MEMORANDUM

To: Phillip J. Cherry

Thru: Dave Schepens
Kevin Coyle
Lee Ann Walling

From: Ronald Graeber

Re: Mountaire's Coastal Zone Application

Date: August 5, 2010

Ground Water Discharge Section (GWDS) staff have reviewed the attached July 26, 2010 letter from CABE Associates regarding the Mountaire Farms Inc., Coastal Zone Application. According to the report submitted by CABE, the construction of the proposed Resource Recovery plant would also include significant upgrades to the Wastewater Treatment Facility (WWTF). The proposed upgrades to the WWTF would include abandoning the existing oxidation ditch, and replace it with a state-of-the-art Biological Nutrient Removal (BNR) system. The BNR system will be able to significantly reduce the total nitrogen concentration in the wastewater by increasing the denitrification capabilities of the WWTF. The current effluent nitrogen concentrations average is 48 mg/l. CABE's report states the design effluent nitrogen concentration from the BNR treatment system would be 15.6 mg/l. This represents a 67% reduction in the effluent nitrogen concentration.

Mountaire's current Wastewater Spray Irrigation permit limits influent flow to 2.6 Million Gallons per Day (MGD). Current flows are averaging just over 2.0 MGD. If we account for the additional 214,000 gallons per day associated with the resource recovery plant, and assume the effluent nitrogen concentration will be 15.6 mg/l, the annual nitrogen load from the WWTF would be m105,000 pounds of nitrogen annually; whereas the nitrogen load from 2009 was 292,000 pounds. This represents a 64% reduction in the nitrogen load from the WWTF if the BNR system is constructed.

The GWDS believes that the proposed upgrades would significantly reduce the nitrogen load to the dedicated spray irrigation fields which are all located within the Inland Bays Basin. The nitrogen load reduction would ensure Mountaire's ability to comply with the Pollution Control

Strategy promulgated for the Inland Bays Basin. Consequently, the GWDS supports the proposed upgrades to the Mountaire facility.

Before Mountaire can proceed with the construction upgrades to the WWTF they will need to submit an updated Design Development Report (DDR), identifying any changes from the original DDR (such as the change in the effluent nitrogen concentrations, and nitrogen balance calculations) in accordance with Table 202-1 (attached). Upon approval of the DDR Mountaire must then submit detailed Plans and Specifications for the construction upgrades at the WWTF. Upon verification that the Plans and Specifications agree with the approved DDR, GWDS will issue a construction permit to Mountaire for the upgrades. Upon completion of construction a new operating permit will be issued, with revised limitations based on the approved DDR.

Please feel free to contact me at ex. 9326 if you have any questions regarding this important project.

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July 26, 2010

Mr. David Schepens
Department of Natural Resources
and Environmental Control
89 Kings Highway
Dover DE 19901

DRAFT

HAND DELIVERED

Re: Mountaire Farms of Delaware, Inc.

Dear Mr. Schepens:

I am writing to you on behalf of my client, Mountaire Farms of Delaware, Inc. (Mountaire). Mountaire filed a Coastal Zone Act (CZA) Permit Application on July 22, 2009 to build a resource recovery plant at their Millsboro facility. As part of the CZA process, Mountaire will be upgrading and expanding the existing wastewater treatment plant to substantially reduce the nitrogen currently being applied to the existing spray fields. The resource recovery plant will increase the 30 day average influent flow to the expanded and upgraded wastewater treatment plant by 214,000 gallons. The treated influent design flow will remain within the hydraulic limits of their existing Design Development Report and State Permit No. LTS5011-87:09.

In discussions with Phil Cherry, Policy Director for the CZA, we have been advised that the CZA application cannot be deemed administratively complete until the Ground Water Discharges section confirms that the upgrade will reduce the nitrogen load by the amount the applicant claims. The upgrade will be a biological nitrogen removal (BNR) process that will be replacing the existing oxidation ditch.

To facilitate your review, we are providing the following information that is required by the Guidance and Regulations Governing Land Treatment of Wastes Design Development Report Table 202-1 Design Development Report Information:

Section 2.0, a site layout showing the existing equipment and the new BNR anoxic and aerobic basins. These will simply replace the oxidation ditch that is already there.

Section 3.0, design wastewater characteristics which were provided in the CZA application as attachment J.

Section 10.0, process analysis and expected performance for projected flows and loadings (June 1, 2009) which identifies the schematic of the new unit processes and provides basin volumes, loading rates, hydraulic retention times and storage capacities.

A representative of Mountaire and I met with Mr. Cherry on July 23, 2010 in order to facilitate the public notice process on this project. We reached an agreement that, procedurally for administrative completeness, he would accept your section's determination that the calculations and other material attached hereto will support the application's contention that we will be reducing the effluent discharged to the fields from approximately 48.5 mg/l total nitrogen to 15.6 mg/l total nitrogen. Please note that the design upgrade target effluent is 14.2 mg/l, to give the facility a 10% factor of safety.

After you have had an opportunity to review the material, please call if you have any questions. Mountaire has been very patient in the CZA review process but is hoping to have their new resource recovery plant operating by the summer of 2011 so time is growing short. Although you and your staff were not a factor in the delay, anything you can do to facilitate this process will be appreciated.

Very truly yours,

CABE ASSOCIATES, INC.

Lee J. Beetschen, P.E., DEE

LJB/cjk
206-067
cc: Mr. John Wren
Mountaire Farms of Delaware, Inc. (W/Attach)

Mr. Phil Cherry
DNREC (W/Attach)
Attachments

Mountaire Farms of Delaware, Inc. - Millsboro
PROCESS ANALYSIS AND EXPECTED PERFORMANCE
FOR PROJECTED FLOWS AND LOADINGS

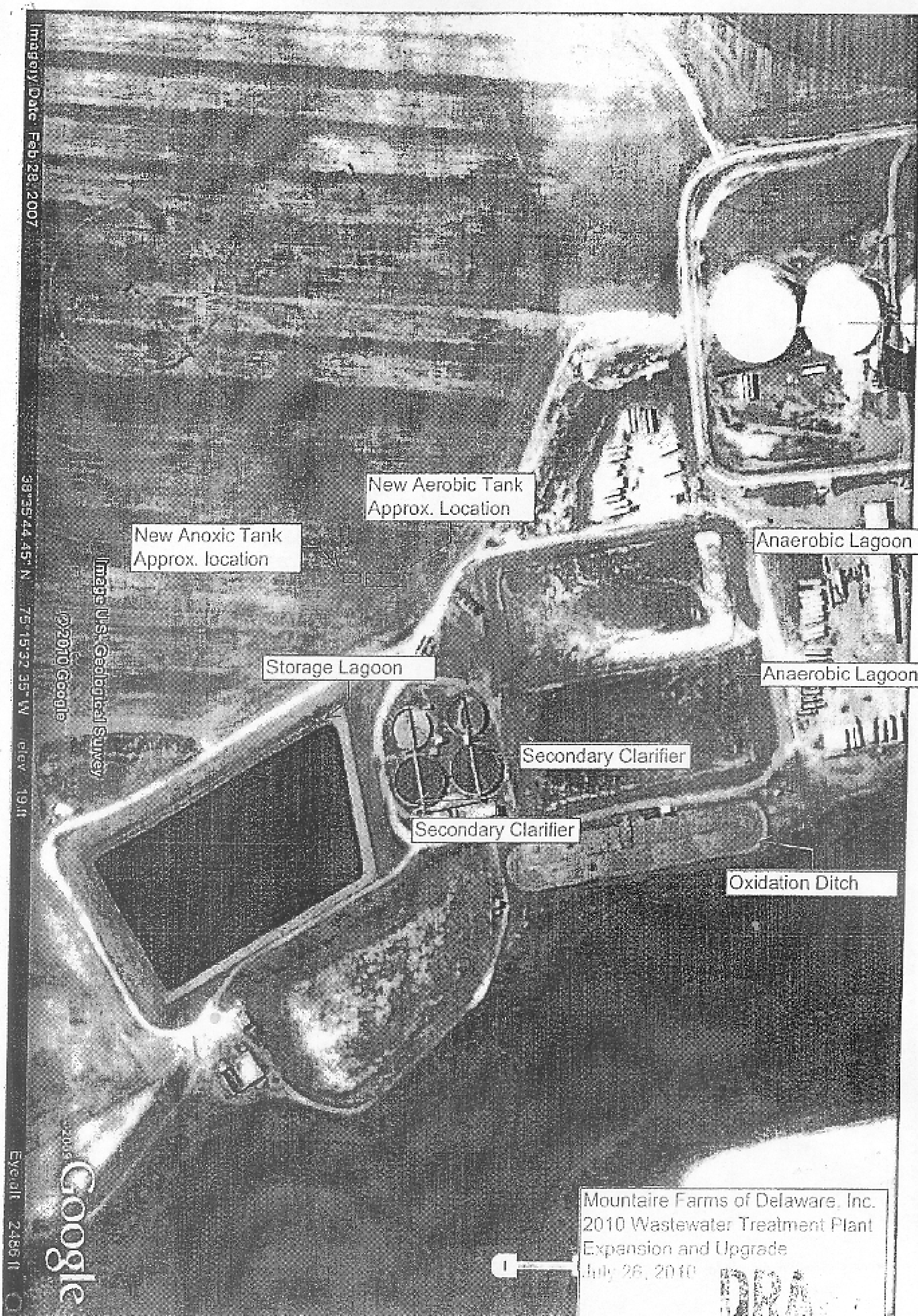
UNIT 1

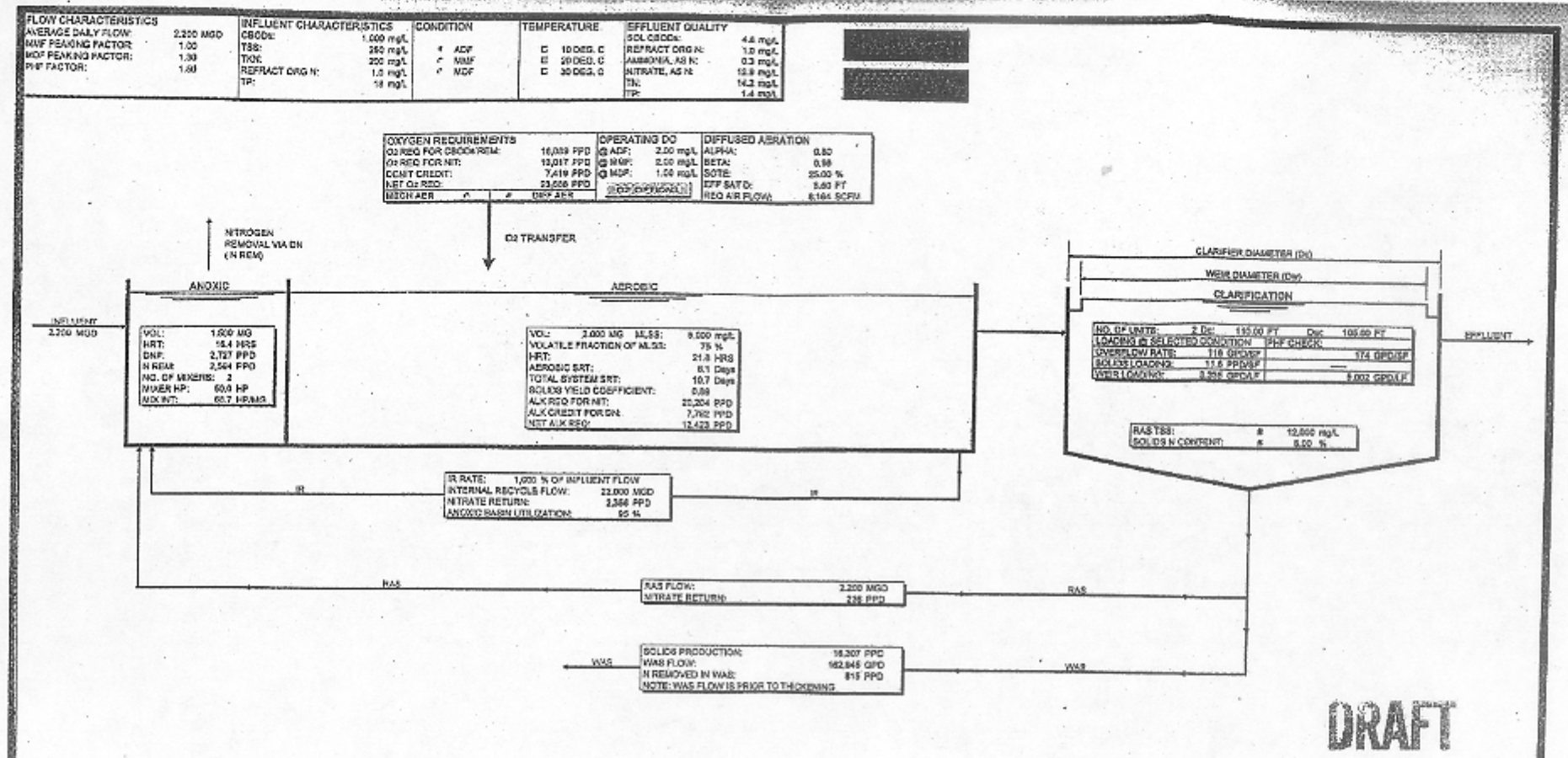
Parameter	Unit	Wastewater Temp. = 20 Deg. C			
		ADF	MMF	MDF	PHF
Flows & Influent Characteristics					
Flow	MGD	2.200	2.200	2.860	3.300
Influent CBODs Concentration	mg/L	1,000	1,000	1,000	---
Influent TSS Concentration	mg/L	250	250	250	---
Influent TKN Concentration	mg/L	200	200	200	---
Influent TP Concentration	mg/L	18	18	18	---
Process Input Parameters					
Anoxic Volume	MG	1.500	1.500	1.500	---
Aerobic Volume	MG	2.000	2.000	2.000	---
MLSS	mg/L	6,000	6,000	6,000	---
Volatile Fraction Of MLSS	Percent	75	75	75	---
RAS TSS Concentration	mg/L	12,000	12,000	12,000	---
Internal Recycle Flow As Percent Of Influent Flow	Percent	1,000	1,000	1,000	---
Internal Recycle Flow	MGD	22.000	22.000	28.600	---
Refractory Organic Nitrogen Concentration	mg/L	1.0	1.0	1.0	---
Nitrogen Content Of WAS Solids	Percent	5.00	5.00	5.00	---
HRT, SRT,Yield, Effluent CBODs, & Effluent Ammonia					
RAS Flow Rate	MGD	2.200	2.200	2.860	---
Anoxic HRT	Hours	16.4	16.4	12.6	---
Aerobic HRT	Hours	21.8	21.8	16.8	---
Total HRT	Hours	38.2	38.2	29.4	---
Aerobic SRT	Days	6.1	6.1	4.5	---
Total System SRT	Days	10.7	10.7	7.9	---
Yield Coefficient	Lb./Lb.	0.89	0.89	0.93	---
Solids Production	PPD	16,307	16,307	22,119	---
WAS Flow	GPD	162,945	162,945	221,014	---
Effluent Soluble CBODs Concentration	mg/L	4.8	4.8	6.2	---
Effluent Ammonia Concentration	mg/L	0.3	0.3	0.5	---
Nitrification Analysis					
Influent TKN	PPD	3,670	3,670	4,770	---
Less Nitrogen Required For Cell Synthesis	PPD	815	815	1,106	---
Less Effluent Ammonia	PPD	6	6	12	---
Less Refractory Organic Nitrogen	PPD	18	18	24	---
TKN To Be Nitrified	PPD	2,830	2,830	3,628	---
Denitrification Potential & Nitrate Removal @ Specified IR Flow					
Anoxic Stage Denitrification Potential	PPD	2,727	2,727	2,892	---
Anoxic Stage Nitrate Removal	PPD	2,594	2,594	2,892	---
Final Nitrogen Balance					
Influent TKN	PPD	3,670	3,670	4,770	---
Less Nitrogen Required For Cell Synthesis	PPD	815	815	1,106	---
Less Effluent Ammonia	PPD	6	6	12	---
Less Refractory Organic Nitrogen	PPD	18	18	24	---
TKN Converted To Nitrate	PPD	2,830	2,830	3,628	---
Less Nitrate Removed	PPD	2,594	2,594	2,892	---
Effluent Nitrate	PPD	236	236	736	---
Effluent TN (Ammonia + Ref Org N + Nitrate)	PPD	260	260	772	---
Effluent Ammonia Concentration	mg/L	0.3	0.3	0.5	---
Refractory Organic Nitrogen Concentration	mg/L	1.0	1.0	1.0	---
Effluent TKN Concentration	mg/L	1.3	1.3	1.5	---
Effluent Nitrate Concentration	mg/L	12.9	12.9	30.9	---
Effluent TN Concentration (Ammonia + Ref Org N + Nitrate)	mg/L	14.2	14.2	32.4	---
Phosphorus Removal Analysis					
Influent TP Concentration	mg/L	18.0	18.0	18.0	---
Excess Phosphorus Removal Propensity Factor	---	0.00	0.00	0.00	---
Phosphorus Removal Potential	mg/L	16.6	16.6	19.4	---
Phosphorus Removal	mg/L	16.6	16.6	18.0	---
Effluent TP Concentration	mg/L	1.4	1.4	0.0	---

Mountaire Farms of Delaware, Inc. - Millsboro
PROCESS ANALYSIS AND EXPECTED PERFORMANCE
FOR PROJECTED FLOWS AND LOADINGS

DRAFT

Parameter	Unit	Wastewater Temp. = 20 Deg. C			
		ADF	MMF	MDF	PHF
Anoxic Basin Mixing Analysis					
Number Of Anoxic Mixers	Each	2	2	2	---
Anoxic Mixer Horsepower, Each	HP	50.0	50.0	50.0	---
Anoxic Basin Mixing Intensity	HP/MG	66.7	66.7	66.7	---
Alkalinity Balance					
Alkalinity Coefficient For Nitrification	Lb./Lb.	7.14	7.14	7.14	---
Alkalinity Coefficient For Denitrification	Lb./Lb.	3.00	3.00	3.00	---
Alkalinity Required For Nitrification	PPD	20,204	20,204	25,907	---
Alkalinity Credit For Denitrification	PPD	7,782	7,782	8,677	---
Net Alkalinity Required	PPD	12,423	12,423	17,230	---
Oxygen Requirements					
Influent CBODs	PPD	18,348	18,348	23,852	---
Effluent CBODs	PPD	88	88	148	---
CBODs Removed	PPD	18,260	18,260	23,704	---
Oxygen Coefficient For CBODs Removal	Lb./Lb.	0.99	0.99	0.94	---
Oxygen Required For CBODs Removal	PPD	18,089	18,089	22,212	---
Oxygen Coefficient For Nitrification	Lb./Lb.	4.60	4.60	4.60	---
TKN Converted To Nitrate	PPD	2,830	2,830	3,628	---
Oxygen Required For Nitrification	PPD	13,017	13,017	16,691	---
Oxygen Coefficient For Denitrification Credit	Lb./Lb.	2.86	2.86	2.86	---
Denitrification Credit	PPD	7,419	7,419	8,272	---
Net Oxygen Requirement	PPD	23,688	23,688	30,631	---
Clarifier Loadings					
Number Of Units	Each	2	2	2	2
Clarifier Diameter	Feet	110.00	110.00	110.00	110.00
Surface Area	SF	19,007	19,007	19,007	19,007
Weir Diameter	Feet	105.00	105.00	105.00	105.00
Weir Length	Feet	660	660	660	660
RAS Flow	MGD	2.200	2.200	2.860	---
Overflow Rate	GPD/SF	116	116	150	174
Weir Loading	GPD/LF	3,335	3,335	4,335	5,002
Solids Loading	PPD/SF	11.6	11.6	15.1	---
Diffused Aeration System Analysis					
Actual Oxygenation Rate (AOR)	PPD	23,688	23,688	30,631	---
Aerobic SRT	Days	6.1	6.1	4.5	---
Alpha	---	0.60	0.60	0.60	---
Beta	---	0.96	0.96	0.96	---
DO Saturation In Clean Water @ 20 Deg. C & 100% RH	mg/L	9.09	9.09	9.09	---
DO Saturation In Clean Water @ Specified Temp. & 100% RH	mg/L	9.09	9.09	9.09	---
Tau	---	1.00	1.00	1.00	---
Standard Atmospheric Pressure	psi	14.70	14.70	14.70	---
Barometric Pressure	psi	14.70	14.70	14.70	---
Saturated Vapor Pressure of Water @ 20 Deg. C	psi	0.34	0.34	0.34	---
Saturated Vapor Pressure of Water @ Specified Temperature	psi	0.34	0.34	0.34	---
Effective Saturation Depth	Feet	5.50	5.50	5.50	---
Omega	---	1.00	1.00	1.00	---
Corrected DO Saturation In Clean Water @ 20 Deg. C & 100% RH	mg/L	10.60	10.60	10.60	---
Operating DO	mg/L	2.00	2.00	1.00	---
OTRf/SOTR	---	0.46	0.46	0.52	---
Standard Oxygen Transfer Efficiency	Percent	25.00	25.00	25.00	---
Field Oxygen Transfer Efficiency	Percent	11.58	11.58	12.95	---
Air Flow Required For Biological Process	SCFM	8,164	8,164	9,438	---


New Aerobic Tank
Approx. Location
New Anoxic Tank
Approx. location
Anaerobic Lagoon
Anaerobic Lagoon
Storage Lagoon
Secondary Clarifier
Secondary Clarifier
Oxidation Ditch
Imagery Date Feb 28, 2007
38°35'44.45" N 75°15'32.35" W elev 19 ft
Image U.S. Geological Survey
© 2010 Google
Eye alt 2486 ft
Google
Mountaire Farms of Delaware, Inc.
2010 Wastewater Treatment Plant
Expansion and Upgrade
July 28, 2010



ABBREVIATIONS			
ADF	AVERAGE DAILY FLOW	ALK	ALKALINITY AS CALCIUM CARBONATE
MMF	MAXIMUM MONTHLY FLOW	MLSS	MIXED LIQUOR SUSPENDED SOLIDS
MDF	MAXIMUM DAILY FLOW	N	NITROGEN
PHF	PEAK HOURLY FLOW	NIT	NITRIFICATION
MGD	MILLION GALLONS PER DAY	DN	DENITRIFICATION
GPD	GALLONS PER DAY	DNP	DENITRIFICATION POTENTIAL
PPD	POUNDS PER DAY	HRT	HYDRAULIC RETENTION TIME
DEG C	DEGREES CENTIGRADE	SRT	SOLIDS RETENTION TIME
CBODu	5-DAY CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND	HRS	HOURS
TSS	TOTAL SUSPENDED SOLIDS	RAS	RETURN ACTIVATED SLUDGE
TKN	TOTAL KJELDAHL NITROGEN, AS N	WAS	WASTE ACTIVATED SLUDGE
REFRACT ORG N	REFRACTORY ORGANIC NITROGEN, AS N	IR	INTERNAL RECYCLE
TP	TOTAL PHOSPHORUS	NO.	NUMBER
COD	CHEMICAL OXYGEN DEMAND	MIX INT	MIXING INTENSITY
mg/L	MILLIGRAMS PER LITER	ATM P	ATMOSPHERIC PRESSURE
SOL	SOLUBLE	RH	RELATIVE HUMIDITY
VOL	VOLUME	DIFF AER	DIFFUSED AERATION
MG	MILLION GALLONS	MECH AER	MECHANICAL AERATION
REQ	REQUIRED	SOR	STANDARD OXYGENATION RATE
LF	LINEAL FOOT	SOTE	STANDARD OXYGEN TRANSFER EFFICIENCY
SF	SQUARE FOOT	EFF SAT D	EFFECTIVE SATURATION DEPTH
O2	OXYGEN	HP	HORSEPOWER
DO	DISSOLVED OXYGEN	SCFM	STANDARD CUBIC FEET PER MINUTE

Mountaire Farms of Delaware, Inc. - Millsboro

PROCESS ANALYSIS AND EXPECTED PERFORMANCE FOR PROJECTED FLOWS AND LOADINGS

PROJECT NO.: 206-053	DATE: June 1, 2009	PREPARED BY: LJB

Table 202-1 DESIGN DEVELOPMENT REPORT INFORMATION.

1.0 Site Description:

- 1.1 Location map
- 1.2 Climate
- 1.3 Geology (including subsurface hydrology)
- 1.4 Topography
- 1.5 Access
- 1.6 Wells within 2500 L.F. of facility
- 1.7 Groundwater quality background data

2.0 Scaled drawing with 2-foot elevation contours showing the preliminary site layout including:

- 2.1 Preapplication treatment facility
- 2.2 Storage pond(s)
- 2.3 Spray fields
- 2.4 Buffer zones
- 2.5 Soil investigation locations
- 2.6 Access roads and utilities
- 2.7 Watercourses
- 2.8 Monitor well locations
- 2.9 Drainage structures
- 2.10 Flood elevations
- 2.11 Residences and habitable structures within or contiguous to the site

3.0 Design wastewater characteristics, influent to preapplication treatment facility and treated effluent to spray fields (specific industrial-type wastewaters and some vegetation management schemes may require different or additional characterization):

- 3.1 Average and peak daily flows
- 3.2 Biochemical Oxygen Demand (for preapplication facility management)
- 3.3 Chemical Oxygen Demand (for land treatment system management)*
- 3.4 Total Organic Carbon
- 3.5 Total Suspended Solids
- 3.6 Ammonia, Total Kjeldahl and Nitrate and Nitrite Nitrogen
- 3.7 Total Phosphorus
- 3.8 Chloride
- 3.9 Sodium Adsorption Ratio (when appropriate)
- 3.10 Electrical Conductivity
- 3.11 Metals
- 3.12 Priority Pollutants**
- 3.13 pH

4.0 Detailed Soil Investigation Report (reference Table 202-2).

5.0 Water Balance/determination of design wastewater loading(s).

6.0 Nitrogen Balance/selection of cover crop and management scheme.

7.0 Phosphorus and other constituent loading rates

8.0 Determination of land limiting constituent (LLC).

9.0 Determination of wetted field area(s) and required storage volume.

10.0 Process design for preapplication treatment facility.

10.1 Schematic of pump stations and unit processes
10.2 Basin volumes, loading rates, hydraulic detention times, storage capacities, etc.
10.3 Capacity of pumps, blowers and other mechanical equipment

11.0 Groundwater and Effluent Monitoring Plan

12.0 Proposed trust indenture for Department approval (for private domestic wastewater irrigation systems)

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*Chemical Oxygen Demand or Total Organic Carbon may be substituted for industrial wastewaters where appropriate.

**Priority pollutant analysis is required for all industrial wastewaters and municipal wastewater systems that receive industrial process wastes. The analyses required depend on the particular process wastewater being discharged and will be determined on a case-by-case basis. However, in all cases the presence of industrial process wastewaters must be identified. A current listing of the 126 priority pollutants can be found by referencing 40 CFR Part 423, Appendix A, 1987.

All design calculations must be submitted. Details and an example of the determination of needed land area and site life are given in the Guidance Section for Slow Rate Land Treatment and in Subsection 703,. Example Calculations.

THIS TABLE IS NOT AN EXHAUSTIVE LISTING OF ALL REQUIREMENTS FOR OBTAINING A SPRAY IRRIGATION PERMIT. PLEASE REVIEW ALL PARTS OF THESE REGULATIONS PRIOR TO SUBMISSION OF A DDR.