

To: Lynn Small, Deputy Director
Environmental Compliance
City of Santa Rosa

Date: August 9, 2012

cc: Dave Smith, Merritt Smith

From: James Klang, PE, K&A
Mark Kieser, K&A

RE: City of Santa Rosa Beretta Dairy BMP #1 Crediting Details

This memorandum is provided in response to a request from the North Coast Regional Water Quality Control Board (RWQCB) for more information regarding Beretta Dairy Best Management Practice (BMP) #1. Information provided herein focuses on more detailed descriptions of the BMP #1 location in relation to BMP #2, and associated credit calculations. Such information is consistent with the June 5, 2012 City of Santa Rosa credit proposal¹ and supplemental information on credit calculation methods are related to proposed BMPs².

This memorandum also clarifies that nutrient load reductions from the proposed BMP #1 are associated with reducing phosphorus and nitrogen loads from diffuse agricultural stormwater runoff at this location. The BMP #1 description using “manure stacking pad” raises questions regarding potential eligibility for nutrient offset credits if it were such that new practices were proposed to abate discharges of manure or raw wastewater. Such is not the case. The area considered for BMP #1 is used for manure stacking and loafing of dairy cows only during the dry season. Soil enrichment occurs during the dry season with manure dewatering, direct contact and incorporation by animal traffic. Current operations and practices (absent proposed crediting BMPs) are consistent with existing requirements found in the current Conditional Waiver of Waste Discharge Requirements³. Accepted practices employed on the Beretta at this location include removal of stacked manure before the wet season followed by scraping, seeding and mulching of the entire heavy use area with no subsequent animal access until the following dry season. These practices avoid manure or raw wastewater discharges.

BMP #1 will address the nutrient loading associated with wet season agricultural stormwater runoff of this managed area by permanently vegetating and fencing this area (thereby excluding future dry season use for manure stacking and loafing). This permanent vegetative cover will

¹ “City of Santa Rosa Offset Credit Proposal for Beretta Dairy BMPs.” Submitted by Lynn Small, City of Santa Rosa to the North Coast Regional Water Quality Control Board, June 5, 2012.

² “Beretta Dairy Summary of Best Management Practice Reduction Estimation Methods for City of Santa Rosa Offset Credits.” Kieser & Associates, LLC Technical Memorandum to Lynn Small, City of Santa Rosa, CA, July 6, 2012.

³ Conditional Waiver of Waste Discharge Requirements Order No. R1-2012-003 for Existing Cow Dairies in the North Coast Region. See:

http://www.waterboards.ca.gov/northcoast/water_issues/programs/dairies/pdf/111024/item_07/12_0003_MRP_Waiver_.pdf

treat diffuse stormwater runoff across nutrient-rich soils, and stabilize these soils that might typically get entrained in sheet flow runoff during winter precipitation events. It is the calculated difference between the nutrient load in diffuse stormwater runoff under current management practices and the reduced nutrient load from stormwater through permanently vegetated runoff that serves as the basis for proposed BMP #1 credits.

Because manure must still be managed on-site, and as the currently stacking area would no longer be available with the application of BMP #1, an alternative stacking location is necessary. To simplify operations for the dairy operator, and to eliminate future soil enrichment, a concrete stacking pad what gravity drains back to the existing lagoon was proposed as part of BMP #1. Additional site-specific information associated with BMP #1 (in relation to the adjacent BMP #2 is discussed below. Support for crediting BMP #1 is also discussed following additional site information in the context of the existing regulations.

Additional Site Description

The attached Figure 1 presents a preliminary plan view of the BMP #1 site. The figure depicts the site conditions before and after BMP installation. In the before-BMP condition, the area north of the manure lagoon is used for the manure stacking pile where manure solids are dewatered prior to handling and transport. Historically, the exact location of the solids pile and handling has varied slightly from year to year. The size of the affected area is estimated to be one acre. In Figure 1, proposed BMPs for the site are presented in green for BMP #1 and red for BMP #2. The additions for BMP #1 include perennial cover, fencing and a concrete manure stacking pad. Under proposed BMP #1, the area north of the manure lagoon would be fenced and vegetated with pasture grass, and the area east of the fencing will be protected by a gravel animal traffic lane and BMP #2's culvert crossing. The grass stand will be flash grazed to limit cattle traffic and provide beneficial long-term grass management. It would no longer be used for manure stacking or loafing. The concrete stacking pad is provided to the dairy operator because manure solids removed from a lagoon will still need to be dewatered and the pad provides more flexibility to the operator to simply relocate the stacking pile and control methods outside of the perennial cover area. The existing stacking pile area for BMP #1 and the heavy use contributing area for BMP #2 overlap.

Site Eligibility Justification

Four considerations are discussed here documenting that BMP #1 credits are consistent with Resolution No. R1-2008-0061. These include:

1. Credits are derived from nutrient reductions from an area that has sufficient BMPs to qualify the loading as allowable agricultural (Ag) stormwater discharges consistent with the Conditional Waiver Order
2. Current manure stacking pile management practices provide adequate protection during the wet season

3. Credit estimation does not credit nutrient reductions from manure or process water sources and is limited to loading reductions from nutrient enriched soils associated with previous practices
4. Crediting methods comply with the Conditional Waiver Order Number. R1-2012-0003, Item 38, which is specific to TMDL nutrient offset programs

These are discussed as follows.

1. Credits are derived from nutrient reductions from an area that has sufficient BMPs to qualify the loading as allowable Ag stormwater discharges consistent with the Conditional Waiver Order

The nutrient reduction credit estimates for BMP #1 are based on managing soils enriched by nutrients at a site that already has implemented adequate agricultural stormwater management controls to be consistent with the Conditional Waiver Order. Currently, the operator implements several practices to protect against manure and related nutrient management discharges. The manure handling processes occurring at BMP #1 site include:

- Agitating the manure in the lagoon and pumping off the liquids for land application
- Removing the remaining manure solids and stacking them in a pile to dewater before land application

The Ag stormwater management controls currently in use are:

- Land applying at agronomic rates
- Removing the manure solids pile prior to the winter wet season
- Closing the site annually by scraping the soil for residual manure, mulching and seeding the area in the fall

The Ag stormwater management practices employed at the Beretta Dairy site are commonly accepted measures for addressing manure dewatering piles in the northwestern region of California. Compliance with the Dairy General Waste Discharge Requirements or Conditional Waiver Orders requires appropriate methods to control manure and process water discharges. These measures can vary substantially from site to site depending on site characteristics. Therefore, the specific controls are not be specified in the Orders. The RWQCB staff agreed with the City to use the Tetra Tech, Inc. site assessment to determine the requirements the Beretta Dairy site must meet in order to comply with the Conditional Waiver Order. The Tetra Tech site assessment includes the following recommendation regarding management of manure stacking piles:

Ensure that manure piled adjacent to ponds (Photo 5, for example) is land applied, covered, or moved to a contained area prior to the wet season. The operator may consider other best management practices to ensure that runoff does not transport piled manure away from the production area.

The operational practices currently in place, prior to implementation of proposed BMP #1, fully comply with this management recommendation. These existing measures therefore qualify the nonpoint source nutrient loading as Ag stormwater runoff loading and not manure or process water discharges. The proposed list of BMPs at the BMP #1 site provides additional nutrient reductions beyond those required for regulatory compliance (e.g., the existing controls). This additional control, along with the designation as Ag stormwater runoff, allows the BMP #1 site to generate credits for the City's Nutrient Offset Program.

2. Current manure stacking pile management practices provide adequate protection during the wet season

The nutrient reductions from BMP #1 are proposed to address soil enriched areas. These nutrient enriched areas are remnants of acceptable management practices. As stated in the first consideration, the current practices comply with the dairy stormwater management recommendations provided by Tetra Tech staff. However, these areas are still vulnerable to soil erosion and can contribute soluble nutrient loading. The proposed BMPs would provide additional reductions to the wet season nutrient nonpoint source loading.

3. Credit estimation does not credit nutrient reductions from manure or process water sources and is limited to loading reductions from nutrient enriched soils associated with previous practices

The selected method for estimating nutrient reduction credits was adapted from the Pennsylvania Department of Environmental Protection (PA DEP) Chesapeake Bay Water Quality Trading program. The PA DEP credit calculation method estimates organic and sediment-attached nutrient losses associated with stormwater runoff from Ag sources. This calculator was modified to fit the Beretta site, and these adaptations resulted in conservatively lower estimates of nutrient availability.

The PA DEP credit calculator was modified to establish a field crediting methodology that was appropriate for estimating reductions from a manure stacking pile. The PA DEP calculation method requires inputting a value for nutrient application rates. However, the stacking pile operation involves an initial application of a large volume of nutrients followed by removing the majority of nutrients and closing the site for the wet season. These processes make it difficult to determine the amount of nutrients on site at time of closure. Determining the remaining nutrients would require estimating the initial application amount, the removal efficiency and the protection provided by the site closure BMPs. These estimations would introduce uncertainties in the reduction and associated credit estimates. However, the uncertainty was minimized by using actual residual soil nutrient concentration test results as a surrogate. The residual soil nutrient content was used to back calculate the application rates for purposes of calculating a credit.

The credit estimates produced by using the soil nutrient content were made more conservative by using soil tests performed in April 2012. This was after the soils and associated nutrients were exposed to runoff and nitrogen volatilization losses throughout the wet season. Using sampling results taken at the end of the wet season generates a low estimate of the soil nutrient concentration.

Questions about the crediting also were raised in regards to the inclusion of a concrete stacking pad in the proposed BMP #1. A concrete stacking pad aligns with the operational desires of the dairy but is not required for the Conditional Waiver Order. The concrete stacking pad will provide the dairy operator more flexibility regarding timing and manure management. Providing the operator with this additional flexibility benefits the City by increasing the likelihood that appropriate operation of the site will continue. The stacking pad is proposed to provide a clear delineation of the change in practices and does not contribute to credit generation from manure runoff during the manure stacking operations.

The Ag stormwater nutrient reductions credits are based on practices that address the existing nutrient enriched soils that have resulted from current adequate manure management operations. These operations comply with the Conditional Waiver Order; however, the enriched soils are vulnerable to runoff and erosion during the wet season. The proposed BMP #1 would address this additional loading, which is not required to be controlled under the Order. As shown in Figure 1, the stacking pile currently located north of the manure lagoon will be relocated east of the lagoon to the concrete stacking pad. As such, soil nutrient enrichment from the manure solids stacking pile will cease. Existing enrichment from the previous management will be protected by applying a perennial pasture cover, which will only be periodically flash grazed. The proposed practices exceed the recommendations put forth by the Tetra Tech, Inc. site assessment. The reduction credits are generated by these additional practices that keep the nutrient enriched soils in place and minimize soluble nutrient losses.

4. Crediting methods comply with the Conditional Waiver Order Number. R1-2012-0003, Item 38, which is specific to TMDL nutrient offset programs

Item 38 is specific to TMDL nutrient offset dairy projects. In this Item, the Order clarifies the length of time a credit is eligible for BMPs that are required under the Order. The City's Nutrient Offset Program Resolution includes the following language in Item 7 of the Order's findings:

The Nutrient Offset Program is designed to encourage the City to undertake nutrient reduction projects that reduce or eliminate non-point source or other discharges not currently subject to waste discharge requirements, waiver, or the other permits. However the Nutrient Offset Program prohibits the City from continuing to receive nutrient reduction credits for a project that later becomes subject to additional regulatory controls imposed by the Regional Water Board. ...

The City representatives expressed concern regarding the Nutrient Offset Program Resolution. Representatives were concerned about a lack of specificity regarding which BMPs are required by future controls and the eligible credit window when transitioning into regulatory control. These concerns were discussed in several conversations with RWQCB staff and during an in-person meeting on October 31, 2011. Item 38 of the Dairy Waiver Order addresses this concern by specifically defining the eligible crediting period for required BMPs to comply with the order. In addition, the discussions held during the October 31st meeting and subsequent conference calls determined that the use of the Tetra Tech, Inc. site assessment recommendations (when

available) is appropriate for determining which BMPs are required by the Dairy Orders and which are general considerations. The Tetra Tech, Inc., site assessments provide the site specificity necessary to determine the required BMPs and those BMPs that are eligible to produce long-term credits. [An explanation for determination of required versus recommended BMPs is provided in the City of Santa Rosa Offset Credit Proposal for Beretta Dairy BMPs.] The Conditional Waiver Order, Item 38 states:

The Regional Water Board may give special TMDL nutrient offset dairy projects an alternative schedule for enrollment and submittal of associated documents for a maximum of two years past the due dates in this Order. These TMDL nutrient offset projects must provide temporary best management practices of equivalent or greater water quality protection in the interim. Also, these projects must be of long-term water quality benefit to the watershed.

This allows dairy operators flexible timing to bring their site up to the thresholds required for the Conditional Waiver. Item 38 of the Dairy Waiver Order and implementing the agreed upon interpretation of the Tetra Tech, Inc. site assessment language provides the necessary clarity to approve credit eligibility for BMP #1. [Note: similar language exists in the Dairy General Waste Discharge Requirements Order Number R1-2012-0002, Findings Item 39. This Order applies to “dairies that potentially pose a significant risk to surface water or to groundwater ...”.]

Summary

- BMP #1 is currently being managed to comply with the Dairy Conditional Waiver Order, and as such, the proposed BMP practices reduce Ag stormwater runoff nutrient loading.
- Manure management aspects of a stacking pad are not included in the proposed credit amount for Beretta Dairy BMP #1.
- Estimated credits are conservative applications of a standardized method for calculating credits associated with nutrient enriched soils.

