

December 28, 2018

Eric Winiecki  
Project Coordinator  
U.S. Environmental Protection Agency, Region 10  
1200 Sixth Avenue, Suite 900  
Seattle, Washington 98101

Re: Yakima Valley Dairies – Docket No. SWDA-10-2013-0080  
Transmittal of Lagoon Abandonment Sampling Data – H.S. Bosma Dairy and Cow Palace, LLC

Dear Eric,

This letter transmits the results of soil testing performed during lagoon abandonment activities at the H.S. Bosma (Bosma) and Cow Palace, LLC (Cow Palace) dairies, consistent with EPA Letter 188, dated December 27<sup>th</sup>, 2018.

At Cow Palace, the lagoon being abandoned is known as the NE Catch Basin. At the Bosma dairy, the lagoons being abandoned include lagoon numbers 8, 9, 19 and 20.

The abandonment plans specify removal of manure, manure-containing soils, and soils containing residual nitrogen levels exceeding 45 mg N/kg (measured as the sum of ammonia-N and nitrate-N). Anchor QEA performed sampling at both the Bosma and Cow Palace dairies during abandonment activities to assess compliance with this threshold.

Abandonment testing data from the NE Catch Basin at Cow Palace are summarized in Table 1. The initial round of sampling was conducted following excavation of soils of the lagoon bottom and four sides. Results of testing demonstrated compliance with the target nitrogen levels on the bottom as well as the west, south and east sides. Nitrogen levels remained above threshold levels on the north side.

In response, the north side of the NE Catch Basin was over-excavated. A follow-up sample taken on the new surface following excavation (representing a location approximately 8 feet north of the original location tested) demonstrated compliance with the removal threshold. Following receipt of that sample, backfill of the lagoon with clean import fill was initiated consistent with the abandonment plan. Backfilling and associated sump and piping construction activities remain in progress.

At Bosma, manure has been removed from all four of the lagoons to be abandoned. Excavation of lagoon bottom soils has been initiated at lagoons 9, 19 and 20. Analytical sampling has been

performed to date at lagoons 9 and 20. Results of testing data for Lagoons 9 and 20 are summarized in Tables 2 and 3, respectively.

At lagoon 9, sampling results indicated that soils need to be over-excavated on the bottom and sides of the lagoon. At lagoon 20, results indicated that no further soil removal is required on the south and west sides of the lagoon, but that over-excavation will be required on the lagoon bottom and east side. A sidewall sample remains to be collected on the north side.

Lagoon abandonment activities remain in progress at both Cow Palace and at Bosma. The status of that work will be documented in our weekly progress meetings/teleconferences, in our monthly written progress reports and in the As-Built Reports to be prepared for each dairy. The As-Built Reports will include copies of the laboratory data packages and data validation reports, as described in the lagoon abandonment plans.

If you require further information, please do not hesitate to contact me ([mlarsen@anchorqea.com](mailto:mlarsen@anchorqea.com) or 206-310-2263 cell).

It has been a pleasure working with you on this project.

Sincerely,



Mark Larsen  
Anchor QEA, LLC

cc:

Kendra Skellenger, Anchor QEA, LLC  
Adam Dolsen, Cow Palace, LLC  
Jeff Boivin, Cow Palace, LLC  
Brendan Monahan, Stokes Lawrence PS  
Henry Bosma, H.S. Bosma Dairy  
Patrick Ryan, Perkins Coie  
Rene Fuentes, U.S. Environmental Protection Agency  
Jennifer MacDonald, U.S. Environmental Protection Agency  
Lucy Edmonson, U.S. Environmental Protection Agency  
Bill Dunbar, U.S. Environmental Protection Agency  
Ed Kowalski, U.S. Environmental Protection Agency  
Chris Hladick, U.S. Environmental Protection Agency

**Table 1. Soil Testing Data for the Abandonment of the NE Catch Basin (Cow Palace)**

	Sample ID's	Depth (ft)	Ammonia-N (mg N/kg)	Nitrate-N (mg N/kg)	Total Ammonia Plus Nitrate (mg N/kg)	Pass/Fail
Bottom	B01-1-181030	0-1 <sup>[1]</sup>	1.6	13.3	14.9	Pass
West Side	S01-1-181030	0-1 <sup>[1]</sup>	2.7	38.7	41.4	Pass
South Side	S02-1-181030	0-1 <sup>[1]</sup>	3.4	30.4	33.8	Pass
East Side	S03-1-181030	0-1 <sup>[1]</sup>	2.5	10.5	13.0	Pass
North Side	S04-1-181030	0-1 <sup>[1]</sup>	2.9	56.6	59.5	Fail
	S04-2-181030	1-2 <sup>[2]</sup>	1.5	286.3	287.8	Fail
	S04-3-181030	2-3 <sup>[2]</sup>	10.1	305.0	315.1	Fail
	S0001-20181126 (after add'l excavation)	0-1 <sup>[3]</sup>	6.2	6.5	12.7	Pass

Notes:

1. Sample was collected from the exposed lagoon surface following initial removal of lagoon bottom soils.
2. Sample was collected from a test pit following initial removal of lagoon bottom soils.
3. Sample was collected from the exposed lagoon surface following over-excavation of lagoon soils on the north side.

**Table 2. Soil Testing Data for the Abandonment of Lagoon 9 (Bosma)**

	Sample ID's	Depth (ft)	Ammonia-N (mg N/kg)	Nitrate-N (mg N/kg)	Total Ammonia Plus Nitrate (mg N/kg)	Pass/Fail
Bottom	B01-1-20181206	0-1 <sup>[1]</sup>	142.4	37.9	180.3	Fail
South Side	S01-1-20181206	0-1 <sup>[1]</sup>	241.9	19.8	261.7	Fail
East Side	S02-1-20181206	0-1 <sup>[1]</sup>	19.6	346.5	366.1	Fail
West Side	S03-1-20181206	0-1 <sup>[1]</sup>	5.4	462.8	468.2	Fail
North Side	S04-1-20181206	0-1 <sup>[1]</sup>	16.6	148.6	165.2	Fail

Notes:

1. Sample was collected from the exposed lagoon surface following initial removal of lagoon bottom soils. Further excavation is planned.

**Table 3. Soil Testing Data for the Abandonment of Lagoon 20 (Bosma)**

	Sample ID's	Depth (ft)	Ammonia-N (mg N/kg)	Nitrate-N (mg N/kg)	Total Ammonia Plus Nitrate (mg N/kg)	Pass/Fail
Bottom	B01-1-20181206	0-1 <sup>[1][2]</sup>	96.4	6.0	102.4	Fail
West Side	S01-1-20181206	0-1 <sup>[1]</sup>	24.4	1.8	26.2	Pass
East Side	S02-1-20181206	0-1 <sup>[1][2]</sup>	18.1	124.9	143.0	Fail
South Side	B03-1-20181206	0-1 <sup>[1]</sup>	42.9	2.0	44.9	Pass
North Side	Not Tested	--	--	--	--	--

Notes:

1. Sample was collected from the exposed lagoon surface following initial removal of lagoon bottom soils.
2. Further excavation is planned for the lagoon bottom and along the east side.