this Order under applicable provisions of the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).
21. In accordance with CEQA, the Central Valley Water Board adopted a Negative Declaration in 1982 concurrently with the adoption of Central Valley Water Board Resolution 82-036 (Waiving Waste Discharge Requirements for Specific Types of Discharge), which waived waste discharge requirements for confined animal facilities where the Discharger complies with Central Valley Water Board guidelines. That waiver program expired on 1 January 2003.
22. The benchmark for evaluating whether this Order will have impacts on the environment is the "environmental baseline." The environmental baseline should

consist of “a description of the physical environmental conditions in the vicinity of the project at the time . . . environmental analysis is commenced.” (Cal. Code Regs., tit. 14, § 15125, subd. [a].) In the context of a Class 1 CEQA exemption for existing facilities, the baseline against which the lead agency determines whether a facility is “existing” consists of the physical conditions existing at the time the lead agency makes its determination that the exemption applies. (See *Citizens for East Shore Parks v. California State Lands Commission* [2011] 202 Cal.App.4th 549, 561.) Central Valley Water Board staff made its determination regarding the application of this categorical exemption when the tentative Bovine General Order was posted for public comment on 10 February 2017. Accordingly, the information contained in the Notices of Intent for existing facilities, particularly herd size, shall be based on the Confined Bovine Feeding Operations, as they existed during the three years prior to the date the tentative Order was posted, or the maximum herd size identified in an approved CEQA document or other regulatory document that has gone through CEQA or a CEQA-equivalent process.

23. This Order is designed to enhance the protection of surface and groundwater resources, and its application to existing facilities is exempt from the provisions of CEQA in accordance with the following categorical exemptions:
 - a. California Code of Regulations, title 14, section 15301, which exempts the “operation, repair, maintenance, [and] permitting . . . of existing public or private structures, facilities, mechanical equipment, or topographical features” from environmental review. The restoration of, or improvements to, Confined Bovine Feeding Operation waste management systems to ensure proper function in compliance with this Order is expected to involve only minor alterations of existing private facilities.
 - b. California Code of Regulations, title 14, section 15302, which exempts the “...replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced....” The Bovine General Order will likely require covered Confined Bovine Feeding Operations to replace or reconstruct portions of their waste management systems to ensure compliance with the Order’s requirements.
 - c. California Code of Regulations, title 14, section 15304 exempts “... minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes....” The Bovine General Order will require covered Confined Bovine Feeding Operations to make improvements to their waste management systems that are expected to result in only minor alterations to land, water, and/or vegetation.
24. To qualify for coverage under this Order, operations meeting the definition of “new” or “expanded” must first submit to the Central Valley Water Board:

- a. Proof of compliance with the provisions of the California Environmental Quality Act (CEQA) in the form of a certified Environmental Impact Report, Mitigated Negative Declaration, or Negative Declaration; and
- b. An NOI that includes all applicable components identified in Attachment 1. Payment of the applicable fee to the State Water Resources Control Board in accordance with the State Water Resources Control Board's fee schedule³ is also a prerequisite to coverage under this Order.

The NOI, proof of CEQA compliance and fee all must be submitted, and an NOA issued by the Executive Officer, before the Discharger is authorized to either populate a new Confined Bovine Feeding Operation or expand an existing Confined Bovine Feeding Operation.

25. Dairies regulated under the Reissued General Order for Existing Milk Cow Dairies, Order R5-2013-0122, or its successor orders, and which are converted to Confined Bovine Feeding Operations after the effective date of this Order are considered to be "existing facilities" as long as the Confined Bovine Feeding Operation is no larger than the dairy operation, as measured in animal units (AU), because the conversion is not expected to result in any new significant effect on the environment. For the purposes of this section, the AUs of the dairy shall be based on the maximum number of all bovine animals reported in any of the last three Annual Reports submitted by the dairy (or another form of documentation acceptable to the Executive Officer, such as an approved CEQA document), and the maximum AUs allowed at the Confined Bovine Feeding Operation shall be this maximum number of all bovine animals converted into animal units.

CONFINED BOVINE FEEDING OPERATION IMPACTS ON WATER QUALITY

26. Regulatory coverage of all existing dairies under general order waste discharge requirements in the Central Valley began with General Order R5-2007-0035 (2007 Dairy General Order). Groundwater monitoring of dairy operations in the Central Valley Region, which can have similar waste management practices to those used at Confined Bovine Feeding Operations, has demonstrated waste impacts to groundwater quality. A University of California study of five dairies in a high-risk groundwater area in the Central Valley Region during the 1990s found elevated salts and nitrates beneath the production area, wastewater retention ponds and land application areas. Data included in the first annual monitoring report of the Central Valley Dairy Representative Monitoring Program (CVDRMP) reported that groundwater beneath some dairies that have begun implementation of practices required by the 2007 Dairy General Order continue to have elevated levels of salts and nitrates beneath the production area, wastewater retention ponds and land application areas. The CVDRMP began monitoring groundwater in 2012, and

³ Available at <http://www.waterboards.ca.gov/resources/fees/>.

some provisions of the 2007 Dairy General Order were only fully implemented by 2012; therefore, monitoring results may not be fully reflective of the effectiveness of current practices.

27. Surface water and groundwater monitoring are the most direct ways to determine if management practices at a Confined Bovine Feeding Operation are protective of water quality. Monitoring and Reporting Program R5-2017-0058 (MRP), which is attached to and made part of this Order, requires surface water and groundwater monitoring to determine if a Confined Bovine Feeding Operation is in compliance with the surface water and groundwater limitations of this Order.
28. Under the MRP, Dischargers have the option of either implementing individual surface water and/or groundwater monitoring or participating in a group option such as a Representative Monitoring Program (RMP) to identify whether their specific management practices are resulting in adverse impacts to surface water or groundwater (i.e., whether the discharge is in compliance with the surface water and groundwater limitations of this Order). Long-term monitoring is needed to document which Confined Bovine Feeding Operation waste management practices are protective of water quality, and what effect these management practices will have on water quality under a variety of different site conditions.
29. This Order prohibits discharges of manure and/or wastewater to surface water from the production area or land application areas. This Order prohibits the discharge of storm water from the production area to surface water. This Order prohibits the discharge of tailwater or storm water from a land application area where manure or wastewater has been applied unless the land application area has been managed consistent with a certified Nutrient Management Plan. If the land application area has been managed consistent with a certified Nutrient Management Plan, this Order requires discharges of tailwater or storm water to be monitored to demonstrate that the discharge will not cause exceedances of surface water limitations as described in Section G.1 of this Order.
30. In many cases, the Confined Bovine Feeding Operations subject to this Order have facilities that were constructed several decades ago. The waste management systems at these existing Confined Bovine Feeding Operations are commonly not capable of preventing all adverse impacts to waters of the State because of their outdated design, the need for maintenance, or both. Historic operation of these Confined Bovine Feeding Operations may have resulted in adverse effects on water quality. Surface water and groundwater data are needed to determine the existence and magnitude of these impacts. If data document impacts, continued operation of Confined Bovine Feeding Operations without waste management improvements will perpetuate the ongoing adverse water quality effects caused by the generation and disposal of Confined Bovine Feeding Operation waste. This Order allows time for operators to implement improvements if surface water or groundwater data indicate that certain types of facilities/practices are not protective of water quality.

STATE ANTI-DEGRADATION POLICY (RESOLUTION 68-16)

31. The discussion in the attached Information Sheet regarding the application of the State Anti-Degradation Policy to this Order is hereby incorporated by this reference. The State Anti-Degradation Policy prohibits the Central Valley Water Board from authorizing the degradation of high-quality surface water or groundwater unless it has been shown that:
 - a. The degradation is consistent with the maximum benefit to the people of the State;
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;
 - c. The degradation does not result in water quality less than that prescribed in State and regional policies, including violation of one or more water quality objectives; and
 - d. The discharger employs best practicable treatment or control to minimize degradation.

32. This Order places restrictions on the discharge of wastes from Confined Bovine Feeding Operations that are intended to prevent pollution and nuisance conditions from occurring or persisting. Though the Board recognizes that degradation of high-quality surface water and/or groundwater may still occur pursuant to this Order, the implementation of Nutrient Management Plans, Waste Management Plans, enhanced management practices within the production area, and improved containment features for new and expanding wastewater retention ponds will limit the amount of degradation that will occur under this Order. Degradation will be limited so that discharges from Confined Bovine Feeding Operations will not cause long-term impacts to beneficial uses. Where immediate compliance with water quality objectives cannot be achieved, this Order allows time for the implementation or modification of waste management practices.

33. Consistent with the *State Anti-Degradation Policy*, this Order establishes requirements and standards that will result in the implementation of Best Practicable Treatment or Control (BPTC) measures to limit the degradation caused by Confined Bovine Feeding Operation discharges. The following is a general description of what the Board considers to be BPTC for specified areas of a Confined Bovine Feeding Operation:
 - a. Production area (including corrals, pens, hutches, solid manure and feed storage areas): Surface water discharges from the production area are prohibited, and the production area shall be managed to limit the extent to which wastewater can infiltrate into the underlying materials.
 - b. Land application areas (including cropland and vegetative filter strips): Dischargers must prepare and implement Nutrient Management Plans. Discharges of tailwater or storm water from land application areas must be

sampled and must not cause or contribute to an exceedance of any applicable water quality objective or federal water quality criteria.

- c. Existing Wastewater Retention Ponds: Existing wastewater retention ponds must be in compliance with design standards specified in title 27 and Pond Specifications C.8 and C.9. However, these design standards have not been found to be protective of groundwater under all conditions, and the immediate replacement of these ponds is not a practicable option for many Confined Bovine Feeding Operations. Therefore, though compliance with title 27 design standards was once considered to be BPTC, the Board now considers BPTC for existing ponds to be an iterative process whereby the ponds are evaluated (either under an individual monitoring program or under an approved Representative Monitoring Program [RMP]) to determine whether or not they are protective of the underlying groundwater, and upgraded or replaced on a time schedule that is as short as practicable if they are found not to be protective. This Order allows time schedules to bring any deficient management practices (including ponds) into compliance.
 - d. New and Expanded Wastewater Retention Ponds: This Order establishes requirements for new and expanded ponds that are more stringent than the requirements in title 27 in order to provide groundwater protection. New and expanded ponds must meet a strict performance standard that only allows for a conservative pond design unless there has been a demonstration that an alternative design meets the strict performance standard.
 - e. New and Existing Composting Operations: This Order incorporates by reference the requirements of the General Waste Discharge Requirements for Composting Operations, State Water Board Order WQ 2015-0121-DWQ, as appropriate to ensure implementation of BPTC measures, including limitations on the types of feedstocks, siting restrictions, and limitations on the permeability of the working surface of the composting operation.
34. This Order also contains closure requirements that specify that the Discharger must maintain coverage under this Order or a subsequent revision to this Order until all manure, wastewater, and animal waste-impacted soil (including soil within the pond[s]), is disposed of or utilized in a manner which does not pose a threat to surface water or groundwater quality or create a condition of nuisance.
 35. This Order will assure that pollution or nuisance will not occur outside of any time schedule for improvements established pursuant to this Order. This Order addresses impacts from future discharges of waste, but does not address the cleanup of surface and groundwater that has been polluted due to historic Confined Bovine Feeding Operations. Any required cleanup would be handled under separate authority under the Water Code.
 36. The Central Valley Water Board recognizes that there is often site-specific, crop-specific, and regional variability which affects the selection of appropriate

management measures, as well as the design constraints and pollution control effectiveness of various practices. In compliance with Water Code section 13360, Confined Bovine Feeding Operation owners/operators have the flexibility to choose management practices that best achieve a management measure's performance expectations given their own unique circumstances. It is expected that this will be an iterative process whereby the effectiveness of any set of practices in minimizing degradation will be periodically reevaluated as necessary as more current and detailed water quality data become available.

37. To assess compliance with the *State Anti-Degradation Policy*, this Order requires Dischargers other than Limited Time and Limited Population Operations to monitor discharges to surface waters and groundwater. The requirements to monitor first encountered groundwater (the point in the aquifer where changes to groundwater quality, caused by the facility, would typically be first detected) are met when the Dischargers perform individual groundwater monitoring or participate in an approved Representative Monitoring Program (RMP). The purpose of monitoring is to confirm that the discharges are effectively controlled by management practices and to evaluate compliance with this Order. Dischargers with a Limited Time or Limited Population Operation may be required to perform individual groundwater monitoring or participate in an approved RMP if directed by the Executive Officer.
38. When the Board prescribes waste discharge requirements that will result in the degradation of high-quality waters, the *State Anti-Degradation Policy* requires that the Board first make a determination that the authorized degradation is consistent with the maximum benefit to the people of the State. Consistent with the evaluation contained in the Information Sheet and considering the economic significance of the Central Valley Confined Bovine Feeding Operation industry, the Central Valley Water Board finds that maintaining the Central Valley Confined Bovine Feeding Operation industry is consistent with the maximum benefit to the people of the State. To maintain the industry and to prevent the loss of jobs and the impacts to the local economy that might otherwise occur, some degradation to high quality waters must be allowed. However, this degradation will be limited by this Order so that there will not be long-term impacts to beneficial uses, thereby allowing the full utilization of the aquifer.
39. This Order requires Limited Time and Limited Population Operations to:
 - a. Submit a Notice of Intent (Attachment A) within 12 months of the adoption of this Order;
 - b. Maintain records and, for Limited Time Operations, submit annual reports, as specified in Monitoring and Reporting Program R5-2017-0058;
 - c. Conduct groundwater monitoring if directed to do so by the Executive Officer;

- d. Prepare an Operation and Maintenance Plan and, for Limited Time Operations submit the Plan, as specified in Section F of Attachment B; and
- e. Document the destinations of exported manure using manifests (Attachment D) or Bills of Sale. Solids content and/or density testing are not required.

GENERAL FINDINGS

- 40. This Order does not authorize violation of any federal, State, or local law or regulation.
- 41. As stated in Water Code section 13263(g), the discharge of waste into waters of the State is a privilege, not a right, and this Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.
- 42. In compliance with Water Code section 106.3, it is the policy of the State that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
- 43. This Order is not a National Pollutant Discharge Elimination System Permit issued pursuant to the Federal Clean Water Act. Coverage under this Order does not exempt a facility from the Clean Water Act. Any facility required to obtain such a permit must notify the Central Valley Water Board.
- 44. The Findings of this Order, supplemental information and details in the attached Information Sheet, and the administrative record of the Central Valley Water Board relevant to Confined Bovine Feeding Operations, were considered in establishing the conditions of discharge.
- 45. In 2006, the Central Valley Water Board, the State Water Board, and regional stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. The stakeholder-led Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has been coordinating efforts to implement new salt and nitrate management strategies. As part of CV-SALTS, the Central Valley Water Board is developing amendments to the Basin Plans to incorporate new strategies for addressing ongoing salt and nitrate accumulation in the waters and soils of the Central Valley. Strategies currently under consideration may:

- a. Alter the way the Board calculates available assimilative capacity for nitrate, which could result in new or modified requirements for nitrate management;
- b. Require Dischargers to implement actions identified under an interim salinity permitting approach; and/or
- c. Establish alternate compliance approaches that would allow Dischargers to participate in efforts to provide safe drinking water to local communities in consideration for longer compliance time schedules.

Should the Board adopt amendments to the Basin Plans to effectuate such strategies, this Order may be amended or modified to incorporate any newly-applicable requirements. The Board expects Dischargers that may be affected by new salt and nitrate management policies to coordinate with the CV-SALTS initiative.

46. The Central Valley Water Board recognizes that some revisions to this Order may be necessary in the future to address issues that are not presently foreseen. The Executive Officer will provide periodic updates to the Central Valley Water Board on the overall compliance with the Order and make recommendations for revisions to the Order if necessary.
47. This Order contains options for Confined Bovine Feeding Operations to work with Irrigated Lands Regulatory Program (ILRP) Coalitions as a potential way to minimize costs for surface water monitoring. This Order places no additional requirements on ILRP coalitions. Any cooperation between Confined Bovine Feeding Operations and ILRP Coalitions to perform monitoring would be by mutual agreement between the two parties. This order provides up to two years after adoption of the Order to form a Joint Monitoring Program for surface water, which should be sufficient time to determine if cooperative monitoring is agreeable to the parties.
48. The Central Valley Water Board has notified interested agencies and persons of its intent to issue this Order for discharges of wastes from Confined Bovine Feeding Operations, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.
49. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the proposal to regulate discharges of wastes from Confined Bovine Feeding Operations under this Order.

IT IS HEREBY ORDERED that, pursuant to Division 7 of the California Water Code and the regulations and policies adopted thereunder, all Dischargers subject to this Order shall comply with the following:

A. PROHIBITIONS

1. The discharge of hazardous wastes, as that term is defined in California Code of Regulations, title 22, section 66261.1 *et seq.*, is prohibited.
2. Except when authorized by a National Pollutant Discharge Elimination System (NPDES) permit, the direct or indirect discharge of waste and/or storm water from the production area to surface waters is prohibited⁴.
3. The discharge of waste from Confined Bovine Feeding Operations to surface waters in a manner causing or contributing to an exceedance of any applicable water quality objective in the Basin Plans or any applicable federal water quality criteria, or a violation of any applicable State or federal policies or regulations, is prohibited.
4. The collection, treatment, storage, discharge or disposal of wastes at a Confined Bovine Feeding Operation shall not result in the creation of a condition of pollution or nuisance⁵.
5. The disposal of waste not generated by on-site animal production activities is prohibited except where a Report of Waste Discharge for the disposal has been submitted to the Executive Officer and the Central Valley Water Board has issued or waived waste discharge requirements for that discharge.
6. The disposal of dead animals in any liquid manure or wastewater retention ponds is prohibited. The disposal of dead animals at a Confined Bovine Feeding Operation is prohibited except when federal, State or local officials declare a State of Emergency, and where all other options for disposal have been exhausted, and the on-site disposal complies with all State and local policies for disposal of dead animals⁶.
7. Pursuant to California Code of Regulations, title 27, section 22561, all animals shall be prohibited from entering any surface water within the animal confinement area.

⁴ Discharges of pollutants from the production area to waters of the United States may not lawfully occur except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permit coverage is not provided by this Order, but rather must be obtained separately.

⁵ A Discharger that is making improvements to waste management practices that have been found not to be protective of the underlying groundwater under a time schedule that is as short as practicable shall be deemed in compliance with this Prohibition A.4.

⁶ In an emergency, guidance is provided by the Conditional Waiver of Waste Discharge Requirements for Disaster-Related Wastes during a State of Emergency within the Central Valley, Order R5-2013-0026.

8. The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner, or in a manner not approved by the Executive Officer, is prohibited.
9. The land application of manure or wastewater to cropland for other than nutrient recycling is prohibited.
10. The discharge of wastewater from a land application area to surface waters is prohibited. Irrigation supply water that comes into contact or is blended with waste or wastewater shall be considered wastewater under this prohibition.
11. The application of wastewater to a land application area before, during, or after a storm event that may result in the discharge of commingled applied water and runoff to surface water is prohibited.
12. The discharge of storm water or tailwater to surface water from a land application area where manure or wastewater has been applied is prohibited unless the land application area has been managed consistent with a certified Nutrient Management Plan.
13. The use of manure to construct containment structures or to repair, replace, improve, or raise existing containment structures is prohibited.
14. The direct discharge of wastewater or chemicals into groundwater via backflow through water supply or irrigation supply wells is prohibited.
15. Any feedstock, additive, amendment, or compost (active, curing, or final product) stored, processed, or composted outside of the designated composting operation areas, as those boundaries are specified in an NOI, and approved by the Executive Officer, is prohibited.
16. Any volume of any feedstock, additive, amendment, or compost (active, curing, or final product) exceeding those specified in the General Waste Discharge Requirements for Composting Operations, Order WQ 2015-0121-DWQ is prohibited.
17. Use of any feedstock, additive, amendment, or material, other than those described in the General Waste Discharge Requirements for Composting Operations, Order WQ 2015-0121-DWQ is prohibited, unless regulated under individual waste discharge requirements or a waiver of waste discharge requirements.

B. GENERAL SPECIFICATIONS

1. Dischargers who are subject to this Order shall implement water quality management practices, as necessary, to protect water quality and to ensure

- attainment of applicable water quality objectives on a schedule that is as short as practicable as described in the Time Schedule for Compliance (Section N of this Order). The proposed time schedule must be supported with appropriate technical or economic justification as to why the proposed schedule is as short as practicable.
2. If groundwater monitoring demonstrates that discharge(s) from a Confined Bovine Feeding Operation have caused or contributed to an exceedance of Receiving Water Limitations G.2 (Groundwater Limitations) of this Order, the Executive Officer may issue an order to the owner/operator of the monitored Confined Bovine Feeding Operation to identify and implement additional or revised management practices that are more protective of groundwater quality on a schedule that is as short as practicable.
 3. All precipitation and surface drainage from outside of the Confined Bovine Feeding Operation (i.e., "run on") shall be diverted away from any manured areas or areas where it could mobilize waste constituents unless such drainage is fully contained.
 4. Manure and wastewater shall not be applied, and composting operations shall not be located, closer than 100 feet to any down gradient surface waters, open tile line intake structures, sinkholes, agricultural or domestic well heads, or other conduits or groundwater, unless (i) a 35-foot wide vegetated buffer or physical barrier is substituted for the 100-foot setback, or (ii) alternative conservation practices or field- or site-specific conditions are demonstrated to provide pollutant reductions equivalent to or better than the reductions achieved by the 100-foot setback.

C. POND SPECIFICATIONS

1. For the purposes of this Order, the term "ponds" refers to wastewater retention ponds and includes settling basins.
2. The Confined Bovine Feeding Operation shall have facilities that are designed, constructed, operated, and maintained to retain all wastewater generated during the storage period (maximum period of time anticipated between land applications of wastewater), together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm (see Section B of **Attachment B**, which is attached to and made part of this Order).
3. In the Sacramento and San Joaquin River Basins, wastewater retention ponds and manured areas at Confined Bovine Feeding Operations in operation on or before 27 November 1984 shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Confined Bovine Feeding Operations that were in operation on or

before 27 November 1984 and that are protected against 100-year peak stream flows must continue to provide such protection. Confined Bovine Feeding Operations that were built or expanded after 27 November 1984 shall be protected against 100-year peak stream flows.

4. In the Tulare Lake Basin, Confined Bovine Feeding Operations in operation on or before 25 July 1975 shall be protected from inundation or washout from overflow from any stream channel during 20-year peak stream flows and Confined Bovine Feeding Operations constructed after 25 July 1975 shall be protected from 100-year peak stream flows. Confined Bovine Feeding Operations that were expanded after 8 December 1984 shall be protected from 100-year peak stream flows.
5. The level of waste in ponds shall be kept a minimum of two (2) feet from the top of each aboveground embankment and a minimum of one (1) foot from the ground surface of each belowground pond. Less freeboard may be approved by the Executive Officer when a Civil Engineer registered in California, or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work, demonstrates that the structural integrity, including potential failure due to wave overtopping, of the pond will be maintained with the proposed freeboard.
6. Ponds shall be managed and maintained to prevent breeding of mosquitoes and other vectors. In particular,
 - a. Small coves and irregularities shall not be allowed around the perimeter of the water surface;
 - b. Weeds shall be minimized through control of water depth, harvesting, or other appropriate method;
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface; and
 - d. Management shall be in accordance with the requirements of the Mosquito Abatement District, Vector Control District, or other local requirements.
7. Ponds designated to contain the 25-year, 24-hour storm event runoff must have a depth marker that clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation from a 25-year, 24-hour storm event.
8. The invert (lowest point) in ponds shall be above the highest anticipated elevation of underlying groundwater. In the Tulare Lake Basin, the invert shall

be a minimum of five feet above the highest anticipated elevation of underlying groundwater. If there is reason to believe that the invert of a pond at an existing facility does not meet these criteria, the Discharger shall conduct an investigation within six months of the issuance of a Notice of Applicability by the Executive Officer to determine if this is the case. If the invert in a pond does not meet these criteria, the Discharger shall propose modifications, with a time schedule for implementation that is as short as practicable, that will ensure that the pond design is protective of water quality. The modifications must be reviewed and approved by the Executive Officer prior to construction pursuant to Pond Specification C.10.b of this Order.

9. Existing Wastewater Ponds⁷

a. **For Dischargers conducting an Individual Monitoring Program:**

Dischargers conducting monitoring pursuant to an Individual Monitoring Program shall maintain existing pond conditions and operational controls throughout the development of the Summary Report that is required by **Monitoring and Reporting Program R5-2017-0058, Attachment A, Section B.10**. The Summary Report is subject to Executive Officer approval, and due within six years of initiating individual monitoring activities or at an earlier date if required by the Executive Officer.

If the monitoring data in the Summary Report indicate that Receiving Water Limitation G.2 (Groundwater Limitations) of this Order has been violated, Dischargers are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that are not high quality) that will bring the facility into compliance with Receiving Water Limitations G.2 (Groundwater Limitations) on a time schedule that is as short as practicable.

b. **For Dischargers enrolled under an approved Representative Monitoring Program:**

Dischargers enrolled under an approved Representative Monitoring Program shall maintain existing pond conditions and operational controls throughout the development of the Summary Representative Monitoring Report (SRMR), which is due to the Central Valley Water Board within six years of initiating monitoring activities and is subject to Executive Officer approval.

If the SRMR indicates that the Discharger's existing ponds may have discharges that violate Receiving Water Limitations G.2 (Groundwater Limitations) of this Order or that such discharges from existing ponds may cause degradation to high quality waters, Dischargers are required to implement the approved SRMR's identified management practices/activities for existing ponds that will bring the facility into

⁷ Existing ponds are defined to mean those ponds in operation as of the date of adoption of this Order and are not new ponds that are designed to meet the Tier 1 or Tier 2 requirements set forth in Pond Specification C.10 of the Order.

compliance with Receiving Water Limitations G.2 (Groundwater Limitations). Such practices are considered to constitute best practical treatment or control or best efforts and are designed to achieve compliance with Receiving Water Limitations G.2 (Groundwater Limitations) on a time schedule that is as short as practicable.

10. New and Reconstructed Wastewater Ponds

- a. New ponds installed in order to comply with the requirements of this Order or modifications of existing ponds shall be designed and constructed to comply with Receiving Water Limitations G.2 (Groundwater Limitations) of this Order.
- b. New and reconstructed pond designs must be reviewed and approved by the Executive Officer prior to construction. This Order provides a tiered approach to pond design requirements to provide an option that will significantly reduce the time required for approval by the Executive Officer as defined below:
 - i. Tier 1: A pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with title 27, section 20340) between the two liners will be considered to be consistent with State Water Board Resolution 68-16. Review for ponds designed to this standard will be conducted in less than 30 days of receipt of a complete design plan package submitted to the Board.
 - ii. Tier 2: A pond lined so as to be protective of water quality as demonstrated by calculations of seepage amounts and the effect of that estimated seepage on underlying groundwater as required in Pond Specification 10.c below. The pond design must include a pan lysimeter monitoring device under the lowest point of the pond, or an equivalent engineered alternative. The engineered alternative must provide equivalent assurance of the earliest possible detection or prevention of a release from the pond.
 - iii. Preapproved Tier 2: A Representative Monitoring Program or other entity may develop and propose a pond design that is demonstrated to be protective of water quality under certain specified site or operational conditions. The design and demonstration shall include leakage calculations and monitoring of groundwater at representative bovine operations with such ponds. Following approval by the Executive Officer,

use of this design under the specified site and operational conditions would not require additional leakage calculations or individual groundwater monitoring wells unless specifically required by the Executive Officer. The Discharger shall obtain written approval by the Executive Officer prior to construction or use of such a pond.

- c. Prior to the enlargement of an existing pond (settling, storage, or retention) or the construction of such new pond, the Discharger shall submit to the Executive Officer:
 - i. For Tier 1, 2, and Preapproved Tier 2 pond designs, a design report prepared by, or under the direct supervision of, and certified by, a Civil Engineer or Certified Engineering Geologist who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work. The design report shall include the following:
 1. Design calculations demonstrating that adequate containment will be achieved,
 2. Details on the liner, pan lysimeter, and leachate collection and removal system (if applicable) materials,
 3. A schedule for construction and certification of completion to comply with Section M, Schedule of Tasks, of this Order,
 4. A construction quality assurance plan describing testing and observations needed to document construction of the pond in accordance with the design and title 27, sections 20323 and 20324, and
 5. An operation and maintenance plan for the pond.
 - ii. For Tier 2 pond designs, the design report shall also include a technical report and groundwater model that demonstrates the proposed pond is in compliance with Receiving Water Limitations G.2 (Groundwater Limitations) of this Order, including calculations that demonstrate the amount and quality of seepage from the proposed pond and its effect on groundwater quality, and include proposed groundwater monitoring to evaluate the impact of pond seepage on groundwater quality. The requirement for groundwater monitoring may be satisfied by membership in an approved

Representative Monitoring Program at the discretion of the Executive Officer.

Enlargement of any existing pond or construction of any new pond shall not begin until the Executive Officer notifies the Discharger in writing that the design report is acceptable.

- d. Prior to the placement of waste in any enlarged existing pond or any such newly constructed pond, the Discharger shall submit a post construction report prepared by, or under the direct supervision of, and certified by, a Civil Engineer or Certified Engineering Geologist who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work.

Waste shall not be placed into the pond until the Executive Officer notifies the Discharger in writing that the post construction report is acceptable. The post construction report shall include: (i) verification that the pond meets the requirements of this Order as specified in Pond Specification C.10.b including documentation of the results of the construction quality assurance testing and observations; (ii) certification that the pond was constructed as designed; and (iii) as-built diagrams.

D. PRODUCTION AREA SPECIFICATIONS

The production area includes, but is not limited to, corrals, pens, hutches, manure and feed storage areas, wastewater conveyances and any other area of the Confined Bovine Feeding Operation that is not the land application area.

Wastewater retention ponds are part of the production area; specifications for ponds are found in Section C of this Order.

1. All corrals, pens, or hutch areas, composting operations, and manure and feed storage areas, shall be graded to promote drainage. All drainage shall be directed to the wastewater management system.
2. Areas beneath and surrounding water troughs and permanent feed racks shall be paved. Spilled water from water troughs shall be conveyed to the wastewater management system.
3. All roofs, buildings, and non-manured areas located in the production area of the Confined Bovine Feeding Operation shall be constructed or otherwise designed so that clean rainwater is diverted away from manured areas and waste containment facilities, unless such drainage is fully contained in the wastewater management system.
4. The animal confinement area (including corrals), and manure and feed storage areas, shall be designed and maintained to convey all water that has

contacted animal wastes or feed to the wastewater retention ponds and to minimize standing water as of 72 hours after the last rainfall and the infiltration of water into the underlying soils.

5. Unlined ditches, swales, and/or earthen-berm channels may not be used for storage of wastewater, manure, or tailwater and may only be used for the conveyance of wastewater collected in the production area to the wastewater retention pond, conveyance of wastewater from the pond to the land application area, irrigation return water management, or temporary control of accidental spills or rainfall-induced overflows at Confined Bovine Feeding Operations designed, constructed, operated, and maintained in compliance with Pond Specification C.2 of this Order.
6. For Dischargers conducting individual groundwater monitoring, if the monitoring data in the Summary Report indicate that the Discharger's production area may have discharges that violate Receiving Water Limitations G.2 (Groundwater Limitations) of this Order or that such discharges may cause degradation to high quality waters, the Dischargers are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that are not high quality) that will bring the facility into compliance with Receiving Water Limitations G.2 on a time schedule that is as short as practicable.
7. For Dischargers enrolled under an approved RMP, if the SRMR indicates that the Discharger's production area may have discharges that violate Receiving Water Limitations G.2 (Groundwater Limitations) of this Order or that such discharges may cause degradation to high quality waters, the Dischargers are required to implement the approved SRMR's identified management practices/activities for production areas that will bring the facility into compliance with Receiving Water Limitation G.2. Such practices are considered to constitute best practical treatment or control or best efforts and are designed to achieve compliance with Receiving Water Limitations G.2 (Groundwater Limitations) on a time schedule that is as short as practicable.

E. LAND APPLICATION AREA SPECIFICATIONS

For the purposes of this Order, "land application area" is as defined in Attachment E, which is attached to and hereby made part of this Order.

The requirements of this section do not apply to Dischargers who do not own, rent, or lease cropland to which manure and/or wastewater from the production area is or may be applied. Such Dischargers do not need to prepare a Nutrient Management Plan.

At the Discharger's discretion, cropland which is under the control of the Confined Bovine Feeding Operation owner or operator, but which only receives solid manure

and never receives wastewater, may be regulated under either this Order as part of the facility's land application area or separately under the Irrigated Lands Regulatory Program.

Wastes and land application areas shall be managed to prevent contamination of crops grown for human consumption. The term "crops grown for human consumption" refers only to crops that will not undergo subsequent processing that adequately removes potential microbial danger to consumers.

1. Land application of all waste from the facility to areas under the Discharger's control shall be conducted in accordance with a certified Nutrient Management Plan (required in Required Reports and Notices K.1.c of this Order) consistent with the technical standards for nutrient management as specified in **Attachment C**. The Nutrient Management Plan shall be modified within 90 days if monitoring shows that discharge from the land application area fails to comply with Receiving Water Limitations G.2 (Groundwater Limitations) of this Order or surface water quality objectives or criteria. The modifications must be designed to bring Dischargers into compliance with this Order. Cropland that receives wastewater from the Confined Bovine Feeding Operation and is owned by the same Discharger that owns the production area must be managed in accordance with a certified Nutrient Management Plan as part of the facility's land application area even if the cropland is leased to an entity other than the Discharger operating the Confined Bovine Feeding Operation.
2. The Discharger shall have a written agreement with each third party prior to receiving wastewater from the Discharger for its own use. Land owned, operated, or controlled completely or in part by Dischargers shall not be considered to be controlled by a third party. Each written agreement shall be included in the Discharger's Nutrient Management Plan, and each new written agreement, modified written agreement, or rescission of a written agreement shall be included in the Annual Report for the year in which the written agreement is either reached, modified, or rescinded. The written agreement(s) shall be effective until the third party is covered under waste discharge requirements or a waiver of waste discharge requirements that are adopted by the Central Valley Water Board. The written agreement shall:
 - a. Clearly identify:
 - i. The Discharger and Confined Bovine Feeding Operation from which the wastewater originates;
 - ii. The third party that will control the application of the wastewater to cropland;

- iii. The Assessor's Parcel Number(s) and the acreage(s) of the cropland where the wastewater will be applied; and
 - iv. The types of crops to be fertilized with the wastewater.
 - b. Include an agreement by the third party to:
 - i. Use the wastewater at agronomic rates appropriate for the crops to be grown; and
 - ii. Prevent the runoff to surface waters of wastewater, storm water or irrigation supply water that has come into contact with manure or is blended with wastewater.
 - c. Include a certification statement, as specified in General Reporting Requirements C.7 of the Standard Provisions and Reporting Requirements (which is attached to and made part of this Order), which is signed by both the Discharger and third party.
3. Land application of wastes for nutrient recycling from Confined Bovine Feeding Operations shall not cause the underlying groundwater to contain any waste constituent, degradation product, or any constituent of soil mobilized by the interactions between applied wastes and soil or soil biota, in excess of the groundwater limitations set forth in this Order.
4. The application of animal waste and other materials containing nutrients to any cropland under control of the Discharger shall meet the following conditions:
 - a. The application is in accordance with a certified Nutrient Management Plan developed and implemented in accordance with Required Reports and Notices K.1.c and **Attachment C** of this Order; and
 - b. Records are prepared and maintained as specified in the Record-Keeping Requirements of Monitoring and Reporting Program R5-2017-0058.
5. The wastewater management system shall be equipped with a calibrated flowmeter with a totalizer or an equivalent method to accurately measure output for land application of wastewater and irrigation water.
6. The application of waste to cropland shall be at rates that preclude development of vectors or other nuisance conditions and meet the conditions of the certified Nutrient Management Plan.

7. Land application areas that receive solid manure shall be managed through implementation of erosion control measures to minimize erosion and must be consistent with a certified Nutrient Management Plan.
8. All wastewater applied to land application areas must infiltrate completely within 72 hours after application.
9. Wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified Nutrient Management Plan (see **Attachment C** of this Order).
10. Off-property discharges of storm water or tailwater from land application areas shall not contain un-ionized ammonia in concentrations exceeding 0.04 mg/l; discharges of storm water or tailwater calculated to contain un-ionized ammonia in concentrations between 0.02 and 0.039 mg/l shall only be discharged off-property if mitigations to protect water quality are present.
11. For Dischargers conducting individual groundwater monitoring, if the monitoring data in the Summary Report indicate that the Discharger's land application area may have discharges that violate Receiving Water Limitations G.2 (Groundwater Limitations) of this Order, or that such discharges may cause degradation to high quality waters, the Dischargers are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that are not high quality) that will bring the facility into compliance with Receiving Water Limitations G.2 (Groundwater Limitations) on a time schedule that is as short as practicable.
12. For Dischargers enrolled under an approved RMP, if the SRMR indicates that the Discharger's land application areas may have discharges that violate Receiving Water Limitations G.2 (Groundwater Limitations) of this Order or that such discharges from land application areas may cause degradation to high quality waters, Dischargers are required to implement the approved SRMR's identified management practices/activities for land application areas that will bring the facility into compliance with Receiving Water Limitation G.2. Such practices are considered to constitute best practicable treatment or control or best efforts and are designed to achieve compliance with Receiving Water Limitation G.2 on a time schedule that is as short as practicable.

F. COMPOSTING OPERATION SPECIFICATIONS

For the purposes of this Order, a composting area located within the production area is deemed to be part of the Confined Bovine Feeding Operation and does not need separate coverage under the General Waste Discharge Requirements for Composting Operations, State Water Board Order WQ 2015-0121-DWQ (Composting General Order), provided that the composting area is designed, constructed, operated, and maintained in accordance with the applicable

provisions and specifications in the Composting General Order. The Discharger may obtain separate coverage under the Composting General Order at its discretion. The composting operation shall be classified according to the provisions of the Composting General Order and shall comply with the allowable feedstock and operational requirements in the Composting General Order. Under this Order, composting operations are exempt from the requirements that otherwise would apply under the Composting General Order if:

1. The composting area is as described in Finding 4.d or 5.e above; or
2. Less than 500 cubic yards of allowable compostable material are received, processed or stored at any given time; or
3. The composting operation meets the definition of "Agricultural Composting". Agricultural Composting means that:
 - a. Feedstocks consist only of materials generated on-site by production of farm, ranch, agricultural, horticultural, silvicultural, floricultural, vermicultural, or viticultural products;
 - b. Animal carcasses are not composted;
 - c. The resulting compost product is returned to that same agricultural site, or to an agricultural site owned by the owner of the composting activity, and is applied at an agronomic rate; and
 - d. No more than 1,000 cubic yards of compost product are given away or sold annually; or
4. Less than 5,000 cubic yards per year of allowable feedstocks, additives, and amendments are received, processed, and stored, provided that:
 - a. Materials are completely covered during storm events as needed to reduce the generation of wastewater; and
 - b. Application of water to composting materials is managed to reduce the generation of wastewater.

G. RECEIVING WATER LIMITATIONS

1. **Surface Water Limitations⁸**

Discharges from Confined Bovine Feeding Operations shall not cause or contribute to an exceedance of applicable water quality objectives in surface water, unreasonably affect applicable beneficial uses, or cause or contribute

⁸ These limitations are effective immediately upon coverage under this Order except where Dischargers are in compliance with a time schedule pursuant to Section N of this Order and the requirements of Sections E or F of Monitoring and Reporting Program R5-2017-0058, **Attachment B**, and such Dischargers are implementing management practices/activities on a time schedule that is as short as practicable.

to a condition of pollution or nuisance. The applicable water quality objectives are summarized in the Information Sheet, which is attached to and made part of this Order, and can be found in the Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.) and for the Tulare Lake Basin (2nd Ed.).

2. **Groundwater Limitations**

Wastes discharged at Confined Bovine Feeding Operations, including on-site composting operations, shall not cause or contribute to an exceedance of applicable water quality objectives in the underlying groundwater, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance. The applicable water quality objectives are summarized in the Information Sheet, which is attached to and made part of this Order, and can be found in the Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.) and for the Tulare Lake Basin (2nd Ed.).

H. PROVISIONS

1. Confined Bovine Feeding Operations shall incorporate protocols and practices to minimize salt as those protocols and practices are identified through the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) process, or otherwise identified by the Executive Officer.
2. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements General Order R5-2017-0058 for Confined Bovine Feeding Operations* (Standard Provisions) dated 8 June 2017, which is attached to and made part of this Order.
3. The Discharger shall comply with all applicable provisions of the California Water Code, title 27, and applicable Water Quality Control Plans.
4. The Discharger shall comply with the attached Monitoring and Reporting Program R5-2017-0058 which is part of this Order, and future revisions thereto or with an individual monitoring and reporting program, as specified by the Central Valley Water Board or the Executive Officer.
5. A discharger may propose an alternative method of compliance with a provision of this General Order provided that the Discharger demonstrates to the satisfaction of the Executive Officer that the alternative method of compliance shall be at least as protective of ground and surface water as the relevant provision of the General Order.
6. The Discharger shall submit a complete NOI in accordance with Water Code section 13260 at least 140 days prior to any material change or proposed

change in the character, location, or volume of the discharge, including any expansion of the facility or development of any treatment technology, or construction of an anaerobic digester.

7. This Order does not apply to facilities where wastes such as, but not limited to, whey, cannery wastes, septage, municipal or industrial sludge, municipal or industrial biosolids, ash or similar types of waste are generated on-site or are proposed to be brought onto the production area or land application area of the Confined Bovine Feeding Operation for the purpose of nutrient recycling or disposal. The Discharger shall submit a complete Report of Waste Discharge and shall not apply or dispose of such waste prior to receiving Waste Discharge Requirements or a waste-specific waiver of Waste Discharge Requirements from the Central Valley Water Board.
8. If site conditions threaten to violate Prohibition A.2 (discharge of waste and/or storm water from the production area in the absence of an NPDES permit) or Prohibition A.4 (creation of a condition of pollution or nuisance) of this Order, the Discharger shall take immediate action to preclude the violation, documenting the condition and all corrective actions. Records of such actions shall be kept and maintained as required in Monitoring and Reporting Program R5-2017-0058. Alterations of the Waste Management Plan (see Required Reports and Notices K.1.c) for the production area to avoid a recurrence shall be submitted to the Central Valley Water Board as a modification to the Waste Management Plan.
9. If a discharge of waste creates, or threatens to create, significant objectionable odors or nuisance odor and vector conditions, enforcement and/or revocation of coverage under this Order may result.
10. The Discharger shall comply with all requirements of this Order and all terms, conditions, and limitations specified by the Executive Officer.
11. Any instance of noncompliance with this Order constitutes a violation of the Water Code and its regulations. Such noncompliance is grounds for enforcement action, and/or termination of the authorization to discharge.
12. The Discharger must maintain coverage under this Order or a subsequent revision to this Order until the Discharger demonstrates to the satisfaction of the Executive Officer that all manure, wastewater, and animal waste impacted soil, including soil beneath the pond(s), is disposed of or utilized in a manner which does not pose a threat to surface water or groundwater quality or create a condition of nuisance. At least 90 days before desiring to terminate coverage under this Order, the Discharger shall submit to the Executive Officer a closure plan that ensures protection of surface water and groundwater. No more than 30 days after completion of site closure, the Discharger shall submit a closure report which documents that all closure

activities were completed as proposed and approved in the closure plan. Coverage under this Order will not be terminated until cleanup is complete.

13. Pursuant to the State Water Board's Composting General Order, at least 90 days prior to ceasing composting operations, the Discharger shall submit a Site Closure Plan to the Central Valley Water Board for approval. The Discharger must jointly notify the Board and Local Enforcement Agency in writing at the conclusion of the site closure activities in a document that describes closure in accordance with the Site Closure Plan and Central Valley Water Board requirements.
14. If a composting operation is eligible for an exemption due to changes in process or procedures, the Discharger may propose termination of coverage under this Order for the composting operation. Filing a request by the Discharger for an exemption or other change in Order coverage to the composting operation does not stay any requirement of this Order.
15. This Order shall become effective upon adoption by the Central Valley Water Board.
16. Upon obtaining coverage under this Order, the Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in terminating the applicability of this Order to a specific facility or Discharger.
17. Technical reports (e.g., Surface Water Monitoring Plan, Monitoring Well Installation and Sampling Plan, Monitoring Well Installation Completion Report, Groundwater Monitoring Report, Waste Management Plan Certification, and portions of the Waste Management Plan) required by this Order must be certified by an appropriately licensed professional as required in this Order and its attachments (see Schedule of Tasks M below). If the Executive Officer provides comments on any technical report, the Discharger is required to address those comments.
18. The Discharger shall maintain a copy of this Order (in paper or electronic format) at the site so as to be available at all times to site-operating

personnel. The Discharger, landowner, and his/her designee shall be familiar with the contents of this Order.

I. EFFECTIVE DATE OF COVERAGE UNDER THIS ORDER

Coverage under this Order is effective upon issuance of a Notice of Applicability by the Executive Officer to the Discharger.

J. PERMIT REOPENING, REVISION, AND REVOCATION

1. If more stringent applicable water quality standards are adopted in the Basin Plans, the Central Valley Water Board may revise and modify this Order in accordance with such standards.
2. This Order may be reopened to address any changes in state plans, policies, or regulations that would affect the water quality requirements for the discharges and as authorized by State law. This includes regulatory changes that may be brought about by the CV-SALTS planning efforts.
3. The Central Valley Water Board or the Executive Officer may revoke coverage under this Order at any time and require the Discharger to submit a Report of Waste Discharge and obtain individual waste discharge requirements.

K. REQUIRED REPORTS AND NOTICES

1. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically. The Notice of Intent may be submitted by email to the Central Valley Water Board. Dischargers must prepare and maintain the following reports as instructed below, and shall submit or make available such reports to the Central Valley Water Board as identified below.
 - a. **Notice of Intent:** To apply for coverage under this Order, the Discharger shall submit a complete Notice of Intent (NOI) to comply with the conditions of this Order for the Confined Bovine Feeding Operation, prepared in accordance with **Attachment A**. For existing facilities, the completed NOI shall be submitted to the Central Valley Water Board within twelve months of the date of the adoption of this Order. Coverage under this Order will commence upon approval of the NOI and issuance of a Notice of Applicability (NOA) by the Executive Officer. The NOI shall

provide facility-specific information on existing conditions at the Confined Bovine Feeding Operation.

If the Confined Bovine Feeding Operation has an on-site composting operation in existence as of the date the NOI is submitted, the Discharger shall also submit a complete NOI for the composting operation, prepared in accordance with **Attachment A-1**. New composting operations that propose to begin operating after the date the NOI for the Confined Bovine Feeding Operation has been submitted are required to submit an NOI for the composting operation, prepared in accordance with **Attachment A-1**, not less than 90 days prior to commencement of the composting operation.

- b. **Operation and Maintenance Plan for Limited Time or Limited Population Operations:** A Discharger classified as either a Limited Time or Limited Population Operation shall prepare, and a Limited Time Operation shall submit an Operation and Maintenance Plan as specified in Section F of Attachment B. For existing Confined Bovine Feeding Operations, the Operation and Maintenance Plan must be prepared and submitted by 31 December 2018. New and expanding Confined Bovine Feeding Operations shall submit an Operation and Maintenance Plan with the NOI.
- c. **Waste Management Plan:** By 1 July 2020, a Discharger with an existing Confined Bovine Feeding Operation shall submit a Waste Management Plan, including an Operation and Maintenance Plan, for the production area, prepared in accordance with **Attachment B**. New and expanding Confined Bovine Feeding Operations shall submit a Waste Management Plan, including an Operation and Maintenance Plan, with the NOI. The Waste Management Plan shall provide an evaluation of the Confined Bovine Feeding Operation's design, construction, operation, and maintenance for flood protection and waste containment and whether the facility complies with Prohibition A.14 (backflow prevention on wells), Pond Specifications C.2 through C.4 (flood protection), Pond Specifications C.5 through C.7 (freeboard, depth marker, and pond maintenance requirements), and Production Area Specifications D.1, D.3, and D.4 (grading and drainage) of this Order. If the design, construction, operation, and/or maintenance of the Confined Bovine Feeding Operation do not comply with these specifications and the prohibition, the Waste Management Plan must propose modifications and a schedule for completion of modifications that will bring the Confined Bovine Feeding Operation into compliance within 2 years. On a case-by-case basis, extension of the two-year time schedule may be considered and approved by the Executive Officer.

- d. **Nutrient Management Plan:** A Discharger who applies manure, bedding, or wastewater to land not covered by the Central Valley Water Board's Irrigated Lands Regulatory Program (ILRP) must develop and implement management practices that control nutrient losses and describe such management practices in a Nutrient Management Plan. For existing Confined Bovine Feeding Operations, the Nutrient Management Plan must be prepared and certification that the Nutrient Management Plan has been completed shall be submitted to the Central Valley Water Board by 1 July 2019. New and expanding Confined Bovine Feeding Operations shall submit a Nutrient Management Plan with the NOI. The Nutrient Management Plan must be certified as specified in **Attachment C** of this Order, maintained at the Confined Bovine Feeding Operation, submitted to the Executive Officer upon request, and must ultimately provide for protection of both surface water and groundwater. Certification that the Nutrient Management Plan has been implemented shall be submitted to the Executive Officer by 1 July 2021, as part of the first Annual Report submitted following the deadline for implementation of the Nutrient Management Plan. The Nutrient Management Plan shall be updated as specified in the Technical Standards for Nutrient Management in **Attachment C** of this Order or if the Executive Officer requests that additional information be included. Surface water and groundwater monitoring will be used to determine if implementation of the Nutrient Management Plan is protective of water quality.
- e. **Annual Report:** An annual monitoring report is due by 1 July of each year, beginning with 1 July 2020. For Full General Order Coverage operations, it will consist of a General Section, a Groundwater Reporting Section (including an Annual Monitoring Report prepared in accordance with **Attachment A** of Monitoring and Reporting Program [MRP] R5-2017-0058), a Storm Water and Tailwater Reporting Section (including a Surface Water Monitoring Report prepared in accordance with **Attachment B** of the MRP), and, if a composting operation is on-site, an Annual Monitoring and Maintenance Report for the Composting Operation. For Limited Time Operations, the Annual Report shall contain the information listed in the MRP under Reporting Requirements section B, second paragraph. Limited Population Operations are not required to prepare or submit an annual report unless requested by the Executive Officer.

Once the Summary Report (for individual Dischargers) or the Summary Representative Monitoring Report (for representative monitoring programs) has been approved, an Annual Implementation Report shall be part of the Annual Report. The contents of the Annual Monitoring Report are described in Reporting Requirements, section B of the MRP.

- f. **Surface Water Quality Management Plan (SWQMP):** If the Executive Officer determines that the results of surface water monitoring conducted by either an individual Discharger or a Joint Monitoring Program indicates a trend in degradation that may threaten applicable Basin Plan beneficial uses in surface waters, the Joint Monitoring Program or Discharger shall develop a SWQMP (see **MRP Attachment B**).
2. Reporting Provisions:
 - a. All NOIs, applications, annual reports, or information submitted to the Central Valley Water Board shall be signed and certified in accordance with C.7 and C.8 of the Standard Provisions and Reporting Requirements.
 - b. The Discharger shall submit all reports as specified in the attached Monitoring and Reporting Program R5-2017-0058.
 - c. Any Discharger authorized to discharge waste under this Order shall furnish, within 30 days, any information the Central Valley Water Board may request, to determine whether cause exists for modifying, revoking, and reissuing, or terminating their authorization for coverage under this Order. The Executive Officer may specify a longer time schedule if it is determined that allowing more than 30 days is reasonable. The Discharger shall, upon request, also furnish to the Central Valley Water Board, within two weeks, copies of records required to be kept by this Order.
 - d. All reports prepared and submitted to the Executive Officer in accordance with the terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board.

L. RECORD-KEEPING REQUIREMENTS

1. The Discharger shall create, maintain for five years, and make available to the Central Valley Water Board upon request by the Executive Officer any reports or records required by this Order including those required under Monitoring and Reporting Program R5-2017-0058.

M. SCHEDULE OF TASKS

1. Dischargers with a Full Coverage Operation are required to submit an NOI. Dischargers with a Limited Time or Limited Population Operation are required to submit an NOI and develop an Operation and Maintenance Plan as specified in Section F of Attachment B. Dischargers with a Limited Time Operation are required to submit the Operation and Maintenance Plan.

Dischargers with a Full Coverage Operation are required to develop, submit, and implement a Waste Management Plan and, if applicable, develop and implement a Nutrient Management Plan. Dischargers with Full Coverage and Limited Time Operations must submit Annual Reports containing information as specified in the MRP. The deadlines for these are specified in Table 1 below. If applicable, Dischargers must submit a statement of completion and a statement of implementation to the Executive Officer for the Nutrient Management Plan by the deadlines specified in Table 1. The statements must be signed and certified by the Discharger as required in Required Reports and Notices K.2. and by the additional professional specified in Table 1.

2. Any Discharger with a Full Coverage Operation may be required to complete the Nutrient Management Plan and/or Waste Management Plan prior to the due date identified in Table 1 if the Executive Officer has determined the facility presents a significant risk to groundwater or surface water.

Table 1 – Schedule for Submittal of Reports

Due Date	Document Due
7/1/2018	o Notice of Intent (NOI) for existing Confined Bovine Feeding Operations
12/31/2018	o Operation and Maintenance Plan for Limited Time Operations o Notify Central Valley Water Board of formation of representative groundwater monitoring group
7/1/2019	o Notify Central Valley Water Board of membership in an ILRP coalition. o Request permission of the Executive Officer to form a Joint Monitoring Program for surface water (for all cropland not covered by ILRP and with a potential to discharge to surface water) o Farm Evaluation Form (all cropland not covered by ILRP) o Certification that Nutrient Management Plan has been completed (certification signed by both Discharger and Certified Nutrient Management Specialist) for all cropland not covered by the Irrigated Lands Regulatory Program (ILRP). o Notify Central Valley Water Board of intent to join (groundwater) RMP or to undertake individual groundwater monitoring
12/31/2019	o Workplan for surface water monitoring for Joint Monitoring Program o Demonstration of No Potential to Discharge to Surface Water from land application areas (Full Coverage Operations) o Farm Water Quality Plan (Full Coverage Operations with potential to discharge to surface water)
7/1/2020	o First Annual Report (and annually thereafter) o Waste Management Plan for Full Coverage Operations o Monitoring and Reporting Workplan for representative groundwater monitoring group (Full Coverage Operations) o Workplan for well installation for individual groundwater monitoring network (Full Coverage Operations)
12/31/2020	o Monitoring Well Installation Completion Report and Certification that well installation is complete for representative groundwater monitoring group o Monitoring Well Installation Completion Report and Certification that well installation is complete for individual groundwater monitoring
4/1/2021	o First Representative Monitoring Report for representative groundwater monitoring group

7/1/2021	o Certification that the Nutrient Management Plan has been implemented o First Annual Groundwater Monitoring Report for individual groundwater monitoring
4/1/2026	o Summary Representative Monitoring Report (SRMR) for representative groundwater monitoring group
7/1/2026	o Summary Report for groundwater monitoring for individual groundwater monitoring

N. TIME SCHEDULE FOR COMPLIANCE

Dischargers with a Full Coverage Operation have the option of either implementing individual groundwater monitoring or participating in a group option such as a Representative Monitoring Program (RMP) to identify whether their specific management practices are resulting in adverse impacts to groundwater (i.e., whether the discharge is in compliance with Receiving Water Limitations G.2 (Groundwater Limitations) of this Order).

Dischargers with a Full Coverage Operation who have the potential to discharge to surface water from the land application areas associated with the bovine operation have the option of either implementing individual surface water monitoring, participating in a Joint Monitoring Program, or joining an Irrigated Lands Regulatory Program coalition, to identify whether their specific management practices are resulting in adverse impacts to surface water (i.e., whether the discharge is in compliance with the Receiving Water Limitations G.1 (Surface Water Limitations) of this Order).

This long-term monitoring of ground and surface water is needed to document which Confined Bovine Feeding Operation waste management practices are protective of water quality, and what effect these management practices will have on water quality under a variety of different site conditions.

If data become available from other representative monitoring programs that identify practices that are not protective of groundwater quality, the Executive Officer may require modification of management practices by a date earlier than the dates specified in this section.

1. Groundwater – Time schedules for evaluating management practices and implementing changes
 - a. For Dischargers conducting individual groundwater monitoring programs:
 - i. Summary Report for Individual Groundwater Monitoring: Dischargers conducting an Individual groundwater monitoring program shall submit a summary report within six years of initiating sampling activities (by 1 July 2026). The summary report must include identification of management practices that need to be implemented to achieve

compliance with applicable water quality objectives, including the groundwater limitations of the Order.

- ii. *Annual Implementation Reports for Individual Groundwater Monitoring:* Following the Executive Officer's review and approval of the Summary Report, the Discharger shall submit Annual Implementation Reports which document actions taken to upgrade management practices that have been found not to be protective of water quality. The Annual Implementation Reports will be submitted as part of the Annual Reports. The first Annual Implementation Report must identify alternative management practices the Discharger intends to implement at its Confined Bovine Feeding Operation along with a schedule for implementation. With each subsequent Annual Implementation Report, the Discharger must provide an update on their implementation of additional or alternative management practices. Implementation of the identified management practices must be as short as practicable and supported with appropriate technical or economic justification, and in no case may time schedules extend beyond 10 years from the date that the Summary Report is approved by the Executive Officer.
- b. For Dischargers participating in Representative Groundwater Monitoring Programs:
 - i. *Summary Representative Monitoring Report for Representative Groundwater Monitoring Programs:* Six years following commencement of groundwater monitoring (by 1 April 2026), the RMP must submit a Summary Representative Monitoring Report (SRMR) to the Board's Executive Officer for review and approval. The SRMR must identify management practices that are protective of water quality for the range of conditions found at facilities participating in the representative monitoring program, and must identify in the SRMR time schedules that are as short as practicable, and supported with appropriate technical or economic justification, for implementation of the identified management practices. The Central Valley Water Board may modify these schedules based on evidence that meeting the compliance date is technically or economically infeasible, or when evidence shows that compliance by an earlier date is feasible. Any applicable time schedules for compliance established in the Basin Plans (e.g., time schedules for compliance with salinity standards that may be established in future Basin Plan amendments through the CV-SALTS process) supersede the schedules established in an SRMR. In no case may time schedules extend beyond 10 years from the date that the SRMR is approved by the Executive Officer.

- ii. Individual Annual Implementation Reports for participants in a Representative Monitoring Program: Dischargers who have participated in the RMP must submit Annual Implementation Reports as part of their Annual Report, following the Executive Officer's approval of the SRMR, which must document actions taken to upgrade management practices that have been found not to be protective of water quality. The Annual Implementation Reports will be submitted as part of the Annual Reports due every 1 July. The first Annual Implementation Report must identify alternative management practices the Discharger intends to implement at its Confined Bovine Feeding Operation along with a schedule for implementation. With each subsequent Annual Implementation Report, the Discharger must provide an update on their implementation of additional or alternative management practices.
2. Surface water – Time schedules for evaluating management practices and implementing changes
 - a. For Dischargers conducting individual surface water monitoring or participating in a Joint Monitoring Program for surface water:
 - i. Farm Water Quality Plan – By 31 December 2019, all Dischargers who have a potential for discharges from their land application areas to reach surface water shall develop a farm-specific Water Quality Plan and submit the Plan to the Executive Officer for review and approval, as outlined in **Attachment B** to MRP R5-2017-0058. The Plan shall include water quality management practices currently used or proposed to comply with the surface water monitoring provisions of the Order and reduce or eliminate discharge of waste to surface waters. The farm management performance standards that must be achieved are to minimize waste discharge offsite in surface water, prevent pollution and nuisance, and minimize or eliminate the discharge of sediment above background levels. If management practices are proposed in the Plan but not yet implemented, the Plan must include timetables for implementation that are as short as practicable and subject to modification and approval by the Executive Officer.
 - ii. Surface Water Quality Management Plan – If the Annual Surface Water Monitoring Report submitted to the Executive Officer either by an individual Discharger or by a Joint Monitoring Program indicates violations of the Surface Water Limitations of the Order, the Discharger or Joint Monitoring Program shall submit a Surface Water Quality Management Plan to the Executive Officer for review and approval. The Plan shall include a description and justification for proposed management practices to be implemented to reduce the discharge of the constituent(s) of concern triggering preparation of the Plan. A time

schedule for implementation of the management practices shall be included in the Plan and shall be as short as practicable.

- b. For Dischargers participating in an Irrigated Lands Regulatory Program (ILRP) coalition for surface water:
 - i. Dischargers participating in an ILRP coalition shall implement changes in management practices in accordance with schedules approved through the ILRP.
3. Compliance Determination – Dischargers covered under this Order shall be deemed in compliance with this Order if they are in full compliance with the time schedules that apply to them in accordance with this Provision N.

O. ENFORCEMENT

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

P. PETITIONS

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 8 June 2017.

Original signed by

PAMELA C. CREEDON, Executive Officer

Attachment A – Notice of Intent
Waste Discharge Requirements General Order R5-2017-0058
For Confined Bovine Feeding Operations

5. COUNTY ASSESSOR PARCEL NUMBER(S) FOR ASSOCIATED CROPLAND (Land Application Areas):

B. OPERATOR NAME: _____ TELEPHONE NO: _____

OPERATOR MAILING ADDRESS: _____
Number and Street City Zip Code

EMAIL ADDRESS: _____

C. NAME OF LEGAL OWNER OF THE FACILITY: _____

LEGAL OWNER MAILING ADDRESS: _____
Number and Street City Zip Code

CONTACT PERSON: _____ TELEPHONE NO: _____

EMAIL ADDRESS: _____

D. WHEN DID/WHEN WILL YOU BEGIN OPERATIONS AT THE FACILITY? ____/____/____
Month Day Year

E. PERSON TO RECEIVE REGIONAL BOARD CORRESPONDENCE (OWNER OR OPERATOR OR BOTH)

A. OWNER: _____

B. OPERATOR: _____

C. BOTH: _____

TYPE OF ANIMALS AND SIZE OF THE OPERATION

Provide the principal breed of animals and the number of animals housed at the facility:

Principal Breed _____

<u>Current Number of Animals</u>			<u>Largest number in single month over last 3 years (month: _____ year: _____)</u>										
<u>Type of Animal</u>	Head	AUs ¹	<u>Type of Animal</u>	Head	AUs								
Beef Cattle	_____	_____	Beef Cattle	_____	_____								
Mature cows	_____	_____	Mature cows	_____	_____								
Bred heifers	_____	_____	Bred heifers	_____	_____								
Heifers (1-year to breeding)	_____	_____	Heifers (1-year to breeding)	_____	_____								
Calves (3 months to 1 year)	_____	_____	Calves (3 months to 1 year)	_____	_____								
Baby Calves (under 3 months)	_____	_____	Baby Calves (under 3 months)	_____	_____								
TOTAL	<table border="1" style="display: inline-table; width: 80px; height: 20px; vertical-align: middle;"> <tr><td style="width: 50%;"></td><td style="width: 50%;"></td></tr> </table>			<table border="1" style="display: inline-table; width: 80px; height: 20px; vertical-align: middle;"> <tr><td style="width: 50%;"></td><td style="width: 50%;"></td></tr> </table>			TOTAL	<table border="1" style="display: inline-table; width: 80px; height: 20px; vertical-align: middle;"> <tr><td style="width: 50%;"></td><td style="width: 50%;"></td></tr> </table>			<table border="1" style="display: inline-table; width: 80px; height: 20px; vertical-align: middle;"> <tr><td style="width: 50%;"></td><td style="width: 50%;"></td></tr> </table>		
	Head	AUs		Head	AUs								

For Auction Markets only: Number of Pens _____
 Total Area of Animal Housing (sq. ft.) _____

Animal Housing:

Describe how the animals are/will be housed (freestalls, calf hutches, open corrals, covered corrals, pasture, etc.) If more than one type of housing will be used, describe how many animals will be housed in each manner:

¹ See Animal Unit Conversion Table at end of NOI for instructions for converting to Animal Units

WASTE PRODUCTION AND REUSE

A. WASTE CONTAINMENT:

DO YOU HAVE A WASTEWATER LAGOON(S)? _____ How many? _____
SETTLING BASIN(S)? _____ How Many? _____

DO ANY OF THE LAGOONS OR BASINS HAVE LINERS? ____ YES ____ NO

IF YES, PLEASE DESCRIBE (e.g. EARTHEN, CONCRETE-LINED, SYNTHETIC LINER):

B. WASTE REUSE

DO YOU APPLY WASTEWATER TO CROPLAND THAT IS PART OF YOUR FACILITY?
_____ YES _____ NO

DO YOU APPLY SOLID MANURE AND/OR BEDDING TO CROPLAND THAT IS PART OF YOUR FACILITY? _____ YES _____ NO

- IF YES, ACREAGE: _____
- IF YES, DO YOU HAVE IRRIGATED LANDS REGULATORY COVERAGE?
 - YES
 - NO

DO YOU APPLY BIOSOLIDS, WHEY OR OTHER WASTE TO CROPLAND THAT IS PART OF YOUR FACILITY? _____ YES _____ NO

C. WASTE REMOVAL:

DO YOU TRANSFER SOME OR ALL OF YOUR SOLID MANURE AND/OR BEDDING TO OTHER PERSONS? _____ YES _____ NO

DO YOU TRANSFER SOME OR ALL OF YOUR WASTEWATER TO OTHER PERSONS?
_____ YES _____ NO

D. FLOOD PROTECTION/RUNOFF CONTROLS

Is there a stream or other waterway located on or bordering your facility?
_____ Yes _____ No

If you checked "Yes", please describe the practices used to prevent animals from entering the waterway:

Is storm water runoff that contacts animal wastes fully retained on the facility? ___ Yes ___ No

Describe how storm water runoff is controlled and where it is stored:

E. COMPOSTING OPERATIONS

Does your facility include a composting operation? _____ Yes _____ No

If so, complete Attachment A-1 describing your composting operation.

F. DO YOU MEET THE CRITERIA FOR THE LIMITED TIME OPERATION TIER IDENTIFIED IN FINDING 4 OF THE BOVINE GENERAL ORDER?

- NO
- YES

IF YES, CONFIRM THE FOLLOWING ABOUT YOUR OPERATION:

4.a.

- BOVINE ANIMALS ARE HOUSED FOR FEWER THAN 24 DAYS PER CALENDAR MONTH.

4.b.

- ALL MANURE IS EXPORTED

OR

- CROPLAND THAT HAS MANURE APPLIED IS COVERED UNDER THE IRRIGATED LANDS REGULATORY PROGRAM

4.c.

- MANURE IS STORED IN A ROOFED STRUCTURE WITH FEATURES TO LIMIT THE ENTRANCE OF PRECIPITATION

OR

- MANURE IS STORED IN A STORAGE AREA THAT HAS A LOW PERMEABILITY SURFACE AND FEATURES TO CONTROL RUN-ON OF WATER ONTO THE PAD, AND RUN-OFF OF LIQUID FROM THE PAD, AND THROUGHOUT THE WET SEASON WHEN NECESSARY (AND AT A MINIMUM ONE DAY PRIOR TO ANY FORECASTED MAJOR STORM EVENT, WHICH IS ONE INCH OF PRECIPITATION WITHIN 24 HOURS), MANURE IS EITHER REMOVED FROM THE SITE OR COVERED WITH A WEATHERPROOF COVERING SUCH THAT RUNOFF LEAVING THE STORAGE AREA WILL NOT HAVE CONTACTED MANURE.

4.d.

- COMPOSTING OF MANURE IS CONDUCTED IN A ROOFED STRUCTURE WITH FEATURES TO LIMIT THE ENTRANCE OF PRECIPITATION, AND ON CONCRETE OR AN EQUIVALENT LOW PERMEABILITY SURFACE, AND FREE LIQUIDS ARE NOT RELEASED DURING THE COMPOSTING PROCESS.

OR

- THE COMPOSTING IS REGULATED SEPARATELY UNDER THE COMPOSTING GENERAL ORDER

4.e.

- CORRAL RUNOFF IS STORED IN POND(S) THAT ONLY CONTAIN WATER SEASONALLY AND ARE OTHERWISE DRY, AND THAT DO NOT RECEIVE WASTEWATER FROM ANY SOURCE OTHER THAN CORRAL RUNOFF.

G. DO YOU MEET THE CRITERIA FOR A LIMITED POPULATION OPERATION TIER IDENTIFIED IN FINDING 5 OF THE BOVINE GENERAL ORDER?

- NO
 YES

IF YES, CONFIRM THE FOLLOWING ABOUT YOUR OPERATION:

5a.

- BETWEEN 6 AND 99 ANIMAL UNITS² ARE HOUSED AT YOUR FACILITY

5b.

- ALL MANURE IS EXPORTED

OR

- CROPLAND THAT HAS MANURE APPLIED IS COVERED UNDER THE IRRIGATED LANDS REGULATORY PROGRAM

5c.

- CORRAL RUNOFF IS STORED IN POND(S) THAT ONLY CONTAIN WATER SEASONALLY AND ARE OTHERWISE DRY, AND THAT DO NOT RECEIVE WASTEWATER FROM ANY SOURCE OTHER THAN CORRAL RUNOFF.

5.d.

- COMPOSTING OF MANURE IS CONDUCTED IN A ROOFED STRUCTURE WITH FEATURES TO LIMIT THE ENTRANCE OF PRECIPITATION, AND ON CONCRETE OR AN EQUIVALENT LOW PERMEABILITY SURFACE, AND FREE LIQUIDS ARE NOT RELEASED DURING THE COMPOSTING PROCESS.

OR

- THE COMPOSTING IS REGULATED SEPARATELY UNDER THE COMPOSTING GENERAL ORDER

ADDITIONAL INFORMATION

PREVIOUS SUBMITTAL OF REPORT OF WASTE DISCHARGE

HAVE YOU PREVIOUSLY SUBMITTED A REPORT OF WASTE DISCHARGE? _____ YES _____ NO

IF SO, WHEN WAS IT SUBMITTED? _____

FACILITY NAME USED : _____

Please attach a map of your facility. The map should show the roads adjacent to the confined bovine feeding operation, the locations of creeks, wells, major buildings, animal housing, waste storage facilities, irrigation lines, drainage channels, and the names, APNs, and location of any fields that receive wastewater, manure, or used bedding.

² 1 Animal Unit (AU) equals 1,000 pounds of animal weight

CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

SIGNATURE OF OWNER OF FACILITY

SIGNATURE OF OPERATOR OF FACILITY

PRINT OR TYPE NAME

PRINT OR TYPE NAME

TITLE AND DATE

TITLE AND DATE

NOI SUBMISSION INSTRUCTIONS

The NOI for facilities in Fresno, Kern, Kings, Madera, Mariposa, and Tulare counties should be submitted to the California Regional Water Quality Control Board, either by email to:

centralvalleyfresno@waterboards.ca.gov

or by mail to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706
Attention: Confined Animal Regulatory Unit

The NOI for facilities in all other counties should be submitted either by email to:

centralvalleysacramento@waterboards.ca.gov

or by mail to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670
Attention: Confined Animal Regulatory Unit

CALCULATION OF ANIMAL UNITS (AU)

To complete the table below, enter the number of head in column A. Then multiply the number by the appropriate factor and enter the results in column B. For mature cows, multiply the results in column B by an adjustment factor as needed and enter the results in columns C and D. For animals other than mature cows, copy the numbers in column B into column D.

			A	B	C	D
		Factor	Head	AU	Adjustment for Breed	Total AUs
	ANIMAL				AU times 1.0, 1.2, or 1.4	
1.	Milk or Dry Cows	1.0				
2.	Heifers (2 years and older)	0.73				
3.	Heifers (1 year to breeding)	0.73				
4.	Calves (3 months to 1 year)	0.35				
5.	Baby Calves (< 3 months)	0.21				
6.	Beef Cattle	1.2				
7.	Total					

Adjustments for Animal Breed: The AU values above are based on a 1,000-pound AU per Title 40 Code of Federal Regulations, Section 122, and can be used directly for mature Jersey cows. For mature Guernseys, multiply the AU values by 1.2; for mature Holsteins, multiply the AU values by 1.4.

**ATTACHMENT A-1
ORDER R5-2017-0058**

**NOTICE OF INTENT (NOI)
FOR
COMPOSTING OPERATIONS AT
CONFINED BOVINE FEEDING OPERATIONS**

Owners and operators of Bovine Operations (Dischargers) who have individual waste discharge requirements, a waiver of waste discharge requirements, or separate coverage under the General Waste Discharge Requirements Composting Operations (WQ 2015-0121-DWQ) for their composting operations do not need to prepare this form.

1. DISCHARGER INFORMATION:

Operator's Name: (if other than operator of the Confined Bovine Feeding Operation):				
Street Address:				
City/Locale:	County	State	Zip	Telephone Number:
Facsimile Number:			Email Address:	

2. COMPOSTING OPERATION INFORMATION:

Type (Check one):	Facility Acreage (acres):
<input type="checkbox"/> Existing Composting Operation	Total Facility Capacity (cubic yards):
<input type="checkbox"/> New Composting Operation	Average Weekly Throughput (cubic yards per week):

3. REASONS FOR FILING:

<input type="checkbox"/> New Discharge	<input type="checkbox"/> Existing Discharge	<input type="checkbox"/> Expansion or Change in Operations
Changes in Owner/Operator:		<input type="checkbox"/> Other:

4. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA):

Has a CEQA determination been made by an Agency? <input type="checkbox"/> YES <input type="checkbox"/> NO	Name of Agency:
Type and Date of Determination	State Clearinghouse Number:

Attachment A-1 – Notice of Intent for Composting Operations
 Waste Discharge Requirements General Order R5-2017-0058
 For Confined Bovine Feeding Operations

5. PROCESS

Allowable Materials (Check all that apply, and specify the largest quantity at any time over past 3 years):	
Manure and used bedding cu. yards:	Other material (describe) cu. yards:
Current Processing Capacity:	
Months during which compostable materials will be on-site:	
Additives/Amendments and maximum dry weight percentage used (list):	

6. SITE CONDITIONS FOR TIER 1 COMPOSTING OPERATIONS

For earthen-surfaced composting areas, anticipated highest groundwater elevation (feet relative to mean sea level): _____
Average ground surface material percolation rate (minutes per inch) or attach results of percolation testing: _____
<p>Is composting area roofed?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Is composting area walled?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Is composting area on concrete or similar flooring?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>

7. TECHNICAL REPORT

Unless the composting operation meets the exemption criteria under Section F of the Bovine General Order, provide a Technical Report for the composting operation containing the information specified in **Attachment D** to the Composting General Order, State Water Board Order WQ 2015-0121-DWQ.

Attachment A-1 – Notice of Intent for Composting Operations
Waste Discharge Requirements General Order R5-2017-0058
For Confined Bovine Feeding Operations

8. CERTIFICATION

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

Signature (Owner or Authorized Representative)	Date
Print Name	Time
Telephone number	Email

**ATTACHMENT B
ORDER R5-2017-0058**

**WASTE MANAGEMENT PLAN FOR THE PRODUCTION AREA
FOR
CONFINED BOVINE FEEDING OPERATIONS**

A Waste Management Plan (WMP) for the production area is required for all Confined Bovine Feeding Operations placed in the Full General Order Coverage Tier of Waste Discharge Requirements General Order R5-2017-0058 (Bovine General Order or Order) and shall address all of the items below.

Confined Bovine Feeding Operations which are regulated as Limited Time or Limited Population Operations need to prepare an Operation and Maintenance Plan containing the information described in sections F and H of this attachment. Limited Time Operations need to submit the Operation and Maintenance Plan to the Central Valley Water Board.

The portions of the WMP that are related to facility and design specifications (sections B and C of this attachment) must be prepared by, or under the responsible charge of, and certified by a civil engineer or certified engineering geologist who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work. Minor changes to the WMP that do not require the exercise of engineering judgement do not require the signature of the licensed professional described above. The WMP shall be revised when conditions in the production area change.

The purpose of the WMP is to ensure that the production area of the Confined Bovine Feeding Operation is designed, constructed, operated and maintained so that wastes generated at the facility are managed in compliance with the Bovine General Order in order to prevent adverse impacts to groundwater and surface water quality.

Contents of the WMP:

- A. A description of the facility that includes:
1. The name of the facility and the county in which it is located;
 2. The address and Assessor's Parcel Number;
 3. The name(s), address(es), and telephone number(s) of the property owner(s), facility operator(s), and the contact person for the facility;
 4. Present and maximum animal population as indicated below (this information is in the Notice of Intent submitted as application for coverage under the Bovine General Order):

Type of Animals	Maximum number of animals housed at the facility in one month between 12/2013 and 12/2016 (specify month and year used) or the maximum herd size identified in an approved CEQA or CEQA equivalent document	Current number of animals housed at the facility (specify date of information)
	DATE / /	DATE / /
Mature Cows and Bulls (> 24 months)		
Steers and Heifers (15 – 24 months)		
Steer and Heifer Calves (7 to 14 months)		
Calves (up to 6 months)		
Other types of Bovine stock		

5. Total volume (gallons) of wastewater generated daily and how this volume was determined; and
6. A Site Map (or Maps) of appropriate scale to show property boundaries and the following in sufficient detail:
 - a. The location of the features of the production area including:
 - i. Structures used for animal housing and other buildings; corrals and ponds; solids separation facilities (settling basins or mechanical separators); other areas where animal wastes are deposited or stored; feed storage areas; drainage flow directions and nearby surface waters; all water supply wells (domestic, irrigation, and animal water supply) and groundwater monitoring wells; and
 - ii. Wastewater conveyance structures, discharge points, and discharge/mixing points with irrigation water supplies; pumping facilities and flow meter locations; upstream diversion structures,

drainage ditches and canals, culverts, drainage controls (berms/levees, etc.), and drainage easements; and any additional components of the waste handling and storage system.

- b. The location and features of all land application areas (land under the Discharger's control, whether it is owned, rented, or leased, to which manure or wastewater from the production area is or may be applied for nutrient recycling) including:
 - i. A field identification system (Assessor's Parcel Number; field by name or number; total acreage of each field; crops grown; indication if each field is owned, leased, or used pursuant to a formal agreement); an indication of what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field; and
 - ii. Wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements;
- c. The location of all cropland that is part of the Confined Bovine Feeding Operation but is not used for waste application, including the Assessor's Parcel Number(s), total acreage, crops grown, and information on who owns or leases the field. The Waste Management Plan shall indicate if such cropland is registered under an Irrigated Lands Regulatory Program coalition instead of the Bovine General Order;
- d. The location of all off-property domestic wells within 600 feet of the production area or land application area(s) associated with the Confined Bovine Feeding Operation and the location of all public water system wells within 1,500 feet of the production area or land application area(s) associated with the facility; and
- e. A vicinity map with scale, north arrow, and the date the map was prepared. The map shall be drawn on a published base map (e.g., a topographic map or aerial photo) using an appropriate scale that shows sufficient details of all facilities.

- B. An engineering report demonstrating that the facility has adequate containment capacity. The report shall include calculations showing if the existing containment structures are able to retain all facility wastewater generated, together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm. A settling basin may be included in storage calculations only if it is not used for manure separation. If a facility has multiple settling basins and a cleanout schedule such that at any point some are empty of manure, the quantity of storage represented by such empty basins can be included in the calculation of containment capacity.

As part of the description of the containment capacity of the facility, the description of the dimensions of the ponds in the wastewater management system shall include the height of the pond embankment relative to the land surface and the depth of the pond below the top of the embankment.

1. The determination of the necessary storage volume shall reflect:
 - a. The maximum period of time, as defined in the Nutrient Management Plan (section C.2 under “Contents of a Nutrient Management Plan” in **Attachment C**), anticipated between land application events (storage period), which shall consider application of wastewater or manure to the land application area as allowed by the Bovine General Order using proper timing and rate of applications;
 - b. Manure, wastewater, and other wastes accumulated during the storage period;
 - c. Normal precipitation or normal precipitation times a factor of one and a half, less evaporation on the surface area during the entire storage period. If normal precipitation is used in the calculation of necessary storage volume, the Waste Management Plan shall include a Contingency Plan as specified in B.3 of this attachment;
 - d. Normal runoff (runoff from normal precipitation), or runoff due to normal precipitation times a factor of one and a half, from the production area during the storage period. If normal runoff is used in the calculation of necessary storage volume, the Waste Management Plan shall include a Contingency Plan as specified in B.3 of this attachment (Note: clean storm water that is diverted to a storm water pond or otherwise appropriately managed does not need to be included in the necessary storage volume);
 - e. 25-year, 24-hour precipitation on the surface (at the required design storage volume level) of the facility;

- f. 25-year, 24-hour runoff from the facility's drainage area;
 - g. Residual solids after liquids have been removed; and
 - h. Necessary freeboard (one foot of freeboard for belowground retention ponds and two feet of freeboard for aboveground retention ponds). If there is a pipe through a pond embankment that is not or cannot be effectively sealed with a valve or by some other method, all measurements of freeboard and all storage calculations need to treat the bottom of the pipe as the top of the embankment. Where ponds are connected by a pipe that is not/cannot be effectively sealed with a valve or by some other method, storage calculations shall not include any storage where the use of that storage in one lagoon will cause the other lagoon to have less freeboard than required under the Bovine General Order.
2. If the facility's storage capacity is inadequate, the WMP shall include proposed modifications or improvements. Any proposed modifications or improvements must be prepared by, or under the responsible charge of, and certified by a civil engineer or certified engineering geologist who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work, and must include:
 - a. Design calculations demonstrating that adequate containment will be achieved;
 - b. Details on the liner, pan lysimeter, and leachate collection and removal system (if appropriate) materials;
 - c. A schedule for construction and certification of completion to comply with the Schedule of Tasks M.1 of the Bovine General Order;
 - d. Pursuant to California Code of Regulations, Title 27, sections 20323 and 20324, a construction quality assurance plan describing testing and observations needed to document construction of the pond; and
 - e. An operation and maintenance plan for the pond.
3. Contingency Plan: If the necessary storage volume calculated in B.1 or B.2 of this attachment is based on normal precipitation and/or runoff rather than precipitation or runoff from normal precipitation times a factor of one and a half (see B.1.c and B.1.d of this attachment), then the engineering report shall include a Contingency Plan that includes a plan on how the excess

precipitation and/or runoff that is generated during higher than normal precipitation will be managed. If the Contingency Plan includes plans to discharge the excess runoff and/or precipitation to land without being in conformance with the NMP, then the Contingency Plan shall include a Monitoring Well Installation and Sampling Plan (MWISP) with a schedule for implementation that proposes monitoring wells to determine the impacts of such disposal on groundwater quality.

- C. An engineering report showing if the facility has adequate flood protection. If the Discharger can provide to the Executive Officer an appropriate published flood zone map that shows the facility is outside the relevant flood zone, an engineering report showing adequate flood protection is not required for that facility. The engineering report shall include a map and cross-sections to scale, calculations, and specifications as necessary. The engineering report shall also describe the size, elevation, and location of all features present to protect the facility from inundation or washout as follows:
1. For facilities in the Sacramento River and San Joaquin River Basins, showing if:
 - a. The ponds and manured areas at facilities in operation on or before 27 November 1984 are protected from inundation or washout by overflow from any stream channel during 20-year peak storm flow; or
 - b. Existing facilities in operation on or before 27 November 1984 that are protected against 100-year peak storm flows will continue such protection; or
 - c. Facilities, or portions thereof, which began operation after 27 November 1984, are protected against 100-year peak storm flows.
 2. For facilities in the Tulare Lake Basin, showing if the facility is protected from overflow from stream channels during 20-year peak stream flows for facilities that existed as of 25 July 1975 and protected from 100-year peak stream flows for facilities constructed after 25 July 1975.
 3. If the facility's flood protection does not meet these minimum requirements, the WMP shall include proposed modifications or improvements with the corresponding design to achieve the necessary flood protection and a schedule for construction and certification of completion to comply with the Schedule of Tasks M.1 of the Bovine General Order.
- D. A report assessing if the animal confinement areas, animal housing, and manure and feed storage areas are designed and constructed properly.

1. The report shall assess if the following design and construction criteria are met:
 - a. Corrals and/or pens are designed and constructed to collect and divert all wastewater to the retention pond;
 - b. The animal housing area (e.g., barn, shed, etc.) is designed and constructed to divert all water that has contacted animal wastes to the retention pond; and
 - c. Manure and feed storage areas are designed and constructed to collect and divert runoff and leachate from these areas to the retention pond.
 2. If the facility does not meet the above design and construction criteria, the WMP shall include proposed modifications or improvements to achieve the criteria and a schedule for construction and certification of completion to comply with the Schedule of Tasks M.1 of the Bovine General Order.
- E. For Full Coverage Confined Bovine Feeding Operations, an Operation and Maintenance Plan that includes:
1. Mortality Management Plan describing the procedure for disposal of dead animals, both under routine conditions and emergency disposal, and including name and contact information on any outside entity involved in carcass disposal for the Confined Bovine Feeding Operation.
 2. Standard Operating Procedures for manure and feed storage areas, corrals and/or pens, and animal housing areas (e.g. barn, shed, etc.), to ensure that leachate and water that has contacted waste is collected and diverted to a retention pond and that infiltration of leachate and water that has contacted waste to the underlying soils is minimized. The Procedures should ensure that gutters, downspouts, or other runoff controls are maintained, and that water is diverted away from manure or other containments within the production area, unless such drainage is fully contained and is included in the storage requirement calculations required in section B of this attachment. The Procedures should ensure that there is no discharge of waste or storm water to surface waters from the production area. The Procedures should ensure that all animals are prevented from entering any surface water within the production area.
 3. Standard Operating Procedures for manure storage and removal, including the frequency of cleanouts of manure from pens, timing of manure removal or protocols for covering manure prior to forecasted major storm events, and the duration of time that stacked manure remains on site.

4. Location of, maintenance procedures for, and testing frequencies for mechanical Backflow Prevention Devices.
 5. For wastewater ponds, Standard Operating Procedures describing the dates when freeboard will be monitored in wastewater ponds and what the target freeboard needs to be (and by what date) to ensure adequate winter storage capacity. The Procedures should include a schedule for lowering the pond so that the target freeboard will be met each fall, and ensure that the point on the depth marker that represents the needed storage is clearly posted at the facility. The Procedures should include a schedule for visual inspections to identify and remediate problems related to odor, breeding of mosquitoes, damage from burrowing animals, damage from equipment during removal of solids, embankment settlement, erosion, seepage, excess weeds, algae, and vegetation. The Procedures should include a schedule and procedures for the periodic removal of solids from the wastewater pond to ensure that pond capacity is maintained and damage to any pond liner is prevented.
 6. A Chemical Management Plan to ensure that chemicals and other contaminants handled at the facility are properly collected and disposed of when used or no longer needed.
 7. A schedule for periodic review of the combined amount of salt in animal drinking water and feed to verify that salt is limited to the animal requirements.
 8. A schedule for regular inspections to ensure that the animal housing area is maintained to collect and divert all water that has contacted animal wastes to a retention pond and to minimize the infiltration of water into the underlying soils.
- F. For Limited Time and Limited Population Operations, an Operation and Maintenance Plan that includes:
1. Mortality Management Plan describing the procedure for disposal of dead animals, both under routine conditions and emergency disposal, and including name and contact information on any outside entity involved in carcass disposal for the Bovine Operation; and
 2. Standard Operating Procedures for manure storage and removal, including the frequency of cleanouts of manure from pens, timing of manure removal or protocols for covering manure prior to forecasted major storm events, duration of time that stacked manure remains on site, and maintenance of runoff controls for the manure storage area.

- G. Documentation from a trained professional (i.e., a person certified by the American Backflow Prevention Association, an inspector from a State or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training) that there are no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the Site Map required in A.6 of this attachment.
- H. The certification required in Required Reports and Notices K.2.a of the Bovine General Order.

**ATTACHMENT C
ORDER R5-2017-0058**

**CONTENTS OF A NUTRIENT MANAGEMENT PLAN
AND
TECHNICAL STANDARDS FOR NUTRIENT MANAGEMENT
FOR
CONFINED BOVINE FEEDING OPERATIONS**

Waste Discharge Requirements General Order R5-2017-0058 (hereinafter referred to as the Bovine General Order, or Order) requires owners and operators of Confined Bovine Feeding Operations (Dischargers) who operate a "land application area" where manure, bedding, or wastewater may be applied to land or pasture for nutrient recycling to develop and implement management practices that control nutrient losses and that are described in a Nutrient Management Plan (NMP). The purpose of the NMP is to budget and manage nutrients applied to the land application area(s) considering all sources of nutrients, crop requirements, soil types, climate, and local conditions in order to prevent adverse impacts to surface water and groundwater quality. The NMP must take the site-specific conditions into consideration in identifying steps that will minimize nutrient movement through surface runoff or leaching past the root zone.

Owners and operators of Confined Bovine Feeding Operations (Dischargers) who do not apply manure, bedding, or wastewater to land for nutrient recycling do not need to prepare an NMP.

The NMP must contain, at a minimum, all of the elements listed below under Contents of a Nutrient Management Plan and must be in conformance with the applicable Technical Standards for Nutrient Management (Technical Standards), also listed below. Note that the NMP must be updated in response to changing conditions, monitoring results and other factors.

A specialist who is certified in developing nutrient management plans shall develop the NMP. A certified specialist is a Professional Soil Scientist, Professional Agronomist, or Crop Advisor certified by the American Society of Agronomy or a Technical Service Provider certified in nutrient management in California by the Natural Resources Conservation Service (NRCS). The Executive Officer may approve alternative proposed specialists. Only NMPs prepared and signed by these parties will be considered certified.

The NMP is linked to other sections of the Bovine General Order. The Monitoring and Reporting Program specifies minimum amounts of monitoring that must be conducted at the bovine facility. As indicated below, this information must be used to make management decisions related to nutrient management. Likewise,

the timing and amounts of wastewater applications to crops must be known to correctly calculate the amount of storage needed in retention ponds.

Wastes and land application areas shall be managed to prevent contamination of crops grown for human consumption. The term “crops grown for human consumption” refers only to crops that will not undergo subsequent processing which adequately removes potential microbial danger to consumers.

Contents of a Nutrient Management Plan

The NMP will include the Notice of Intent (**Attachment A** to this Order) and the annual reports required by Monitoring and Reporting Program R5-2017-0058. Copies of these reports shall be maintained on the facility for 5 years.

The NMP shall identify the name and address of the Confined Bovine Feeding Operation, and the name and mailing address of the operator and of the legal owner of the property and shall contain all of the following elements to demonstrate that the Discharger can control nutrient losses that may impact surface water or groundwater quality and comply with the requirements of the Order and the Technical Standards for Nutrient Management (Technical Standards).

A. Land Application Area Information

1. Identify each land application area, including pasture land (under the Discharger’s control, whether it is owned, rented, or leased, to which manure or wastewater from the production area is or may be applied for nutrient recycling) on a published base map (topographic map or aerial photo) at an appropriate scale which includes:
 - a. A field identification system (Assessor’s Parcel Number); land application area by name or number; total acreage of each land application area; crops grown; indication if each land application area is owned, rented, or leased by the Discharger; indication of the type of waste applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field; and
 - b. Wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping

facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements.

2. Provide the following information for each land application area identified in A.1 of this attachment:
 - a. Field's common name (name used when keeping records of nutrient and waste applications);
 - b. Assessor's Parcel Number;
 - c. Total acreage;
 - d. Crops grown and anticipated crop rotation;
 - e. Information on who owns and/or leases the field; and
 - f. Proposed sampling locations for discharges of storm water and tailwater to surface water.
3. Provide copies of written agreements with third parties that receive wastewater for their own use from the Discharger's bovine feeding operation (Technical Standards E.1.a and E.1.c of this attachment).
4. Identify each field under the control of the Discharger and within five miles of the bovine feeding operation where neither wastewater nor manure is applied. Each field shall be identified on a published base map at an appropriate scale by the following:
 - a. Assessor's Parcel Number;
 - b. Field's common name (name used when keeping records of nutrient and waste applications);
 - c. Total acreage; and
 - d. Whether the field is registered under the Irrigated Lands Regulatory Program.

Note: The NMP must be updated and the Central Valley Water Board notified in writing before waste is applied to the lands identified in this section.

B. Sampling and Analysis (see Technical Standard I below)

Identify the sample location, sampling methods, sampling frequency, and analyses to be conducted for soil, manure, wastewater, irrigation water, and plant tissue analysis (Technical Standard A of this attachment).

C. Nutrient Budget (see Technical Standard E of this attachment)

The Discharger shall develop a nutrient budget for each land application area. The nutrient budget shall establish planned rates of nutrient applications for each crop based on soil test results, manure and wastewater analyses, irrigation water analyses, crop nutrient requirements and patterns, seasonal and climatic conditions, the use and timing of irrigation water, and the nutrient application restrictions listed in Technical Standards E.1 through E.4 of this attachment. The Nutrient Budget shall include the following:

1. The planned rate of application of manure and wastewater for each crop in each land application area (also considering sources of nutrients other than manure or wastewater) to meet each crop's nutrient needs without exceeding the application rates specified in Technical Standard E.2 of this attachment. The basis for the planned manure and application rates must be provided;
2. The timing of applications for each crop in each land application area and the basis for the timing (Technical Standard E.3 of this attachment). The maximum period of time anticipated between land application events (storage period) based on proper timing and compliance with Technical Standard E.3 of this attachment. This will be referenced in the Waste Management Plan (item B.1 of **Attachment B**) to determine the storage capacity needs; and
3. The method of manure and wastewater application for each crop in each land application area (Technical Standard E.4 of this attachment).
4. If phosphorus and/or potassium applications exceed the amount of these elements removed from the land application area in the harvested portion of the crop, the soil and crop tissue analyses shall be reviewed by an agronomist at least every five years. If this review determines that the buildup of phosphorus or potassium threatens to reduce the long-term productivity of the soil or the yield, quality or use of the crops grown, application rates will be decreased to prevent or correct the problem.

D. Setbacks, Buffers, and Other Alternatives to Protect Surface Water (see Technical Standard G of this attachment)

1. Identify all potential surface waters or conduits to surface water that are within 100 feet of any land application area.
2. For each land application area that is within 100 feet of surface water or a conduit to surface water, identify the setback, vegetated buffer, or other alternative practice that will be implemented to protect surface water (Technical Standard G of this attachment).

E. Record-Keeping (see Technical Standard I of this attachment)

Identify the records that will be maintained for each land application area identified in A.1 of this attachment.

F. Nutrient Management Plan Review (see Technical Standard J of this attachment)

1. Identify the schedule for review and revisions to the NMP.
2. Identify the person who will conduct the NMP review and revisions.

Technical Standards for Nutrient Management

The Discharger shall comply with the following Technical Standards for Nutrient Management in the development and implementation of the Nutrient Management Plan (NMP).

A. Sampling and Analysis

Soil, manure, wastewater, irrigation water, and plant tissue shall be monitored, sampled, and analyzed as required in Monitoring and Reporting Program R5-2017-0058, and any future revisions thereto. The results of these analyses shall be used during the development and implementation of the NMP.

B. Crop Requirements

1. Realistic yield goals for each crop in each land application area shall be established. For new crops or varieties, industry yield recommendations may be used until documented yield information is available.
2. Each crop's nutrient requirements for nitrogen, phosphorus, and potassium shall be determined based on recommendations from the University of California, *Western Fertilizer Handbook* (9th Edition) for the first year only, during preparation of the NMP, or for the first year of a new crop, or from historical crop nutrient removal (as determined by harvest yields, nutrient requirements, and tissue sample analyses).

C. Available Nutrients

1. All sources of nutrients (nitrogen, phosphorus, and potassium) available for each crop in each land application area shall be identified prior to land applications. Potential nutrient sources include, but are not limited to, existing nutrients in soil, manure, wastewater, irrigation water, commercial fertilizers, and residual biomass from previous crops.
2. Nutrient values of soil, manure, wastewater, and irrigation water shall be determined based on laboratory analysis. "Book values" for manure and wastewater may be used for planning of waste applications during the first year during initial development of the NMP if necessary. Acceptable book values are those values recognized by American Society of Agricultural and Biological Engineers (ASABE), the Natural Resources Conservation Service (NRCS), and/or the University of

California that accurately estimate the nutrient content of the material. The nutrient content of commercial fertilizers shall be derived from California Department of Food and Agriculture published values.

3. Nutrient credit from previous legume crops shall be determined by methods acceptable to the University of California Cooperative Extension, the NRCS, or a specialist certified in developing nutrient management plans.

D. Overall Nutrient Balance

If the NMP shows that the nutrients generated by the bovine feeding operation exceed the amount needed for crop production in the land application area, the Discharger must implement management practices (such as offsite removal of the excess nutrients, treatment, or storage) that will prevent impacts to surface water or groundwater quality due to excess nutrients.

E. Nutrient Budget

The NMP shall include a nutrient budget which includes planned rates of nutrient applications for each crop that do not exceed the crop's requirements for total nitrogen considering the stage of crop growth, and that also considers all nutrient sources, climatic conditions, the irrigation schedule, and the application limitations in 1 through 4 below.

1. General Standards for Nutrient Applications

- a. Prohibition A.8 of the Order: *“The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner or in a manner not approved by the Executive Officer, is prohibited.”*
- b. Prohibition A. 9 of the Order: *“The land application of manure or wastewater to cropland for other than nutrient recycling is prohibited.”*
- c. Land Application Specification E.2 of the Order: *“The Discharger shall have a written agreement with each third party prior to receiving wastewater from the Discharger for its own use. Land owned, operated, or controlled completely or in part by Dischargers shall not be considered to be controlled by a third party. Each written agreement shall be included in the Discharger’s Notice of Intent and Nutrient Management Plan, and each new written agreement, modified written agreement, or*

rescission of a written agreement shall be included in the Annual Report for the year in which the written agreement is either reached, modified, or rescinded. The written agreement(s) shall be effective until the third party is covered under waste discharge requirements or a waiver of waste discharge requirements that is adopted by the Central Valley Water Board. The written agreement shall:

- a. *Clearly identify:*

 - i. *The Discharger and Confined Bovine Feeding Operation from which the wastewater originates;*
 - ii. *The third party that will control the application of the wastewater to cropland;*
 - iii. *The Assessor's Parcel Number(s) and the acreage(s) of the cropland where the wastewater will be applied; and*
 - iv. *The types of crops to be fertilized with the wastewater.*

- b. *Include an agreement by the third party to:*

 - i. *Use the wastewater at agronomic rates appropriate for the crops to be grown; and*
 - ii. *Prevent the runoff to surface waters of wastewater, storm water or irrigation supply water that has come into contact with manure or is blended with wastewater.*

- c. *Include a certification statement, as specified in General Reporting Requirement C.7 of the Standard Provision and Reporting Requirements (which is attached to and made part of this Order), which is signed by both the Discharger and third party."*
- d. Land Application Specification E.4 of the Order: *"The application of animal waste and other materials containing nutrients to any cropland under control of the Discharger shall meet the following conditions:*
 - a. *The application is in accordance with a certified Nutrient Management Plan developed and implemented in accordance with Required Reports and Notices K.1.c and **Attachment C** of this Order; and*

- b. Records are prepared and maintained as specified in the Record-Keeping Requirements of Monitoring and Reporting Program R5-2017-0058.”*
- e. Land Application Specification E.6 of the Order: *“The application of waste to cropland shall be at rates that preclude development of vectors or other nuisance conditions and meet the conditions of the certified Nutrient Management Plan.”*
- f. Land Application Specification E.8 of the Order: *“All wastewater applied to land application areas must infiltrate completely within 72 hours after application.”*
- g. Land Application Specification E.9 of the Order: *“Wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified Nutrient Management Plan (see **Attachment C** of this Order).”*
- h. Provision H.7 of the Order: *“This Order does not apply to facilities where wastes such as, but not limited to, whey, cannery wastes, septage, municipal or industrial sludge, municipal or industrial biosolids, ash or similar types of waste are generated onsite or are proposed to be brought onto the production area or land application area of the Confined Bovine Feeding Operation for the purpose of nutrient recycling or disposal. The Discharger shall submit a complete Report of Waste Discharge and shall not apply or dispose of such waste prior to receiving waste discharge requirements or a waste-specific waiver of waste discharge requirements from the Central Valley Water Board.”*
- i. Plans for nutrient management shall specify the form, source, amount, timing, and method of application of nutrients on each land application area to minimize nitrogen and/or phosphorus movement to surface and/or ground waters to the extent necessary to meet the provisions of the Order.
- j. Where crop material is not removed from the land application area, waste applications are not allowed. For example, if a pasture is not grazed or mowed (and cuttings removed from the land application area), waste shall not be applied to the pasture.

- k. Manure and/or wastewater will be applied to the land application area for use by the first crop covered by the NMP only to the extent that soil tests indicate a need for nitrogen application.
 - l. Supplementary commercial fertilizer(s) and/or soil amendments may be added when the application of nutrients contained in manure and/or wastewater alone is not sufficient to meet the crop needs, as long as these applications do not exceed provisions of the Order.
 - m. Nutrient applications to a crop shall not be made prior to the harvest of the previous crop except where the reason for such applications is provided in the NMP.
 - n. Water applications shall not exceed the amount needed for efficient crop production.
 - o. Nutrients shall be applied in such a manner as not to degrade the soil's structure, chemical properties, or biological condition.
2. Nutrient Application Rates
- a. General
 - i. Planned rates of nutrient application shall be determined based on soil test results, crop tissue test results, nutrient credits, manure and wastewater analysis, crop requirements and growth stage, seasonal and climatic conditions, and use and timing of irrigation water. Actual applications of nitrogen to any crop shall be limited to the amounts specified below.
 - ii. Nutrient application rates shall not attempt to approach a site's maximum ability to contain one or more nutrients through soil adsorption. Excess applications or applications that cause soil imbalances should be avoided. Excess manure nutrients generated by the Discharger must be handled by export to a good steward of the manure, or the development of alternative uses.
 - b. Nitrogen

Total nitrogen applications to a land application area prior to and during the growing of a crop will be based on pre-plant or pre-side dress soil analysis to establish residual nitrogen remaining in the field from the previous crop to establish early season nitrogen

applications. Pre-plant or side dress nitrogen applications will not exceed the estimated total crop use as established by the nutrient management plan. Dischargers shall use their best efforts to ensure that application rates do not result in total nitrogen applied to the land application areas exceeding 1.4 times the nitrogen that will be removed from the field in the harvested portion of the crop. Failure to use best efforts is a violation which may be subject to enforcement action.

c. Phosphorus and Potassium

- i. Phosphorus and potassium may be applied in excess of crop uptake rates. If, however, monitoring indicates that levels of these elements are causing adverse impacts, corrective action must be taken. Cessation of applications may be necessary until crop uptake and harvest has reduced the concentration in the soil.

Important Note:

Use of animal manure as a primary source of nitrogen commonly results in applications of phosphorus and potassium at rates that exceed crop needs. Over time, these elements build up in the soils and can cause adverse impacts. For example, phosphorus leaving the land application area as surface runoff contributes to excessive algae growth in receiving waters, and potassium can build up in crops to the point of limiting their use as animal feed. Application of manure, which contains these nutrients, at agronomic levels, along with reasonable erosion control and runoff control measures, will normally prevent such problems.

Nutrients are being evaluated in several Central Valley surface waters. Where these studies show that runoff of nutrients are adversely impacting beneficial uses, the Central Valley Water Board will work with parties in the watershed, including Confined Bovine Feeding Operations, to reduce discharges of phosphorus, nitrogen and possibly other constituents to surface waters.

3. Nutrient Application Timing

- a. Wastewater application is not the same as irrigation. Wastewater application scheduling should be based on the nutrient needs of the crop, the daily water use of the crop, the water holding capacity of the soil, and the lower limit of soil moisture for each crop and soil.

- b. Wastewater shall not be applied when soils are saturated. During the wet season rainfall can exceed crop water demand. However, the application of wastewater is allowable if tests show that there is an agronomic need and current conditions indicate that threat of nitrate leaching is minimal.
 - c. The timing of nutrient application must correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, and land application area accessibility.
 - d. Nutrient applications for spring-seeded crops shall be timed to avoid surface runoff and leaching by winter rainfall.
 - e. Except for orchards and vineyards, nutrients shall not be applied during periods when a crop is dormant.
4. Nutrient Application Methods
- a. The Discharger shall apply nutrient materials uniformly to application areas or as prescribed by precision agricultural techniques.
 - b. Land Application Specification E.7 of the Order: *“Land application areas that receive solid manure shall be managed through implementation of erosion control measures to minimize erosion and must be consistent with a certified Nutrient Management Plan.”*

F. Wastewater Management on Land Application Areas

Control of water and wastewater applications and runoff is a part of proper nutrient management since water transports nutrients, salts, and other constituents from cropland to groundwater and surface water. The Discharger shall comply with the following provisions of the Order, which place requirements on applications of manure and wastewater to, and runoff from, cropland:

1. Prohibition A.3 of the Order: *“The discharge of waste from Confined Bovine Feeding Operations to surface waters in a manner causing or contributing to an exceedance of any applicable water quality objective in the Basin Plans or any applicable federal water quality criteria, or a violation of any applicable State or federal policies or regulations is prohibited.”*

2. Prohibition A.4 of the Order: *“The collection, treatment, storage, discharge or disposal of wastes at a Confined Bovine Feeding Operation shall not result in the creation of a condition of pollution or nuisance.”*
 3. Prohibition A.10 of the Order: *“The discharge of wastewater to surface waters from a land application area is prohibited. Irrigation supply water that comes into contact or is blended with waste or wastewater shall be considered wastewater under this prohibition.”*
 4. Prohibition A.11 of the Order: *“The application of wastewater to a land application area before, during, or after a storm event that may result in the discharge of commingled applied water and runoff to surface water is prohibited.”*
 5. Prohibition A.12 of the Order: *“The discharge of storm water or tailwater to surface water from a land application area where manure or wastewater has been applied is prohibited unless the land application area has been managed consistent with a certified Nutrient Management Plan.”*
 6. Land Application Specification E.3 of the Order: *“Land application of wastes for nutrient recycling from Confined Bovine Feeding Operations shall not cause the underlying groundwater to contain any waste constituent, degradation product, or any constituent of soil mobilized by the interactions between applied wastes and soil or soil biota, in excess of the groundwater limitations set forth in this Order.”*
 7. Land Application Specification E.8 of the Order: *“All wastewater applied to land application areas must infiltrate completely within 72 hours after application.”*
 8. Land Application Specification E.9 of the Order: *“Wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified Nutrient Management Plan (see **Attachment C** of this Order).”*
- G. Setbacks and Vegetated Buffer
1. General Specification B.4 of the Order: *“Manure and wastewater shall not be applied, and composting operations shall not be located, closer than 100 feet to any down gradient surface waters, open tile line intake structures, sinkholes, agricultural or domestic well heads, or other conduits to surface waters or groundwater, unless (i) a 35-foot wide vegetated buffer or physical barrier is substituted for the 100-foot*

setback or (ii) alternative conservation practices or field- or site-specific conditions are demonstrated to provide pollutant reductions equivalent to or better than the reductions achieved by the 100-foot setback.”

2. A setback is a specified distance from surface waters or potential conduits to surface waters where manure and wastewater may not be land applied, but where crops may continue to be grown.
3. A vegetated buffer is a narrow, permanent strip of dense perennial vegetation where no crops are grown and which is established parallel to the contours of and perpendicular to the dominant slope of the land application area for the purposes of slowing water runoff, enhancing water infiltration, trapping pollutants bound to sediment, and minimizing the risk of any potential nutrients or pollutants from leaving the land application area and reaching surface waters.
4. The minimum widths of setbacks and vegetated buffers must be doubled around the wellhead of a drinking water supply well constructed in a sole-source aquifer.
5. Practices and management activities for vegetated buffers include the following:
 - a. Removal of vegetation in vegetated buffers will be in accordance with site production limitations, rate of plant growth, and the physiological needs of the plants.
 - b. Do not mow below the recommended height for the plant species.
 - c. Maintain adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
 - d. Maintain adequate ground cover, litter, and canopy to maintain or improve infiltration and soil condition.
 - e. Periodic rest from mechanical harvesting may be needed to maintain or restore the desired plant community following episodic events such as drought.
 - f. When weeds are a significant problem, implement pest management to protect the desired plant communities.
 - g. Prevent channels from forming.

H. Field Risk Assessment

The results of the water quality monitoring of discharges of manure, wastewater, storm water, and tailwater to surface water from each land application area, as required by Monitoring and Reporting Program R5-2017-0058, shall be used by the Discharger to assess the movement of nitrogen and phosphorus from each land application area. The Discharger shall follow guidelines provided by the Central Valley Water Board in conducting these assessments.

I. Record-Keeping

The Discharger shall maintain records for each land application area as required in the Record-Keeping Requirements of Monitoring and Reporting Program R5-2017-0058.

J. Nutrient Management Plan Review

1. Provide the name and contact information (including address and phone number) of the person who created the NMP; the date that the NMP was drafted; the name, title, and contact information of the person who approved the final NMP; and the date of NMP implementation.
2. The NMP shall be updated when discharges from any land application area exceed water quality objectives, a nutrient source has changed, site-specific information has become available to replace default values used in the overall nutrient balance or the nutrient budget, nitrogen application rates in any land application area exceed the rates specified in Technical Standard E.2 or the Field Risk Assessment finds that management practices are not effective in minimizing discharges.
3. The NMP shall be updated prior to any anticipated changes that would affect the overall nutrient balance or the nutrient budget such as, but not limited to, a crop rotation change, changes in the available cropland, or changes in the volume of wastewater generated.
4. The Discharger shall review the NMP at least once every five years and notify the Central Valley Water Board in the annual report of any proposed changes that would affect the NMP.

**ATTACHMENT D
ORDER R5-2017-0058**

**MANURE/ WASTEWATER TRACKING MANIFEST
FOR
CONFINED BOVINE FEEDING OPERATIONS**

Instructions:

- 1) Complete one manifest for each hauling event, for each destination. A hauling event may last for several days, as long as the manure is being hauled to the same destination.
- 2) If there are multiple destinations, **complete a separate form for each destination.**
- 3) The operator must obtain the signature of the hauler upon completion of each manure-hauling event.
- 4) The operator shall submit copies of manure/ wastewater tracking manifest(s) with the Annual Report for Confined Bovine Feeding Operations.
- 5) Manifests cannot be used when transferring manure or wastewater to cropland owned or controlled by the owner or operator of the Confined Bovine Feeding Operation as a substitute for preparing and implementing a Nutrient Management Plan for the cropland.
- 6) Manifests are not needed to document the use of manure for bedding at the operation where the manure was generated.

Operator Information:				
Name of Operator: _____				
Name of Facility: _____				
Facility Address: _____				
Number and Street	City	Zip Code		
Contact Person Name and Phone Number: _____				
Name		Phone Number		
Manure/ Wastewater Hauler Information:				
Name of Hauling Company/Person: _____				
Address of Hauling Company /Person: _____				
Number and Street	City	Zip Code		
Contact Person: _____				
Name		Phone Number		
Destination Information:				
Composting Facility / Broker / Farmer / Other (identify) _____ (please circle one)				
Contact information of Composting Facility, Broker, Farmer, or Other (as identified above):				

Name	Number and Street	City	Zip Code	Phone Number
Manure/ Wastewater Destination Address or Assessor's Parcel Number:				

Number and Street	City	Zip Code	Assessor's Parcel Number	
GPS coordinates of the manure/ wastewater destination: _____				
Dates Hauled: _____				

Amount Hauled:

Enter the amount of manure hauled in tons, the manure solids content, and the method used to calculate the amount:

Manure: _____ Tons

Manure Solids Content: _____

Method used to determine amount of manure: _____

Enter the amount of wastewater hauled in gallons and the method used to determine the amount.

Wastewater: _____ Gallons

Method used to determine volume of wastewater: _____

Written Agreement:

Does the Operator have a written agreement (in compliance with Land Application Specification E.2 of Waste Discharge Requirements General Order R5-2017-0058) with any party that receives wastewater from the Operator for its own use? (please check one)

Yes No

Certification:

I declare under the penalty of law that I personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Operator's Signature: _____ Date: _____

Hauler's Signature: _____ Date: _____

**ATTACHMENT E
ORDER R5-2017-0058**

**DEFINITIONS
FOR
CONFINED BOVINE FEEDING OPERATIONS**

1. “Additive” is defined as material mixed with compost, feedstocks or added during the composting process to adjust the moisture content, carbon to nitrogen ratio, or porosity. Additives can include fertilizers.
2. “Agronomic rates” is defined as the land application of irrigation water and nutrients (which may include animal manure, bedding, or 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. “Amendment” is defined as material added to stabilized or cured compost (once composting is completed) to provide attributes such as increased bulk, increased nutrient value, or a change in pH.
4. “Anaerobic digester” is defined as a basin, pond, or tank designed, constructed, maintained, and operated for the anaerobic treatment of liquid or solid animal waste and which promotes the decomposition of manure or “digestion” of the organics in manure to simple organics and gaseous biogas products.
5. “Animal Unit or AU”, for the purposes of the Order, is a measure of a quantity of bovine animals which equals 1,000 pounds of animal weight.
6. “As short as practicable” is defined as the shortest time required to implement an action, as demonstrated by appropriate technical and economic justifications. The justifications are subject to review and concurrence by the Executive Officer.
7. “Aquifer” is defined as groundwater that occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs.
8. “Calendar quarter” is defined as one of four three-month periods during the calendar year. The calendar quarters are: Quarter 1 - 1 January through 30 March; Quarter 2 – 1 April through 30 June; Quarter 3 – 1 July through 30 September; and Quarter 4 – 1 October through 31 December.
9. “Central Valley Water Board” is defined as the California Regional Water Quality Control Board, Central Valley Region.
10. “Certified Nutrient Management Plan” is defined as 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. "Confined animal facility" is defined in California Code of Regulations, title 27, 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.*"
12. "Confined area" is defined as the area where animals are confined within the production area.
13. "Confined Bovine Feeding Operations" means commercial operations where cattle (cows, bulls, steers, heifers, or calves) representing 6 or more Animal Units (AU) are confined and fed or maintained for a total of 45 days or more in any 12-month period, and where vegetation is not sustained over a majority of the confinement area during the normal growing season. Confined Bovine Feeding Operations include, but are not limited to: beef cattle stockyards, finishing yards, and/or auction yards; calf ranches; dairy heifer operations; and veal calf facilities. Confined Bovine Feeding Operations do not include operations where animals primarily graze on pasture or rangeland, including any corrals that are contiguous with and an integral part of the grazing or pasture operations. However, corrals or other confinement areas used to finish cattle for slaughter at a grazing operation are considered Confined Bovine Feeding Operations requiring coverage under this Order.
14. "Cropland" is defined as the land application area where dry or solid manure and/or wastewater is recycled for the purpose of beneficially using the nutrient value of the manure and/or wastewater for crop production.
15. "Degradation" is defined as any measurable adverse change in water quality.
16. "Discharge" is defined as the discharge or release of waste to land, surface water, or groundwater.
17. "Discharger" is defined as the property owner and/or the operator of a Confined Bovine Feeding Operation subject to Waste Discharge Requirements General Order R5-2017-0058.
18. "Dry season" is defined as the period of time between 1 June and 30 September of each year.
19. "Existing herd size" is defined as the maximum number of bovine animals (beef cattle, bulls, heifers, and calves) housed at the facility in a single month period that

occurred in the three years immediately prior to the issuance of the tentative Order, 10 February 2017, or the maximum herd size identified in an approved CEQA document or other regulatory document that has gone through CEQA or a CEQA-equivalent process..

20. "Expansion" is defined as, but not limited to, any increase in the existing herd size (i.e., an increase in Animal Units beyond the number calculated and reported in the Notice of Intent) or an increase in the storage capacity of the retention ponds or acquisition of more acreage for reuse of nutrients from manure or wastewater in order to accommodate an expansion of the existing herd size. "Expansion" does not include installation or modification of facilities or equipment to achieve compliance with the requirements of Waste Discharge Requirements General Order R5-2017-0058 so long as the modification or installation is sized to accommodate only the existing herd size.
21. "Facility" is defined as a Confined Bovine Feeding Operation subject to Waste Discharge Requirements General Order R5-2017-0058.
22. "Field" is defined as cropland and does not include non-farmable surfaces such as roads and perimeter ditches, or structures, such as barns or sheds.
23. "Field moisture capacity" is defined as "the upper limit of storable water in the soil once free drainage has occurred after irrigation or precipitation."
24. "Freeboard" is defined as the elevation difference between the wastewater (liquid) level in a pond and the lowest point of the pond embankment or unsealed pipe through the embankment which would allow overflow or uncontrolled release of wastewater.
25. "Incorporation into soil" is defined as the complete infiltration of 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 of combining nutrients with soil.
26. "Irrigation return flow" is defined as surface and subsurface water that leaves a field following application of irrigation water.
27. "Land application area" is defined as land under control of the Confined Bovine Feeding Operation owner or operator, whether it is owned, rented, or leased, to which manure or wastewater from the production area is or may be applied for nutrient recycling. This includes property owned by a third party where agreements with the Discharger require the third party to accept wastewater at a time determined by the Discharger. Fields that are planted in the same crop and are irrigated, fertilized, and harvested at the same time and in the same way can be considered a single land application area.

28. "Local Enforcement Agency" is defined as the agency at the county or local level which bears responsibility for ensuring the correct operation and closure of solid waste facilities, and for guaranteeing the proper storage and transportation of solid waste.
29. "Major storm event" is defined as a storm event that results in a minimum of one inch of precipitation within 24 hours.
30. "Manure" is defined as the fecal and urinary excretion of livestock and other commingled materials. Manure may include bedding and waste feed.
31. "Manure solids" is defined as manure that has sufficient solids content such that it will stack with little or no seepage.
32. "Normal precipitation" is defined as 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. 1981 to 2010) if such data is available.
33. "Notice of Intent" or "NOI" is defined as the form used to serve as a notification of the intention of the facility identified on the form to adhere to the provisions of the General Order.
34. "Nuisance" is defined in Water Code section 13050(m) as "*...anything which meets all of the following requirements:*
 - (1) *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.*
 - (2) *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.*
 - (3) *Occur during, or as a result of, the treatment or disposal of wastes.*"
35. "Nutrient" is defined as 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.
36. "Nutrient Management Plan" or "NMP" is defined as a plan written by a certified nutrient consultant in accordance with the Technical Standards to manage the amount, placement, timing and application of nutrients in order to reduce nutrient loss or runoff and to maintain the productivity of soil when growing agricultural commodities.
37. "Nutrient recycling" is defined as the application of nutrients at agronomic rates for crop production.

38. "Off-property discharge" is defined as the discharge or release of waste beyond the boundaries of the property of the Confined Bovine Feeding Operation's production area or the land application area or to water bodies that run through the production area or land application area.
39. "Open tile line intake structure" is defined as an air vent for a subsurface (tile) drain system.
40. "Operator" is defined as any person who is in control of, or has responsibility for, the operation of the Facility.
41. "Order" is defined as Waste Discharge Requirements General Order R5-2017-0058.
42. "Overflow" is defined as the intentional or unintentional diversion of flow from the collection, treatment, land application, and conveyance systems, including pumping facilities.
43. "Owner" is defined as any person who owns a Facility.
44. "Pasture" is defined as grazing lands comprised of introduced or domesticated native forage species that are used primarily for the production of livestock. They receive periodic renovation and/or cultural treatments such as tillage, fertilization, mowing, weed control, and may be irrigated. They are not in rotation with crops. (from USDA NRCS National Range and Pasture Handbook)
45. "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."*
46. "Pollution" is defined in Water Code section 13050(l)(1) 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."*
47. "Pond" is defined as retention ponds, storage ponds, settling basins, or any structures used for the treatment, storage, disposal, and recycling of wastewater. Ponds are differentiated from sumps, which are structures in a conveyance system used for the installation and operation of a pump.

48. "Production area" is defined as that part of a Confined Bovine Feeding Operation that includes the barns, corrals, manure storage area, raw materials storage area, water conveyances, and any other area of the facility that is not the land application area. The production area includes the wastewater storage ponds.
49. "Public water system" is defined as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. A public water system includes the following:
 - a. Any collection, treatment, storage, or distribution facilities under control of the operator of the system that are used primarily in connection with the system.
 - b. Any collection or pretreatment storage facilities not under the control of the operator that are used primarily in connection with the system.
 - c. Any water system that treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.
50. "Regional Board" is defined as one of the nine California Regional Water Quality Control Boards.
51. "Salt" is defined as 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.
52. "Salt in animal rations" is defined as the sodium chloride and any added minerals (such as calcium, phosphorus, potassium, sulfur, iron, selenium, copper, zinc, or manganese) in the animal ration.
53. "Significant (quantity)" is defined as the volume, concentrations, or mass of a pollutant that can cause or threaten to cause pollution, contamination, or nuisance; adversely impact human health or the environment; and/or cause or contribute to a violation of any applicable water quality standards for the receiving water.
54. "Sole-source aquifer" is defined as an aquifer that supplies 50 percent or more of the drinking water of an area.
55. "State" is defined as the State of California.
56. "State Water Board" is defined as the State Water Resources Control Board.
57. "Solid separation facilities" are defined as settling basins or mechanical separators used to separate manure solids from wastewater. Excavators or loader scrapers are not solid separation facilities.

Waste Discharge Requirements General Order R5-2017-0058
For Confined Bovine Feeding Operations

58. "Storm water" is defined as storm water runoff, snowmelt runoff, and surface runoff and drainage.
59. "Subsurface (tile) drainage" is defined as 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.
60. "Surface water" is defined as 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.
61. "Tailwater" is defined as the runoff of irrigation water that has not been blended with wastewater from an irrigated field.
62. "25-year, 24-hour rainfall event" is defined as a precipitation event with a probable recurrence interval of once in twenty-five years as estimated by the National Oceanic and Atmospheric Administration's National Weather Service, Hydrometeorological Design Studies Center, Precipitation Frequency Data Server, NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA (http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca), or equivalent regional or State rainfall probability information developed from this source.
63. "Waste" is defined as set forth in Water Code section 13050(d), and includes manure, leachate, wastewater and any water, precipitation or rainfall runoff that comes into contact with raw materials, products, or byproducts such as manure, compost piles, feed, silage, or bedding.
64. "Waste Management Plan" or "WMP" is defined as a plan written in accordance with the Confined Bovine Feeding Operations General Order that documents and recommends a combination of conservation practices and management measures for the handling, storage, treatment and management of manure or wastewater from a Confined Bovine Feeding Operation.
65. "Wastewater" is defined as water directly or indirectly used in the operation of a Confined Bovine Feeding Operation for any or all of the following: spillage or overflow from animal watering systems; washing, cleaning, or flushing pens, barns, manure pits, or 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, or bedding. Wastewater includes leachate or any other liquid flowing from, or on, the working surface of a composting operation, or any water that comes in contact with compost, additives, amendments, or feedstocks.

66. "Waters of the State" is defined in Water Code section 13050 as "*...any surface water or groundwater, including saline waters, within the boundaries of the state.*"
67. "Wet season" is defined as the period of time between 1 October and 31 May of each year.

ATTACHMENT F
Order R5-2017-0058

ACRONYMS AND ABBREVIATIONS
FOR
CONFINED BOVINE FEEDING OPERATIONS

ASABE	American Society of Agricultural and Biological Engineers
ARMR	Annual Representative Monitoring Reports
APN	Assessor Parcel Number
AU	Animal Units
BPT	best practicable control technology currently available
BPTC	best practicable treatment or control
CAFOs	Concentrated animal feeding operations
CalEMA	California Emergency Management Agency
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
Central Valley Water Board	California Regional Water Quality Control Board, Central Valley Region
cm/sec	centimeters per second
CPS	Conservation Practice Standard
CVDRMP	Central Valley Dairy Representative Monitoring Program
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWC	California Water Code
DWQ	Division of Water Quality
DWR	Department of Water Resources
EC	electrical conductivity
ESP	Environmental Stewardship Program
ETo	Evapotranspiration from a standardized grass surface
GWPA	Groundwater Protection Area
MCL	maximum contaminant level
mg N/L	Milligram(s) nitrogen per liter
mg/L	Milligram(s) per liter
ml	Milliliter(s)

MPN	most probable number
MRP	Monitoring and Reporting Program
MWICR	monitoring well installation completion report
MWISP	monitoring well installation and sampling plan
NAD83	North American Datum 1983
NAVD88	North American Vertical Datum 1988
NMP	nutrient management plan
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
pH	Logarithm of the reciprocal of hydrogen ion concentration in gram atoms per liter
QA/QC	quality assurance/quality control
REC-1	water contact recreation
Region	Central Valley Region
Regional Board	California Regional Water Quality Control Board
ROWD	Report of Waste Discharge
RMP	Representative Monitoring Program
SPRR	Standard Provisions and Reporting Requirements
SRMR	Summary Representative Monitoring Reports
State Water Board	State Water Resources Control Board
State Water Board Resolution 68-16	State Water Resources Control Board Resolution 68-16 <i>(Statement of Policy with Respect to Maintaining High Quality of Waters in California)</i>
State Water Board Resolution 88-63	State Water Resources Control Board Resolution 88-63 <i>(Sources of Drinking Water Policy)</i>
State Water Board Resolution 92-49	State Water Resources Control Board Resolution 92-49 <i>(Policies and Procedures for Investigation and Cleanup or Abatement of Discharges Under Water Code Section 13304 or Cleanup and Abatement Policy)</i>
TDS	total dissolved solids

title 3	title 3 of the California Code of Regulations, Division 2, Chapter 1, Article 22
title 27	title 27 of the California Code of Regulations, Division 2, Subdivision 1, Chapter 7, Subchapter 2, Article 1
UCCE	University of California Committee of Experts
U.N.	United Nations
μ mhos/cm	micromhos per centimeter (same as μ S/cm)
μ S/cm	microsiemens per centimeter (same as μ mhos/cm)
USEPA	United States Environmental Protection Agency
WDRs	waste discharge requirements
WMP	waste management plan

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

MONITORING AND REPORTING PROGRAM ORDER R5-2017-0058

**GENERAL ORDER
FOR
CONFINED BOVINE FEEDING OPERATIONS**

INTRODUCTION

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (CWC) section 13267 which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board) to require preparation and submittal of technical and monitoring reports. This MRP establishes specific surface and groundwater monitoring, reporting, and electronic data deliverable requirements for owners and/or operators (Dischargers) subject to and enrolled under Waste Discharge Requirements General Order for Confined Bovine Feeding Operations, Order R5-2017-0058(hereafter referred to as the “Bovine General Order” or “Order”) as Full Coverage Operations, and lesser requirements for Dischargers enrolled as Limited Time Operations. Limited Population Operations shall comply with this MRP as directed to do so by the Executive Officer. The requirements of this MRP are necessary to monitor Discharger compliance with the provisions of the Order and determine whether State waters receiving discharges from Confined Bovine Feeding Operations are meeting water quality objectives. Additional discussion and a rationale for this MRP’s requirements are provided in the Information Sheet to the Order.

For Full Coverage Operations, this MRP includes Monitoring, Record-Keeping, and Reporting requirements. Monitoring requirements include monitoring of discharges of manure and/or wastewater, storm water, tailwater, surface water, and groundwater.

Monitoring requirements also include monitoring of nutrients applied to, and removed from, land application areas in order for the Discharger to develop and implement a Nutrient Management Plan for cropland controlled by the Discharger, which will minimize leaching of nutrients and salts to groundwater and transport of these constituents to surface water.

In addition, monitoring requirements include periodic visual inspections of Confined Bovine Feeding Operations conducted by or on behalf of the Discharger to confirm that they are being operated and maintained to ensure continued compliance with the Order.

This MRP requires the Discharger to keep and maintain records for five years of the monitoring activities for the production and land application areas and to prepare and submit reports containing the results of specified monitoring as indicated below.

All monitoring must begin immediately upon issuance of a Notice of Applicability (NOA) to the Discharger by the Executive Officer. Note that some types of events require that

a report be submitted to the Central Valley Water Board within 24 hours (see Reporting Requirements, section A).

Monitoring requirements for surface waters and groundwater will be periodically reassessed to determine if changes should be made to better represent discharges to waters of the State from Confined Bovine Feeding Operations. The monitoring schedule will also be reassessed so that constituents are monitored during application and/or release timeframes when constituents of concern are most likely to affect water quality. The Discharger shall not implement any changes to this MRP unless the Central Valley Water Board or the Executive Officer issues a revised MRP; the Central Valley Water Board or the Executive Officer may revise this MRP as necessary.

The Discharger shall conduct monitoring, record-keeping, and reporting as specified below.

Confined Bovine Feeding Operations qualifying as Limited Time Operations shall monitor discharges of wastewater to ponds as required in Table 3 of this MRP and keep records of the export destinations of manure as required under the Record-Keeping Requirements section of this MRP. Limited Time Operations shall submit annual reports as required under Reporting Requirements section B, Annual Reporting, of this MRP. Limited Time Operations shall monitor groundwater as directed by the Executive Officer.

GENERAL PROVISIONS

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data.

All regulatory documents, submissions, materials, data, monitoring reports, and correspondence shall be converted to a searchable Portable Document Format (PDF) and submitted electronically to the State Water Resources Control Board's Internet-accessible database system (Geotracker database). The exception is the Notice of Intent, which may be submitted by email or mail to the Central Valley Water Board.

Dischargers or their representatives need to create a Geotracker user account. Instructions for setting up an account and the process of claiming a site, formatting and uploading data, and other technical information can be found under the "ESI Overview" and "Getting Started" sections at http://www.swrcb.ca.gov/water_issues/programs/ust/electronic_submittal/

Monitoring data and correspondence need to be in searchable Portable Document Format (PDF). Documents must be less than 100 MB to be uploaded to the Geotracker database. If not, PDF file size reduction tools should be used to reduce the size of files larger than 100 MB.

The Executive Officer may require that monitoring data be submitted in a format suitable for uploading to an electronic database specified by the Executive Officer.

MONITORING REQUIREMENTS

A. General Monitoring Requirements

1. Dischargers must follow sampling and analytical procedures approved by the Executive Officer. Approved sampling and analytical procedures will be posted on the Central Valley Water Board's web site. A Discharger may submit alternative procedures for consideration, but must receive written approval from the Executive Officer before using them. If monitoring consistently shows no significant variation of a constituent concentration or parameter, the Discharger may request the MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.
2. If conditions are not safe for surface water sampling, the Discharger must provide documentation why samples could not be collected and analyzed (e.g., photo documentation, flow measurements/estimates). For example, the Discharger may be unable to collect samples during dangerous weather conditions (such as local flooding, high winds, tornados, electrical storms, etc.). However, once the dangerous conditions have passed, the Discharger shall collect a sample of the discharge or, if the discharge has ceased, from the next discharge event.
3. The Discharger shall comply with all the "Requirements Specifically for Monitoring Programs and Monitoring Reports" as specified in the Standard Provisions and Reporting Requirements.
4. The Discharger shall use clean sample containers and sample handling, storage, and preservation methods that are accepted or recommended by the selected analytical laboratory or, as appropriate, in accordance with approved United States Environmental Protection Agency analytical methods.
5. All samples collected shall be representative of the volume and nature of the material being sampled.
6. All sample containers shall be labeled with a unique identifier (e.g., field/well number) and records maintained to show the time and date of collection as well as the person collecting the sample, the sample location, and method of sample collection and preservation.

7. The Discharger shall ensure that all sample analyses are conducted by a laboratory certified for such analyses by the Environmental Laboratory Accreditation Program (ELAP) of the Division of Drinking Water, State Water Resources Control Board. The laboratory analyses shall be conducted in accordance with Title 40 Code of Federal Regulations Part 136 (*Guidelines Establishing Test Procedures for the Analysis of Pollutants*) or other test methods approved by the Executive Officer.
8. All samples collected for laboratory analyses shall be preserved and submitted to the laboratory within the required holding time appropriate for the analytical method used and the constituents analyzed.
9. All samples submitted to a laboratory for analyses shall be identified in a properly completed and signed chain of custody form that should be obtained prior to sample collection from the analytical laboratory to be used.
10. Field test instruments used for pH, electrical conductivity, temperature, turbidity, ammonia nitrogen, un-ionized ammonia nitrogen, and dissolved oxygen may be used provided:
 - a. The operator is trained in the proper use and maintenance of the instruments;
 - b. The instruments are calibrated prior to each monitoring event per manufacturer instructions and at the recommended frequency during sampling; and
 - c. Instruments are serviced per the manufacturer's recommended frequency.

B. Visual Monitoring

The Discharger shall conduct and record the inspections specified in Table 1 below and maintain records of the results on-site for a period of five years.

Table 1. INSPECTIONS

Production Area

Weekly during the wet season (1 October to 31 May) and monthly between 1 June and 30 September:

Inspect all feed, bedding, and waste storage areas (solid manure and liquid waste); document any conditions or changes that could result in discharges to surface water and/or from property under control of the Discharger.

Note whether freeboard within each liquid waste storage structure is less than, equal to, or greater than the minimum required (two feet for above ground ponds and one foot for below ground ponds) and document any issues with flow meters, berm integrity, cracking, slumping, erosion, excess vegetation, animal burrows, or seepage.

Inspect the animal confinement area(s), raw materials storage area(s), and solid waste storage area(s) for proper drainage to the wastewater management system

Within 12 hours after the end of each major storm event (one inch of precipitation within 24 hours):
Visual inspections of wastewater containment structures for discharge, freeboard, berm integrity, cracking, slumping erosion, and seepage.

Monthly on the 1st day of each month:

Photograph each pond showing the height of wastewater relative to the depth marker and the current freeboard on that date. Photograph each flow meter, clearly showing the volume reading. All photos shall be dated and maintained as part of the Discharger's record.

Annually:

Inspect aboveground pipes and/or pumps that are part of the wastewater management system for leakage, and repair as necessary.

Land Application Areas

Prior to each wastewater application:

Inspect the land application area and note the condition of land application berms including rodent holes, piping, and bank erosion. Verify that any field valves are correctly set to preclude off-property or accidental discharges of wastewater.

Daily when wastewater is being applied:

Inspect the land application area and note the condition of land application berms including rodent holes, piping, and bank erosion; the presence (or lack) of field saturation, ponding, erosion, runoff (including tailwater discharges from the end of fields, pipes, or other conveyances), and nuisance conditions; and the conditions of any vegetated filter strips/buffers or alternative conservation practices.

Composting Operation

Quarterly:

Inspect working surfaces, berms, ditches, perimeter, erosion control best management practices, and any other operational surfaces for cracking, subsidence, ponding on working surfaces or within ditches, effectiveness of erosion control, maintenance activities, and evidence of any uncontrolled water or wastewater leaving or entering the operation area. Photograph observed and corrected deficiencies.

Table 1. INSPECTIONS

Composting Operation (cont.)

Annually, prior to the wet season:

Survey the composting operation to confirm that all containment structures are prepared for the pending wet season. Conduct the survey no later than 31 August and complete any necessary construction, maintenance, or repairs by 1 October. Include this information in the Annual Monitoring and Maintenance Report (see Reporting Requirements, section B).

After Major Storm Events (a minimum of one inch of precipitation within 24 hours):

Inspect all precipitation, diversion, and drainage facilities for damage within 7 days following major storm events. Necessary repairs shall be completed within 30 days of the inspection. Report any damage and subsequent repairs, including photographs of the problem and repairs, in the Annual Monitoring and Maintenance Report portion of the Annual Report.

C. Nutrient Monitoring

The Discharger shall monitor wastewater, manure, and plant tissue produced at the facility, soil in each land application area, and irrigation water used on each land application area under control of the Discharger for the constituents and at the frequency as specified in Table 2 below. This information is to be used to develop and implement the Nutrient Management Plan at the individual land application areas and at the facility as a whole. The Discharger shall collect and analyze a sufficient number of samples to characterize the mass of nutrients applied to the land application area.

Land application areas (cropland) associated with the Confined Bovine Feeding Operation that do not receive wastewater may be enrolled in the Irrigated Lands Regulatory Program (ILRP) in lieu of enrollment under the Bovine General Order. The nutrient monitoring requirements of this section do not apply to cropland enrolled in the ILRP program.

Land application areas associated with the Confined Bovine Feeding Operation that do receive wastewater are subject to the requirements of the Bovine General Order and shall comply with the nutrient monitoring requirements of this section. If the land application areas are subject to the Bovine General Order and a crop is grown on the areas, then the plant tissue, soil, and irrigation water monitoring outlined in Table 2 are required regardless of whether or not wastewater or manure is applied.

Table 2. NUTRIENT MONITORING

Wastewater – Dischargers must collect samples of wastewater that are representative of the amount of nitrogen being applied to the land application area(s). If there is variation in the amount of nitrogen in the wastewater depending on where or when samples are collected, then that variation must be accounted for in the sampling procedure. The sample should be collected at a point such that the sample represents the nutrient content of the wastewater as it is being applied to the land application area(s). Typically, this will be at a sample point in line with and near a flow meter. For every calendar quarter in which wastewater is applied, wastewater is to be sampled at least once and the following analyses performed. The volume needs to be based on accurate measurements using a calibrated flow meter with a totalizer, or another equivalently accurate method.

At a minimum, the Discharger shall do the following:

Each application:

Record the volume (gallons or acre-inches) and date of wastewater application to each land application area.

Quarterly during one application event:

Laboratory analyses for nitrate-nitrogen (only when wastewater pond is aerated), ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium, and total dissolved solids.

Once every two years (biennially):

Laboratory analyses for general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, and chloride).

Solid Manure that is land applied (including manure that is exported for land application):

One separate sample from each source of manure (corrals, separator, etc.) collected twice per year at the time of each land application event or export to a grower for land application:
Laboratory analyses for total Kjeldahl nitrogen, total phosphorus, total potassium, and percent moisture.

One separate sample from each source of manure (corrals, separator, etc.), collected once every two years (biennially):
Laboratory analyses for calcium, magnesium, sodium, potassium, and chloride.

Each application to each land application area:

Record the percent moisture and total weight (tons) applied.

Each offsite export of manure:

Record the percent moisture and total weight (tons) exported.

Annually:

Calculate the total dry weight (tons) of manure applied annually to each land application area and the total dry weight (tons) of manure exported offsite.

Plant Tissue – required of land application areas that are not enrolled in the Irrigated Lands Regulatory Program.

At harvest:

Record the percent moisture and total weight (tons) of harvested material removed from each land application area.

Table 2. NUTRIENT MONITORING
<p><i>Plant Tissue (cont.)</i></p> <p>Laboratory analyses, including chain of custody forms, for total nitrogen, and percent moisture. Chain of custody forms must indicate the length of time between sample collection and sample analysis.</p> <p>If it is anticipated that crop nutrient requirements will be significantly in excess of 1.4 times crop uptake, additional plant tissue testing should be conducted to indicate the amount of additional nitrogen required to obtain a crop yield typical for the soils and other local conditions.</p>
<p><i>Soil</i></p> <p><u>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):</u> Laboratory analyses for soluble phosphorus</p> <p><u>Annually, before the planting of the fall crop, from each land application area:</u> Laboratory analysis for total nitrogen</p>
<p><i>Irrigation Water¹</i></p> <p><u>Each irrigation event for each land application area:</u> Record volume (gallons or acre-inches) and source (well or canal) of irrigation water applied and dates applied. For irrigation wells with total nitrogen levels higher than 10 ppm, the volume needs to be based on accurate measurements using a calibrated flow meter with a totalizer or another equivalently accurate method.</p> <p>Use of well water flow rates based on agricultural pump efficiency tests performed by a certified pump tester annually, combined with electric energy consumption data from an electrical utility, may be proposed as an equivalently accurate method for volume calculations of groundwater supply wells only.</p> <p><u>One irrigation event during each irrigation season during actual irrigation events:</u> For each irrigation water source (well and canal): Total dissolved solids, and total nitrogen.² Data collected to satisfy the groundwater monitoring requirements (below) can be used to satisfy this requirement.</p>

¹ The Discharger shall monitor irrigation water (from each water well source and canal) that is used on all land application areas.

² In lieu of sampling the irrigation water, the Discharger may provide equivalent data from the local irrigation district.

D. Monitoring of Surface Discharges or Runoff

Dischargers who do not land apply wastewater and therefore are not required to sample wastewater in accordance with Table 2 above shall conduct one-time monitoring of discharges of manure, wastewater, or storm water that are retained in ponds for the constituents specified in Table 3, "Discharges of Wastewater to Ponds", below. This requirement does not apply to Limited Population Operations.

Dischargers shall monitor any discharges of manure, wastewater, storm water, or irrigation tailwater that have the potential to reach surface waters of the State from the production area or land application area for the constituents and at the frequencies specified in the applicable sections of Table 3 below.

All Dischargers operating land application areas with the potential to impact surface waters of the State shall comply with additional surface water monitoring requirements specified in **MRP Attachment B** either through individual surface monitoring or by participation in an Executive Officer-approved Joint Monitoring Program, as laid out in **MRP Attachment B**.

Table 3. DISCHARGE MONITORING
<p><i>Discharges of Wastewater to Ponds</i></p> <p><u>Once, following the first precipitation event that creates a volume of wastewater in the pond capable of producing a representative sample:</u> Laboratory analyses for nitrate-nitrogen, ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium, and total dissolved solids.</p> <p><u>Once, following the first precipitation event that creates a volume of wastewater in the pond capable of producing a representative sample:</u> Laboratory analyses for general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, and chloride).</p> <p>Additional sampling of discharges of wastewater to ponds may be required by the Executive Officer.</p>
<p><i>Discharges of Manure or Wastewater from the Production Area or Land Application Area – Prohibited Discharge, Priority Reporting of Significant Event (PROSE)¹ Report Required</i></p> <p><u>Daily during each discharge:</u> Record date, time, approximate volume (gallons) or weight (tons), duration, location, source, and ultimate destination of the discharge.</p> <p>Field measurements of the discharge for electrical conductivity, temperature, and pH.</p>
<p>Laboratory analyses of the discharge for nitrate-nitrogen, ammonia-nitrogen, un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium, total dissolved solids, and total and fecal coliform.</p> <p><u>Daily during each discharge to surface water:</u> <u>For surface water upstream² and downstream³ of the discharge:</u> Field measurements for electrical conductivity, temperature, dissolved oxygen, and pH.</p> <p>Laboratory analyses for nitrate-nitrogen, ammonia-nitrogen, un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium, total dissolved solids, and total and fecal coliform.</p>

Table 3. DISCHARGE MONITORING
<p><i>Storm Water Discharges to Surface Water from the Production Area⁴</i> <i>- Prohibited Discharge, PROSE Report Required</i></p> <p><u>Daily during each discharge to surface water:</u> Record date, time, approximate volume, duration, location, source, and ultimate destination of the discharge.</p> <p><u>For (1) the discharge and surface water (2) upstream and (3) downstream of the discharge:</u> Field measurements of electrical conductivity, dissolved oxygen, temperature, and pH.</p> <p>Laboratory analyses for nitrate-nitrogen, ammonia-nitrogen, un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, turbidity, total phosphorus, total potassium, total dissolved solids, and total and fecal coliform.</p>
<p><i>Storm Water Discharges to Surface Water from Each Land Application Area⁴ - Some Discharges Require Testing Before Release</i></p> <p><u>First storm event of the wet season⁵ and during the peak storm season⁶ (typically February) each year from one third of the land application areas⁷ with the land application areas sampled rotated each year⁸:</u> Record date, time, approximate volume, duration, location, and ultimate destination of the discharge.</p> <p>Field measurements of the discharge for electrical conductivity, temperature, pH, and ammonia-nitrogen.</p> <p>Using the temperature, pH, and ammonia-nitrogen, determine the un-ionized ammonia-nitrogen.</p> <p>In accordance with section E.10 of the Bovine General Order (Land Application Area Specifications), storm water discharges shall be retained on-property if the un-ionized ammonia-nitrogen concentration in the storm water is calculated to be at or above 0.04 mg/l. If the un-ionized ammonia nitrogen concentration is calculated to be between 0.02 and 0.039 mg/l, the storm water should only be released if other mitigations such as high freshwater flows are present.</p> <p>If the calculated un-ionized ammonia-nitrogen concentration in the storm water is at or above 0.02 mg/l, the Discharger shall conduct laboratory analyses of the discharge for nitrate-nitrogen, ammonia-nitrogen, total phosphorus, and total and fecal coliform. The Discharger shall submit an analysis to the Executive Officer within 30 days of the testing event describing the reason for the elevated un-ionized ammonia concentration and proposed changes to land application area management practices to ensure limitation of un-ionized ammonia in future discharges.</p>
<p><i>Tailwater Discharges to Surface Water from Land Application Areas⁹ - All Discharges Require Testing Before Release</i></p> <p><u>Each discharge from each land application area:</u> Field measurements of discharge for electrical conductivity, temperature, pH, and ammonia-nitrogen.</p> <p>Using temperature, pH, and ammonia-nitrogen, determine the un-ionized ammonia-nitrogen.</p> <p>In accordance with section E.10 of the Bovine General Order (Land Application Area</p>

Specifications), tailwater discharges shall be retained on-property if the un-ionized ammonia-nitrogen concentration in the tailwater is calculated to be at or above 0.04 mg/l. If the un-ionized ammonia nitrogen concentration is calculated to be between 0.02 and 0.039 mg/l, the storm water should only be released if other mitigations such as high freshwater flows are present.

If the calculated un-ionized ammonia nitrogen concentration in the tailwater is at or above 0.02 mg/l, the Discharger shall conduct laboratory analyses for nitrate-nitrogen, ammonia-nitrogen, total phosphorus, and total and fecal coliform. The Discharger shall submit an analysis to the Executive Officer within 30 days of the testing event describing the reason for the elevated un-ionized ammonia concentration and proposed changes to land application area management practices to ensure limitation of un-ionized ammonia in future discharges.

¹ See Reporting Requirements, Section A, of this Monitoring and Reporting Program regarding PROSE Reports.

² Upstream samples shall be taken just far enough upstream so as not to be influenced by the discharge.

³ Downstream samples shall be taken just far enough downstream where the discharge is blended with the receiving water but not influenced by dilution flows or other discharges.

⁴ Sample locations must be chosen such that the samples are representative of the quality and quantity of storm water discharged.

⁵ This sample shall be taken during business hours from the first storm event of the season that produces significant storm water discharge such as would occur during continuous storm water runoff for a minimum of one hour, or intermittent storm water runoff for a minimum of three hours in a 12-hour period.

⁶ This sample shall be taken during business hours from a storm event that produces significant storm water discharge and that is preceded by at least three days of dry weather. The sample shall be taken during the first hour of the discharge.

⁷ One land application area shall be sampled for Dischargers that have one to three land application areas, two land application areas shall be sampled for Dischargers that have four to six land application areas, etc.

⁸ The Discharger may propose in the annual storm water report to reduce the constituents and/or sampling frequency of storm water discharges to surface water from any land application area based on the previous year's data (see Storm Water Reporting section below).

⁹ Sample locations must be chosen such that the samples are representative of the quality and quantity of tailwater discharged.

E. Groundwater Monitoring

1. Beginning within six months of issuance of an NOA, the Discharger shall annually sample each domestic and agricultural supply well for two (2) years, and then once every five (5) years, to characterize existing groundwater quality. This monitoring shall be conducted during the same time each year for the constituents specified in Table 4 below.
2. The Discharger shall sample each subsurface (tile) drainage system present in the land application area(s). This monitoring shall be conducted at the frequency and for the parameters specified in Table 4 below.
3. The Discharger shall comply with the additional groundwater monitoring requirements specified in **MRP Attachment A** either through individual groundwater monitoring or by participation in an Executive Officer-approved Representative Monitoring Program for Confined Bovine Feeding Operations, as laid out in **MRP Attachment A**. Limited Time and Limited Population Operations shall monitor groundwater as directed by the Executive Officer.
4. All monitoring wells and supply wells (domestic and agricultural) must be identified with a unique identification (name/number) for the purposes of sample collection and data interpretation.

5. Groundwater samples from domestic wells shall be collected from the tap nearest to the pressure tank (and before the pressure tank if possible) after water has been pumped from this tap for 10 to 20 minutes. If the sample cannot be collected prior to a pressure tank, the well must be purged at least twice the volume of the pressure tank.
6. Groundwater samples from agricultural supply wells shall be collected after the pump has run for a minimum of 30 minutes or after at least three well volumes have been purged from the well.
7. Samples from subsurface (tile) drains shall be collected at the discharge point into a canal or drain.

Table 4. GROUNDWATER MONITORING
<i>Domestic and Agricultural Supply Wells</i>
<u>Annually for two years and then once every five years (may be distributed over a 5-year period by sampling 20% of the wells annually):</u> Field measurements of electrical conductivity and ammonium nitrogen ¹ . Laboratory analyses for nitrate-nitrogen and general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, chloride, and total dissolved solids).
<i>Subsurface (Tile) Drainage System</i>
<u>Annually during the irrigation season:</u> Field Measurements of electrical conductivity and ammonium nitrogen ¹ Laboratory analyses of nitrate-nitrogen, total phosphorus, and total dissolved solids

¹ If field measurement indicates the presence of ammonium nitrogen, the Discharger shall collect a sample for laboratory analysis of ammonium nitrogen.

RECORD-KEEPING REQUIREMENTS

Dischargers shall maintain on-site for a period of five years from the date they are created all information as follows (Owners must maintain their own copies of this information). If wastewater, manure, or commercial fertilizer is not applied to land application areas owned or controlled by the Discharger, requirements A, C and D, below, do not apply to the Discharger.

Limited Time Operations shall maintain Pond Testing records as required in Table 3 above and Tracking Manifest forms as described under section E below.

- A. All information necessary to document implementation and management of the Nutrient Management Plan, including the information described in Items B through F below;
- B. All records for the production area including:
 - 1. Records documenting the inspections required under the Monitoring Requirements above;
 - 2. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction;
 - 3. Records of the date, time, and estimated volume of any overflow or bypass of the wastewater storage or conveyance structures;
 - 4. Records of mortality management and practices, including documentation of proper disposal (e.g., manifests, invoices, receipts, or other documents demonstrating who transported the mortalities and where they were taken for disposal);
 - 5. Steps and dates when action is taken to correct unauthorized releases as reported in accordance with Priority Reporting of Significant Events below;
 - 6. Records of monitoring activities and laboratory analyses conducted as required in Standard Provisions and Reporting Requirements D.5;
 - 7. Testing schedule and results of periodic testing of all mechanical backflow devices; and
 - 8. Records of all measures, observations, and actions that are taken through implementing the Operation and Maintenance Plan.
- C. All records for the land application area including:
 - 1. Expected and actual crop yields;
 - 2. Identification of crop, acreage, and dates of planting and harvest for each field;
 - 3. Dates, locations, and approximate weight and moisture content of manure applied to each field;
 - 4. Dates, locations, and volume of wastewater and irrigation water applied to each field;
 - 5. Whether precipitation occurred, or standing water was present, at the time of manure and wastewater applications and for 24 hours prior to and following applications;

6. Dates, locations, and test methods for soil, manure, wastewater, irrigation water, and plant tissue sampling;
 7. Results from manure, wastewater, irrigation water, soil, plant tissue, discharge (including tailwater), and storm water sampling;
 8. Explanation for the basis for determining manure or wastewater application rates, as provided in the Technical Standards for Nutrient Management established by the Order (**Attachment C** of the Bovine General Order);
 9. Calculations showing the nitrogen, total phosphorus, and total potassium to be applied to each field from all nutrient sources including manure, wastewater, and chemical fertilizers to each crop in each land application area (Nutrient Budget);
 10. Amount of nitrogen, phosphorus, and potassium actually applied to each field from all nutrient sources, including manure, wastewater, and chemical fertilizer, to each crop in each land application area for each application, including documentation of the total amounts applied (Nutrient Application Calculations);
 11. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction; and
 12. Records of monitoring activities and laboratory analyses conducted as required in Standard Provisions and Reporting Requirements D.5.
- D. A copy of the Discharger's site-specific Nutrient Management Plan;
- E. Tracking Manifest forms (**Attachment D** of the Bovine General Order) for off-site exports of manure or wastewater which includes information on the manure hauler, destination of the manure, dates hauled, amount hauled, and certification; and
- F. All analyses of manure, wastewater, irrigation water, wastewater in ponds, soil, plant tissue, discharges (including tailwater discharges), surface water, storm water, subsurface (tile) drainage, and groundwater.

REPORTING REQUIREMENTS

A. Priority Reporting of Significant Events (PROSE Report) (Prompt Action Required)

The Discharger shall report any noncompliance that endangers human health or the environment or any noncompliance with Prohibitions A.1 through A.5 and A.8 through A.12 of the Bovine General Order, **within 24 hours** of becoming aware of its occurrence. The incident shall be reported to the Central Valley Water Board office, local environmental health department, and to the California

Emergency Management Agency (CalEMA). During non-business hours, the Discharger shall leave a message on the Central Valley Water Board's voice mail. The message shall include the time, date, place, and nature of the noncompliance, the name and number of the reporting person, and shall be recorded in writing by the Discharger. CalEMA is operational 24 hours a day. A written report shall be submitted to the Central Valley Water Board office **within two weeks** of the Discharger becoming aware of the incident. The report shall contain a description of the noncompliance, its causes, duration, and the actual or anticipated time for achieving compliance. The report shall include complete details of the steps that the Discharger has taken or intends to take, in order to prevent recurrence. All intentional or accidental spills shall be reported as required by this provision. The written submission shall contain:

1. The approximate date, time, and location of the noncompliance including a description of the ultimate destination of any unauthorized discharge and the flow path of such discharge to a receiving water body;
2. A description of the noncompliance and its cause;
3. The flow rate, volume, and duration of any discharge involved in the noncompliance;
4. The amount of precipitation (in inches) the day of any discharge and for each of the seven days preceding the discharge;
5. A description (location; date and time collected; field measurements of pH, temperature, dissolved oxygen and electrical conductivity; sample identification; date submitted to laboratory; analyses requested) of noncompliance discharge samples and/or surface water samples taken to comply with the Monitoring Requirements above for *Discharges of Manure or Wastewater from the Production Area or Land Application Area* and *Storm Water Discharges to Surface Water from the Production Area* (Table 3);
6. The period of noncompliance, including dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
7. A time schedule and a plan to implement corrective actions necessary to prevent the recurrence of such noncompliance.
8. The laboratory analyses of the noncompliance discharge sample and/or upstream and downstream surface water samples shall be submitted to the Central Valley Water Board office within 45 days of the discharge.

B. Annual Reporting

An annual monitoring report is due by **1 July of each year, beginning on 1 July 2020**. It will consist of a General Section, a Groundwater Reporting Section (including an appropriate Groundwater Monitoring Report prepared in accordance with **MRP Attachment A**), a Storm Water and Tailwater Reporting Section (including an appropriate Surface Water Monitoring Report prepared in accordance with **MRP Attachment B**) and, if a composting operation is on-site, an Annual Monitoring and Maintenance Report for the Composting Operation as described below. Once the (groundwater) Summary Report (for individual Dischargers) or the (groundwater) Summary Representative Monitoring Report (for representative monitoring groups) has been approved, an Annual Implementation Report (see **MRP Attachment A**) shall be included in the Annual Report.

The annual report for Limited Time Operations shall contain items 1, 2, 12, and 14 of the General Section below, and a signed certification that the facility continues to meet the criteria to qualify as a Limited Time Operation. If the facility includes a composting operation, an Annual Monitoring and Maintenance Report for the Composting Operation must be submitted. A single annual report may be submitted for multiple Limited Time Operations managed by the same Discharger provided that information for items 1, 2, 12, and 14 are provided for each facility.

General Section

The General Section of the annual report shall include all the information as specified below. This section of the annual report shall cover information on crops harvested during the previous calendar year, including nutrients applied and nutrients removed in plant tissue. If a crop spans two calendar years (planted in one year and harvested in the following year), all the data regarding nutrients and irrigation water applied to that crop should be included in the annual report for the year in which the crop was harvested.

1. Identification of the beginning and end dates of the annual reporting period;
2. Monthly maximum and monthly average number and type of animals, whether in open confinement or housed under roof, during the reporting period;
3. Total amount of manure (tons) and wastewater (gallons or acre-inches) generated by the facility during the annual reporting period; results of biennial sampling of solid manure for calcium, magnesium, sodium, and chloride; results of biennial sampling of wastewater for general minerals; and a calculation of the:

- a. Total Kjeldahl nitrogen, total phosphorus, and total potassium of the solid manure; and
 - b. Total nitrate nitrogen, ammonia-nitrogen, Kjeldahl nitrogen, total phosphorus, total potassium, and total dissolved solids of the wastewater;
4. Total amount of manure (tons) and wastewater (gallons or acre-inches) applied to each land application area during the annual reporting period and a calculation of the total nitrogen, total phosphorus, and total potassium applied to each land application area;
 5. Calculation of the ratio of total nitrogen applied and total nitrogen removed in the harvested portion (nitrogen uptake) for each crop in each land application area. If the applied/removed ratio exceeds 1.4 for a given crop, provide an explanation for the exceedance and a discussion of steps that have been taken to limit such an exceedance in the future;
 6. Total amount of manure (tons) and wastewater (gallons or acre-inches) transferred to other persons by the facility during the annual reporting period; a calculation of the total nitrogen, total phosphorus, and total potassium in the transferred material;
 7. Total number of acres and the Assessor Parcel Numbers for all land application areas that were not used for application of manure or wastewater during the reporting period;
 8. Total number of acres and the Assessor Parcel Numbers of properties that were used for land application of manure and wastewater during the annual reporting period;
 9. Summary of all manure and wastewater discharges from the production area to surface water or to land areas (land application areas or otherwise) when not in accordance with the facility's Nutrient Management Plan that occurred during the annual reporting period, including date, time, location, and approximate volume; a map showing discharge and sample locations; rationale for sample locations; and method of measuring discharge flows;
 10. Summary of all wastewater discharges from the land application area to surface water that have occurred during the annual reporting period, including the date, time, approximate volume, location, and source of discharge (i.e., wastewater or blended wastewater); a map showing the discharge and sample locations; rationale for sample locations; and method of measuring discharge flows;

11. A statement indicating if the Nutrient Management Plan has been updated and whether the current version of the facility's Nutrient Management Plan was developed or approved by a certified nutrient management specialist as specified in **Attachment C** of the Bovine General Order;
12. Copies of all manure/ wastewater tracking manifests for the reporting period;
13. For the first annual report submitted, copies of all written agreements with each third party that receives solid manure or wastewater from the Discharger (if any). For subsequent annual reports, a statement indicating if there were any changes to the third party agreements. If there were any changes, submit copies of all new or revised written agreements;
14. A description of mortality management practices;
15. Dates and results of testing, and description of any corrective actions taken, for all mechanical backflow prevention devices;
16. Tabulated analytical data for samples of manure, wastewater, irrigation water, soil, and plant tissue, and chain of custody forms for plant tissue samples. The data shall be tabulated to clearly show sample dates, constituents analyzed, constituent concentrations, and detection limits;
17. Results of the Record-Keeping Requirements for the production and land application areas specified in Record-Keeping Requirements B.2, B.3, C.1, C.2, C.3, C.4, C.5, C.10, and C.12; and
18. Composting Operation Information: a summary of all monitoring and maintenance activities performed and adverse conditions noted since the prior reporting period with respect to all berms, ditches, working surfaces, and monitoring systems, and a certification that the composting operation complies with the requirements of the Order and applicable portions of the MRP.

Groundwater Reporting Section

Groundwater monitoring results shall be included with the annual reports.

1. Dischargers that monitor domestic and agricultural wells and subsurface (tile) drainage systems shall submit information on the location of sample collection and all field and laboratory data, including all laboratory analyses (including chain-of-custody forms and laboratory QA/QC results).
2. Annual Monitoring Report: Dischargers that have individual monitoring well systems shall include all laboratory analyses (including chain of custody forms

and laboratory QA/QC results) and tabular and graphical summaries of the monitoring data. Data shall be tabulated to clearly show the sample dates, constituents analyzed, constituent concentrations, detection limits, depth to groundwater, and groundwater elevations. Graphical summaries of groundwater gradients and flow directions shall also be included. Each groundwater monitoring report shall include a summary data table of all historical and current groundwater elevations and analytical results. The groundwater monitoring reports shall be certified by a California registered professional as specified in General Reporting Requirements C.9 of the Standard Provisions and Reporting Requirements of Order R5-2017-0058.

Storm Water and Tailwater Reporting Section

Storm water and tailwater monitoring results will be included in the annual report. If applicable, the section shall include the Annual Surface Water Monitoring Report prepared in accordance with **MRP Attachment B**. The report shall include a map showing all sample locations for all land application areas; rationale for all sampling locations; a discussion of how flow measurements were made; the results (including the laboratory analyses, chain of custody forms, and laboratory QA/QC results) of all samples of storm water and tailwater; whether, based on the sampling results, the storm water or tailwater was released from the land application area; and any modifications made to the facility or sampling plan in response to pollutants detected in storm water or tailwater. The annual report must also include documentation if no significant discharge of storm water or tailwater occurred from the land application area(s) or if it was not possible to collect any of the required samples or perform visual observations due to adverse climatic conditions.

Annual Monitoring and Maintenance Report for the Composting Operation

If the Confined Bovine Feeding Operation includes a composting operation, include an annual monitoring and maintenance report section in the annual report. The report shall include the following information:

1. The results of quarterly inspections, including dates of the inspections, type and cause of any deficiency/non-compliance observed, including a map and photographs, and a description of corrective actions undertaken or planned, including the date and time of repairs and measures taken to prevent a recurrence of the problem;
2. The results of the annual survey conducted prior to the wet season, including date of the inspection, type and cause of any deficiency/non-compliance observed, including a map and photographs, and a description of corrective actions undertaken or planned, including the date and time of repairs and measures taken to prevent a recurrence of the problem; and

3. The results of inspections conducted after major storm events, including dates of the inspections, type and cause of any deficiency/non-compliance observed, including a map and photographs, and a description of corrective actions undertaken or planned, including the date and time of repairs and measures taken to prevent a recurrence of the problem.

C. General Reporting Requirements

1. The results of any monitoring conducted more frequently than required at the locations specified herein shall be reported to the Central Valley Water Board.
2. Each report shall be signed by the Discharger or a duly authorized representative as specified in the General Reporting Requirements C.7 of the Standard Provisions and Reporting Requirements of Order R5-2017-0058, and shall contain the following statement:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

3. Each report shall include the name of the preparer of the report and the preparer's contact information.

ORDERED BY:

Original signed by

PAMELA C. CREEDON, Executive Officer

8 June 2017

Date

**MONITORING AND REPORTING PROGRAM R5-2017-0058
ATTACHMENT A**

**GROUNDWATER MONITORING,
MONITORING WELL INSTALLATION AND SAMPLING PLAN,
AND
MONITORING WELL INSTALLATION COMPLETION REPORT
FOR
CONFINED BOVINE FEEDING OPERATIONS**

A. Groundwater Monitoring

The provisions of **Attachment A** are set out pursuant to the Executive Officer's authority under California Water Code (CWC) section 13267 to order Dischargers to implement monitoring and reporting programs. The purpose of groundwater monitoring required by these provisions is to confirm that management practices being employed for the wastewater management system, land application areas, and production area, are protective of groundwater quality, and comply with Receiving Water Limitations G.2 (Groundwater Limitations) of the Waste Discharge Requirements General Order for Confined Bovine Feeding Operations, Order R5-2017-0058 (Bovine General Order or Order).

Individuals conducting groundwater monitoring on their facility shall, **by 1 July 2019**, notify the Central Valley Water Board of their intent to conduct individual groundwater monitoring and, **by 1 July 2020**, submit a workplan to the Executive Officer for approval that describes the installation of groundwater monitoring wells and meets the requirements set forth in section B of this attachment. **By 31 December 2020**, the Discharger shall submit a Monitoring Well Installation Completion Report, in accordance with section E of this attachment, and certify that monitoring well installation is complete.

As an alternative to installing monitoring wells on an individual basis as set out in section B below, Dischargers subject to the Bovine General Order may participate in a Representative Monitoring Program that meets the requirements set forth in section C of this attachment. **By 31 December 2018**, any entity wishing to form a Representative Monitoring Group shall notify the Executive Officer of their intent to do so. **By 1 July 2020**, the Monitoring and Reporting Workplan for the Representative Monitoring Program, prepared in accordance with section C, shall be submitted to the Executive Officer for approval. **By 31 December 2020**, the Representative Monitoring Group shall submit a Monitoring Well Installation Completion Report, in accordance with section E below, and certify that monitoring well installation is complete.

Individuals or a Representative Monitoring Program may use methods other than monitoring wells to evaluate the impacts of waste on groundwater, provided that the monitoring results from the alternative methods are validated with groundwater monitoring.

Dischargers choosing to participate in a Representative Monitoring Program must notify the California Regional Water Quality Control Board, Central Valley Region (Central

Valley Water Board) by letter **by 1 July 2019**. The letter shall state that they are voluntarily joining the Representative Monitoring Group, they are aware of the conditions and requirements to be a member of the Group, they intend to fully comply with the monitoring and reporting program and intent of the Program, and they are fully aware that failure to comply with the Program may result in their removal from the Program and that they may be subject to enforcement by the Central Valley Water Board. Notification to the Central Valley Water Board¹ must include identification of the Representative Monitoring Group that the Discharger intends to join. Dischargers choosing not to participate in a Representative Monitoring Program or those failing to notify the Central Valley Water Board of their decision to participate in a Representative Monitoring Program will continue to be subject to the individual groundwater monitoring requirements of the Bovine General Order and Monitoring and Reporting Program R5-2017-0058 (MRP).

A Representative Monitoring Group is not a Discharger. Owners and operators of Confined Bovine Feeding Operations are Dischargers and are responsible and liable for individual compliance and for determining if they are in compliance with the terms of the Bovine General Order. As set forth in section C of this attachment, an eligible Representative Monitoring Group will convey information related to a Discharger's participation in the Representative Monitoring Program, conduct representative monitoring pursuant to an approved monitoring plan, and prepare and submit any required plans and monitoring reports. However, member Dischargers will be responsible for failure on the part of the Representative Monitoring Group to comply with the MRP.

If a Discharger participating in a Representative Monitoring Program wishes to terminate participation in the Program, the Discharger shall submit a Notice of Termination to the Executive Officer and the administrator of the Representative Monitoring Program. Administrators of a Representative Monitoring Program shall also notify the Executive Officer of a participant's failure to participate in their Representative Monitoring Program. A Representative Monitoring Group shall inform the Executive Officer of the participant's failure to participate within 45 days, which may result in the Executive Officer issuing a Notice of Termination to the Discharger stating that the Discharger is no longer eligible to participate in a Representative Monitoring Program as an alternative to individual groundwater monitoring. Termination from participation in a Representative Monitoring Program will occur on the date specified in the Notice of Termination, unless otherwise specified. Dischargers who voluntarily terminate their participation in a Representative Monitoring Program, receive a Notice of Termination from a Representative Monitoring Program, or receive a Notice of Termination from the Executive Officer, shall be individually subject to the groundwater monitoring requirements of the Bovine General Order and MRP.

Pursuant to Water Code section 13267, the Executive Officer may, at any time, order implementation of individual groundwater monitoring at a Confined Bovine Feeding Operation, even if the Discharger participates in a Representative Monitoring Program.

¹ In lieu of individual discharger notifications to the Central Valley Water Board, a Representative Monitoring Group may provide to the Central Valley Water Board a list of participants that have signed up and met the initial requirements for participation in that Representative Monitoring Program.

Such order may occur, for instance, if violations of the Order are documented and/or the facility is found to be in an area where site conditions and characteristics pose a high risk to groundwater quality. In the event the Executive Officer orders implementation of individual groundwater monitoring to a participant of a Representative Monitoring Program, such an order shall constitute a Notice of Termination to the participant and the Discharger shall no longer be eligible to participate in a Representative Monitoring Program to comply with the groundwater monitoring requirements of the MRP.

If data become available from other representative monitoring programs that identify practices that are not protective of groundwater quality, the Executive Officer may require modification of management practices by a date earlier than the dates specified in sections B.10 and C. 9 and 10, of this Attachment.

B. Individual Monitoring Program Requirements

1. The Discharger shall install sufficient monitoring wells to:
 - a. Characterize groundwater flow direction and gradient beneath the site;
 - b. Characterize natural background (unaffected by the Discharger or others) groundwater quality upgradient of the facility; and
 - c. Characterize groundwater quality downgradient of the corrals, downgradient of the retention ponds, and downgradient of the land application areas.
2. It may be necessary to install more than one upgradient monitoring well (i.e., for the production area and the land application area). The Executive Officer may order more extensive monitoring based on site-specific conditions.
3. Prior to installation of monitoring wells, the Discharger shall submit to the Executive Officer a Monitoring Well Installation and Sampling Plan (MWISP) (see below) and schedule prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. Installation of monitoring wells shall not begin until the Executive Officer notifies the Discharger in writing that the MWISP is acceptable.
4. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the well (including the annular space outside of the well casing) from acting as a conduit for pollutant/contaminant transport. Each monitoring well shall be appropriately designed and constructed to enable collection of representative samples of the first encountered groundwater.
5. The construction and destruction of monitoring wells and supply wells shall be in accordance with the standards under *Water Wells* and *Monitoring Wells* in the *California Well Standards Bulletin 74-90 (June 1991)* and *Bulletin 74-81 (December 1981)*, adopted by the Department of Water Resources (DWR). Should any county or local agency adopt more stringent standards than that adopted by the DWR, then

these local standards shall supersede the Well Standards of DWR, and the Discharger shall comply with the more stringent standards. More stringent practices shall be implemented if needed to prevent the well from acting as a conduit for the vertical migration of waste constituents.

6. The horizontal and vertical position of each monitoring well shall be determined by a registered land surveyor or other qualified professional. The horizontal position of each monitoring well shall be measured with one-foot lateral accuracy using the North American Datum 1983 (NAD83 datum). The vertical elevations of each monitoring well shall be referenced to the North American Vertical Datum 1988 (NAVD88 datum) to an absolute accuracy of at least 0.5 feet and a relative accuracy between monitoring wells of 0.01 feet.
7. Within 45 days after completion of any monitoring well, the Discharger shall submit to the Executive Officer a Monitoring Well Installation Completion Report (MWICR) as described in section E of this Attachment, prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology.
8. The Discharger shall sample monitoring wells for the constituents and at the frequency as specified in Table 5 below. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest water table levels.

Table 5. ADDITIONAL GROUNDWATER MONITORING
<p><i>Monitoring Wells</i></p> <p><u>Quarterly</u>¹: Measurement of the depth to groundwater from a surveyed reference point to the nearest 0.01 foot in each monitoring well.</p> <p><u>Semi-annually</u>: Field measurements of electrical conductivity, temperature, and pH. Laboratory analyses for nitrate and ammonia.</p> <p><u>Within six months of well construction and every two years thereafter</u>: Laboratory analyses for general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, and chloride).</p>

¹ After two years of quarterly depth to groundwater measurements, the Discharger may request reduction of frequency of depth to groundwater measurements to semi-annually upon demonstration there are no seasonal impacts to groundwater levels.

9. Groundwater samples from monitoring wells shall be collected as specified in the approved MWISP.
10. Dischargers implementing individual monitoring shall submit the following reports to the Board's Executive Officer:

Annual Monitoring Reports: The Discharger shall submit to the Executive Officer an annual assessment of the groundwater monitoring data due 1 July of each year, **beginning 1 July 2021**. The annual assessment may be attached to the annual report required in Reporting Requirements, section B of MRP R5-2017-0058. The annual assessment shall include a tabulated summary of all analytical data collected to date including analytical laboratory reports for data collected during the past year. The assessment shall include an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided is representative of conditions upgradient and downgradient of the production area and land application area of the bovine facility. The assessment shall also include an evaluation of the groundwater monitoring data collected to date with a description of the statistical or non-statistical methods used. The assessment must use methods approved by the Executive Officer. If the Discharger determines that the analytical methods required by this MRP are insufficient to identify whether site activities are impacting groundwater quality, the annual assessment must address Item B.11 below and employ the needed analyses during future monitoring events.

Summary Report: Within 6 years of initiating sampling activities, **by 1 July 2026**, the Discharger shall submit to the Executive Officer a summary report presenting a detailed assessment of the monitoring data to evaluate whether site activities associated with operation of the wastewater management system, production area, or land application areas (if present) have impacted groundwater quality. This summary report can be required at an earlier date if evaluation by the Discharger or Central Valley Water Board staff indicates that the assessment can be completed at an earlier date. This summary report shall also include detailed descriptions of management practices employed at the wastewater retention system, animal confinement areas, and land application areas along with the design standards of the wastewater retention system. The summary report must include an adequate technical justification for the conclusions incorporating available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality. The summary report is subject to approval by the Executive Officer. If monitoring data indicate that Receiving Water Limitations G.2 (Groundwater Limitations) of the Order has been violated, this assessment shall include a description of changes in management practices and/or activities that will be undertaken to bring the facility into compliance.

Annual Implementation Reports: Following the Executive Officer's approval of the Summary Report, the Discharger shall submit Annual Implementation Reports which document what they are doing to upgrade management practices that have been found not to be protective of water quality and an evaluation of progress in complying with Receiving Water Limitations G.2 of the Order. The Annual Implementation Reports will be submitted as part of the Annual Reports. The first annual report must identify alternative management practices the Discharger intends to implement at its Confined Bovine Feeding Operation along with a schedule for implementation. With each subsequent Annual Monitoring Report, the Discharger must provide an update on their implementation of additional or alternative

management practices. Implementation of the identified management practices must be as short as practicable and supported with appropriate technical or economic justification, and in no case may time schedules extend beyond 10 years from the date that the summary report is approved by the Executive Officer.

11. If the monitoring parameters required by MRP R5-2017-0058 are insufficient to definitively identify whether site activities are impacting groundwater quality, the Discharger must employ all reasonable chemical analyses to differentiate the source of the particular constituent. This includes, but is not limited to, analyses for a wider array of constituents and chemical isotopes.
12. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically, as specified in the General Provisions of MRP R5-2017-0058.

C. Representative Monitoring Program Requirements

To establish a Representative Monitoring Program in lieu of individual groundwater monitoring, the Representative Monitoring Group must have Executive Officer approval of a submitted Monitoring and Reporting Workplan. The Monitoring and Reporting Workplan shall include sufficient information for the Executive Officer to evaluate the adequacy of the proposed groundwater monitoring program to serve as an alternative to the installation of individual groundwater monitoring wells at facilities. The Monitoring and Reporting Workplan must explain how data collected at facilities that are monitored will be used to assess impacts to groundwater at facilities that are not part of the Representative Monitoring Program's network of monitoring wells. This information is needed to demonstrate whether collected facility monitoring data will allow identification of practices that are protective of water quality at all facilities represented by the Representative Monitoring Program, including those for which on-site data are not collected. The Monitoring and Reporting Workplan must additionally propose constituents the Representative Monitoring Program will monitor and the frequency of monitoring for each constituent identified. The Monitoring and Reporting Workplan must propose a list of constituents that is sufficient to identify whether activities at facilities being monitored are impacting groundwater quality. The list of constituents may necessarily be greater than the constituents required to be monitored at sites under individual orders (as listed in Table 5 above), as failure to determine whether groundwater has been impacted at a monitored facility will impair the ability to extrapolate findings to facilities where monitoring does not occur. At a minimum, the baseline constituents shall include those required of individual groundwater monitoring systems.

1. Once the Monitoring and Reporting Workplan is approved, the Representative Monitoring Group shall begin the process of installing monitoring wells as prescribed in paragraphs 3 through 7 below.
2. Prior to installation of monitoring wells, the Representative Monitoring Group shall submit to the Executive Officer a MWISP (see section D of this attachment) and

schedule prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. Installation of monitoring wells shall not begin until the Executive Officer notifies the Representative Monitoring Group in writing that the MWISP is acceptable. The MWISP must be submitted within 60 days of Executive Officer approval of the Monitoring and Reporting Workplan.

3. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well borehole and prevents the well (including the annular space outside of the well casing) from acting as a conduit for pollutant/contaminant transport. Each monitoring well shall be appropriately designed and constructed to enable collection of representative samples of the first encountered groundwater.
4. The construction and destruction of monitoring wells and supply wells shall be in accordance with the standards under *Water Wells and Monitoring Wells* in the *California Well Standards Bulletin 74-90 (June 1991)* and *Bulletin 74-81 (December 1981)*, adopted by the Department of Water Resources (DWR). Should any county or local agency adopt more stringent standards than that adopted by the DWR, then these local standards shall supersede the Well Standards of DWR, and the Representative Monitoring Program shall comply with the more stringent standards. More stringent practices shall be implemented if needed to prevent the well from acting as a conduit for the vertical migration of waste constituents.
5. The horizontal and vertical position of each monitoring well shall be determined by a registered land surveyor or other qualified professional. The horizontal position of each monitoring well shall be measured with one-foot lateral accuracy using the North American Datum 1983 (NAD83 datum). The vertical elevations of each monitoring well shall be referenced to the North American Vertical Datum 1988 (NAVD88 datum) to an absolute accuracy of at least 0.5 feet and a relative accuracy between monitoring wells of 0.01 feet.
6. Within 45 days after completion of any monitoring well network, the Representative Monitoring Group shall submit to the Executive Officer a MWICR (see below) prepared by, or under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. In cases where monitoring wells are completed in phases or completion of the network is delayed for any reason, monitoring well construction data are to be submitted within 180 days of well completion, even if this requires submittal of multiple reports.
7. Once the groundwater monitoring network is installed pursuant to an approved Monitoring and Reporting Workplan and paragraphs 3 through 6 above, the Representative Monitoring Group shall sample monitoring wells for the constituents and at the frequencies as specified in the approved Monitoring and Reporting Workplan. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest water table levels. In cases where the monitoring wells are completed in phases or completion of the monitoring well network is delayed for

any reason, collection and analysis of groundwater samples from each well is to commence within 180 days of completion of that well.

8. Groundwater samples from monitoring wells shall be collected as specified in an approved MWISP.
9. The Representative Monitoring Group shall submit the following reports to the Board's Executive Officer on behalf of its members :

Annual Representative Monitoring Reports: The Representative Monitoring Group shall submit to the Executive Officer Annual Representative Monitoring Reports (ARMR). The ARMUR shall be due by 1 April of each year, **beginning 1 April 2021**, and shall include all data (including analytical reports) collected during the previous calendar year. The ARMUR shall also contain a tabulated summary of data collected to date by the Representative Monitoring Program. The ARMUR shall describe the monitoring activities conducted by the Representative Monitoring Program, and identify the number and location of installed monitoring wells and other types of monitoring devices. Within each ARMUR, the Representative Monitoring Program shall evaluate the groundwater monitoring data to determine whether groundwater is being impacted by activities at facilities being monitored by the Representative Monitoring Program. The submittal shall include a description of the methods used in evaluating the groundwater monitoring data. Each ARMUR shall include an evaluation of whether the representative monitoring program is on track to provide the data needed to complete the Summary Representative Monitoring Report. If the evaluation concludes that information needed to complete the Summary Report may not be available by the required deadline, the ARMUR shall include measures that will be taken to bring the program back on track.

The ARMUR shall include an evaluation of data collected to date and an assessment of whether monitored facilities are implementing management practices that are protective of groundwater quality. If the management practices being implemented at a facility being monitored are found to not be protective of groundwater quality, the Executive Officer may issue an order to the owner/operator of the facility to identify and implement management practices that are protective of groundwater quality prior to submittal of the report described in the following paragraph.

Summary Representative Monitoring Report: No later than six years following submittal of the first ARMUR, **by 1 April 2026**, the Representative Monitoring Group shall submit a Summary Representative Monitoring Report (SRMR) to the Executive Officer for approval which identifies management practices that are protective of groundwater quality for the range of conditions found at facilities participating in the Representative Monitoring Program. The identification of management practices for the range of conditions must be of sufficient specificity to allow participants covered by the Representative Monitoring Program and the Central Valley Water Board to identify which practices at monitored facilities are appropriate for facilities with a corresponding range of site conditions, and generally where such facilities may be located within the Central Valley (e.g., the SRMR may need to include maps of the

Central Valley that identify the types of management practices that should be implemented in certain areas based on specified site conditions). The SRMR must include an adequate technical justification for the conclusions incorporating available data and reasonable interpretations of geologic and engineering principles to identify management practices protective of groundwater quality. The SRMR must include time schedules that are as short as practicable, and supported with appropriate technical or economic justification, for implementation of the identified management practices. The Central Valley Water Board may modify these schedules based on evidence that meeting the compliance date is technically or economically infeasible, or when evidence shows that compliance by an earlier date is feasible. In no case may time schedules extend beyond 10 years from the date that the SRMR is approved by the Executive Officer. The Executive Officer may require the SRMR to include additional management practices that have been identified by other programs as protective of water quality.

10. Individual Annual Implementation Reports: On 1 July following Executive Officer approval of the SRMR, each Discharger that is a participant covered by a Representative Monitoring Program shall include in their annual report required in MRP R5-2017-0058 a description of management practices currently being implemented at their wastewater management system, land application areas (if present), and production area. If these management practices are not confirmed to be protective of groundwater quality based on information contained in the SRMR, and therefore are not confirmed to be sufficient to ensure compliance of the facility with Receiving Water Limitations G.2 (Groundwater Limitations) of the Bovine General Order, the Discharger's first annual report shall identify which alternative management practices the participant intends to implement at its facility and a schedule for their implementation (based on the findings of the SRMR). Implementation of the identified management practices must be as short as practicable and must not exceed time schedules set out in the SRMR. Management practices deemed to be protective of groundwater quality are subject to approval by the Executive Officer. With each annual report submitted after the first report following Executive Officer approval of the SRMR, each participant shall include within his or her annual report an update with respect to implementation of the additional or alternative management practices being employed by the Discharger to protect groundwater quality.
11. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically, as specified in the General Provisions of MRP R5-2017-0058.

D. Monitoring Well Installation and Sampling Plan (MWISP) (Applicable to both Individual and Representative Monitoring Program Requirements)

At a minimum, the MWISP must contain all of the information listed below.

1. General Information:
 - a. Topographic map showing any existing nearby (within 2,000 feet) domestic, irrigation, and municipal supply wells and monitoring wells known to the Discharger, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features, as appropriate;
 - b. Site plan showing proposed well locations, other existing wells, unused and/or abandoned wells, major physical site structures (such as corrals, freestall barns, feed storage areas, calf hutches, etc.), waste handling facilities (including solid separation basins, retention ponds, and manure storage areas), irrigated cropland and pasture, and on-site surface water features;
 - c. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater. In the case of a Representative Monitoring Program, this information must include an explanation of how the location, number, and depths of wells proposed will result in the collection of data that can be used to assess groundwater at sites with a variety of conditions that have joined the Representative Monitoring Group but are not being monitored as part of the monitoring network;
 - d. Local permitting information (as required for drilling, well seals, boring/well abandonment);
 - e. Drilling details, including methods and types of equipment for drilling and logging activities. Equipment decontamination procedures (as appropriate) should be described; and
 - f. Health and Safety Plan.
2. Proposed Drilling Details:
 - a. Drilling techniques and
 - b. Well logging method.
3. Proposed Monitoring Well Design– all proposed well construction information must be displayed on a construction diagram or schematic to accurately identify the following:
 - a. Well depth;
 - b. Borehole depth and diameter;

- c. Well construction materials;
 - d. Casing material and diameter – include conductor casing, if appropriate
 - e. Location and length of perforation interval, size of perforations, and rationale;
 - f. Location and thickness of filter pack, type and size of filter pack material, and rationale;
 - g. Location and thickness of bentonite seal;
 - h. Location, thickness, and type of annular seal;
 - i. Surface seal depth and material;
 - j. Type of well cap(s);
 - k. Type of well surface completion; and
 - l. Well protection devices (such as below-grade water-tight vaults, locking steel monument, bollards, etc.).
4. Proposed Monitoring Well Development:
- a. Schedule for development (not less than 48 hours or more than 10 days after well completion);
 - b. Method of development;
 - c. Method of determining when development is complete;
 - d. Parameters to be monitored during development; and
 - e. Method for storage and disposal of development water.
5. Proposed Surveying:
- a. How horizontal and vertical position of each monitoring well will be determined;
 - b. The accuracy of horizontal and vertical measurements to be obtained; and
 - c. The California licensed professional (licensed land surveyor or civil engineer) to perform the survey.

6. Proposed Groundwater Monitoring:
 - a. Schedule (at least 48 hours after well development);
 - b. Depth to groundwater measuring equipment (e.g., electric sounder or chalked tape capable of ± 0.01 -foot measurements);
 - c. Well purging method, equipment, and amount of purge water;
 - d. Sample collection (e.g., bottles and preservation methods), handling procedures, and holding times;
 - e. Quality assurance/quality control (QA/QC) procedures (as appropriate);
 - f. Analytical procedures; and
 - g. Equipment decontamination procedures (as appropriate).
7. Proposed Schedule for:
 - a. Fieldwork;
 - b. Laboratory analyses; and
 - c. Report submittal.

E. Monitoring Well Installation Completion Report (MWICR) (Applicable to both Individual and Representative Monitoring Program Requirements)

At a minimum, the MWICR shall summarize the field activities as follows:

1. General Information:
 - a. Brief overview of field activities including well installation summary (such as number, and depths), and description and resolution of difficulties encountered during field program;.
 - b. Topographic map showing any existing nearby domestic, irrigation, and municipal supply wells and monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features;
 - c. Site plan showing monitoring well locations, other existing wells, unused and/or abandoned wells, major physical site structures (such as corrals, freestall barns, feed storage areas, calf hutches, etc.), waste handling facilities (including solid separation basins, retention ponds, manure storage areas), land application area(s), and on-site surface water features; and

- d. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).
2. Monitoring Well Construction:
 - a. Number and depths of monitoring wells installed;
 - b. Monitoring well identification (i.e., numbers);
 - c. Date(s) of drilling and well installation;
 - d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards;
 - e. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing);
 - f. Name of drilling company, driller, and logger (site geologist to be identified);
 - g. As-builts for each monitoring well with the following details:
 - i. Well identification,
 - ii. Total borehole and well depth,
 - iii. Date of installation,
 - iv. Boring diameter,
 - v. Casing material and diameter (include conductor casing, if appropriate),
 - vi. Location and thickness of slotted casing, perforation size,
 - vii. Location, thickness, type, and size of filter pack,
 - viii. Location and thickness of bentonite seal,
 - ix. Location, thickness, and type of annular seal,
 - x. Depth of surface seal,
 - xi. Type of well cap,

- xii. Type of surface completion,
 - xiii. Depth to water (note any rises in water level from initial measurement) and date of measurement, and
 - xiv. Well protection device (such as below-grade water-tight vaults, stovepipe, bollards, etc.);
 - h. All depth to groundwater measurements during field program;
 - i. Field notes from drilling and installation activities (e.g., all subcontractor dailies, as appropriate); and
 - j. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.
3. Monitoring Well Development:
- a. Date(s) and time of development;
 - b. Name of developer;
 - c. Method of development;
 - d. Methods used to identify completion of development;
 - e. Development log: volume of water purged and measurements of temperature, pH, and electrical conductivity during and after development;
 - f. Disposition of development water; and
 - g. Field notes (such a bailing to dryness, recovery time, number of development cycles).
4. Monitoring Well Survey:
- a. Identify coordinate system or reference points used;
 - b. Description of measuring points (e.g., ground surface, top of casing, etc.);
 - c. Horizontal and vertical coordinates of well casing with cap removed (measuring point to nearest ± 0.01 foot);
 - d. Name, license number, and signature of California licensed professional who conducted survey;

- e. Surveyor's field notes; and
- f. Tabulated survey data.

**MONITORING AND REPORTING PROGRAM R5-2017-0058
ATTACHMENT B**

**SURFACE WATER MONITORING
FOR
CONFINED BOVINE FEEDING OPERATIONS**

A. Surface Water Monitoring

The provisions of this attachment to Monitoring and Reporting Program (MRP) R5-2017-0058 are set out pursuant to the Executive Officer's authority under California Water Code (CWC) Section 13267 to order Dischargers to implement monitoring and reporting programs. The purpose of surface water monitoring required by these provisions is to confirm that management practices being employed for the operation of land application areas are protective of surface water quality and comply with Receiving Water Limitation G.1 (Surface Water Limitations) of the Waste Discharge Requirements General Order for Confined Bovine Feeding Operations, Order R5-2017-0058 (Bovine General Order or Order). These surface water monitoring provisions do not preclude the requirement for Dischargers to monitor surface runoff as described in Monitoring Requirements, Section D of MRP R5-2017-0058.

The provisions of this attachment do not apply to Limited Time and Limited Population Bovine Operations or to Full Coverage Confined Bovine Feeding Operations that do not land apply waste to their own cropland.

As an alternative to monitoring surface water for pesticides on an individual basis or as a member of a Joint Monitoring Program pursuant to Section F of this **Attachment B**, Dischargers required to monitor surface water for pesticides may participate in an Irrigated Lands Regulatory Program (ILRP) Monitoring Coalition. Dischargers choosing to participate in an ILRP Coalition shall notify the Central Valley Water Board **by 1 July 2019** and identify the Coalition that the Discharger intends to join.

B. Farm Evaluation Survey Form

All Confined Bovine Feeding Operations that farm land not covered under the Irrigated Lands Regulatory Program shall, **by 1 July 2019**, complete and submit to the Executive Officer a Farm Evaluation Survey form (**Attachment B-1** to MRP R5-2017-0058). The Farm Evaluation Survey form serves as a summary of farm management practices being used on land application areas to protect surface and groundwater from pesticides and nutrients, including drift. It consists of:

1. A Whole Farm Evaluation (Part A),
2. Evaluation forms for each field regarding irrigation practices; nitrogen management methods; and sediment, drift, and erosion control practices (Parts B and C), and
3. Irrigation well information (Part D).

C. Demonstration of No Potential to Discharge

After completion of a Farm Evaluation Survey form, a Confined Bovine Feeding Operation may be exempted from the surface water monitoring requirements of the Bovine General Order if it can be demonstrated that any discharge from the land application areas associated with the operation, including drift, have no potential to reach surface water. The written demonstration is **due by 31 December 2019**, shall be submitted to the Executive Officer for review, and shall include an aerial photograph identifying nearby surface waters (or lack thereof), including any ditches that connect to surface water. Features relied upon to prevent a discharge to surface water shall be discussed, and shall either represent natural conditions such as topography or a lack of nearby surface water, or substantial artificial features such as levees. After review of the demonstration, the Executive Officer will notify the facility if compliance with the surface water monitoring provisions is required.

D. Exclusion of Pesticides from Monitoring

A Discharger may request the Executive Officer that a pesticide in use on a specific land application area be excluded from monitoring based on the overall runoff risk posed by that pesticide. Pesticides identified as having a low overall runoff risk in Publication 8161 (University of California, Division of Agriculture and Natural Resources) or an equivalent peer-reviewed scientific publication would be eligible for an exclusion from monitoring.

A Discharger may request the Executive Officer that a pesticide in use on a specific land application area be excluded from sediment toxicity testing based on the adsorption runoff potential posed by that pesticide. Pesticides identified as having a low adsorption runoff potential in Publication 8161 (University of California, Division of Agriculture and Natural Resources) or an equivalent peer-reviewed scientific publication would be eligible for an exclusion from sediment toxicity testing.

The Executive Officer may issue a list of pesticides that must be included in monitoring programs if used on site and there is a potential for discharge.

E. Reduction in Monitoring Frequency

The Discharger may petition the Executive Officer to reduce surface water monitoring frequencies if, after three consecutive years of monitoring for a constituent, there are no exceedances and no trends of degradation that may threaten applicable Basin Plan beneficial uses. The maximum surface water monitoring frequency reduction authorized by this section is one that reduces monitoring frequencies to once every five years. The Executive Officer may reinstate the required monitoring if an exceedance occurs, if a trend of degradation that may threaten applicable Basin Plan beneficial uses is indicated by available data, or if management practices change in a manner that could result in an exceedance or a trend of degradation.

F. Individual Monitoring Requirements

1. Surface Water Monitoring Requirements

a. *Discharges to be Monitored*

A Discharger whose discharges of storm water or irrigation tailwater have the potential to reach surface water shall monitor discharges of storm water, irrigation tailwater, and surface water channel-deposited sediments as specified in Table 6 below, unless modified by the Executive Officer. The purpose of this monitoring is to assess the wastes in discharges from land application areas to surface waters and to evaluate the effectiveness of management practice implementation. Water quality is evaluated with both field-measured parameters and laboratory analytical data. The monitoring required below does not apply to surface water discharges from tile drainage systems. Tile drainage system discharge monitoring requirements are included in Monitoring Requirements Section E.2 of MRP R5-2017-0058. **Monitoring of surface water shall begin by 1 July 2020 or, for new or expanding facilities, within 6 months of receipt of the Notice of Applicability.**

TABLE 6. SURFACE WATER MONITORING

The following samples shall be collected each year from one third of the irrigation tailwater discharge points and storm water discharge points.^a The discharge points sampled shall be rotated each year, so that all discharge points from the Discharger's land application areas will be sampled every three years. Sample locations must be chosen such that the samples are representative of the quality and quantity of irrigation tailwater or storm water discharge, and at a point downgradient of water quality management practices.

Irrigation tailwater monitoring is not required where the irrigation system produces an effectively immeasurable^b tailwater discharge.

Irrigation Tailwater and Storm Water Discharges to Surface Water

Irrigation tailwater samples and storm water discharge samples shall be collected during the first hour of discharge per the following frequency:

- D.1 First and final (estimated final irrigation event) discharge of the growing season.
- D.2 First irrigation or storm event discharge that occurs within 60 days of application of a pesticide used on the land application area (sample is not required if there is no irrigation or storm water discharge within 60 days of application).^c For each application of a pesticide, a new 60-day monitoring window begins.
- D.3 Irrigation discharges during employment of fertigation operations.

For each sample, the Discharger shall record the date, time, location,^d and ultimate destination of the discharge. Irrigation tailwater and storm water discharge samples shall be collected and analyzed for the constituents in Table 7 (as noted: D.1, D.2, D.3).

Sediment Toxicity

D.4 Sediment sample during the first irrigation or storm event discharge that occurs within 60 days of application of a pesticide used on the land application area (sample is not required if there is no irrigation tailwater or storm water discharge within 60 days of application). This shall be carried out at each location where surface water discharges are sampled, if sediment is present in the discharge.^e

- ^a A discharge point is defined as a location where surface water discharges leaves the Discharger's property. One discharge point per year shall be sampled for Dischargers that have one to three discharge points from land application areas, two discharge points per year shall be sampled for Dischargers that have four to six discharge points, etc.
- ^b An effectively immeasurable discharge includes standing water (i.e., ponding, backflow) or where the total volume discharged in a 15-minute period of time is less than what is needed to collect the necessary sample volume.
- ^c The list of pesticides that must be monitored is based on the pesticides used on a particular field, as listed in the Farm Water Quality Plan or annual updates provided as part of the Annual Report.
- ^d The location of sample collection shall be recorded as latitude and longitude coordinates in decimal degrees, with at least four recorded decimal places.
- ^e Not more than one sediment sample is required to be collected each year. Sediment must be present in the discharge in a quantity sufficient for testing; otherwise, testing is not required.

b. Pesticides to be Monitored

i. Surface Water

The Discharger shall monitor surface water discharges for pesticides identified in the Farm Water Quality Plan as in use on the land application area from which the discharge originated, and those pesticides identified in annual updates provided as part of the Annual Surface Water Monitoring Report.

ii. Sediment

The Discharger shall test sediment for pesticides identified in the Farm Water Quality Plan as in use on the land application area from which the discharge originated, and those pesticides identified in annual updates provided as part of the Annual Surface Water Monitoring Report,

Sediment toxicity shall be tested using Hyalella Azteca; the Hyalella azteca sediment toxicity test endpoint is survival.

All sediment samples must be analyzed for total organic carbon (TOC), as specified in Table 7 below. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. If the sample is not toxic to the test species, the additional sample volume can be discarded.

Sediment samples that show significant toxicity to *Hyaella azteca* at the end of an acceptable test and exhibit less than 80% organism survival compared to the control will require pesticide analysis of the same sample in an effort to determine the potential cause of toxicity. The pesticide analysis must include, at a minimum, the pesticides that triggered the sediment sampling. If the pesticides used by the Discharger are detected in the sediment sample (sediment toxicity trigger), the Discharger shall prepare a Surface Water Quality Management Plan and resample the receiving water or discharge channel one time per year if a surface water discharge occurs within 60 days of an application of the pesticide. The annual sampling requirement shall be reduced to one sample every 5 years when the sediment toxicity trigger is not exceeded for three consecutive sampling events at the discharge/receiving water location where the sediment toxicity was initially triggered.

If the sediment toxicity sampling frequency is reduced as described above, the Discharger shall continue the current, or equivalent, water quality management practices with respect to pesticide use and sediment and erosion control with sediment toxicity sampling once every 5 years. If equivalent management practices for pesticide use or sediment and erosion control are discontinued, sediment toxicity monitoring reverts to the annual sampling described in Table 6 above. The Discharger may petition the Executive Officer to remove the sediment toxicity monitoring requirement based on information showing that employed management practices protect against sediment toxicity, e.g., practices in place result in no measurable sediment discharge.

TABLE 7. DISCHARGE MONITORING OF TAILWATER, STORM WATER, AND SEDIMENT TOXICITY^(a)

Constituent	Frequency (as given in Table 1)
Flow or volume of discharge	D.1, D.2, D.3
Duration of discharge	D.1, D.2, D.3
Turbidity	D.1(b)
Temperature (water)	D.3 (c)
pH	D.1, D.3 (c)
Electrical conductivity (EC) (at 25 °C)	D.1
Nitrate + nitrite (as nitrogen)	D.1, D.3
Dissolved oxygen	D.1, D.3
Ammonia	D.3 (d)
E. coli	D.1 (e)
Pesticide(s)	D.3 (f)
Hardness (as CaCO ₃)	D.3 (g)
Sediment toxicity to <i>Hyaella Azteca</i>	D.4
Sediment total organic carbon	D.4
Sediment total suspended solids	D.4
Sediment total settleable solids	D.4

- a. Analytical methods, reporting limits, and reporting units are listed on the Central Valley Water Board website.
- b. When measuring effluent turbidity, upstream receiving water turbidity shall also be measured.
- c. For D.3 discharges, temperature and pH measurements are only required when ammonia is used.
- d. Required when ammonia is used in fertigation.
- e. Required for irrigated pasture operations, as well as any operation type where manure is applied within the last year.
- f. Pesticides that must be monitored are identified through the procedures outlined in this Attachment.
- g. Hardness samples are only required when sampling for dissolved copper.

2. Reporting Requirements

The results of any water quality monitoring conducted more frequently than required at the locations specified herein shall be maintained in accordance with the requirements specified in Record-Keeping Requirements MRP R5-2017-0058 and included in Annual Surface Water Monitoring Reports.

a. *Farm Water Quality Plan (FWQP)*

By 31 December 2019, the Discharger shall develop a farm-specific water quality plan and submit the plan to the Central Valley Water Board. Dischargers are encouraged to work with technical service organizations such as resource conservation districts, commodity groups, and the University of California Cooperative Extension in the development of the entire FWQP. The Board recommends the University of California, Division of Agriculture and Natural Resources' Publication 8332, *The Farm Water Quality Plan*, as a reference to help complete this requirement. Under a FWQP, the Discharger is required to track and evaluate the farm's current management practices for pesticide use and runoff control and describe those practices needed or currently in use to minimize waste discharge to achieve surface water quality protection. The Executive Officer may require additional surface water quality monitoring to evaluate the effectiveness of the practices implemented. Additional practices/monitoring may be necessary, in an iterative process, to address water quality concerns.

The FWQP shall include, at a minimum:

- i. Description of the operation, including number of land application acres, and crops;
- ii. Pesticides that may be applied, recommended rates, and practices associated with the pesticides that could affect the discharge of pesticides to surface water, such as application methods and irrigation related practices;
- iii. Map(s) showing the location of irrigated production areas, discharge points to surface waters, surface water bodies, and water quality sampling locations;
- iv. Rationale for the water quality sampling locations;
- v. Water quality management practices used or to be used (if planned, include timetable for implementation) to comply with the Order and reduce or eliminate

discharge of waste to surface waters. As described in the Order, following are the farm management performance standards that must be achieved:

- (1) Minimize waste discharge offsite in surface water,
- (2) Prevent pollution and nuisance, and
- (3) Minimize or eliminate the discharge of sediment above background levels.

b. *Water Quality Triggers*

This Order requires that Dischargers comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin (Basin Plans) contain numeric and narrative water quality objectives applicable to surface water within the Order's coverage area (the Central Valley region). USEPA's 1993 National Toxics Rule and 2000 California Toxics Rule contain water quality criteria which, when combined with Basin Plan beneficial use designations, constitute numeric water quality standards.

This Order establishes water quality triggers for developing SWQMPs. Water quality triggers are based on Basin Plan water quality objectives, some of which are site-specific, and therefore difficult to apply generally across the entire Order coverage area. Consequently, this Order establishes a process for providing Dischargers with water quality triggers for surface water. This process is initiated when the Discharger files a Farm Water Quality Plan. The Executive Officer will review the Plan and may issue an NOA containing surface water quality triggers and any additional monitoring requirements based on review of the Plan. Additional monitoring requirements will include monitoring for compliance with any applicable Basin Plan Total Maximum Daily Loads and associated load limits.

c. *Surface Water Quality Management Plan (SWQMP)*

The Discharger shall develop a SWQMP when required by the Executive Officer. The Plan shall include the following elements.

- i. Constituent(s) for which the SWQMP is required (constituent[s] of concern), relevant sample results, and collection dates of the exceedances, if applicable, that triggered development of the SWQMP;
- ii. Summary of onsite sources of the constituent(s) of concern;
- iii. Description and justification for the proposed management practices that will be implemented to reduce the discharge of the constituent(s) of concern to address the problem triggering preparation of the SWQMP;
- iv. Proposed monitoring plan to evaluate the effectiveness of improved management; and
- v. Proposed time schedule for implementation of management practices to address the problem triggering the preparation of the SWQMP. Time schedule shall be as short as practicable.

d. Annual Surface Water Monitoring Report

The Discharger shall submit to the Executive Officer an annual assessment of the surface water monitoring data due 1 July of each year, **with the first report due 1 July 2021**. The annual assessment may be attached to the annual report required in MRP R5-2017-0058. The annual assessment shall include a tabulated summary of all field-measured and analytical data collected to date including analytical lab reports for data collected during the past year. The assessment shall include an evaluation of the surface water monitoring program's adequacy to assess compliance with the Surface Water Limitations of the Order. The Annual Surface Water Monitoring Report shall include the following sections and elements:

i. Surface water monitoring results:

Sample date
Constituent
Sample concentration result and trigger limit
Indicate which results are exceedances of trigger limits
Sample collection location with latitude and longitude coordinates in decimal degrees to at least the fourth decimal place
Sample site name / code

- ii. Copies of all field sheets associated with water quality sample collection;
- iii. Copies of all laboratory certified analytical reports associated with water quality samples;
- iv. For exceedances that have triggered a SWQMP, a summary of the updates to the Farm Water Quality Plan to reduce waste discharge and prevent future exceedances consistent with the requirements of the Order;
- v. For exceedances that have triggered a SQQMP, a summary of the progress made meeting the time schedules approved in the SWQMP; and
- vi. Updates on pesticide use. This section shall list all pesticides used during the annual monitoring period and all planned pesticides for the next reporting period.
- vii. If required by the Executive Officer, water monitoring data shall be submitted in a format suitable for uploading to an electronic database.

e. Record-Keeping Requirements

- i. Records of on-site activities shall include:
 - (1) Date the observations were recorded, measurements were made, or samples were collected;
 - (2) Name and signature of the individual(s) who made the observations, made and recorded the measurements, or conducted the sampling;
 - (3) Location of measurements or sample collection;

- (4) Procedures used for measurements or sample collection;
 - (5) Unique identifying number assigned to each sample; and
 - (6) Method of sample preservation utilized.
- ii. Records of laboratory analyses shall include:
- (1) Results for the analyses performed on the samples that were submitted;
 - (2) Chain-of-Custody forms used for sample transport and submission;
 - (3) Form that records the date that samples were received by the laboratory and specifies the analytical tests requested;
 - (4) Name, address, and phone number of the laboratory which performed the analysis;
 - (5) Analytical methods used;
 - (6) Date(s) analyses were performed;
 - (7) Identity of individual(s) who performed the analyses or the lab manager; and
 - (8) Results for the quality control/quality assurance (QA/QC) program for the analyses performed.

All records described in this section will be submitted as part of the Annual Surface Water Monitoring Report.

G. Joint Monitoring Program Requirements

As an alternative to conducting individual surface water monitoring as detailed in Section F of this attachment, a group of Dischargers whose discharges of storm water or irrigation tailwater have the potential to reach surface water and which grow similar crops and have similar pesticide use can join together to monitor a representative portion of their combined land application areas. The group of Dischargers shall, **by 1 July 2019**, request approval from the Executive Officer to conduct such representative monitoring. The request shall include, at a minimum, the names of the Dischargers in the group; list of crops grown and pesticides used; and a map showing the location of all of their land application areas, and indicating which crops are grown and which pesticides are used on which land application areas. The map shall also show the location of the proposed monitoring points and the crops and pesticides to be monitored by each point. Such joint monitoring shall not commence until written approval is issued by the Executive Officer. **By 31 December 2019**, a Joint Monitoring Program shall submit a workplan for surface water monitoring to the Executive Officer for approval.

All Dischargers in a Joint Monitoring Program shall individually complete a Farm Water Quality Plan and submit it to the Central Valley Water Board. The Joint Monitoring Program shall conduct monitoring and keep records as described in Section F of this attachment for individual monitoring programs. The Joint Monitoring Program shall prepare and submit the Surface Water Quality Management Plan and Annual Surface Water Monitoring Reports to the Central Valley Water Board on behalf of the Dischargers in the Joint Monitoring Program.

A Joint Monitoring Program is not a Discharger. Owners and operators of Confined Bovine Feeding Operations are Dischargers and are responsible and liable for individual compliance

and for determining if they are in compliance with the terms of the Order and MRP. Pursuant to the Water Code Section 13267, the Executive Officer may, at any time, order implementation of individual surface water monitoring at a Confined Bovine Feeding Operation, even if the Discharger participates in a Joint Monitoring Program. Such order may occur, for instance, if violations of the Order are documented and/or the facility is found to be in an area where site conditions and characteristics pose a high risk to surface water quality. In the event the Executive Officer orders implementation of individual surface water monitoring to a participant in a Joint Monitoring Program, the Discharger shall no longer be eligible to participate in a Joint Monitoring Program to comply with the surface water monitoring requirements of the MRP.

MONITORING AND REPORTING PROGRAM
R5-2017-0058
Attachment B-1
Farm Evaluation Survey
for
Confined Bovine Feeding Operations

This Farm Evaluation Survey is intended to be a summary of farm management practices being used on land application areas to protect surface and groundwater. All Confined Bovine Feeding Operations that irrigate a "land application area" that is not covered under the Irrigated Lands Regulatory Program (whether or not manure or wastewater is applied to that land) shall complete and submit this form to the Executive Officer.

There are three, one-page "parts" to the Farm Evaluation Survey to complete:

- Part A: Whole Farm Evaluation; complete only once (1 page).
- Part B: Specific Field Evaluation; complete one page for each field.
- Part C: Sediment and Erosion Control Practices; complete one page for each field.

Answer questions based on practices used in 2018.

You may need to make copies of Parts B and C of the survey and complete separate surveys for each of your fields that are managed differently or have different crops. See detailed instructions on the following pages.

The practices recorded on the survey should correspond to the APN parcels and Field IDs used in your Nutrient Management Plan. You may subdivide a parcel into fields, assigning each field a name or number (if one is not already assigned).

For example, you might have two fields of different crops in one APN so they could be identified as APN# 111-00-222, field A; APN# 111-00-222, field B, etc. or any other designation used by the County Agricultural Commissioner or your own records.

If all parcels/fields listed have the same practices, fill out one (1) survey for all parcels and return. If parcels/fields have different practices, make copies of the survey and fill out one (1) survey for each parcel/field with different practices.

For example, if a Discharger has 3 parcels enrolled with one crop grown (Parcel A, B, and C) and he manages Parcel A and B the same, he can fill out one survey for Parcels A and B. Another survey needs to be filled out for Parcel C to record the crops or practices that differ from A and B.

Step by Step Instructions

The Farm Evaluation has 3 components:

Part A: Whole Farm Evaluation

Part B: Specific Field Evaluation

Part C: Sediment & Erosion Control Practices

Step 1: Part A: Answer Questions 1 – 3 for all cropland.

Step 2: Part B, Question 1: List the parcels described on that page. Remember to fill out a page for each of your parcels or fields that are managed differently.

Step 3: Part B: Answer questions 2 – 4 for parcels that **you identified** at the top of the page by checking the applicable box(es). *If parcels or fields differ in their practices, you must make a copy of the page to answer questions for parcels/fields differently.*

Step 4: Part C: Answer questions as you did in Part B in reference to parcels that **you identified** at the top of the page. *If parcels or fields differ in their practices you must make a copy of the page to answer questions for parcels/fields differently.*

Step 5: Sign the bottom of Part A to certify that all of the information provided is current and accurate and submit to the Executive Officer **by the due date, 1 July 2019.**

Part A – Whole Farm Evaluation

Facility Name: _____ Facility Address: _____

1. Which pest management application practices have you implemented? (check all that apply)

- Followed County Permit
- Followed Label Restrictions
- Mapped Sensitive Areas
- Attended Pest Management Trainings
- Used End of Row Sprayer Shutoff
- Avoided Surface Water When Spraying
- Reapplied Rinsate to Treated Field
- Used Targeted Sensing Sprayer
- Used Drift Control Agents
- Integrated Pest Management (Reduced Pesticide Use)
- Monitored Wind Conditions
- Used Buffer Zones
- Used Vegetative Drain Ditches
- Monitored Rain Forecasts
- Followed PCA Recommendations
- Used Chemigation
- Mixed and loaded on low runoff hazard site (e.g. away from creeks or wells)
- Applied Lower Risk Pesticides
- Limited/controlled irrigation runoff after pesticide
- No Pesticides Applied
- Other _____

2. Who do you have develop your Nutrient Management Plan? (check all that apply)

- Certified Crop Advisor (CCA)
- UC Farm Advisor
- Certified Technical Service Providers by NRCS
- Professional Soil Scientist
- Professional Agronomist
- None of the Above

3. Do one of more of your fields have the potential to discharge sediment to off-farm surface waters? Circle One: Yes No

*If so, complete Part C on sediment and erosion control practice used on farm field(s).
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

Signature

Printed Name

Date

Part B – Field Specific Evaluation

Facility Name: _____ Facility Address: _____

1. Identify the Parcels and Fields covered by this evaluation.

Fill out a separate survey for parcels/fields with different practices.

Parcel (APN)	Field ID	Acres	Crop
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Which irrigation method(s) are used for the parcel/field covered by this evaluation? (A secondary system could be used for crop germination, frost protection, crop cooling, etc.)

Primary (check one)

(Secondary (if applicable check one))

- Drip
- Micro Sprayer/Sprinkler
- Furrow
- Sprinkler
- Border Strip
- Flood

- Drip
- Micro Sprayer/Sprinkler
- Furrow
- Sprinkler
- Border Strip
- Flood

3. Which irrigation management practices are implemented for the parcel/field covered by this evaluation? (Check all that apply)

- Laser Levelled Fields
- Weather-based irrigation
- Based irrigation on crop water need
- Measured soil moisture
- Tested/improved distribution uniformity (DU)
- Used tailwater return/reuse system

- Measured plant water stress
- Measured applied irrigation water (water meter)
- Maintained irrigation system for optimal performance
- Used pressure control regulators
- Used variable speed pump
- Other _____

4. Nitrogen Management Methods to Minimize Leaching Past the Root Zone (Check all that apply)

- Scheduled Fertilizer application to match crop need
- Used Cover Crop or crop rotation
- Used split fertilizer applications
- Tested soil for residual nitrogen
- Used Tissue/Petiole testing
- GPS used for Variable Rate Application
- Applied Foliar N

- Used Urease and/or nitrification inhibitors
- Mixed and load fertilizers on low runoff sites (away from creeks/wells)
- Tested irrigation water N concentration
- Used Fertigation
- Measured N content of organic amendments
- Evaluated crop nitrogen need
- Other _____

Part C – Sediment & Erosion Control Practices

Facility Name: _____ Facility Address: _____

1. Identify the Parcels and Fields covered by this evaluation.

Fill out a separate survey for parcels/fields with different practices.

Parcel (APN)	Field ID	Acres	Crop
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Which Irrigation Practices are used for the parcel/field covered by this evaluation for Managing Sediment and Erosion? (Check all that apply).

- In-furrow dams are used to increase infiltration and settling out of sediment prior to entering the tail ditch.
- The time between pesticide applications and the next irrigation is lengthened as much as possible to mitigate runoff of pesticide residue.
- Shorter irrigation runs are used with checks to manage and capture flows
- PAM (polyacrylamide) used in furrow and flood irrigated fields to help bind sediment and increase infiltration.
- Use drip or micro-irrigation to eliminate irrigation drainage.
- Use of flow dissipaters to minimize erosion at discharge point.
- Tailwater Return System.
- Catchment Basin.
- No irrigation drainage due to field or soil conditions.

3. Which Cultural Practices are implemented for the parcels/fields covered by this evaluation for Managing Sediment and Erosion? (check all that apply)

- Storm water is captured using field borders.
- Vegetative filter strips and buffers are used to capture flows.
- Sediment basins/holding ponds are used to settle out sediment and hydrophobic pesticides such as pyrethroids from irrigation and storm runoff.
- Cover crops or native vegetation are used to reduce erosion.
- Hedgerows or trees are used to help stabilize soils and trap sediment movement.
- Soil water penetration has been increased through the use of amendments, deep ripping and/or aeration.
- Crop rows are graded, directed and at a length that will optimize the use of rain and irrigation water.
- Creek banks and stream banks have been stabilized.
- Subsurface pipelines are used to channel runoff water.
- Berms are constructed at low ends of fields to capture runoff and trap sediment.
- Minimum tillage incorporated to minimize erosion.
- Field is lower than surrounding terrain.
- No storm drainage due to field or soil conditions

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
Order R5-2017-0058**

STANDARD PROVISIONS AND REPORTING REQUIREMENTS

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR
CONFINED BOVINE FEEDING OPERATIONS**

8 June 2017

A. Introduction

1. These Standard Provisions and Reporting Requirements (SPRR) are applicable to Confined Bovine Feeding Operations that are regulated pursuant to the provisions of Title 27 California Code of Regulations (CCR) Division 2, Subdivision 1, Chapter 7, Subchapter 2, Sections 22560 et seq.
2. Any violation of the Order constitutes a violation of the California Water Code and, therefore, may result in enforcement action.
3. If there is any conflicting or contradictory language between the Order, the Monitoring and Reporting Program (MRP) associated with the Order, or the SPRR, then language in the Order shall govern over the MRP and the SPRR, and language in the MRP shall govern over the SPRR.

B. Standard Provisions

1. The requirements prescribed in the Order do not authorize the commission of any act causing injury to the property of another, or protect the Discharger from liabilities under federal, state, or local laws.
2. The Discharger shall comply with all federal, state, county, and local laws and regulations pertaining to the discharge of wastes from the facility that are at least as stringent as the requirements of the Order.
3. All discharges from the facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or to other courses under their jurisdiction that are at least as stringent as the requirements of the Order.
4. The Order does not convey any property rights or exclusive privileges.
5. The provisions of the Order are severable. If any provision of the Order is held invalid, the remainder of the Order shall not be affected.

6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with the Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.
7. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the Order shall not be a defense for violations of the Order by the Discharger.
8. The filing of a request by the Discharger for modification, revocation and reissuance, or termination of the Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of the Order.
9. The Order is not transferable to any person except after notice to the Central Valley Water Board. The Central Valley Water Board may modify or revoke and reissue the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the California Water Code. For composting operations, notice must also be provided to CalRecycle and the Local Enforcement Agency.
10. The Discharger shall provide to the Executive Officer, within a reasonable time, any information which the Executive Officer may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the Discharger's coverage under the Order or to determine compliance with the Order. The Discharger shall also provide to the Executive Officer upon request, copies of records required by the Order to be kept.
11. After notice and opportunity for a hearing, the Order may be terminated or modified for cause, including but not limited to:
 - a. Violation of any term or condition contained in the Order;
 - b. Obtaining the Order by misrepresentation, or failure to disclose fully all relevant facts;
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge; or
 - d. A material change in the character, location, or volume of discharge.
12. The Order may be modified if new state statutes or regulations are promulgated, and if more stringent applicable water quality standards are approved pursuant to Title 27 of the CCR, or as adopted into the Central Valley Water Board *Water Quality Control Plans (Basin Plans) for the Sacramento River and San Joaquin River Basins (4th Ed)*, and for the *Tulare Lake Basin (2nd Ed.)*. The Order may also be modified

for incorporation of land application plans, and/or changes in the waste application to cropland.

13. The Central Valley Water Board may review and revise the Order at any time upon application of any affected person or by motion of the Board.
14. The Discharger shall ensure compliance with existing and/or future promulgated standards that apply to the discharge.
15. The Discharger shall permit representatives of the Central Valley Water Board and the State Water Resources Control Board (State Water Board), upon presentation of credentials at reasonable hours, to:
 - a. Enter premises where wastes are treated, stored, or disposed and where any records required by the Order are kept;
 - b. Copy any records required to be kept under terms and conditions of the Order;
 - c. Inspect facilities, equipment (monitoring and control), practices, or operations regulated or required by the Order; and
 - d. Sample, photograph, and/or video tape any discharge, waste, waste management unit, or monitoring device.
16. The Discharger shall properly operate and maintain in good working order any facility, unit, system, or monitoring device installed to achieve compliance with the Order. Proper operation and maintenance includes best practicable treatment and controls, and the appropriate quality assurance procedures.
17. Animal waste storage areas and containment structures shall be designed, constructed, and maintained to limit, to the greatest extent possible, infiltration, inundation, erosion, slope failure, washout, overtopping, by-pass, and overflow.
18. Setbacks or separation distances contained under Water Wells, Section 8, Part II, in the *California Well Standards, Supplemental Bulletin 74-90 (June 1991)*, and *Bulletin 94-81 (December 1981)*, California Department of Water Resources (DWR), shall be maintained for the installation of all monitoring wells and groundwater supply wells at existing dairies. A setback of 100 feet is required between supply wells and animal enclosures in the production area. A minimum setback of 100 feet, or other control structures (such as housing, berming, grading), shall be required for the protection of existing wells or new wells installed in the cropland. If a county or local agency adopts more stringent setback standards than that adopted by the DWR, then these local standards shall carry precedence over the Well Standards of DWR, and the Discharger shall comply with the more stringent standards.

19. Following any storm event that causes the freeboard of any wastewater pond to be less than one (1) foot for below-grade ponds, or two (2) feet for above-grade ponds, the Discharger shall take action as soon as possible to provide the appropriate freeboard in the wastewater pond.
20. For any electrically operated equipment at the facility, the failure of which would cause loss of control or containment of waste materials, or violation of this Order, the Discharger shall employ safeguards to prevent loss of control over wastes or violation of this Order. Such safeguards may include alternate power sources, standby generators, standby pumps, additional storage capacity, modified operating procedures, or other means.

C. General Reporting Requirements

1. The Discharger shall give at least 60 days advance notice to the Central Valley Water Board of any planned changes in the ownership or control of the facility. For composting operations, the Discharger shall notify the Central Valley Water Board, CalRecycle, and the Local Enforcement Agency, in writing, at least 30 days in advance of any change in control or ownership. In both cases, the notification shall include:
 - a. A statement of acknowledgment that the current owner is liable for violations occurring up to the transfer date and that the new owner is liable for violations occurring after the date that ownership of the property transfers; and
 - b. The new owner's Notice of Intent.
2. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of the Order by letter at least 60 days in advance of such change, a copy of which shall be immediately submitted to the Central Valley Water Board office in accordance with General Reporting Requirement C.12 below.
3. To assume operation under the Order, any succeeding owner or operator must request, in writing, that the Executive Officer transfer coverage under the Order. The Central Valley Water Board will provide a form for this request that will allow the succeeding owner or operator to provide their full legal name, address and telephone number of the persons responsible for contact with the Central Valley Water Board and a responsibility statement and a signed statement in compliance with General Reporting Requirement C.7 below. The form will also include a statement for signature that the new owner or operator assumes full responsibility for compliance with the Order and that the new owner or operator will implement the Waste Management Plan and the Nutrient Management Plan prepared by the preceding owner or operator. Transfer of the Order shall be approved or disapproved in writing by the Executive Officer. The succeeding owner or operator

is not authorized to discharge under the Order and is subject to enforcement until written approval of the coverage transfer is issued by the Executive Officer.

4. The Executive Officer may require the Discharger to submit technical reports pursuant to the Order and California Water Code Section 13267.
5. The Discharger shall identify any information that may be considered to be confidential under state law and not subject to disclosure under the Public Records Act. The Discharger shall identify the basis for confidentiality. If the Executive Officer cannot identify a reasonable basis for treating the information as confidential, the Executive Officer will notify the Discharger that the information will be placed in the public file unless the Central Valley Water Board receives, within 10 calendar days, a written request from the Discharger to keep the information confidential containing a satisfactory explanation supporting the information's confidentiality.
6. Except for data determined to be exempt from disclosure under the Public Records Act (California Government Code Sections 6275 to 6276), and data determined to be confidential under Section 13267(b)(2) of the California Water Code, all reports prepared in accordance with the Order and submitted to the Executive Officer shall be available for public inspection at the offices of the Central Valley Water Board. Data on waste discharges, water quality, meteorology, geology, and hydrogeology shall not be considered confidential.
7. All technical reports and monitoring program reports shall be accompanied by a cover letter with the certification specified in C.8 below and be signed by a person identified below:
 - a. For a sole proprietorship: by the proprietor;
 - b. For a partnership: by a general partner;
 - c. For a corporation: by a principal executive officer of at least the level of senior vice-president; or
 - d. A duly authorized representative if:
 - i. The authorization is made in writing by a person described in Subsection a, b, or c of this provision;
 - ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the facility, such as the position of manager. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and
 - iii. The written authorization is submitted to the Central Valley Water Board.

8. Each person, as specified in C.7 above, signing a report required by the Order or other information requested by the Central Valley Water Board shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

9. In addition to Item C.7 above, all technical reports required in the Order that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by, or under the direction of, and signed by persons registered to practice in California pursuant to California Business and Professions Code, Sections 6735, 7835, and 7835.1 or federal officers and employees who are exempt from these Sections by California Business and Professions Code, Section 6739 or 7836. To demonstrate compliance with Title 16 CCR, Sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

10. The Discharger shall file a Notice of Intent with the Central Valley Water Board at least 140 days before making any material change in the character, location, or volume of the discharge. A material change includes, but is not limited to, the following:

- a. The addition of a new wastewater that results in a change in the character of the waste;
- b. Significantly changing the disposal or waste application method or location;
- c. Significantly changing the method of treatment;
- d. Increasing the discharge flow beyond that specified in the Order; and/or
- e. Expanding herd size beyond the maximum herd size reported in the Notice of Intent (**Attachment A**).

11. For changes to a composting operation, the Discharger shall submit a revised Notice of Intent (NOI) to the Central Valley Water Board, CalRecycle, and the Local Enforcement Agency at least 90 days prior to:

- a. Adding a new feedstock, additive, or amendment;

- b. Changing material or construction specifications;
 - c. Changing a monitoring program; or
 - d. Changing an operation or activity that was not described in the approved noi. The central valley water board may require submittal of a revised technical report.
12. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically to the State Water Resources Control Board's Internet-accessible database system (Geotracker database). The exception is the Notice of Intent, which may be submitted by email or mail to the Central Valley Water Board (see submittal directions at the end of the Notice of Intent form).

Dischargers or their representatives need to create a Geotracker user account. Instructions for setting up an account and the process of claiming a site, formatting and uploading data, and other technical information can be found under the "ESI Overview" and "Getting Started" sections at http://www.swrcb.ca.gov/water_issues/programs/ust/electronic_submittal/.

Monitoring data and correspondence needs to be in searchable Portable Document Format (PDF). Documents must be less than 100 MB to be uploaded to the Geotracker database. If not, PDF file size reduction tools should be used to reduce the size of files larger than 100 MB.

D. Requirements Specifically for Monitoring Programs and Monitoring Reports

1. The Discharger shall file self-monitoring reports and/or technical reports in accordance with the detailed specifications contained in the MRP attached to the Order.
2. The Discharger shall maintain a written monitoring program sufficient to assure compliance with the terms of the Order. Anyone performing monitoring on behalf of the Discharger shall be familiar with the written program.
3. The monitoring program shall include observation practices, sampling procedures, and analytical methods designed to ensure that monitoring results provide a reliable indication of water quality at all monitoring points.
4. All instruments and devices used by the Discharger for the monitoring program shall be properly maintained and shall be calibrated as recommended by the manufacturer and at least once annually to ensure their continued accuracy.
5. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by the Order, and

records of all data used to complete the reports. Records shall be maintained for a minimum of five years from the date of sample, measurement, report, or application. Records shall also be maintained after facility operations cease if wastes that pose a threat to water quality remain at the site. This five-year period may be extended during the course of any unresolved litigation regarding the discharge or when requested in writing by the Executive Officer.

- a. Records of on-site monitoring activities shall include the:
 - i. Date that observations were recorded, measurements were made, or samples were collected;
 - ii. Name and signature of the individual(s) who made the observations, made and recorded the measurements, or conducted the sampling;
 - iii. Location of measurements or sample collection;
 - iv. Procedures used for measurements or sample collection;
 - v. Unique identifying number assigned to each sample; and
 - vi. Method of sample preservation utilized.
- b. Records of laboratory analyses shall include the:
 - i. Results for the analyses performed on the samples that were submitted;
 - ii. Chain-of-custody forms used for sample transport and submission;
 - iii. Form that records the date that samples were received by the laboratory and specifies the analytical tests requested;
 - iv. Name, address, and phone number of the laboratory which performed the analysis;
 - v. Analytical methods used;
 - vi. Date(s) analyses were performed;
 - vii. Identity of individual(s) who performed the analyses or the lab manager; and
 - viii. Results for the quality control/quality assurance (QA/QC) program for the analyses performed.

E. Enforcement

1. California Water Code Section 13350 provides that any person who violates WDRs or a provision of the California Water Code is subject to civil liability of up to \$5,000 per day or \$15,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil liability of up to \$10 per gallon, or \$20 per gallon; or some combination thereof, depending on the violation, or upon the combination of violations. In addition, there are a number of other enforcement provisions that may apply to violation of the Order.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
Order R5-2017-0058**

INFORMATION SHEET

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR CONFINED
BOVINE FEEDING OPERATIONS**

INTRODUCTION

This Information Sheet provides information to supplement, clarify, and elaborate upon the findings and requirements contained in the Waste Discharge Requirements General Order for Confined Bovine Feeding Operations, Order No. R5-2017-0058 (Bovine General Order). This Information Sheet is considered a part of the Bovine General Order.

The Bovine General Order will serve as general Waste Discharge Requirements for discharges of waste from Confined Bovine Feeding Operations. The Bovine General Order is not a National Pollutant Discharge Elimination System (NPDES) permit, and does not authorize discharges to surface waters that would otherwise require an NPDES permit.

BACKGROUND ON REGULATION OF CONFINED ANIMAL OPERATIONS

Pursuant to Water Code section 13260, any person discharging or proposing to discharge wastes that could affect the quality of the waters of the state is obliged to file a report of that discharge with the appropriate regional water board and receive waste discharge requirements from that board. The regional water boards have the authority to waive this requirement pursuant to Water Code section 13269. In 1982, the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board or Board) adopted Resolution No. 82-036, which waived waste discharge requirements for most confined animal operations. This waiver remained in place until statutory changes to Water Code section 13269 resulted in the automatic expiration of all waivers on 1 January 2003.

To replace the expiring waiver, the Central Valley Water Board adopted Resolution R5-2002-0205 on 6 December 2002 that states all operations that discharge or propose to discharge waste would be expected to obtain regulatory coverage under either:

- Individual or general waste discharge requirements prescribed by the Board pursuant to Water Code section 13263;
- A conditional waiver that the Board would adopt pursuant to Water Code section 13269; or
- Individual or general National Pollutant Discharge Elimination System (NPDES) permits, which would be issued by the Board pursuant to Federal law.

The Central Valley Water Board rescinded Resolution R5-2002-0205 on 13 March 2003, because neither general waste discharge requirements nor a general NPDES

permit were available as options for facilities to consider before the deadlines in the Resolution expired.

Since the waiver expired, the Regional Board has been developing and implementing General Orders for various groups of dischargers, including confined animal operations. The Bovine General Order is aimed at protecting surface and groundwater quality in the Central Valley from waste produced by Confined Bovine Feeding Operations.

RATIONALE FOR ISSUING A GENERAL ORDER

The Board regulates most discharges by prescribing waste discharge requirements or by issuing conditional waivers. All Confined Bovine Feeding Operations (as defined in Cal. Code Regs., tit. 27, § 20164) are subject to the Board's regulatory authority.

Water Code section 13263(i) describes the criteria that the Board uses to determine whether a group of operations should be regulated under a general order (as opposed to individual orders). These criteria include:

- The discharges are produced by the same or similar types of operations,
- The discharges involve the same or similar types of wastes,
- The discharges require the same or similar treatment standards, and
- The discharges are more appropriately regulated under general WDRs rather than individual WDRs.

Confined Bovine Feeding Operations are appropriately regulated by a General Order because they: (a) involve similar types of operations, where animals are confined and where their wastes are managed by onsite storage, land application, or removal offsite; (b) the discharges from these operations, which are primarily composed of animal waste, are similar; (c) the operations are subject to regulations that impose the same or similar treatment standards; (d) discharges of bovine wastes have the same potential to impact waters of the state; and, (e) given the large number of operations and their similarities, the operations are more appropriately regulated under a General Order.

BOVINE OPERATIONS IN THE CENTRAL VALLEY

Confined Bovine Feeding Operations for the purposes of this General Order, are defined to include all types of commercial operations, except dairies, that house bovine animals and meet the feeding, duration, and population criteria in the General Order (see Attachment E, Definitions, and Finding 2 on page 1 of the Bovine General Order). The bovine animals can be a variety of ages, from calf to adult, housed in a variety of ways, including calf hutches, corrals, and barns.

No single state agency or private entity maintains a comprehensive list of all bovine operations within the Central Valley. Of the four main classes of operations (calf, heifer, beef feedlots, and auction yards), a comprehensive list is only available for auction yards.

There are 25 auction yards within the Central Valley Region, with the largest number in Stanislaus and Tulare Counties. In most cases, animals are only housed at the facilities on the days that sales are taking place, and are rarely housed overnight. Because animals are not continuously housed at most auction yards, the volume of manure generated is less than that a facility where animals are housed continuously, and there are more times when pens are emptied so that manure removal can be done. Auction yards without continuous animal housing are expected to qualify for the Limited Time Operations tier.

To develop an estimate of the number of calf, heifer, and beef feedlots that house 100 or more Animal Units (AUs), and would therefore qualify as Full General Order Coverage Operations, staff reviewed air photos and in-house records. Staff also reviewed dairy sites closed out of the Dairy General Order that were planned for conversion to non-dairy bovine operations. Staff from the California Department of Food and Agriculture assisted in the air photo review and provided some additional information on active bovine operations. The review was conducted for 17 of the 36 counties that are entirely or partially within the boundaries of the Central Valley Region. The counties reviewed were those anticipated to have the largest number of bovine operations.

The 17 counties surveyed were estimated to have approximately 350 bovine operations. There were roughly 50 calf operations and 50 beef feedlots, with the remaining operations presumed to be either raising dairy support stock (heifer operations) or operations raising both heifers and calves.

The operations were not divided by the number of AUs housed on site. Operations vary widely in size, with the largest beef feedlot housing in excess of 100,000 animals (Harris Ranch Feeding Company).

Because of the lack of any centralized database on smaller bovine operations housing between 6 and 99 AUs that would be classified as Limited Population Operations, the number of such facilities has not been estimated. Most of these types of facilities do not require local land use permits or any other special types of approvals. It is anticipated that operations within this population range may be many times the number of operations housing 100 or more AUs.

POTENTIAL IMPACTS OF BOVINE WASTE ON WATER QUALITY

For the purposes of this General Order, bovine waste includes, but is not limited to, manure, leachate, process wastewater and any water, precipitation or rainfall runoff that came into contact with raw materials, products, or byproducts such as manure, compost piles, feed, silage, or bedding.

Waste generated at bovine operations is stored in solid form in piles or in liquid form in waste retention ponds. The wastes are then applied to cropland or transported off-site for utilization on cropland as a nutrient source. These nutrient-laden materials are

applied to soils of varying character and drainage characteristics, varying proximity to surface drainages and waterways, and different character of geology and depth to groundwater. Because of the site variability, this General Order requires bovine operations that apply waste to cropland under their control to develop a Nutrient Management Plan that is field specific to ensure that optimum nutrient utilization takes place. Although the waste materials provide nutrients to crops, they can create nuisance conditions if improperly managed or cause pollution of surface water and/or groundwater if site conditions are not taken into account in preparing a nutrient utilization and management strategy. This General Order regulates the management of bovine wastes onsite and requires nutrient monitoring, discharge monitoring, groundwater monitoring (individual or representative) and tracking of materials being taken off-site for utilization.

Manure from bovine operations contains high concentrations of salts (total dissolved solids, including constituents such as sodium and chloride) derived primarily from the feed and water sources used in the raising of bovine animals. Manure from bovine operations contains nutrients (including nitrogen, ammonia, phosphorus and potassium compounds) that can be used in crop production. Manure generation per animal for the categories subject to the Bovine General Order (calves, heifers, and feedlot beef cattle) is less than lactating (milk) cows but can be substantial at large operations:

Animal Type	Animal Weight (pounds)	Manure excreted Per Day (pounds)	Nitrogen Excreted Per Day (pounds)
Lactating Cow ¹	1,400	150	1.0
Calf ¹	330	19	0.14
Heifer ¹	970	49	0.26
Beef Finishing Cattle ²	1,000	66	0.4

This manure must be managed to minimize impacts to water quality.

The application of bovine waste to cropland provides some challenges due to the complexity of nitrogen in the soil-crop system. Soil nitrogen occurs primarily in three different forms - organic nitrogen, ammonium, and nitrate. Sources of organic nitrogen in soil include crop residue, the soil organic matter pool, and bovine waste applications. Organic nitrogen will mineralize to ammonium over time (one to seven years according to the University of California Committee of Experts [UCCE] review). Thus, organic nitrogen provides a steady, relatively slow release of plant available and leachable nitrogen.

Applying manure with high organic nitrogen content may not meet a crop's nitrogen need during the most rapid growth stage, while exceeding the crop nitrogen uptake

¹ Lactating cow, calf and heifer data from ASAE D384.2, March 2005, Table 1.b.

² Beef finishing cattle derived from "Managing Manure from Beef Feedlots for crop Production"; Cattle Feeders Conference; June 10-11, 2009.

during the remainder of the crop's growing season, when the nitrogen may be subject to leaching.

Ammonium nitrogen is immediately available to the plant, but also sorbs to soil particles. Ammonium nitrogen that is unused by the plant remains in the soil and is converted to nitrate typically within days to weeks under oxidizing conditions which are present in much of the Central Valley. Nitrate is also immediately available to the plant, but unlike organic nitrogen and ammonium nitrogen, it does not adsorb to soil particles. Instead, it is in a dissolved form and moves readily with soil water.

The application of manure or wastewater to a land application area results in the discharge of salts and nitrogen compounds. Oxidation of nitrogen compounds by nitrifying bacteria (i.e., ammonia and organic nitrogen compounds) to nitrites and nitrates has the potential to degrade the quality of surface water and groundwater in the Central Valley Region, if not properly managed. Runoff from manured land application areas poses a threat to surface water quality. A similar threat to groundwater exists if the wastes are applied to the land application area at rates that exceed crop needs. The UCCE review of dairy waste states that based on field experiments and computer models, the appropriate nitrogen loading rate that minimizes nitrogen leaching and maximizes nitrogen harvest is between 140 to 165% of the nitrogen harvested. This is a slightly higher loading rate than what is allowed under New Mexico regulations, which require "...the total nitrogen in effluent that is applied to a crop that is harvested shall not exceed by more than 25 percent the maximum amount of nitrogen reasonably expected to be taken up by the crop..." (20.6.2.3109 NMAC). New Mexico does not allow adjustment of the nitrogen content to account for volatilization or mineralization processes. This Order uses a target of 140% of the nitrogen harvested (1.4 times crop uptake) to minimize overapplication of nitrogen. However, it is understood that the 1.4 target cannot be consistently achieved under all conditions. The Representative Monitoring Program will research alternative standards for the Executive Officer to consider for approval.

Surface water can also be degraded and polluted by both the type and high concentrations of pollutants in bovine manure and manure wastewater. Ammonia in the waste is highly toxic to aquatic life and can suppress dissolved oxygen concentrations. In addition, nitrogen and phosphorus compounds in the waste can cause excessive algal growth in surface waters, resulting in lower oxygen levels and which in turn causes fish and other organisms to die. The presence of pathogens in the waste can create a public health threat through human contact with affected waters.

In contrast to most dairy operations, where animals are kept in freestall barns and manure is flushed with water into wastewater ponds, most bovine operations housing animals older than young calves use corrals. This results in an operation that generates much less wastewater than a conventional dairy. However, corral runoff can contain significant quantities of pollutants, including salts and ammonia. Central Valley Water Board staff has investigated some cases where cases were corral runoff has resulted in impacts to surface water quality. The Bovine General Order includes prohibitions,

specifications, and provisions for the production area (including corrals and existing and new ponds) and land application areas that are designed to protect water quality. Consistent with Title 27, this General Order prohibits the direct or indirect discharge of waste from the production area to surface water. This General Order also prohibits discharges of: (1) wastewater to surface waters from cropland, and (2) waste to surface waters that causes pollution or nuisance, or that causes or contributes to exceedances of any water quality objective in the Basin Plans or water quality criteria set forth in the California Toxics Rule and the National Toxics Rule.

Storm water may contain pollutants from bovine wastes if the storm water is allowed to contact manured areas or commingle with wastewater. This General Order prohibits discharges of storm water from the production area to surface water and any discharge of storm water to surface water from the land application areas being used for nutrient utilization unless that discharge is from land that has been managed consistent with a certified Nutrient Management Plan.

WASTE MANAGEMENT PROVISIONS IN THE BOVINE GENERAL ORDER

The Bovine General Order contains prohibitions, general specifications, and specific requirements for wastewater ponds, the production area where animals are housed, the land application area where crops are grown and monitoring requirements. The goal of the Order is to ensure that Bovine Operations implement water quality management practices that protect surface and groundwater. Practices can be physical, like the construction of new wastewater ponds in ways that protect water quality, or can be management-related, like the scraping of excess manure from corrals prior to the wet season and the maintenance of ponds to ensure adequate storage capacity.

Excluded Operations: The Order does not regulate Confined Bovine Feeding Operations having fewer than 6 animal units onsite. An animal unit is 1000 pounds of live weight, and is roughly 1 heifer or 3 calves. Therefore, operations having fewer than 6 heifers or 18 calves, for example, are not required to obtain coverage under this Order. Such operations are almost exclusively non-commercial and present a minimal risk to water quality.

Three Tiered Regulatory System: Central Valley Board staff is proposing a three-tiered regulatory system.

Limited Time Operation tier - Because many of the operational characteristics of auction yards (i.e. animals are not continually housed onsite, therefore corrals can be regularly maintained while animals are absent) such operations that do not house animals continuously can be placed in a Limited Time Operation tier with reduced waste management requirements.

Limited Population Operation tier - Because of the generally drier nature of bovine feedlot operations versus dairies, and because of the generally lower threat posed by them, operations that house between 6 and 99 AUs of bovine animals can be placed in

a Limited Population Operation tier with reduced waste management and minimal reporting requirements.

Full General Order Coverage tier – Confined Bovine Feeding Operations that house 100 or more AUs and do not meet the Limited Time Operation criteria are Full General Order Coverage Operations.

Confined Bovine Feeding Operations considered to be Limited Time operations are required to:

- Submit a Notice of Intent within 12 months of the adoption of the Order;
- Maintain records and submit annual reports;
- Develop, submit, and implement an Operation and Maintenance Plan describing how the facility will be operated to protect water quality; and
- Either document the destinations of exported manure using manifests or enroll irrigated cropland associated with the facility that receives only solid manure in the Irrigated Lands Regulatory Program.

Confined Bovine Feeding Operations considered to be Limited Population operations are required to:

- Submit a Notice of Intent within 12 months of the adoption of the Order; and
- Develop and implement an Operation and Maintenance Plan describing how the facility will be operated to protect water quality.

Confined Bovine Feeding Operations considered to be Full Coverage operations are required to:

- Submit a Notice of Intent within 12 months of the adoption of the Order,
- Where applicable, monitor wastewater, soil, crops, manure, surface water discharges, and storm water discharges;
- Where applicable, monitor surface water and groundwater in accordance with a monitoring and reporting program (regulated operations have the option to join a Representative Groundwater Monitoring Program (RMP) in lieu of individual monitoring of first encountered groundwater);
- Prepare, submit, and implement a Waste Management Plan (WMP) for the production area (including an Operation and Maintenance Plan);
- Where applicable, prepare and implement a Nutrient Management Plan (NMP) for land application areas, or document the destinations of exported manure using manifests;
- Maintain records and submit annual reports; and

- Improve or replace management practices that are found not to be protective of water quality.

Terms Used to Describe Areas at Confined Bovine Feeding Operations: In the Bovine General Order, the land associated with a bovine operation is divided into a “production area” and a “land application area”. The Order uses the term “production area” to refer to the area of the operation where animals are housed, feed and manure are stored, and wastewater is managed. The Order uses the term “land application area” to refer to cropland where wastes and wastewater generated at the facility are applied to grow crops.

Water Quality Concerns for Land Application Areas (cropland): When used as a fertilizer on cropland, bovine waste is applied to soils of varying character and drainage characteristics, varying proximity to surface drainages and waterways, and different depths to groundwater. Because of the site variability, this General Order requires Confined Bovine Feeding Operations that apply bovine wastewater to their own cropland, or that have cropland that receives nutrients other than wastewater and that is not enrolled under the Irrigated Lands Regulatory Program, to develop a Nutrient Management Plan that is field specific to ensure that optimum nutrient utilization takes place. Although the waste materials provide nutrients to crops, they can create nuisance conditions if improperly managed or cause pollution of surface water and/or groundwater if site conditions are not taken into account in preparing a nutrient utilization and management strategy. This General Order regulates the management of bovine wastes onsite and requires nutrient monitoring, discharge monitoring, groundwater monitoring (individual or representative), and manifesting of bovine waste exported from the operation.

Surface water can also be degraded by both the type and high concentrations of pollutants in bovine manure and wastewater. Ammonia in the waste is highly toxic to aquatic life and can suppress dissolved oxygen concentrations. In addition, nitrogen and phosphorus compounds in the waste can cause excessive algal growth in surface waters, resulting in lower oxygen levels and which in turn causes fish and other organisms to die. The presence of pathogens in the waste can create a public health threat through human contact with affected waters. The Bovine General Order prohibits the discharge of waste and water that has contacted waste from the production area, the discharge of waste and wastewater from cropland, and requires the monitoring of the discharge of storm water and tailwater to surface water from cropland.

Groundwater Monitoring for Full General Order Coverage Operations: In order to assess the impacts to groundwater associated with various waste management practices employed at the Full General Order Coverage Confined Bovine Feeding Operations, the Order contains two parallel approaches to monitoring: 1) individual monitoring, where Confined Bovine Feeding Operations can elect to conduct their own monitoring, submitting a Monitoring Well Installation Plan to the Board for approval and collecting and analyzing their own groundwater samples; and 2) a Representative

Monitoring Program (RMP) for Confined Bovine Feeding Operations that would prefer to pool their resources.

Under the RMP approach, individual Confined Bovine Feeding Operations regulated under the Full General Order have the option of joining together to collectively monitor different waste management practices in a variety of geologic settings in lieu of developing individual monitoring programs. Bovine Operations utilizing management practices that are found not to be protective of groundwater quality will be required to make improvements in those management practices.

CEQA COMPLIANCE FOR OPERATIONS REGULATED BY THE BOVINE GENERAL ORDER

Bovine facilities which are operational at the date of the issuance of the Tentative Order (10 February 2017) will be considered to be existing facilities for the purposes of the California Environment Quality Act (CEQA), and will not require additional environmental assessment prior to receiving coverage under the General Order. Further information on the applicability of CEQA categorical exemptions to the Bovine General Order is discussed on Page IS – 31.

Operations which commence after 10 February 2017, and operations which “expand” after 10 February 2017, will need to comply with the provisions of CEQA before they can be covered by the Bovine General Order.

“Expand” is defined in two ways in the Bovine General Order. If a Confined Bovine Feeding Operation completed and received approval of a CEQA document in the past, it is considered to have expanded if it increases its herd size beyond the herd size described in the CEQA document. If a bovine operation did not complete and receive approval of a CEQA document in the past, it is considered to have expanded if it increases its herd size beyond its “existing herd size”, which is the maximum number of bovine animals, measured in Animal Units, housed at the facility in a single month period that occurred in the three years immediately prior to 10 February 2017. The establishment of “existing herd size” is based on this time span because herd sizes typically fluctuate.

HOW WILL THIS ORDER BE ENFORCED?

- The State Water Board’s Water Quality Enforcement Policy (Enforcement Policy) establishes a process for using progressive levels of enforcement, as necessary, to achieve compliance. It is the goal of the Central Valley Water Board to enforce this order in a fair, firm, and consistent manner. Violations of this Order will be evaluated on a case-by-case basis with appropriate enforcement actions taken based on the severity of the infraction and may include issuance of administrative civil liabilities. Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative dischargers in achieving compliance; 2) compel compliance for

repeat violations and recalcitrant violators; and 3) provide a disincentive for noncompliance. Progressive enforcement actions may begin with informal enforcement actions such as a verbal, written, or electronic communication between the Central Valley Water Board and a Discharger. The purpose of an informal enforcement action is to quickly bring the violation to the Discharger's attention and to give the Discharger an opportunity to return to compliance as soon as possible. The highest level of informal enforcement is a Notice of Violation. The Enforcement Policy recommends formal enforcement actions for the highest priority violations, chronic violations, and/or threatened violations. Violations of the Bovine General Order that will be considered as high priority violations include, but are not limited to:

- Any discharge of waste and/or storm water from the manure storage areas (including ponds) to surface waters.
- The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner.
- The discharge of wastewater to surface water from cropland.
- Failure to submit notification of a discharge to surface water.
- Falsifying information or intentionally withholding information required by applicable laws, regulations or an enforcement order.
- Failure to submit a Design Report for any new or enlarged wastewater pond prior to construction and/or a Post Construction Report for such construction.
- Failure to pay annual fee, penalties, or liabilities.
- Failure to monitor as required.
- Failure to submit required reports on time.

ECONOMIC ANALYSIS OF THE IMPACT OF THIS ORDER

Based on currently available information on the operational practices at Confined Bovine Feeding Operations, staff has estimated the cost of compliance for facilities in the Limited Time, Limited Population, and Full General Order Coverage tiers. For each type of facility, the number of animals and the number of features at the operation (cropland, wastewater ponds, and composting operations, for example) that would require monitoring and report preparation were estimated. The results of that analysis are summarized in Table 1.

Type of Operation	Cost Based on Complexity of Operation First year cost/facility // Annual cost/facility			First year cost/facility	Annual cost/facility
	Simple	Medium	Complex		
Limited Time				\$15,000	\$7,500
Limited Population				\$1,000	N/A
Full General Order Coverage – Small (250 animals)	First year =\$10,100 Annual =\$6,600	Not evaluated	First year =\$41,600 Annual =\$22,700		
Full General Order Coverage – Medium (2,000 animals)	First year =\$13,400 Annual = \$9,100	First year =\$30,100 Annual =\$15,700	First year =\$46,600 Annual =\$27,200		
Full General Order Coverage – Large (100,000 animals)	First year =\$21,500 Annual =\$17,800	First year =\$47,900 Annual =\$29,000	First year =\$60,700 Annual =\$39,500		

Table 1. Cost of Implementation of Bovine General Order

Confined Bovine Feeding Operations in the “Simple” category have no cropland associated with the facility, and therefore do not need to develop a Nutrient Management Plan or collect the associated wastewater, plant tissue, and soil samples, or maintain records of nutrient applications or harvested quantities of crops. They do not have composting operations or wastewater ponds. As a result, their compliance costs are smaller relative to operations that have such features.

Operations in the “Medium” category have cropland associated with the facility and have wastewater ponds on site. However, they do not have composting operations and are not at risk to discharge to surface water, which reduces inspection and monitoring costs.

Operations in the “Complex” category have the most elements that require monitoring and reporting. They have cropland, wastewater ponds, and composting operations associated with the facility. They also have discharges of storm water and/or tailwater to surface water that will require monitoring.

For Limited Time tier operations, the cost of compliance is assumed to consist of preparation of a Notice of Intent, inspections of the production area, testing of corral runoff retained in storage ponds, preparation and submittal of annual reports, and the development of an Operation and Maintenance Plan for the production area features, such as corrals, at the facility.

For Limited Population tier operations, the cost of compliance is assumed to consist of preparation of a Notice of Intent, and the development of an Operation and

Maintenance Plan for the production area features, such as corrals, at the facility. Annual reports are not required for Limited Population tier operations.

The cost of implementing the Operation and Maintenance (O & M) Plan is not included in Table 1 for any of the types of facilities. The O & M Plan outlines good housekeeping procedures customized to the specific bovine operations that are designed to ensure that impacts to ground and surface water are minimized. In most cases, the O & M Plan will memorialize practices already in place at the bovine operation, such as the regular cleaning and grading of corrals and the maintenance of gutters and water troughs.

Costs for the construction of wastewater ponds are site-specific. General information on the cost of several types of wastewater ponds are included on Pages IS-26 and 27, and in Attachments A and B to this Information Sheet. Improvements to the facility to provide flood protection and the construction of a facility-specific groundwater monitoring network have not been included in Table 1 as the need for these tasks and the associated costs are dependent on site-specific conditions. Estimated additional costs for participation in a representative groundwater monitoring program as an alternative to the construction of an individual groundwater monitoring network have not been provided in Table 1, as these programs have not yet been developed.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Water Quality Control Plans

The Central Valley Water Board has adopted Water Quality Control Plans (Basin Plans) for the Sacramento River and San Joaquin River Basins (4th ed.) and for the Tulare Lake Basin (2nd ed.). These two Basin Plans designate the beneficial uses of groundwater and surface waters of the Central Valley Region, specify water quality objectives to protect those uses, and include implementation programs for achieving water quality objectives. The Basin Plans also incorporate, by reference, plans and policies of the State Water Board, including the *State Anti-Degradation Policy* and State Water Board Resolution 88-63 (*Sources of Drinking Water Policy*). The Bovine General Order contains requirements necessary to bring the discharges of waste from the Operations into compliance with the Basin Plans, including requirements to meet the water quality objectives and protect beneficial uses specified in the Basin Plans, and other applicable plans and policies.

Beneficial Uses of Surface Water and Groundwater

The State Water Board adopted statewide standard definitions for beneficial uses of surface and ground waters. These standard definitions were used to identify the existing and potential future beneficial uses contained in the Basin Plans. Consideration also was given to the practicability of restoring uses which may have been lost because of water quality.

Surface Waters: Pursuant to Chapter II of the Basin Plans, the beneficial uses of surface water may include: municipal and domestic supply; agricultural supply; industrial process supply; industrial service supply; hydro-power generation; water contact

recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning reproduction and/or early development; wildlife habitat; navigation; rare, threatened, or endangered species; groundwater recharge; freshwater replenishment; aquaculture; and preservation of biological habitats of special significance. The Sacramento River and San Joaquin River Basins Plan includes four additional beneficial use designations not specified in the Tulare Lake Basin Plan (agricultural stock watering, commercial and sport fishing, estuarine habitat, and shellfish harvesting). Both Basin Plans contain a Table that lists the surface water bodies and the beneficial uses. Where water bodies are not specifically listed, the Basin Plans designate beneficial uses based on the waters to which they are tributary.

The beneficial uses are protected in the Bovine General Order by, among other requirements, a prohibition on the direct or indirect discharge of waste and/or storm water from the production area to surface waters, a prohibition on the discharge of wastewater to surface waters from cropland, a prohibition on any discharge of storm water to surface water from the land application areas unless the land application area has been managed consistent with a certified Nutrient Management Plan, and a prohibition on the discharge of waste from Confined Bovine Feeding Operations to surface waters that causes or contributes to an exceedance of any applicable water quality objective or any applicable state or federal water quality criterion.

Groundwater: Chapter II of the Sacramento River and San Joaquin River Basin Plan states:

“Unless otherwise designated by the Regional Water Board, all groundwaters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.”

Chapter II of the Tulare Lake Basin Plan designates the beneficial uses of groundwater to include municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, water contact recreation, and wildlife habitat. The Tulare Lake Basin Plan includes a table that lists the designated beneficial uses of groundwater within the Basin.

These beneficial uses are protected in this Order by, among other requirements, the specification that the discharge of waste at Confined Bovine Feeding Operations shall not cause a violation of water quality objectives or cause pollution or nuisance. Degradation of groundwater is allowed provided it is in accordance with this Bovine General Order.

Water Quality Objectives

Pursuant to Water Code section 13263(a), Waste Discharge Requirements (WDRs) must implement the Basin Plans, and the Board must consider the beneficial uses of water, the water quality objectives reasonably required to protect those beneficial uses,

other waste discharges, and the need to prevent nuisance conditions. Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. (Wat. Code, § 13050(h).) Water quality objectives apply to all waters within a surface water or groundwater resource for which beneficial uses have been designated. Water quality objectives are listed separately for surface water and groundwater in Chapter III of the Basin Plans and are either numeric or narrative. The water quality objectives are implemented in WDRs consistent with the Basin Plans' *Policy for Application of Water Quality Objectives*, which specifies that the Central Valley Water Board "will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives." To derive numeric limits from narrative water quality objectives, the Board considers relevant numerical criteria and guidelines developed and/or published by other agencies and organizations.

The primary waste constituents of concern (COCs) due to discharges of waste from Confined Bovine Feeding Operations with respect to surface waters are: nitrogen in its various forms (ammonia and un-ionized ammonia, nitrate, nitrite, and total Kjeldahl nitrogen), phosphorus, potassium, salts (as measured by total dissolved solids and electrical conductivity), total suspended solids, and pathogens.

The COCs due to discharges of waste from Confined Bovine Feeding Operations with respect to groundwater are: nitrogen in its various forms (ammonia and un-ionized ammonia, nitrate, nitrite, and total Kjeldahl nitrogen), salts, and general minerals (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, and chloride). The discharge of waste from Confined Bovine Feeding Operations must not cause surface water or groundwater to exceed the applicable water quality objectives for those constituents. If compliance cannot be immediately achieved, the Board may set a compliance time schedule for the discharger to achieve compliance with the water quality objectives. Under the Basin Plans, this time schedule must be "as short as practicable."

Water Quality Objectives and Federal Criteria for Surface Water¹

Water quality objectives that apply to surface water include, but are not limited to, (1) numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Cal. Code Regs., tit. 22, §§ 64431 and 64444 and are applicable through the Basin Plans to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, and the salinity objectives; and (2) narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, and the toxicity objective. The Basin

¹ The Bovine General Order prohibits the direct or indirect discharge of waste and/or storm water from the production area to surface waters, the discharge of wastewater to surface waters from cropland, and the discharge of storm water to surface water from the land application areas where manure or process wastewater has been applied unless the land application area has been managed consistent with a certified Nutrient Management Plan.

Plans also contain numeric water quality objectives that apply to specifically identified water bodies, including for example, electrical conductivity objectives for the Delta. Federal water quality criteria that apply to surface water are contained in federal regulations referred to as the California Toxics Rule and the National Toxics Rule. (See 40 C.F.R. §§ 131.36 and 131.38.)

Water Quality Objectives for Groundwater

Water quality objectives that apply to groundwater include, but are not limited to, (1) numeric objectives, including the bacteria objective and the chemical constituents objective (includes state MCLs promulgated in Cal. Code Regs., tit. 22, §§ 64431 and 64444 and are applicable through the Basin Plans to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives. The Tulare Lake Basin Plan also includes numeric salinity limits for groundwater.

State Water Board Resolution 88-63 (The Sources of Drinking Water Policy)

The *Sources of Drinking Water Policy* states that all surface waters and groundwaters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply, except where the groundwater meets one or more of the criteria specified in the Basin Plan, including:

1. The TDS exceeds 3,000 milligrams per liter (mg/L) (5,000 micromhos per centimeter ($\mu\text{mhos/cm}$) electrical conductivity) and the aquifer cannot reasonably be expected by the Regional Board to supply a public water system;
2. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices;
3. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; or
4. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4. for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

Both Basin Plans include criteria for granting exceptions to municipal and domestic supply designations based on the *Sources of Drinking Water Policy*. The Tulare Lake Basin Plan also includes criteria for granting exceptions to the designation of beneficial uses for agricultural supply and industrial supply. The Tulare Lake Basin Plan specifies exceptions to the designated beneficial uses for some groundwater within the Tulare Lake Basin. Exceptions to the *Sources of Drinking Water Policy* are not self-implementing, but must be established in an amendment to the Basin Plan.

Title 27 of the California Code of Regulations

Title 27 of the California Code of Regulations prescribes minimum standards for animal waste at confined animal operations. For surface water protection, Title 27 includes requirements for the design of containment facilities for both storm water and process wastewater and for adequate flood protection. For groundwater protection, the minimum standards in Title 27 require Confined Bovine Feeding Operations to minimize percolation of wastewater to groundwater in fields, apply manure and wastewater to fields at reasonable agronomic rates, and minimize infiltration of water into underlying soils in manured areas. Furthermore, retention ponds must be located in, or lined with, soils of at least 10 percent clay and no more than 10 percent gravel. (Cal. Code. Regs., tit. 27, § 22562(d).)

However, it is Central Valley Water Board staff's understanding that the retention pond standard was developed based on the assumption that manure solids contained within the wastewater would effectively reduce the permeability of the soils lining the wastewater ponds. This reduced permeability would result in a lowering of the pond leaching rate to a level thought to be protective of groundwater quality. An October 2003 report (the "Task 2 Report") by Brown, Vence, and Associates (BVA) confirmed that the "...current Title 27 requirements are insufficient to prevent groundwater contamination from Confined Bovine Feeding Operations, particularly in vulnerable geologic environments." Adverse impacts have been detected in areas where groundwater is as deep as 120 feet below ground surface, and in some areas underlain by fine-grained sediments. Factors that appear to affect a clay-lined pond's ability to be protective of groundwater quality vary significantly from site to site due to native soil conditions, pond construction, pond age, manure properties, climate, pond operation, pond maintenance and depth to groundwater. Potential controlling factors appear to include: the inherent structure of the underlying soil, the moisture content of the unsaturated portion of the aquifer (vadose zone), the presence or absence of macropores or preferential pathways within the vadose zone (examples are desiccation cracking, earthworm channels, and development of root holes), and the oxidation reduction conditions present within the vadose zone and within the aquifer itself.

Resolution 68-16 (State Anti-Degradation Policy)

The *State Anti-Degradation Policy*, adopted by the State Water Board in October 1968, limits the Board's discretion to authorize the degradation of high-quality waters. This policy has been incorporated into the Board's Basin Plans. High-quality waters are those waters where water quality is more than sufficient to support beneficial uses designated in the Board's Basin Plan. Whether or not water is high-quality water is established on a constituent-by-constituent basis, which means that an aquifer can be considered high-quality water with respect to one constituent, but not for others. (State Water Board Order WQ 91-10.)

The following provisions of the *State Anti-Degradation Policy* are directly applicable to the discharges regulated by the Bovine General Order:

- Whenever the quality of water is better than the quality established in policies as of the date on which such policies become effective, such high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.
- Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

Generally speaking, these provisions require that the Board adopt standards and requirements to ensure the Discharger controls the discharge by employing “best practicable treatment or control” methodologies to limit the extent of the degradation, and that the Board carefully consider whether the permitted degradation inheres to the maximum benefit to the people of the State when the Board prescribes waste discharge requirements that will result in the degradation of high-quality waters. The *State Anti-Degradation Policy* also requires that the Board prohibit waste discharges from resulting in water pollution or nuisance, though this is a requirement that also exists outside the context of the *State Anti-Degradation Policy*. (see Wat. Code, § 13263.)

The State Water Board has provided only limited guidance regarding the *State Anti-Degradation Policy*. The State Water Board’s Administrative Procedures Update 90-004 provides guidance for implementing *State Anti-Degradation Policy* and the Clean Water Act’s anti-degradation provisions (40 C.F.R. § 131.12.) in the context of NPDES permitting. Although APU 90-004 is not directly applicable to the Bovine General Order because nonpoint discharges from agriculture are exempt from NPDES permitting requirements, the Appellate Court found this document informative in interpreting the *State Anti-Degradation Policy*.

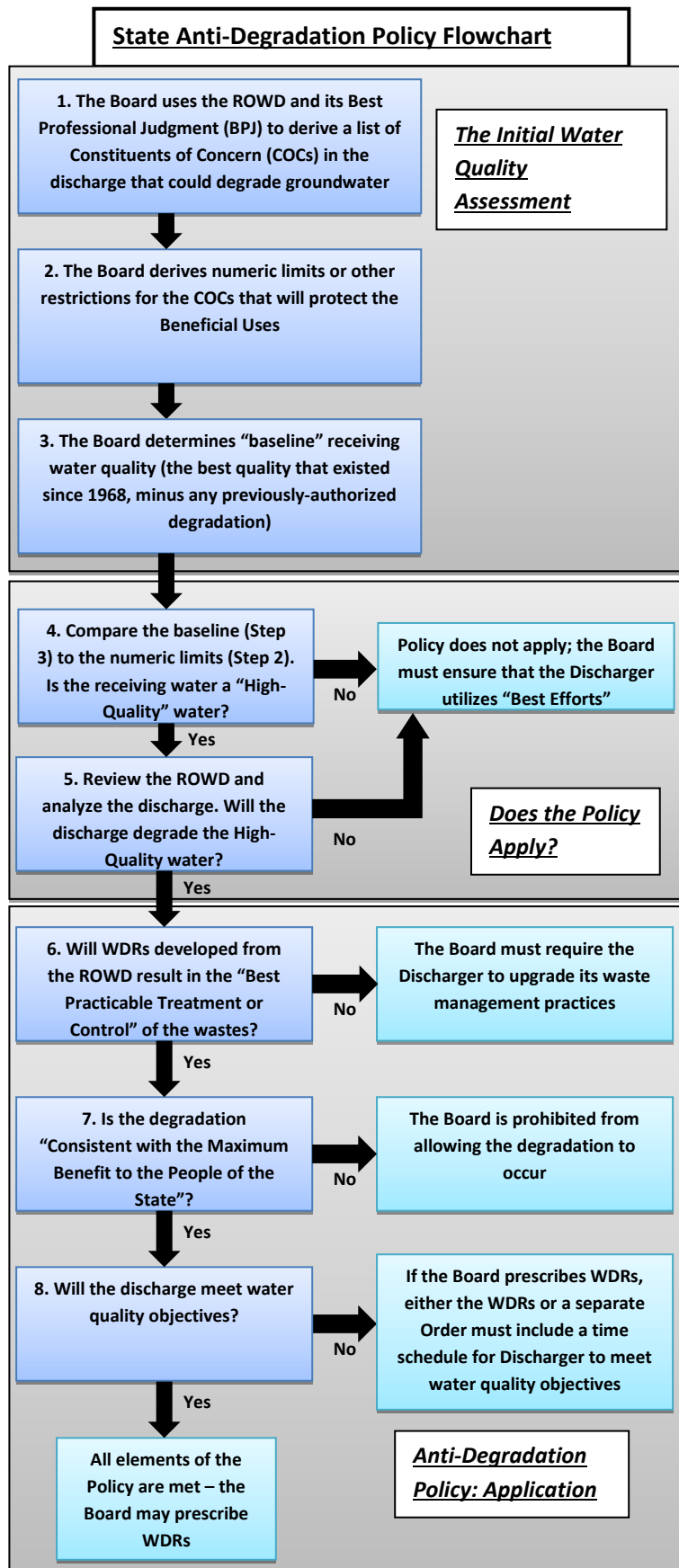
The flow chart on the following page describes the process that the Board generally uses to apply the *State Anti-Degradation Policy*, and the following discussion elaborates on how these requirements are applied in the context of the Bovine General Order.

The following sections describe the step-by-step approach for applying the Anti-Degradation Policy, followed by the direct application of this policy to the Bovine General Order.

The Initial Water Quality Assessment

Step 1: Due to the constituent-by-constituent nature of an anti-degradation analysis, the

Board must first compile a list the waste constituents present in the discharge that could degrade groundwater. These constituents are referred to as “constituents of concern,” or COCs. The Board uses its best professional judgment to determine this suite of COCs, which is usually extrapolated from the ROWD that was submitted by the discharger.



Step 2: Once the Board has compiled the list of COCs, it then references numeric limits or other restrictions that would protect the beneficial uses associated with the receiving water. Some constituents, such as those constituents that have Maximum Contaminant Levels established in Title 22 of the California Code of Regulations, have numeric water quality objectives associated with them, while others have only narrative water quality objectives associated with them. For constituents that have only narrative water quality objectives associated with them, the Board derives numeric limits by considering relevant numerical criteria and guidelines developed and/or published by other agencies and organizations. (e.g., State Water Board, California Department of Health Services, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and

Wildlife, U. S. EPA, U. S. Food and Drug Administration, National Academy of Sciences, U. S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations).

Step 3: The Board then makes a good-faith effort to determine best water quality that has existed since 1968, the year in which the anti-degradation policy was promulgated (often data from 1968 or earlier are unavailable). The Board then determines whether any subsequent lowering of water quality was due to a regulatory action taken by the Board. The best quality that has existed since 1968, minus any authorized degradation, becomes the “baseline” water quality¹.

Determining Whether the Anti-Degradation Policy is Triggered

Step 4: The Board compares the numeric limits derived in Step 2 with the baseline water quality derived in Step 3. For each constituent, if the baseline water quality is better than the derived limits (i.e., the quality needed to support all of the beneficial uses), then the water is considered a “high-quality water.” If the receiving water is not a high-quality water for all of the COCs, then the State Anti-Degradation Policy does not apply.

Step 5: The Board determines whether the discharge will degrade the receiving water. The Board makes this determination by comparing the information contained in the discharger’s ROWD or other applicable information with the baseline water quality. If the discharge will not degrade the receiving water, then the State Anti-Degradation Policy does not apply.

Application of the State Anti-Degradation Policy’s Requirements

Step 6: If the discharge will degrade a high-quality water, then the State Anti-Degradation Policy requires the Board to prescribe requirements that will result in the best practicable treatment or control (BPTC) of the wastes in the discharge. BPTC is an evolving concept that takes into account changes in the technological feasibility of deploying new or improved treatment or control methodologies, new scientific insights regarding the effect of pollutants, and the economic realities that regulated industries face. Because this concept evolves over time, standard industry practices that are considered BPTC today may not be considered BPTC in the future. And though “practicality” limits the extent to which a discharger must implement expensive treatment or control measures, the Board must ultimately ensure that discharges do not cause pollution or nuisance, thereby protecting those who rely on the quality of groundwater and surface waters.

¹ Water quality control policies adopted subsequent to 1968 may alter the calculation of this baseline.

Neither the Water Code nor the State Anti-Degradation Policy defines the term “best practicable treatment or control.” However, the State Water Board has stated that “one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality.” (See Order WQ 2000-07, at pp. 10-11). Furthermore, in a “Questions and Answers” document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to include:

“[A] comparison of the proposed method to existing proven technology; evaluation of performance data (through treatability studies); comparison of alternative methods of treatment or control, and consideration of methods currently used by the discharger or similarly situated dischargers.”

Though the Board is prohibited from specifying the design, location, type of construction, or particular manner in which a discharger may comply with a requirement, order, or decree (Wat. Code § 13360.), the Board can still compare the treatment or control practices that a discharger has described in its ROWD to the treatment or control practices employed by similarly-situated dischargers in order to make a BPTC determination. (State Water Board Order WQ 2000-7.) Furthermore, “practicability” dictates that the Board consider the costs associated with the treatment or control measures that are proposed in the ROWD.

Step 7: The *State Anti-Degradation Policy* also requires that the Board consider whether the degradation authorized in a permit is “consistent with the maximum benefit to people of the state.” For discharges subject to the federal Clean Water Act, it is only after “intergovernmental coordination and public participation” and a determination that “allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located” that the Board can allow for degradation. (40 C.F.R. § 131.12.)

As described in the Question and Answers Document mentioned above, some of the factors that the Board considers in determining whether degradation is consistent with the maximum benefit to people of the State include: economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. USEPA guidance clarifies that the federal anti-degradation provision,

“... is not a ‘no growth’ rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in “high quality waters” is necessary to accommodate important economic or social

development” (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4).

It is, however, important to keep the “maximum benefit to people of the state” requirement in context. Neither the *State Anti-Degradation Policy* nor the Water Code allows unreasonable effects to beneficial uses. Therefore, such unreasonable effects (such as the unmitigated pollution of a drinking water source) are not the focus of the Board’s inquiry, because they are legally prohibited. Instead, the *State Anti-Degradation Policy* requires the Board to consider the costs that may be imposed on other dischargers as a result of the degradation that the Board is allowing to occur. For example, if the Board allows a discharger to operate a sub-standard facility that degrades a high-quality groundwater, dischargers situated downstream (for surface waters) or downgradient (for groundwaters) from that discharge would be discharging to a receiving water that lacks any capacity to assimilate additional waste loads. This may impose higher treatment costs on the downstream/downgradient discharger.

Ultimately, the Board may allow degradation to occur following a demonstration that the degradation is consistent with the maximum benefit to the people of the state; the *State Anti-Degradation Policy* is not a no-growth or no-degradation policy. However, the Board must justify why this degradation is beneficial not only to the discharger, but to others reliant on the water quality of the receiving water body.

Step 8: The Board must ensure that discharges will not unreasonably affect present and anticipated beneficial uses, will not result in water quality less than that prescribed in relevant policies, and will not cause pollution or nuisance. The Water Code defines “pollution” to mean an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either the waters for beneficial uses or the facilities which serve these beneficial uses, i.e., violation of water quality objectives. (Wat. Code, § 13050(1).) The term nuisance is defined as anything that is, (1) injurious to health, 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; (2) affects an entire community or considerable number of persons; and (3) occurs during, or as a result of, the treatment or disposal of wastes. (Wat. Code, § 13050(m).) To constitute a nuisance, all three factors must be met.

The Board ensures that this component of the *State Anti-Degradation Policy* is met by requiring a discharger to comply with water quality objectives designed to protect all designated beneficial uses, thereby protecting those who rely on the quality of groundwater and surface waters.

The State Anti-Degradation Policy as Applied to the Bovine General Order

Steps 1-5 (Applied): Although background water quality varies significantly in those areas covered by the Bovine General Order, most receiving waters are considered high-quality waters for one or more constituents of concern, and wastes from bovine facilities will degrade these waters, thereby triggering the *State Anti-Degradation Policy*.

Step 6 (Applied): Given that the *State Anti-Degradation Policy* applies, the Board must ensure that the Bovine General Order requires regulated facilities to implement BPTC measures to minimize the amount of degradation that will occur.

Although facilities vary, generally speaking, the waste management practices employed by Confined Bovine Feeding operations can be broken down into three distinct areas: production areas (including feed storage areas and corral areas), wastewater ponds, and land application areas. The following is a discussion of what the Board considers to be BPTC for each of these three components of the regulated bovine operations.

Best Practicable Treatment or Control Measures for the Production Area

The Bovine General Order considers the term “Production Area” to mean feed and non-liquid manure storage areas, wastewater ponds, and corrals (i.e., animal confinement areas). Pond requirements are discussed separately below. For the remaining areas, the most effective way to reduce or eliminate water quality impacts is to restrict the infiltration of waste in these areas. The Bovine General Order requires that all corrals, pens, or hutch areas, composting operations, and manure and feed storage areas be graded and maintained to promote drainage and convey all drainage to the wastewater management system. All production area structures must be constructed or otherwise designed so that clean rainwater is diverted away from manured areas, feed storage areas, and waste containment facilities, unless drainage is fully contained in the wastewater management system. Areas beneath and surrounding water troughs and permanent feed racks are to be paved. Operators must design and maintain the animal confinement area (including corrals), and manure and feed storage areas in a manner that limits infiltration so that wastes, nutrients, and contaminants generated are directed to the wastewater pond(s). The Bovine General Order requires that standing water in these areas as of 72 hours after the last rainfall and infiltration of water into the underlying soils be minimized (see Production Area Specification D-4 of the Bovine General Order).

Best Practicable Treatment or Control Measures for Land Application Areas

Normal commercial farming practices, including the application of bovine wastes to cropland as fertilizer, can contribute salts, nutrients, pesticides, trace elements, sediments, and other by-products that can affect the quality of surface water and groundwater. Evaporation and crop transpiration remove water from soils, which can result in an accumulation of salts in the root zone. Additional amounts of water are often applied to leach the salts below the root zones. These leached salts can cause impacts to groundwater or surface waters. Even using the most efficient irrigation systems and appropriate fertilizer application rates and timing to correspond to crop needs, irrigation of cropland may degrade high-quality groundwater. In addition, in land application areas where groundwater is shallow, some Dischargers have installed subsurface (tile) drainage systems to maintain the groundwater level below the crop’s root zone. Drainage from these systems, which may include constituents originating from the

Confined Bovine Feeding Operations, may be discharged directly to surface water bodies or to drainage ditches that discharge to surface water bodies. Some of these systems discharge to evaporation basins that are subject to waste discharge requirements.

With respect to salts and nutrients, the key to limiting degradation and ensuring compliance with water quality objectives at the bovine operations' land application areas is an effective Nutrient Management Plan, which specifies the volume and composition of the wastewater that can be applied to land application areas without causing adverse groundwater impacts. The Board considers an effective Nutrient Management Plan to be BPTC for the land application areas. Many operations subject to the Bovine General Order have been operating for many years without a Nutrient Management Plan. In response, the Bovine General order requires each operator to develop and implement a Nutrient Management Plan. Cropland that only receives solid manure has the option, under the Bovine General order, of being placed under the Irrigated Lands Regulatory Program (ILRP) and complying instead with the nutrient management provisions of that program because solid manure is already used as a nutrient source on other cropland that is not a part of a bovine operation and is regulated under the ILRP.

Unlike most other groundwater-related components of a bovine operation's waste management strategy, Nutrient Management Plans have received a significant amount of attention from the USEPA. This is because precipitation-related discharges from land application areas are considered agricultural storm water discharges, and are therefore not subject to the federal Clean Water Act's CAFO regulations. However, this exemption applies only when the "...manure, litter, or process wastewater [at the land application area] has been applied in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater..." (40 C.F.R. §122.23.) Therefore, the USEPA has taken a close interest in the "site specific nutrient management practices" for application of waste from large concentrated animal feeding operations to land application areas. The Bovine General Order mandates that Confined Bovine Feeding Operations employ the management practices required by Title 40 Code of Federal Regulations Section 122.42(e)(1)(vi)-(ix).

Because the Bovine General Order requires compliance with the federal CAFO regulatory requirements, precipitation-related discharges from land application areas at facilities operating in compliance with this Order are considered agricultural storm water discharges. And since they are consistent with USEPA's "best practicable control technology," the technical standards for nutrient management represent BPTC for the purposes of compliance with the *State Anti-Degradation Policy*. In addition, the Bovine General Order requires operations that utilize tile drain systems to identify their location and discharge point(s) and to monitor discharges from these systems. The Bovine General Order also specifies well and surface water setbacks and requires certification of backflow prevention for all irrigation wells (General Specification B4 and Attachment B, Section G [*Waste Management Plan for the Production Area for Confined Bovine Feeding Operations*]). Additionally, the Bovine General Order's Land Application Area

Specifications contains additional requirements regarding waste infiltration and soil moisture capacity limits for waste application.

Pond Requirements: Generally

The Bovine General Order includes requirements that all ponds must be verified by an engineer to have adequate capacity and structural integrity to hold wastewater and precipitation. All ponds must be managed and maintained to prevent breeding of mosquitoes and other vectors. Ponds shall not have small coves and irregularities around the perimeter of the water surface. Weeds shall be minimized in all ponds through control of water depth, harvesting, or other appropriate method, and dead algae, vegetation, and debris shall not be allowed to accumulate on the water surface. These measures are required elements of a BPTC program for all ponds, whether they are already existing ponds or new or expanded ponds.

In addition, the Bovine General Order includes a requirement that the invert (lowest point) in all ponds (whether existing, new, or expanded) must be above the highest anticipated elevation of underlying groundwater. In the Tulare Lake Basin, the invert must be a minimum of five feet above the highest anticipated elevation of groundwater, as required in the Basin Plan for the Tulare Lake Basin. This requirement is designed to preclude a direct connection between ponds and groundwater. If there is reason to believe that the invert of an existing pond does not meet these criteria, the Bovine General Order requires the Discharger to conduct an investigation within six months of issuance of a Notice of Applicability to the bovine operation, to determine if the invert of the pond intersects groundwater. If the investigation indicates that the pond does not meet the separation requirement, the Discharger shall propose modifications, with a time schedule that is as short as practicable, that will ensure that the pond design is protective of water quality. This provision will ensure that ponds that pose the greatest threat to groundwater quality are promptly identified and modified to be protective.

Best Practicable Treatment or Control Measures for New or Expanded Ponds

Three counties in the Central Valley Region, many other states, and the Natural Resources Conservation Service have pond design requirements that are more stringent than what is required by Title 27 (see Table 1 at the end of this Information Sheet). For new or expanded ponds, the Board considers these more stringent design standards to be BPTC.

Kings County and Merced County require new or modified ponds to have pond liners with a maximum seepage rate of 1×10^{-6} centimeters per second (cm/sec). Solano County requires new and enlarged ponds at animal operations having 1000 or more cattle or veal calves to be lined with a 60 mil high density polyethylene (HDPE) geomembrane over two feet of compacted clay.

The ten highest milk producing states and the top five states for cattle in feedlots (feedlots with a capacity of more than 1000 head) were surveyed. All but California's

Title 27 requirements include a maximum seepage rate for new waste ponds. Seepage rates range from 1×10^{-5} cm/sec (Pennsylvania) to 1×10^{-7} cm/sec (New Mexico, Wisconsin). Most state requirements include a synthetic liner option. Some state requirements are based solely on the Federal Concentrated Animal Feeding Operation (CAFO) requirements (Michigan), but most include requirements for operations that are not required to be regulated under the federal CAFO definition.

The federal Natural Resources Conservation Service (NRCS) has issued state-specific waste storage guidelines (Conservation Practice Standard [CPS] 313). In California, CPS 313 requires pond liners designed by NRCS to have a maximum target seepage rate of 1×10^{-6} cm/sec, except where aquifer vulnerability or risk is high, in which case a synthetic liner or other alternative liner is required (see Table 1 of this Information Sheet).

While these pond design requirements provide more groundwater protection than the Title 27 requirements, there are no known studies that fully evaluate the ability of any of these county, state, or NRCS pond liner requirements to protect groundwater quality. It would be difficult to determine if any proposed pond design would be protective of groundwater quality without an evaluation of site-specific information on depth to groundwater, existing groundwater quality beneath the facility, nature of the geologic material between the bottom of the retention pond and the first encountered groundwater, nature of the leachate from the retention pond, and proximity to existing supply wells. Proposed pond designs that do not include such an evaluation should be very conservative to assure protection of groundwater under any likely conditions. The most conservative pond design would include a double lined pond with a leachate collection and removal system between two geosynthetic liners. Such pond designs are currently being approved by the Central Valley Water Board at classified waste management units regulated under Title 27 of the California Code of Regulations (i.e., landfills and Class II surface impoundments) and a limited number of wastewater retention ponds at dairies.

The Bovine General Order provides a two-tiered approach that will allow the Discharger two options for retention pond design. Tier 1 includes a retention pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with Cal. Code Regs., tit. 27, § 20340) between the two liners. Review for retention ponds designed to this standard will be conducted in less than 30 days of receipt of a complete design plan package submitted to the Board. Tier 2 includes two pond options. A Tier 2 pond is a pond lined to as to be protective of water quality, as demonstrated by calculations of seepage amounts and the effect of that estimated seepage on underlying groundwater. A Tier 2 pond design must include a pan lysimeter monitoring device under the lowest point of the pond, or an engineered alternative that provides equivalent assurance of the earliest possible detection or prevention of a release from the pond.

A second option within the Tier 2 category is a “Preapproved Tier 2” design. In this case an entity, such as a Representative Monitoring Program, can develop and propose a pond design that is demonstrated by calculations to be protective of water quality under certain specified site or operational conditions. Following approval of the design by the Executive Officer, use of this design would not require additional leakage calculations or individual groundwater monitoring.

Best Practicable Treatment or Control (BPTC) Measures for Ponds at Existing Bovine Operations

Waste management features at bovine feedlot operations, and specifically wastewater retention systems, are more variable as compared to wastewater management systems at milk cow dairies. This variability poses a challenge in determining the appropriate BPTC measures for each individual existing pond at bovine operations. For example, bovine operations may be located at former dairies, which often had wastewater ponds built to contain and store large quantities of manure and recycled water used for flushing freestall barns and cleaning milking parlors and equipment. However, wastewater retention features at facilities that were designed and operated solely as bovine feedlot operations, or which were converted from former dry scrape (non-flushing) dairies, may have relatively small ponds used to capture corral runoff. Feedlot operations with small numbers of animals and a limited number of corrals would require considerably less wastewater retention capacity as compared to larger operations with more acreage devoted to livestock corrals. Feedlot operations located in areas with much more seasonal precipitation, such as Glenn County, must manage a larger amount of corral runoff as compared to feedlot operations in relatively arid areas, such as Fresno and Tulare counties, which have considerably less runoff from the livestock corrals. Variability in the permeability of soils and depth to first encountered groundwater throughout the region also poses a challenge in determining the appropriate BPTC measures for each individual existing pond at bovine operations.

In addition to the variability in the size, design, and siting of existing ponds at bovine operations, the economics of bovine operations also pose a challenge in implementing BPTC for existing ponds. The economic analysis that starts on Page IS-10 estimates the costs for implementing the monitoring and reporting requirements of the Bovine General Order at three sizes of facilities (250, 2,000, and 100,000 animals) and three levels of complexity (simple, medium, and complex). These cost estimates do not include the cost of capital improvements, such as the upgrading of existing wastewater ponds. In addition, the estimates assume that there are no wastewater ponds at “simple” operations; it is likely that a pond to collect corral runoff will need to be installed at such facilities. Staff’s estimate of the cost of construction of a 1.2 million gallon capacity wastewater pond that meets the Tier 1 (double liner) requirements is \$250,000, based on a memorandum from John Schaap and Steve Bommelje, Provost & Pritchard, to Theresa A. Dunham, Somach Simmons & Dunn (August 5, 2013), *Costs to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons*.

Information developed by a Colorado-based consulting firm estimated a capital cost of \$29,000 to construct a 140,000 gallon capacity pond with a single synthetic liner (without a pan lysimeter) at a 300 head feedlot, or \$97/head. For a 2,500 head feedlot, a similarly constructed pond with 1.2 million gallons of capacity was estimated to cost \$89,000, or \$36/head. Feedlot properties are typically valued from a low of \$100/head to a high of \$150/head. For a 300 head feedlot, the cost of a single lined pond (\$29,000) approaches the value of the property itself (\$30,000 to \$45,000). (AGPROfessionals, *Comments Regarding Capital Investment and Costs associated with draft Waste Discharge Requirements General Order for Confined Bovine Feeding Operations*, September 2016). If a double lined pond were installed, the cost of the pond would likely substantially exceed the value of the property. Because of the high cost of retrofitting existing ponds relative to the value of the property, many bovine operations, especially small ones, would likely go out of business in lieu of performing retrofitting.

Considering the wide-spread economic impacts that would occur with respect to requiring application of Tier 1 or Tier 2 requirements to existing ponds, the Central Valley Water Board finds that BPTC for existing ponds constitutes an iterative process of evaluation that includes groundwater monitoring individually or through a Representative Monitoring Program (RMP), assessment of data collected, evaluation of existing pond conditions and their impact on groundwater quality, and case studies that evaluate potential changes in management practices and/or activities that may be necessary to further protect groundwater quality from pollutant infiltration from existing ponds.

The Bovine General Order allows for the formation of an RMP to monitor a representative number of bovine operations. The Board will use the Summary Representative Monitoring Report (for bovine operations represented in an RMP) or individual Summary Monitoring Reports (for bovine operations that conduct individual monitoring), to determine whether upgrades to existing ponds will be required. Facilities where data demonstrate that an existing pond is resulting in degradation beyond what is authorized under this Order will be required to upgrade facilities on a time schedule that is as short as practicable. Substituting alternative management practices for the existing ponds (such as reducing the water level in the ponds or other methods) would also be acceptable, provided those management practices are found to be protective of groundwater quality for the conditions present where they would be implemented. Regulated bovine operations that are found not to be protective of underlying groundwater must upgrade their management practices on a time schedule that is as short as practicable, supported with appropriate technical or economic justification, but in no case may time schedules extend beyond 10 years from the date that the Summary Monitoring Report or Summary Representative Monitoring Report is approved by the Executive Officer.

The Order also includes a provision that, should other representative monitoring programs for other industries, such as the Central Valley Dairy Representative Monitoring Program, identify management practices that are not protective of water quality, bovine operations that use those management practices may be required by the

Executive Officer to modify their practices by a date earlier than the dates specified in the Bovine General Order.

Step 7 (Applied): In the case of the Confined Bovine Feeding Operations regulated by the Bovine General Order, allowing the maximum extent of degradation allowed by law (i.e., degradation up to the water quality objectives that are protective of the designated beneficial uses) would allow the Board to focus its efforts on ensuring that the discharges do not impact sensitive populations that rely on the quality of the receiving waters. In other words, while the focus of the *State Anti-Degradation Policy* is on justifying degradation that will ultimately result in water quality somewhere between the “best water quality that has existed since 1968” and a numeric limit that is protective of all beneficial uses, the Board and the bovine industry acknowledge that their primary task lies in preventing pollution and protecting sensitive uses.

The Board acknowledges that significant degradation has occurred throughout the Central Valley Region due to historic agricultural practices, including the operation of bovine facilities. In issuing the Bovine General Order, the Board will allow the maximum extent of degradation allowed by law to occur. The Bovine General Order is structured in such a way as to compel the bovine industry to focus their available resources on meeting water quality objectives, thereby protecting communities that are dependent on groundwater. As the bovine industry develops more effective management practices in the coming years, the Board may re-evaluate this goal, and may impose more stringent requirements that reflect the availability of better practicable management practices.

Step 8 (Applied): Although bovine waste materials provide nutrients to crops, they can create pollution or nuisance conditions if improperly managed or cause pollution of surface water and/or groundwater if site conditions are not taken into account in preparing a nutrient utilization and management strategy.

While the Board recognizes that it may be impracticable for the bovine industry to make dramatic changes to its waste management practices overnight, or even in a few years, those bovine operations whose practices are found to not be protective of the underlying groundwater through required individual or representative monitoring must upgrade their operations to ensure compliance with water quality objectives on a time schedule that is as short as practicable.

Allowing regulated Confined Bovine Feeding Operations (beef feedlots, calf ranches, and heifer operations) to degrade high quality waters is consistent with the maximum benefit to people of the State as long as that degradation does not result in detrimental impacts to beneficial uses over the long term. Cattle and calves represent the fourth largest agricultural commodity in California with a gross annual income of \$3.4 billion. Four of the five leading counties in California for the production of cattle and calves are located in the Central Valley (Tulare, Fresno, Merced, and Kern counties); a total of approximately 3.5 million beef cattle and dairy support stock are raised in the Central Valley. Beef feedlots in California market roughly 500,000 head of cattle annually with at least 1/3 of that total marketed by feedlots in the Central Valley. Feedlots in the Central

Valley support the two largest beef packing plants left in California, both of which exist in Fresno County, that together provide thousands of good paying jobs. California ranchers depend on beef feedlots in the Central Valley to purchase their cattle to finish and harvest. The loss of beef feedlots in the Central Valley would have a rippling affect across the industry and result in lower prices for ranchers throughout California because cattle would need to be shipped to buyers in the Midwest. Feedlots also directly employ hundreds of employees in the Central Valley working to raise cattle and mill feed along with providing thousands of indirect jobs that include but are not limited to truck drivers, farmers and farm workers that grow feed for livestock and employees at beef packing plants that depend on a local supply of beef cattle ready for harvest.

Calf ranches in California raise male dairy calves specifically to be marketed to feedlots as beef cattle and depend on a sustainable supply of male dairy calves from local dairies in the Central Valley. There are numerous calf ranches in the Central Valley that together raise 300,000 - 400,000 beef calves. Based on standard industry practices of the number of calves assigned to each employee, Central Valley calf ranches employ approximately 1,600 people. These jobs are typically well paid to promote retention and keep employees that have experience working with livestock. An industry survey suggests that calf ranch employees on average are paid in excess of \$14.00 per hour, far more than the current minimum wage of \$10.50 per hour.

In 2016, California dairies produced over 40 billion pounds of milk, with a value in excess of \$6 billion, and representing about a fifth of the nation's milk supply. According to a study conducted by the University of California Agriculture Issues Center on behalf of the California Milk Advisory Board, California's dairy industry generated \$65 billion in economic impact and supported 189,000 jobs in 2015. In 2015, the eight leading counties in California for total milk production were located in the Central Valley (Tulare, Merced, Kings, Stanislaus, Kern, Fresno, San Joaquin and Madera counties); these 8 counties accounted for 89.9% of California's total milk production. Of the 1,438 dairies statewide as of 2015, 1,180 dairies or 82% were in the Central Valley region. The availability of replacement stock (young milk cows) is important to maintain the productivity of dairies. The cost of raising replacement stock (calves and heifers) to maintain milk production represented 12% of the cost of producing milk in 2015. During 2015, heifer ranches raising replacement stock for dairies generated approximately \$953 million in sales.

Considering the economic significance of the Central Valley feedlot, calf, and heifer industries as well as the important role Central Valley bovine operations play in providing replacement animals to dairies, thus helping ensure adequate milk and beef supplies to the nation, the Central Valley Water Board finds that maintaining the Central Valley bovine industry is to the benefit of the people of the state.

Verifying that the State Anti-Degradation Policy is Satisfied

Although not an explicit provision of the *State Anti-Degradation Policy*, the Appellate Court in *Asociación de Gente Unida por el Agua v. Central Valley Regional Water*

Quality Control Bd. (2012) 210 Cal.App. 4th 1255, is precedential and instructive regarding compliance with the *State Anti-Degradation Policy*. In accordance with that decision, the Bovine General Order includes a monitoring program that is designed to determine whether discharges are in fact complying with the Order and with the *State Anti-Degradation Policy*.

The primary method used to determine if water quality objectives and the requirements of the *State Anti-Degradation Policy* are being met is surface water and groundwater quality monitoring. The Bovine General Order prohibits discharges of storm water from the production area to surface water and any discharge of storm water to surface water from the land application areas being used for nutrient utilization unless that discharge is from land that has been managed consistent with a certified Nutrient Management Plan, and unless a representative portion of such discharges have been tested to verify that ammonia and pesticides are within acceptable levels. Should discharges of manure, wastewater, or storm water occur from the production area, the Bovine General Order requires discharge monitoring and chemical analysis to determine if an exceedance of a water quality objective has occurred. The Bovine General Order also requires periodic monitoring of storm water discharges to surface waters from land application areas on a rotating basis (1/3 of the fields per year); and tailwater discharges to surface waters from the land application areas. Likewise, the Bovine General Order requires individual or representative groundwater monitoring of natural background water quality and the water quality downgradient of the waste management units (the production area, including corrals and wastewater ponds, and land application areas).

Monitoring and Reporting Program R5-2017-0058 (MRP) requires Confined Bovine Feeding Operations to sample domestic and irrigation supply wells on their property, and to either monitor first-encountered groundwater at their facility or participate in an approved representative groundwater monitoring program. The purpose of requiring monitoring of water supply wells includes identifying the quality and trends of water being used at the bovine operation and the amount of nutrients contained in irrigation water so it can be accounted for in the development of the required nutrient management plan. The purpose of requiring monitoring of first-encountered groundwater is to evaluate current management practices in order to determine whether such practices are protective of groundwater quality at the most vulnerable point. Groundwater monitoring at existing Confined Bovine Feeding Operations is necessary to: determine background groundwater quality; determine existing groundwater conditions near wastewater ponds, production areas, and land application areas; determine whether improved management practices need to be implemented; and confirm that any improved management practices will have the desired result on groundwater quality.

This Order requires the Discharger to report any noncompliance that endangers human health or the environment or any noncompliance with the Prohibitions contained in the Order within 24 hours of becoming aware of its occurrence. The Bovine General Order also requires the Discharger to submit annual monitoring reports which contain the

analytical results of laboratory data, including all laboratory analyses (including Chain of Custody forms and laboratory QA/QC results) for surface and groundwater monitoring. Additionally, an annual assessment of groundwater monitoring is required. The assessment must include an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided are representative of conditions upgradient and downgradient of the production area and land application area of the bovine operation.

Similar to the individual groundwater monitoring program, the representative groundwater monitoring program is required to submit annual monitoring reports and an evaluation of data collected to date and an assessment of whether participating bovine operations are implementing management practices that minimize degradation of high quality groundwaters and are protective of beneficial uses.

The Central Valley Water Board recognizes that monitoring the effectiveness of the bovine operations' waste management practices and their effect on groundwater is needed to verify that water quality is adequately protected and the intent of the anti-degradation policy is met. Accordingly, the Bovine General Order, in conjunction with the MRP, requires additional groundwater monitoring that must be conducted on an individual facility basis or through Representative Monitoring Programs (RMPs). Under the terms of the Bovine General Order and MRP, all Confined Bovine Feeding Operations subject to the terms of the Bovine General Order must either conduct their own groundwater monitoring or actively participate in a RMP. It is envisioned that most bovine operations subject to this Order will choose to join a RMP.

Both the individual groundwater monitoring provisions and the RMP's monitoring requirements are designed to measure water quality data over time in first-encountered groundwater. An RMP would be further required to conduct such monitoring on a variety of Confined Bovine Feeding Operations that represent the overall range of conditions on bovine facilities within the Central Valley. This means for a RMP that a variety of physical site conditions must be monitored, such as varying soil types and depth to groundwater. Varying management conditions must also be measured, such as different types of crops, irrigation methods, waste storage structures and animal housing.

It is recognized that in many cases, a single set of groundwater monitoring data, or even monitoring data over a period of months or years, may not be sufficient to determine the effectiveness of existing management practices. Evaluating groundwater results over an extended period of time, in conjunction with gathering data regarding existing surface practices, is necessary to determine whether water quality is being protected or is being unreasonably impacted.

Waters that are Not High Quality: The "Best Efforts" Approach

When a receiving water body quality exceeds or just meets the applicable water quality objective due to naturally-occurring conditions or due to prior Board-authorized

activities, it is not considered a high-quality water, and it is not subject to the requirements of the *State Anti-Degradation Policy*. However, where a groundwater constituent exceeds or just meets the applicable water quality objective, the Board must set limitations no higher than the objectives set forth in the Basin Plan. This rule may be relaxed if the Board can show that “a higher discharge limitation is appropriate due to system mixing or removal of the constituent through percolation through the ground to the aquifer.” (State Water Board Order No. WQ 81-5.) However, the Board should set limitations that are more stringent than applicable water quality objectives if the more stringent limitations can be met through the use of “best efforts.” (State Water Board Order No. WQ 81-5.) (*City of Lompoc*) The “best efforts” approach involves the establishment of requirements that require the implementation of reasonable control measures. Factors which are to be analyzed under the “best efforts” approach include the water quality achieved by other similarly situated dischargers, the good faith efforts of the Discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance. (*City of Lompoc*, at p. 7.) The State Water Board has applied the “best efforts” factors in interpreting BPTC. (See State Water Board Order Nos. WQ 79-14 and WQ 2000-07.)

In summary, the Board may establish requirements more stringent than applicable water quality objectives even outside the context of the *State Anti-Degradation Policy*. The “best efforts” approach must be taken where a water body is not “high quality” and the antidegradation policies are accordingly not triggered.

California Environmental Quality Act

As applied to existing facilities, the adoption of the Bovine General Order is exempt from the requirements of the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.) based on the following three categorical exemptions:

- California Code of Regulations, title 14, section 15301 exempts the “operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features” from environmental review. Eligibility to enroll under the Bovine General Order as an “existing” facility is limited to bovine operations that were existing facilities as of 10 February 2017. Facilities that begin operations after this date, or increase their herd size beyond the maximum number reported in their Notice of Intent, must file proof of CEQA compliance in order to obtain regulatory coverage under this Order. Note that the restoration of, or improvements to, bovine waste management systems to ensure proper function in compliance with this Order will involve minor alterations of existing private facilities.
- California Code of Regulations, title 14, section 15302 exempts the “...replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced...” The Bovine General Order will likely require covered operations to replace or reconstruct waste management systems to ensure compliance with the Order’s requirements.

- California Code of Regulations, title 14, section 15304 exempts "... minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes..." The Bovine General Order will require covered operations to make improvements to their waste management systems that will result in only minor alterations to land, water, and/or vegetation.

Confined Bovine Feeding Operations in the Central Valley currently are not regulated under a permit from the Central Valley Water Board. Confined Bovine Feeding Operations were included under a waiver program that was in effect from 1982 until its rescission in December 2002. This Bovine General Order imposes more stringent requirements compared to the previous waiver of WDRs.

The Bovine General Order reduces impacts to surface water by prohibiting discharges of: (1) waste and/or storm water to surface water from the production area, (2) wastewater to surface waters from cropland, and (3) storm water to surface water from the land application area where manure or wastewater has been applied, unless the land application area has been managed consistent with a certified Nutrient Management Plan and storm water has been tested in accordance with the Monitoring and Reporting Program.

This General Order reduces impacts to groundwater by requiring full General Order-coverage Dischargers to: (1) develop and implement Nutrient Management Plans that will control nutrient losses from land application areas; (2) implement remedial measures when groundwater monitoring demonstrates that an existing pond has adversely impacted groundwater quality; (3) design and construct new ponds and reconstructed existing ponds to comply with the groundwater limitations and specifications in the Bovine General Order; (4) document that no cross connections exist that would allow the backflow of wastewater into a water supply well; and (5) submit an Operation and Maintenance Plan to ensure that (a) procedures have been established for solids removal from retention ponds to prevent pond liner damage and (b) corrals and/or pens, animal housing areas, and manure and feed storage areas are maintained to collect and divert process wastewater and runoff to the retention pond and to minimize infiltration of wastewater and leachate from these areas to the underlying soils.

In the MRP, the Board is requiring the monitoring of discharges, surface water, groundwater, storm water, tile drainage water, and tailwater to determine compliance with the Bovine General Order.

Central Valley Salinity Alternatives for Long-Term Sustainability

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten achievement of water quality objectives in Central Valley surface waters and groundwater. The Bovine General Order requires actions that will reduce nitrate discharges and should result in practices that reduce salt loading.

The Central Valley Water Board intends to coordinate all such actions with the CV-SALTS initiative. CV-SALTS may identify additional actions that need to be taken by Confined Bovine Feeding Operations and others to address these constituents. The Bovine General Order can be amended in the future to implement any policies or requirements established by the Central Valley Water Board as a result of the CV-SALTS process.

Information Sheet
Waste Discharge Requirements General Order No. R5-2017-0058
For Confined Bovine Feeding Operations

Table 1. Regional, State, and National Pond Liner Design Requirements

Central Valley Water Board	Pond Liner Design Requirements
Waste Discharge Requirements General Order No. R5-2017-0058 (Bovine General Order)	<p>Tier 1, Tier 2, or Preapproved Tier 2 option:</p> <p><u>Tier 1:</u> A pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with Section 20340 of Title 27) between the two liners will be acceptable without a demonstration that the pond design is protective of groundwater quality.</p> <p><u>Tier 2:</u> A pond lined so as to be protective of water quality as demonstrated by calculations of seepage amounts and the effect of that estimated seepage on underlying groundwater as required in pond Specification 10c. The pond design must include a pan lysimeter monitoring device under the lowest point of the pond, or an equivalent engineered alternative that provides equivalent assurance of the earliest possible detection or prevention of a release from the pond.</p> <p>Preapproved Tier 2: A pond design that is demonstrated to be protective of water quality under certain specified site or operational conditions. The design and demonstration shall include leakage calculations and monitoring of groundwater at representative dairies with such ponds.</p>
Central Valley Counties	Pond Liner Design Requirements
Kings County	The specific discharge (seepage rate) of process water through the soils lining the bottom and sides of the manure separation pits and lagoons shall not be greater than 1×10^{-6} centimeters per second (cm/sec).
Merced County	Liner shall be designed and constructed with a seepage rate of 1×10^{-6} cm/sec or less (with no credit for manure sealing) and a minimum thickness of one foot.
Solano County	<p><u>Large confined animal facilities (700 or more mature dairy cows, 1000 or more cattle or veal calves):</u> Liner placed atop bedrock or foundation materials comprised of (from bottom to top):</p> <ol style="list-style-type: none"> (1) Two feet of compacted clay with permeability less than or equal to 1×10^{-7} cm/sec, (2) 60 mil high-density polyethylene geomembrane with a permeability less than or equal to 1×10^{-13} cm/sec, (3) Geomembrane filter fabric, and (4) 24-inch thick soil operations layer. <p><u>Medium sized confined animal facilities (200 to 699 mature dairy cows, 300-999 cattle or veal calves):</u> Liner of compacted clay that is a minimum of one foot thick, with maximum permeability of 1×10^{-6} cm/sec.</p>

Information Sheet
Waste Discharge Requirements General Order No. R5-2017-0058
For Confined Bovine Feeding Operations

Table 1. Regional, State, and National Pond Liner Design Requirements

Top 10 Milk Producing States (in order of highest to lowest milk production)	Pond Liner Design Requirements for Confined Animal Facilities
California	Title 27 of the California Code of Regulations: 10% clay and no greater than 10% gravel.
Wisconsin	Wisconsin Natural Resources Conservation Service (NRCS) Practice Standard 313: In-place soils (more than 50 percent fines and three feet thick or thicker), clay (maximum permeability of 1×10^{-7} cm/sec), geomembrane (60 mil high density polyethylene or 60 mil linear low density polyethylene), geosynthetic clay liner, or concrete .
New York	New York NRCS Conservation Practice Standard 313 and NRCS Agricultural Waste Management Field Handbook Appendix 10D (see below)
Idaho	Soils with a minimum of 15% clay or having a coefficient of permeability so that the initial design seepage is no greater than 1×10^{-6} cm/sec, or lined pursuant to NRCS Agricultural Waste Management Field Handbook Appendix 10D (see below).
Michigan	Michigan NRCS Conservation Practice Standard 313: Maximum specific discharge of 5.411×10^{-6} cm/sec; acceptable materials are compacted clay treatment, flexible membrane, soil dispersant liner, bentonite treatment liner, or concrete.
Pennsylvania	Pennsylvania NRCS Conservation Practice Standard 313: In place soils with acceptable permeability (see Appendix 10D below) or lined (soil liner with maximum seepage rate of 1×10^{-5} cm/sec, flexible membrane, bentonite, soil dispersant, or concrete)
Texas	1.5 feet of compacted clay with maximum permeability of 1×10^{-7} cm/sec and specific discharge not to exceed 1.1×10^{-6} cm/sec with water level at the spillway depth. Requires documentation of no significant leakage or that any leakage will not migrate to waters of the state.
Minnesota	Any material that meets maximum seepage standard of $1/56^{\text{th}}$ inch/day (5.0×10^{-7} cm/sec).
New Mexico	Case-by-case but 2 feet of compacted clay or 60 mil High Density Polyethylene (HDPE) synthetic is standard, permeability of 1×10^{-7} cm/sec or less.
Washington	Washington NRCS Conservation Practice Standard 313: Maximum soil permeability of 1×10^{-6} cm/sec or a compacted clay liner, amended soil or synthetic liner required meeting requirements of NRCS Conservation Practice Standards 521A through 521D.

Information Sheet
Waste Discharge Requirements General Order No. R5-2017-0058
For Confined Bovine Feeding Operations

Top 5 States for Cattle in Feedlots (feedlots with a capacity of more than 1000 head)	Pond Liner Design Requirements
Texas	See preceding table
Nebraska	Percolation of existing ponds not to exceed 7.35×10^{-6} cm/sec. New or expanding ponds to either have earthen liners with percolation rate not to exceed 3.82×10^{-6} cm/sec or to be lined with a flexible membrane liner over a compacted subbase.
Kansas	New or modified ponds to be lined with either a synthetic liner or 2 or more layers of compacted soil. Seepage rate from the pond not to exceed 2.94×10^{-6} cm/sec if over sensitive groundwater area; otherwise, seepage rate is not to exceed 7.35×10^{-6} cm/sec.
Colorado	Seepage rate of 1×10^{-6} cm/sec or less or, for pond collecting only open lot runoff, 7.35×10^{-6} cm/sec plus documentation that the pond is not designed as an evaporation impoundment and that the ten foot soil depth zone immediately beneath the impoundment has a cation exchange capacity of at least 15 meq/100 g of soil.
Iowa	Steel or concrete ("formed") structures preferred. If new "unformed" structure, seepage rate to be 1.84×10^{-6} cm/sec or less and to be a minimum of 12 inches thick if onsite soils used or 24 inches thick if imported soils used due to lack of suitable materials onsite.

Information Sheet
Waste Discharge Requirements General Order No. R5-2017-0058
For Confined Bovine Feeding Operations

<p style="text-align: center;">Natural Resources Conservation Service (NRCS)</p>	<p style="text-align: center;">Pond Liner Design Requirements</p>
<p>NRCS Agricultural Waste Management Field Handbook Appendix 10D – Geotechnical, Design, and Construction Guidelines</p>	<p>In-place soils at least two feet thick and maximum permeability of 1×10^{-6} cm/sec.</p> <p>Consider liner if: aquifer is unconfined and shallow and/or aquifer is a vital water supply; site underlain by less than two feet soil over bedrock, coarse-grained soils with less than 20 percent low plasticity fines, or soils with flocculated clays or highly plastic clays with blocky structure.</p> <p>Acceptable liners: Compacted clay liner (allowable seepage rate of 1×10^{-6} cm/sec if manure sealing cannot be credited or 1×10^{-5} cm/sec if manure sealing can be credited, minimum thickness of one foot), concrete, geomembranes, or geosynthetic clay liners.</p>
<p>California NRCS Conservation Practice Standard 313</p>	<p>Target maximum seepage rate of 1×10^{-6} cm/sec for all vulnerability/risk categories, except that:</p> <ol style="list-style-type: none"> (1) Synthetic liner required when aquifer vulnerability and risk are high (i.e., groundwater is within five to 20 feet of the pond bottom or coarse soils are present <u>and</u> the pond is within 600 feet from a domestic supply well), or (2) Other storage alternatives required when the aquifer vulnerability and risk are very high (i.e., groundwater is within five feet of the pond bottom or the pond is less than 600 feet from an improperly abandoned well <u>and</u> the pond is less than 1,500 feet from a public supply well or less than 100 feet from a domestic supply well).



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Information Sheet - Attachment A

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MEMORANDUM

To: Theresa A. Dunham; Somach, Simmons & Dunn

From: John Schaap, Steve Bommelje

Subject: Costs to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons.

Date: August 5, 2013

This memo estimates the costs to retrofit existing dairies that have do not have Tier 1 or Tier 2 lagoons for a range of dairy sizes. It also discusses other cost drivers that could impact retrofit projects.

Qualifications

John Schaap graduated from California Polytechnic State University, San Luis Obispo, California with a B.S. in Agricultural Engineering. He also holds an M.S. in Biological and Agricultural Engineering from the University of California, Davis, California.

Mr. Schaap is a registered agricultural and civil engineer in the State of California (license numbers AG 563 and C 61754). He has been in private practice as a consulting agricultural and civil engineer since January 2001, and has specialized full-time in dairy related matters in the San Joaquin Valley since that time. Mr. Schaap is a principal engineer with Provost and Pritchard Consulting Group (P&P).

Provost and Prichard Consulting Group has been meeting agricultural design and consulting needs in Central California since 1968. We have offices in Fresno, Bakersfield, Visalia, Clovis, Modesto, and Los Banos. Our staff includes licensed agricultural and civil engineers, as well as licensed geologists and other technical staff experienced in dairy work.

P&P acquired the dairy design firms of Valley Management Systems, Inc. (VMS) and EJS & Associates, Inc. in 2004, enfolding key personnel into the company to strengthen our dairy business. Since then, our firm has been at the forefront in assisting dairy clients achieve compliance with new or changing regulatory requirements, for both new and existing facilities.

Within approximately the last 10 years, P&P has designed and assisted in the certification of over 50 dairy lagoons in the Central Valley. These have included approximately 27 sites with lagoons meeting the 10% clay soil requirement, 7 sites that followed the NRCS Appendix 10D compacted clay liner guidelines, 10 sites with single liners, mostly using high density polyethylene (HDPE) material; and 8 sites with double HDPE liners with leachate collection and recovery systems (LCRS). Our firm has many more dairy liner projects that are currently in the design stage. The above projects do not include other similar wastewater impoundments that have been engineered for food processors, wastewater treatment plants, or other similar facilities, going back further in P&P's history. In the last ten years, approximately 14 of our technical staff have worked on lagoon projects.

Cost to Retrofit Existing Dairies That Do Not Have Tier 1 Or Tier 2 Lagoons

Cost Estimates

We have prepared a range of cost estimates for retrofitting or rebuilding dairy lagoons with new liners. See Table 1. The estimates are for four sizes of dairies within a range typically found in the Central Valley: 300 milk cows (MC), 750 MC, 1,500 MC, and 3,000 MC. For each herd size we have calculated costs for four possible scenarios. These scenarios represent the four possible combinations of the following variables:

- 1) Liner design: single (Tier 2) or double (Tier 1) liner;
- 2) Lagoon location: new location or build within the current footprint of an existing lagoon location.

In order to keep the analysis consistent through the range of herd sizes, some baseline assumptions were used in sizing lagoons. These include the following:

- Weather conditions found in the Tulare and Kings County area;
- A 5:1 rectangular shape with a total depth of 20 feet;
- A constant rate of dairy barn water generation of 50 gallons per milk cow per day;
- 120 day winter storage period from November 1 to March 1; and,
- Overall storage capacity ratio (actual/required) between 100% and 105%.

Cost estimates assume a completely below ground lagoon with more than 5 feet of clearance to highest anticipated groundwater. Costs for design, earthwork, lining, and construction quality assurance and reporting are included.

Option of Single or Double HDPE Liner Design

The Dairy General Order stipulates that all new or modified lagoons meet the conditions described as a Tier 1 or Tier 2 lagoon. The Tier 1 lagoon is a 60-mil HDPE double liner with a leachate collection and recovery system. The Tier 2 option does not specify the liner material needed; however, it requires groundwater modeling as part of the design, and proposed ongoing monitoring that demonstrates protection of ground water. At this time, when the conditions are such that a single liner is possible, we have found it necessary to design a liner consisting of one layer of 60-mil HDPE over a one-foot thick soil layer with low permeability. Thus, for the Tier 2 case, this is what we have used as the basis of our estimate.

HDPE liner material with proper care and maintenance should have a service life of 20 to 30 years. We have not calculated a life cycle cost, but simply a single installation cost. Dairy facilities can have a useful life that exceeds the liner life, and thus a liner may need to be reinstalled at least once over the useful life of a dairy.

Option of New Location or Existing Location

The existing location option assumes that the size of the current lagoon is adequate, requiring only the excavation of several feet of organic laden soil, and contouring of the side slopes. An existing location requires the removal of liquid and solid manure prior to any construction work. Costs were included for that effort.

The new location option includes estimates for full excavation (assuming stockpiling nearby) and a location within close proximity in order to connect to the existing wastewater system. Here, the cleanout of manure from the old lagoon could be performed at any time but will at some point need to be performed to close the lagoon. If the old lagoon was allowed to dry, the cleanout costs could be reduced by handling the manure in a dry state. So we have included

Cost to Retrofit Existing Dairies That Do Not Have Tier 1 Or Tier 2 Lagoons

the “liquid and wet solid” cleanout cost in parentheses in Table 1 to provide an understanding of the range of costs that could be expected to clean the old lagoon to close the project.

Table 1. Costs to retrofit lagoons based on dairy size and retrofit type.

	<u>Existing Location*</u>	<u>New Location</u>	<u>Wet Cleanout**</u>
300 MC, 2.1 ac lagoon			
Single	\$198,000	\$180,000	(+\$37,000)
Double	\$270,000	\$252,000	(+\$37,000)
750 MC, 3.4 ac lagoon			
Single	\$300,000	\$275,000	(+\$78,000)
Double	\$425,000	\$399,000	(+\$78,000)
1,500 MC, 6.0 ac lagoon			
Single	\$521,000	\$482,000	(+\$171,000)
Double	\$753,000	\$714,000	(+\$171,000)
3,000 MC, 10.7 ac lagoon			
Single	\$948,000	\$887,000	(+\$357,000)
Double	\$1,383,000	\$1,321,000	(+\$357,000)

* An existing location estimate includes the cleanout of liquid and solid manure from the lagoon before construction can begin.

** A new location estimate does not include any cleanout cost of the old lagoon. This wet cleanout cost could be expected if performed while water is in the old lagoon.

Issues

There are many issues that may arise with the retrofitting or replacement of a lagoon. Each dairy has a different set of circumstances that may require additional effort to be expended in locating and designing a lagoon.

Tier 1 Lagoon (Double Liner) vs. Tier 2 Lagoon (Single Liner)

From the estimated costs shown in Table 1, a single liner appears to be a more cost-effective option. However, to obtain approval for a single liner, the design must show that groundwater will not be impacted via a model, and a monitoring system must be installed and maintained.

Groundwater models that are currently used to predict the performance of a liner are simplified models that are highly conservative. Conditions contributing to passing the modeling are low nitrate levels in background groundwater samples, high velocity groundwater flow beneath the site, low permeability soils, and minimal defects in the post-construction liner.

Currently, we are finding that most sites do not pass the simplified model and a single liner is thus not an eligible option. If a detailed modeling effort were performed, the modeling cost could equal the cost of the extra liner layer in question, without a guarantee of positive results. Thus, detailed modeling is generally not pursued at this time.

A single liner requires some type of accompanying groundwater monitoring, as noted above. Monitoring wells focused around the subject lagoon (outside of the representative monitoring program) are the typical monitoring system proposed. When depth to first encountered water is

Cost to Retrofit Existing Dairies That Do Not Have Tier 1 Or Tier 2 Lagoons

great, the cost for installing monitoring wells increases and other groundwater quality influences can possibly be mixed in the samples taken, obscuring the conclusions that can be drawn.

In Table 1 above the single liner option includes costs for installing lagoons, but does not include costs for monitoring. These can include the installation of monitoring wells, sampling and laboratory analysis on an ongoing basis, data assessment and analysis, and technical reports. These costs are not insignificant and can cost tens of thousands of dollars for well installation and hundreds to thousands of dollars per year in ongoing costs.

New Location vs. Existing Location

To rebuild a lagoon in the current location, provisions must be made to divert and contain the daily barn water generation (and any rainfall runoff) temporarily during the construction period. In many cases this may not be feasible, leading to the only other option, to build in a new location.

To compact the soil for structural support and installation of the HDPE liner, the side slopes must typically be 2:1 (horizontal: vertical) or flatter, depending on soil properties. Typical existing lagoon slopes are 1.5:1 or steeper. Therefore a larger lagoon footprint is likely to be needed to maintain the storage volume. In addition, the retrofit will need to provide 5 to 6 feet of additional room around the lagoon perimeter for an anchor trench to hold the liner material. Many lagoons are positioned near other structures on the dairy and this additional space may not be available.

Relocating the lagoon to a new area may require county permit changes if the location is outside of the established footprint of the dairy. Such changes are likely to trigger the need to comply with the California Environment Quality Act (CEQA), which could require the preparation of a mitigated negative declaration or an Environmental Impact Report (EIR). Other land use permits may also be triggered. Additional costs to comply with local land use permitting processes (including CEQA compliance) could possibly ranging between \$30,000 to \$100,000 or more.

The estimates in Table 1 indicate approximately how many acres the new lagoon is expected to occupy. In some cases, locating the new lagoon near the existing lagoon is infeasible and additional costs may be incurred to route the wastewater to a more distant location. In some cases, significant infrastructure, such as a pump station, may be required.

Highest Anticipated Groundwater

In shallow groundwater areas, this can be a significant issue complicating lagoon design. In other areas where the groundwater has deepened, but historically has been within 5 feet of the invert, it can present a physical or regulatory risk.

In order to quantify the highest anticipated groundwater to plan lagoon construction, areas with shallow groundwater require study on factors influencing the groundwater level, including influences from irrigations, ditches, or rainfall. This could require a complete year of study, periodically recording depth to groundwater in the intended site area, followed by a report from a geologist documenting the findings and recommendations. Conclusions may dictate reducing lagoon depth, building an above ground lagoon, and/or artificially controlling the water table with a tile drainage system.

Cost to Retrofit Existing Dairies That Do Not Have Tier 1 Or Tier 2 Lagoons

Above Ground Lagoon

The above ground lagoon can be a good option for a new lagoon, from the perspective of minimizing the volume of soil that must be moved. However, in many areas, these are required due to high groundwater conditions.

Depending on the available soils, embankment height may be limited by engineering constraints. If below grade depth is limited, a deep lagoon (and efficient use of liner area) may not be possible at all. For a given storage volume, decreasing the depth of the lagoon will require increasing the footprint and corresponding liner costs. Thus, the cost for an above ground lagoon could be higher than identified in Table 1, as a function of the depth of the lagoon. There could be a decrease in earthwork costs, as less total volume of earth may need to be moved to provide the same storage volume; however, this is offset by the increased cost of placement of compacted fill in above ground embankments.

Using the 750 milk cow dairy case as an example, an above ground lagoon with only 12 feet of total depth increases the foot print by 1.2 acres and adds an additional cost of approximately \$34,000 to the single liner and \$83,000 for the double liner installation.

Manure and Sand Separation

New lagoons lined with thin layers of synthetic material are vulnerable to damage from lagoon cleaning equipment. A small hole in the liner can allow wastewater to get underneath. The wastewater naturally produces carbon dioxide and methane, byproducts of anaerobic digestion. The trapped gases under the liner can accumulate (if not vented) and eventually tend to float the liner to the surface, introducing stresses in the liner, leading to more liner damage, more wastewater under the liner, and yet more trapped gases. Thus, a minor nick or puncture of a 60 mil layer can lead to a major incident, requiring the replacement of the entire liner. Costs could approach what is estimated in Table 1 for an existing lagoon relining operation. Accordingly, it is very important to minimize liner exposure to equipment and to reduce cleanings as much as possible.

Manure solids separation systems are common on dairies. Some systems still allow a significant amount of solids into the lagoon because of various issues. Good solids separation can be an important factor enhancing the useful life of a liner. Thus, when installing a lined lagoon it is important to consider or reconsider manure separation. Adding a new screen separator and concrete drying pad can cost from \$180,000 for a smaller dairy to \$400,000 or more for a larger dairy. These costs are not included in Table 1 but may be necessary on many dairies to properly maintain and operate lagoons with synthetic liners.

Sand or dirt removal is also an important consideration. Sand can be introduced to the manure stream from bedding, feed, track-in from corrals, or other sources. Sand settling lanes or traps are a good solution, but must be considered during design to account for location, elevation, and gravity flow constraints.

Increased Rainfall and Storage Period

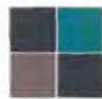
The estimates in Table 1 considered the weather conditions representative within Kings and Tulare Counties. Other areas to the north have more rainfall and may require a longer storage period, both of which require additional storage volume. Providing greater storage volume results in increased costs over what was estimated in Table 1.

Cost to Retrofit Existing Dairies That Do Not Have Tier 1 Or Tier 2 Lagoons

Using the 750 milk cow dairy again, changing the rainfall numbers to what is expected in the northern Sacramento Valley near Orland, the 750 milk cow dairy needs an additional 1.7 acres and costs are increased by roughly 50%. Adding an additional month of storage adds approximately another 7% to the cost.

Conclusion

The estimated costs provided in Table 1 are based on the minimum anticipated cost for the construction of an HDPE lined lagoon for a range of dairy sizes. These estimates are conservative (at an estimated higher cost) based on standardized assumptions that were outlined. However, when compared to each unique dairy situation additional cost drivers can easily increase the overall cost. These additional costs outlined in the Issues section can include location, groundwater conditions, manure and sand separation systems, higher rainfall areas than the south valley, and the length of the storage period.



Comments Regarding Capital Investment and Costs
associated with draft
Waste Discharge Requirements General Order
for
Confined Bovine Feeding Operations

on behalf of the
California Cattlemens Association
by
AGPROprofessionals

September 2016

Introduction

During review of the Administrative Draft Waste Discharge Requirements General Order for Confined Bovine Feeding Operations (Order) and subsequent working group sessions, some costs analysis data has been presented that represents the costs of compliance, predominantly regarding costs associated with the filing of registrations, reports, developing plans and regulatory interaction by consultants. Little, if any data has been presented on the potential capital investment costs by regulated facilities in order to comply.

Associated with costs are time and resources. Any actions that increase or decrease time and/or resources affects costs. If time is decreased, costs and resources increase. The schedule for implementation of the Bovine Order, as currently proposed, adds additional cost and requires more resources which will affect compliance.

Review and Methodology

AGPROfessionals reviewed the conditions within the regulations that would require significant capital investments and improvements at a facility of various sizes. The items most significant are structures to contain and manage storm water runoff from significant precipitation events, such as a 25-year, 24-hour event (25/24). These structures, while not the only facility improvements, would likely be the largest facility investment. There may be other improvements (i.e. run-on diversions, reconfiguration of the facility, and grading for positive drainage) that may be necessary but are so site specific it would convolute the purpose of these comments.

Additionally, there are considerable variables in the 25/24 from the North-South Central Valley as well as potential runoff yields and runoff curve calculations per site. The purpose of these comments are to demonstrate, in relative terms, that there are significant capital investments that may be required of the industry, and whether the cost-benefit is warranted, or if a more contentious, site-specific, risk-based approach would be more prudent.

For the purposes of these calculations, admittedly there are some gross generalities: 1) an average 3.75 inches for the 25/24 value across the valley published by U.C. Davis was used, 2) an 80% runoff yield for volume, 3) three months storage capacity, and 4) a 6-foot storage design depth was used.

Various feed yard sizes, from 300 head to 100,000 head were chosen to represent scale and note that on a per-head basis, and as a percentage of investment-to-facility-value, these costs have a much larger effect on smaller facilities.

Creating storm water impoundments also involves costs of some type of improved liner material. For the purposes of these comments, we reserve discussion on the appropriateness of clay vs. synthetic or other alternatives and presented a cost of \$4

per square foot for clay liners, and \$2 per square foot for 60 mil HDPE liner material installed. The \$2 for 60 mil HDPE liner was used as logical for calculations as both a reasonable and less expensive liner. A value of \$2 per cubic yard was used for general excavation and earthwork. These are well-rounded generalities based on AGPRO's experience, but can vary widely due to location, markets, design and demand. For the scale of capital investment costs within the industry, we feel these are adequate for this example.

Review and discussion within the draft Order and the working group includes monitoring wells or a monitoring network. While there is flexibility to use existing wells, or a collective group monitoring network, for this example, costs for installation of monitoring wells has been included.

Lastly, in our review and methodology, consulting and compliance costs for consultants and engineers appear to be primarily oriented towards costs of documentation and compliance reporting. These costs have been estimated as low as \$5,000 and as high as \$50,000, yet still pale in comparison to the capital improvement costs at regulated facilities. Costs for necessary surveying, civil and geotechnical engineering have been included in the capital costs as necessary to construct storm water impoundments. Again, these may be gross generalities and are based on experience, but deemed reasonable and adequate given site specific analysis is impractical and unnecessary in order to illustrate the point for these comments.

Surveying was estimated at one-half of the engineering costs, and geotechnical engineering was estimated as one-third of engineering costs.

Calculation and Results (See attached spreadsheet)

Fourteen facility sizes were arbitrarily chosen, from 300 head to 100,000 head facilities. It is recognized that typically, 1,000 head is the CAFO designation. Two smaller examples of a 500 head and 300 head facility are presented as they could be either classified as a medium CAFO under federal guidelines or, according to the Order, site specific designations can be made. Facility acreage was estimated using 200 square-feet per head plus 25% for roads, alleys, feed, processing, and working areas. This example also and predominately is based on beef backgrounding or finishing feedlots and not calf ranches or converted dairies that generate process wastewater. This is conscious and by design. Facilities such as calf ranches and converted dairies that generate both storm water and process wastewater could be assumed to have larger single or dual impoundments, additional design considerations, and therefore even higher costs for capital improvements.

Capital investment costs range from nearly \$30,000 for a 300-head facility, to over \$1.6 million for a 100,000-head operation. There are efficiencies of scale with the larger facilities as the cost per head range from \$26 per head investment for a 100,000 head feedlot, to nearly twice as much - \$50 for a 1,000 head operation. This is relevant and significant.

However, what is most significant is the comparison for the capital investment costs as a percentage of property value. Again, these property value estimates are a generality and based on experience, but adequate for the purpose herein. Feed yard property values are usually on a per-head basis. These values do not consider additional intrinsic value as development property, or property with significant additional features such as homes, feed mills, farm ground or water rights. Neither do these values account for liabilities and conditions that may devalue an "average" property.

Feed lot properties were valued from a low of \$100 per head, up to \$150 per head. As a percentage of capital investment that may be required by the Order, expenditures range from $\frac{1}{4}$ to $\frac{1}{2}$ of the value of the property for 100,000 head down to 1,000 head, respectively. For smaller facilities, the capital investments could range from $\frac{1}{2}$ to $\frac{2}{3}$ of their properties' value.

A 25 to 30 percent investment in a feedlot would be a cost-of-doing-business and does not increase the value of the property in any substantial way. These economics will force many facilities to consider going out of business.

Also, while the economics warrant additional detail, a bovine feeding business on a cash-flow basis has little comparison to dairy farms regulated by the Dairy Order. The Bovine Order and the Dairy Order have similar requirements and expense. As a rule of thumb and scale and based on experience, a 1,000 to 3,000 cow dairy would have similar economics and cash flow to a 10,000 to 30,000 head beef operation.

Comments Conclusion

The costs of compliance with the draft Bovine Order during the pre-hearing working group phase has predominantly included registration, reporting and on-going compliance. Little information has been discussed or provided regarding the up-front capital investment costs to the industry; they are significant and may trigger some facility owners to discontinue operations. Final development of the Bovine Order should closely evaluate the cost-benefit to the industry and public. Allowances for a risk-based and cost-benefit approach would yield the intended environmental protections while enabling reduced up front, potentially crippling costs of compliance.

Requiring construction of containment and impoundments as the predominant control method also has other side effects such as potential odor and air quality impacts. Whereas alternative control methods, for example, terraces and filter strips may suffice. Also, risk-based evaluations of facilities in areas with little rainfall and few potential environmental receptors may be better served.

Facilities with similar head count regulated under the Dairy Order and the Bovine Order do not compare in economics. Cost-of-compliance capital investment of $\frac{1}{4}$ to $\frac{1}{2}$ of the properties' value is not only significant, it is detrimental to the industry; in some cases, beyond public benefit. Options, alternatives, and risk-based evaluations should be

heavily considered in the rulemaking and final draft of the Bovine Order. If not, additional time and phasing of the compliance schedules for the Order should be substantially extended.

The proposed schedule of compliance will also impact costs to producers. Shorter timelines will require additional costs and resources. The potential degree of data collection, site investigation, surveying, engineering and reporting is substantial and is exacerbated by the proposed timeline.

The Notice of Intent (NOI) information should be as titled; merely a "notice of intent". Typically a NOI identifies the producer, contact person, size, type and location, and their "intent" of their compliance strategy for their operation. As proposed, the NOI also requires some engineering and technical information that exceeds a common NOI. Currently the Waste Management Plan (WMP), Nutrient Management Plan (NMP), and the Farm Evaluation form are all required within the first 12 months.

Considering the Bovine Order is a substantial change for producers, the wide range of site-specific conditions, the variety of facility types, and the education process necessary, extension of the compliance deadlines is warranted. The NOI should more appropriately be a "*who, what, where, and when*" document.

An insufficient timeline will increase costs and the necessity of additional resources. The Dairy General Order has been in effect for almost ten years and allowed six years to phase-in compliance. The Federal Clean Water Act regulating CAFO's was passed in 1972. A shift in the proposed compliance schedule of the Bovine Order of six-to-twelve months will not materially affect water quality in light of those regulations. Extending the proposed timeline is not an unreasonable request to better assure quality submittals and information at a reasonable cost to both the private sector and public resources.

California Feedyard Stormwater Containment & Facility Engineering Example
Capital Construction Input Example

25 Yr. 24 hr. Precip. " 3.75 Avg. UC Davis Valley N to S
 Runoff Yield % 80%
 Months Storage 3
 Avg. Design Depth (FT) 6
 Area Avg. S.F. / Hd. 200
 \$ / Yd. General Earthwork \$2
 \$ / Yd. Clay Liner \$4
 \$ / Yd. 60 mil. HDPE \$2 (Used Synthetic \$)
 Monitoring Well \$ \$4,000

Feedyard Capacity	Runoff		Survey \$ (1/2 Engineering)		Geotech \$ (1/3rd of Engineering)		# Wells	Monitoring Well Install	General Earthwork \$	Clay Liner \$ (Not Used)	60 mil. Liner \$	Total	\$/hd.	Estimated Feedyard Value (\$/hd.)	Compliance Capital Investment % of property value
	Acreage	Volume (cy)	Engineering	Engineering	Engineering	Engineering									
300	2	694	2,500	5,000	1,665	3	\$12,000	\$1,388.60	\$12,497.42	\$6,248.71	\$28,802.31	\$96.01	\$150	64%	
500	3	1,157	2,500	5,000	1,665	3	\$12,000	\$2,314.34	\$20,829.03	\$10,414.51	\$33,893.85	\$67.79	\$150	45%	
1,000	6	2,314	3,500	7,000	2,331	3	\$12,000	\$4,628.67	\$41,658.06	\$20,829.03	\$50,288.70	\$50.29	\$150	34%	
2,500	14	5,786	3,500	7,000	2,331	3	\$12,000	\$11,571.68	\$104,145.14	\$52,072.57	\$88,475.26	\$35.39	\$150	24%	
5,000	29	11,572	4,000	8,000	2,664	4	\$16,000	\$23,143.37	\$208,290.29	\$104,145.14	\$157,952.51	\$31.59	\$125	25%	
7,500	43	17,358	4,500	9,000	2,997	4	\$16,000	\$34,715.05	\$312,435.43	\$156,217.72	\$223,429.77	\$29.79	\$125	24%	
10,000	57	23,143	6,000	12,000	3,996	4	\$16,000	\$46,286.73	\$416,580.58	\$208,290.29	\$292,573.02	\$29.26	\$125	23%	
15,000	86	34,715	7,000	14,000	4,662	4	\$16,000	\$69,430.10	\$624,870.87	\$312,435.43	\$423,527.53	\$28.24	\$125	23%	
20,000	115	46,287	9,000	18,000	5,994	5	\$20,000	\$92,573.46	\$833,161.16	\$416,580.58	\$562,148.04	\$28.11	\$110	26%	
30,000	172	69,430	11,000	22,000	7,326	5	\$20,000	\$138,860.19	\$1,249,741.74	\$624,870.87	\$824,057.06	\$27.47	\$110	26%	
40,000	230	92,573	13,000	26,000	8,658	5	\$20,000	\$185,146.92	\$1,666,322.31	\$833,161.16	\$1,085,966.08	\$27.15	\$110	26%	
50,000	287	115,717	15,000	30,000	9,990	5	\$20,000	\$231,433.65	\$2,082,902.89	\$1,041,451.45	\$1,347,875.10	\$26.96	\$100	27%	
75,000	430	173,575	18,000	36,000	11,988	6	\$24,000	\$347,150.48	\$3,124,354.34	\$1,562,177.17	\$1,999,315.65	\$26.66	\$100	27%	
100,000	574	231,434	20,000	40,000	13,320	6	\$24,000	\$462,867.31	\$4,165,805.79	\$2,082,902.89	\$2,643,090.20	\$26.43	\$100	27%	

From: Justin Oldfield [<mailto:justin@calcattlemen.org>]

Sent: Wednesday, April 26, 2017 15:16

To: Patteson, Doug@Waterboards

Subject: RE: Economic Numbers

Cattle and calves represent the fourth largest agricultural commodity in California with a gross annual income of \$3.4 billion. Four of the five leading counties in California responsible for the largest production of cattle and calves are located in the Central Valley and include Tulare, Fresno, Merced and Kern Counties. 3.5 million beef and dairy cattle are raised in the Central Valley.

Beef feedlots in California market roughly 500,000 head of cattle annually with at least 1/3 of that total marketed by feedlots in the Central Valley. Feedlots in the Central Valley support the two largest beef packing plants left in California, both of which exist in Fresno County, that together provide thousands of good paying jobs.

California ranchers depend on beef feedlots in the Central Valley to purchase their cattle to finish and harvest. The loss of beef feedlots in the Central Valley would have a rippling affect across the industry and result in lower prices for ranchers all throughout California because cattle would need to be shipped to buyers in the Midwest. Feedlots also directly employ hundreds of employees in the Central Valley working to raise cattle and mill feed along with providing thousands of indirect jobs that include but are not limited to truck drivers, farmers and farm workers that grow feed for livestock and employees at beef packing plants that depend on a local supply of beef cattle ready for harvest.

Calf ranches in California raise male dairy calves specifically to be marketed to feedlots as beef cattle and depend on a sustainable supply of male dairy calves from local dairies in the Central Valley. There are numerous calf ranches in the Central Valley that together raise 300,000 - 400,000 beef calves. Based on standard industry practices of the number of calves assigned to each employee, Central Valley calf ranches employ approximately 1,600 people. These jobs are typically well paid to promote retention and keep employees that have experience working with livestock. An industry survey suggests that calf ranch employees make far more than the current minimum wage of \$10.50 per hour. Average wages already exceed \$14.00 per hour.

Justin Oldfield

Vice President, Government Affairs

California Cattlemen's Association



 WESTERN**UNITED**DAIRYMEN

April 28, 2017

Re: Heifer ranches' economic value to the state of California

Dear Mr. Sousa,

Western United Dairymen would like to add supplemental comments on the economic value of heifer ranches. Heifer ranches generated approximately \$953 million in sales in 2015¹. Their economic impact goes even further: through the people they employ, the feed and equipment they purchase, the veterinary and other specialists they hire and the bank loans they utilize. Heifer ranches support a wide range of businesses throughout California's central valley. To determine the value generated from raising heifers, one need to look no further than to the costs involved: in 2015, heifer growers spent \$436 million in feed, \$6.7 million in bedding, \$12.9 million in veterinary services, \$10.1 million in breeding, \$37.6 million in interest, \$84.6 million in labor, \$67.5 million in housing and \$6.1 million in equipment to raise heifers. This total of \$662 million undoubtedly supported businesses throughout the state and the many jobs that depend on them².

Dairy replacements are an important part of the cost of milk production. Any increase in the cost of dairy replacements would be a direct hit on the California dairy industry. And a hit on the dairy industry has ripple effects far beyond the farm. According to a study conducted by the University of California Agriculture Issues Center on behalf of the California Milk Advisory Board, California's dairy industry generated \$65 billion in economic impact and supported 189,000 jobs in 2015.

Sincerely,

Annie AcMoody, Director of Economic Analysis, Western United Dairymen

¹ Heifers moving to dairies times market price. The heifers' market value used was \$2,112, the same as in WUD's submitted comments to the Water Board. The number of heifers moving from growing facilities to dairies was calculated as follows: according to CDFA data, the cull rate in 2015 was 44%. There were 1,747,770 milk cows in California in 2015, which means 769,019 cows were culled that year. The number of cows in California is slightly declining (-0.5% from 2015-2016), this would mean 765,174 heifers would have been needed to exactly replace those that left. It is an industry accepted ratio that dairies need to take in approximately 1.2 heifers per cow that leaves to maintain a constant cow number. This means 918,208 heifers would have made their way to a dairy. Based on the CDFA's cost of production sample, approximately 49% of dairies in the central valley use a custom raising service. This means sales from custom growers cover 449,921 heifers, multiplied by \$2,118 per heifer equals \$953 million.

² Cost per heifer details submitted in WUD's comment letter to the Water Board.