

Dairy Waste System Calculations
University of Idaho
College of Agriculture
07/12/2001

Prepared by:
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General Dairy Information

Date Plan Prepared
07/12/2001

Dairy Owner/Operator... Chad Blick

Address...

Buhl

ID

Blick Dairy Proposal

Comments: New Dairy Proposal

Dairy Herd Information

					Number of		
					Animals	Animals	Units
Milking Cows.....	1,500	Heifers	100 to 300 lbs.....	0	Cows....	1,765	2,471
Dry Cows.....	265		300 to 500 lbs....	0	Heifers..	0	0
Average Weight of Cows...	1,400		500 to 700 lbs....	0	Total.....	1,765	2,471
			700 to 900 lbs....	0			
			900 to 1100 lbs...	0			

Herd Waste Information

Milking Herd:		Replacements:	
Daily Manure Produced.....	3385	0	Cu.Ft.
Daily Bedding per Cow.....	1.47	0.00	Cu.Ft.
% of Manure Stored as Liquid.....	15	0	Percent
Volume of Manure Stored as Liquid...	203	0	Cu.Ft.

Milk Parlor Water Volumes

Milkings per Day..... 2 Milk Parlor Type.. Parallel Milking Parlor No. of Stalls... 48

Gallons of Water for:

Cleaning Parlor Floor.....	500	gallons	Cleaning Cows (per hd).....	0.50	gallons
Cleaning Milkroom.....	150	gallons	Total Used to Clean Cows.....	1,500	gallons
Cleaning Bulk Tank.....	500	gallons	Backflush Water Per Day.....	1,500	gallons
Cleaning Pipeline.....	300	gallons	Parlor Deckflush/Wash.....	3,000	gallons
Cleaning Equipment.....	100	gallons	Milk Cooling Equipment Water...	28,571	gallons
			Equipment Cooling Water.....	0	gallons

Holding Pen Water Volumes

Total Water Used in Parlor..... 7,550 gallons

Number of Sprinklers in Holding Pen.....	0
Output of Sprinklers in G.P.M.....	4.98
Minutes Sprinklers Operated Daily.....	0
Maximum Usage in a Six Month Period.....	100 %
Avg Daily Sprinkler Water Use.....	0 gallons
Water Used to Flush Holding Pen.....	1,500 gallons
Total Water in Holding Pen.....	1,500 gallons

Total of All Liquids.. 9,050 gallons

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Solid Separator Information

Percent of Solids Retained by Separator.....	0 %	Separator Cell Width.....	0 ft.
Days Between Cleanout of Cells.....	0 days	Separator Cell Length.....	0 ft.
Number of Cells in the Separator.....	0	Separator Cell Depth.....	0 ft.
Separator Apron Slope.....	0 to 1	Separator Apron Length.....	0 ft.
Separator Freeboard.....	0 in.	Separator Floor Length.....	0 ft.
Separator Volume.....	0 cu.ft.		

Solid Storage Information

Percent of Milking Herd Solids Stored.....	0 %	Storage Area	One	Two
Percent of Replacements Solids Stored....	0 %	Length	0 ft.	0 ft.
Days of Storage Provided.....	0 days	Width	0 ft.	0 ft.
Percent Stored in Area One.....	0 %	Depth	0 ft.	0 ft.
Percent Stored in Area Two.....	0 %			
		Storage Required....		0 cu.ft.
		Storage Provided....		0 cu.ft.

Water Use Information

	Gallons	Cu. Ft.	Acre Ft.
Milking Herd Daily Drinking Water.....	57,800		
Milking Herd Annual Drinking Water.....	21,097,000	2,820,454.5	64.74
Replacement Herd Daily Drinking Water.....	0		
Replacement Herd Annual Drinking Water...	0	0.0	0.00
Daily Barn Water Usage*.....	9,050	1,210	
Annual Barn Water Usage.....	3,303,542	441,650	10.13
Total of All Water Used Annually.....	24,400,542	3,262,104	74.88

* Daily Barn Water Usage Includes any Cooling Water which is not recycled.

Nutrient Management Information

Annual Excretion of Nitrogen.....	333,708 lbs.
Percent Nitrogen Loss (Volatilization).....	50 %
Annual Nitrogen to be Applied.....	166,854 lbs.
Annual Excretion of Phosphorus.....	62,232 lbs.
Annual Excretion of P ₂ O ₅	144,306 lbs.
Annual Excretion of Potassium.....	180,383 lbs.
Annual Excretion of K ₂ O.....	216,459 lbs.
Approximate Tons of Solids Excreted.....	450 tons
Approximate Tons of Bedding Used.....	2,182 tons

Total Acres Needed for Waste Disposal Based on Varied Uptake Levels.....

Phosphorus @ 30#/Acre.....	2074 Acres
Phosphorus @ 40#/Acre.....	1556 Acres
Phosphorus @ 50#/Acre.....	1245 Acres
Nitrogen @ 100#/Acre.....	1669 Acres
Nitrogen @ 150#/Acre.....	1112 Acres
Nitrogen @ 200#/Acre.....	834 Acres
Potassium @ 100#/Acre.....	1804 Acres
Potassium @ 200#/Acre.....	902 Acres
Potassium @ 300#/Acre.....	601 Acres

Runoff Information and Volumes

Corral Areas and Runoff

	Length	Width	Slope	Paved	Runoff Vol. (Storm+Winter)
Area 1	1,090	1,000	2	F	223,779
Area 2	0	0	0	F	0
Area 3	0	0	0	F	0
Area 4	0	0	0	F	0
Area 5	0	0	0	F	0
Area 6	0	0	0	F	0

25 Year 24 Hour Storm Value in Inches..... 2.0 inches

One in 5 Year Winter Precipitation
Value in Inches..... 1.30 inches

Total Area for Which Runoff
Calculations Are Being Made..... 1,090,000 sq.ft.

Total Volume of All 25 yr. Storm Runoff..... 105,696 cu.ft.

Total Volume of Winter Precipitation Runoff.. 118,083 cu.ft.

Total of All Runoff..... 223,779 cu.ft.

Total Barn Water to be Stored..... 217,800 cu.ft.

Total Manure to be Stored..... 36,540 cu.ft.

All Storage Required..... 478,119 cu.ft.

Lagoon Storage Information

	Primary Storage	First Additional Storage	Second Additional Storage	
% of Waste Stored.....	100	0	0	%
% of Runoff Stored.....	100	0	0	%
Days of Storage Provided....	180			days
Number of Cells in Stg.....	2			
Length of each Cell.....	250			ft.
Width of each Cell.....	200			ft.
Depth of each Cell.....	8			ft.
Freeboard for each Cell.....	2			ft.
Wall Slope of Cell.....	2			to 1
Total Volume of Waste & Runoff Stored	478,119			cu.ft.

Conatainment Berm	Percentage of Runoff Stored in Containment Berm.....	0 %
	Length of Runoff Containment Berm.....	ft.
	Width of Runoff Containment Berm.....	ft.
	Depth of Runoff Containment Berm.....	ft.
	Volume of Runoff Conatainment Berm.....	cu.ft.
	Total Storage Provided.....	478,119 cu.ft.
	Total Storage Required.....	478,119 cu.ft.

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