Animal Waste Management Plan
April 2014

Jersey Lane Farm LLC

Operated by:

Debbie Timm and Barbie Payzant
35414 East Lacomb Road
Lebanon, Oregon 97355

Facility Address:
35414 East Lacomb Road
Lebanon, Oregon 97355

Operation:

Grade A Dairy
Medium Federal CAFO

As owner and operator of Jersey lane farm LLC. I intend to manage in accordance with the practices and operation and maintenance described in animal waste management plan #08076, as approved on December 10, 2008.

Signature Barbara L Payzant Date 3-31-14

Animal Waste Management Plan

July 2008

MA#.
1000012
~~994845~~
08076

Mountainside Farms

Operated by:

Bradley Freeman
35414 East Lacomb Road
Lebanon, Oregon 97355
541-258-3181

Facility Address:
35414 East Lacomb Road
Lebanon, Oregon 97355

RECEIVED
JUL 31 2008
NATURAL RESOURCES DIVISION

Operation:

Grade A Dairy
Medium Federal CAFO

As owner and operator of Mountainside Farms. I intend to manage in accordance with the practices and operation and maintenance described in this animal waste management plan.

Signature Bradley Freeman Date 7-29-08

Approved 12/1/08

GENERAL NARRATIVE DESCRIPTION

Mountainside Farms is located at 35414 East Lacomb road in Lebanon, Oregon and is owned and operated by Bradley Freeman. The operation is a Grade A Organic Dairy. When the dairy is at maximum capacity, the Jersey and Mixed breed dairy herd consists of 300 milk cows, 50 dry cows, and 160 replacement heifers, and 80 calves, for a total of 590 animals. The cows and heifers are typically on pasture during April through October.

Manure Collection Methods

The milk and dry cows are housed in two free stall barns that are equipped with an automated recycle flush system. Manure is flushed from the barns daily, and transported to the first of two reception pits a 8'x8'x4' (1920 gallon) then into an earthen settling basin 20'x50'x8' and then into a 8'x10'x8' (4800 gallon) sump and on into the 33 acre foot lagoon via a 6" buried mainline. During the winter Flushing may be discontinued to maintain storage capacity, and scraping may be used.

Wastewater generated from the milking parlor and wash water from the holding pen is collected in a below ground reception tank. This reception tank has a float valve that automatically starts the pump to transfer the contents to the 1,920 gallon below ground reception tank.

All roofs are guttered and maintained to divert clean rainwater from the storage system. Two downspouts currently drain into the system and are accounted for in the accompanying ORAWM run. The other gutter downspouts outlet into pasture.

Manure Storage Facilities and Transfer

Manure from the freestall barns and wastewater runoff is collected in the sumps. The manure slurry is pumped into a waste storage pond, which is 33 acre-feet. The storage pond will contain manure slurry and contaminated water for 180 days. Liquid manure from the storage pond is utilized on pastures for its nutrient value. The liquid is agitated, or dilluted then pumped from the storage pond and transported through underground mainlines to the pasture acreage. Hand lines and a traveling big gun are used to irrigate liquid manure.

The solid manure storage area is a 40'x 70' Asphalt pad. Bedding is used to soak up any liquids from the manure and the pile is covered during the wet season. This storage facility can hold approximately 13,440 cubic feet of manure, which gives about ~~180~~ 105 days storage. Solid manure is transported to fields using a manure spreader.

Manure Utilization

All liquid manure is utilized on crop ground and grass pastures either owned or leased by the dairy operation. Mountainside Farms owns 174 acres available for manure applications. There are 110 acres of established pasture, and 64 acres of grass woodlands that are being harvested and renovated into pasture lands; the renovation will be worked on slowly over time. Average yields are 6 tons/acre of grass pasture (DHM) on the established pasture and 4 tons/acre on newly established pastures. A buried 6" mainline system and portable mainline can transport the liquid manure from the waste storage pond to all of the described acreage.

SPECIFIC DESCRIPTIONS AND CALCULATIONS

Land Application Areas

Aerial photos showing numbered field locations for all manure application acreage and surface water features, a topography map and a schematic of the dairy headquarters are included in this Animal Waste Management Plan.

Five different soil types make up the manure application acreage. Soil Types include Clackamas gravelly silt loam (23), Courtney gravelly silt loam (29), Hazelair silty clay loam (43B), McBee silty clay loam (67), and Waldo silty clay loam (98). A soils map and soil map unit descriptions for all manure application areas are included in this Animal Waste Management Plan.

Manure and Wastewater Volumes

Calculated volumes of all manure, bedding, wash water, silage leachate, and contaminated storm water have been completed using the USDA/NRCS Animal Waste Management Worksheet, Version 3.0. The worksheet is included in this Animal Waste Management Plan.

Nutrient Content of Manure, Little and Process Waste Water

The USDA/NRCS Animal Waste Management Worksheet, Version 3.0 to estimate content and volume of nutrients in manure, little and process waste water for nutrient balance.

Farm Nutrient Balance

The Animal Waste Management Worksheet also includes calculated data for nutrient balance for the operation. Mountainside Farms is balancing for Nitrogen which is the most limiting nutrient as determined by the NRCS Phosphorus Index.

Application Schedule and Limitations

Liquid manure will be field applied to fields beginning in March and continuing through the growing season that ends in October.

Solid manure is applied in April or May. Solids may be applied again in September or October prior to fall green up, if available and needed.

The only surface water bodies on the farm are the lagoon, and a seasonal drainage that runs along the base of the hilside. A thirty five foot Vegetated buffer where no manure is applied will be maintained.

The irrigation season runs from approximately June through September. To reduce potential for runoff and leaching, irrigation water is applied at approximately 1 inch per week.

Animal Mortality Management

Deceased animals are sent to a rendering company or sent to the local landfill.

Record Keeping and Reporting

Soil samples will be taken in each field where manure is applied, once every 5 years. Protocol for sampling and testing soil, are included in this Animal Waste Management Plan.

Records of applications of manure, litter and process waste will be kept, including the date and the amount of N and P applied during each application.

Records of exported manure, litter and process waste will also be kept.

Any discharge will be reported orally to ODA within 24 hours. Within 5 days, a written statement describing this discharge will also be submitted to ODA. The

amount of manure, litter and process waste applied will be reported annually. The amount of manure, litter and process waste exported will be reported annually.

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

1251508
STATE: OREGON

CLIENT: Mountainside Farms

ASSISTED BY: ODA CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

ANIMAL INVENTORY

Type of Animal	Number of Animals	Average Weight (lbs.)	Animal Units (1,000 lb.)	Milk Production in Pounds/Cow/Day= 43 — Nutrient Production (lbs./day/1000 lb. Animal Unit) N	P	K	Nutrient Production (lbs./day) N	P	K	Manure CF/D/AU	Annual Days Confined	Annual Days Grazed
MILKER (Holstein)	300	900	270.0	0.65	0.11	0.29	174.42	28.37	79.30	1.51	169	196
MILKER (DRY)	50	1,000	50.0	0.33	0.07	0.17	16.50	3.50	8.50	0.92	120	245
HEIFERS (12-24 Months)	160	700	112.0	0.27	0.05	0.12	29.79	5.10	13.44	0.90	120	245
CALVES (1-12 Months)	80	150	12.0	0.42	0.05	0.11	5.04	0.65	1.32	1.34	120	245
Totals/Averages-	590	688	444.0	0.51	0.08	0.23	225.8	37.6	102.6	1.3		

GRAZING PERIOD

Type of Animal	Percent of Month and Number of Animals Grazing OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	AU-YR.
MILKER (Holstein)	80%	0%	0%	0%	0%	80%	80%	80%	80%	80%	80%	80%	
	300	300	300	300	300	300	300	300	300	300	300	300	1,728
MILKER (DRY)	100%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	
	50	50	50	50	50	50	50	50	50	50	50	50	400
HEIFERS (12-24 Months)	100%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	
	160	160	160	160	160	160	160	160	160	160	160	160	896
CALVES (1-12 Months)	100%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	
	80	80	80	80	80	80	80	80	80	80	80	80	96
													0
													0
													0
													0
													0
													0
Total AUM's Available>	0	0	0	0	0	0	0	0	0	0	0	0	0
Total AUM's Needed>>>	390	0	0	0	0	390	390	390	390	390	390	390	3,120
Total AUM's>>>>>>>>>>	-390	0	0	0	0	-390	-390	-390	-390	-390	-390	-390	-3,120

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

CLIENT: Mountainside Farms

ASSISTED BY: ODA CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

WEATHER STATION LA COMB 1 WNW

Month	25Yr-24Hr 4.00 Monthly Average in Inches: Precipitation	Evaporation	Lot Runoff Factors as a Percent of Monthly Precipitation: Paved	Unpaved
October	4.41	1.75	50%	15%
November	8.82	0.76	50%	20%
December	8.33	0.65	50%	15%
January	7.28	0.78	50%	20%
February	6.53	1.03	45%	15%
March	5.97	1.41	40%	10%
April	4.86	2.30	35%	10%
May	4.10	3.56	35%	10%
June	2.85	4.59	40%	10%
July	1.10	5.95	30%	0%
August	1.22	5.45	30%	10%
September	2.03	3.68	37%	15%
Annual	57.5	31.91		

AREAS CONTRIBUTING RUNOFF TO LIQUID STORAGE FACILITY

Description of Runoff Area	Area in SF
Paved Lot Area >> Is paved lot scraped daily? (Y/N) NO	0
Unpaved Lot Area >>	0
Roof Area >>	6,875
Surface Area of Silage Storage Facility>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> Does Silage Seepage Drain to Storage Facility? (Y/N) YES	0
Total Runoff Area Contributing to Liquid Storage Facility>>>>>>>>>>>>>>>>>	6,875

WATER USE THAT ENTERS LIQUID STORAGE FACILITY

Type of Water Use	Number of Animals	Number of Washes per Day	Gallons of Water Used per Wash-Day	Total Water Use per Day, Gallons	Total Water Use per Day, Cubic Feet
Animal Washwater	300.0	0	0.25	0	0.0
Equipment Wash		2	200.00	400	53.5
Flushwater		0	0.00	0	0.0
Miscellaneous		2	87.50	175	23.4
Total>>				575	76.9

CROP DATA

Field Number	Acres	Crop	Percent Dry Matter (DM)	Yield Units	Target Yield	Nutrients Removed in Pounds per Acre: Nitrogen N	Phosphorous P2O5	Potassium K2O
1-9	111.0	Perennial Hay/Pasture(Med-High Intensity)	85%	Ton	6.50	320	101	266
hill	64.0	Grass/Legume Hay/Pasture	85%	Ton	4.00	136	51	166

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

CLIENT: Mountainside Farms

ASSISTED BY: ODA

CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

BEDDING VOLUME

Type of Animal	Type of Bedding Facility	Bedding Material	Unit Weight Lbs/CF	Amount Needed Lbs/Day/AU	Volume CF/Day/AU	Total Volume CF/Day	Total Weight Lbs/Day
MILKER (Holstein)	Free Stall	Sawdust	12.00	5.00	0.42	113	1,350
MILKER (DRY)	Free Stall	Sawdust	12.00	2.00	0.10	5	100
HEIFERS (12-24 Months)	Loose Housing	Sawdust	12.00	5.00	0.42	47	560
CALVES (1-12 Months)	Loose Housing	Sawdust	12.00	5.00	0.42	5	60

SOLIDS SEPARATION FACTOR

Type of Animal	Type of Separator	Separation Factor %	Volume of Solids Separated CF/Day	Volume of Solids in Liquids CF/Day	Volume of Manure in Liquids CF/Day	Volume of Manure in Solids CF/Day	Accumulated Sludge in Storage CF/Day	Density of Separated Solids Lbs/CF	Weight of Separated Solids Lbs/Day
MILKER (Holstein)	Gravity Basin	50%	82	82	382	26	115	36	2,946
MILKER (DRY)	Dry Scrape System	75%	38	13	12	35	3	36	1,377
HEIFERS (12-24 Months)	Dry Scrape System	75%	111	37	25	76	13	36	3,982
CALVES (1-12 Months)	Dry Scrape System	75%	16	5	4	12	2	36	569
Total Solids>>>			247	137	423	148	133		8,874

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

1251508
STATE: OREGON

CLIENT: **Mountainside Farms**
ASSISTED BY: ODA

CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

Month	Runoff in Cubic Feet: Roof Area Square Feet 6,875	Runoff in Cubic Feet: Paved Slab Area Square Feet 0	Runoff in Cubic Feet: Unpaved Lot Area Square Feet 0	Runoff in Cubic Feet: Silage Pit Surface Area, SF 0	Facility Water Use Cubic Feet	Manure: Solids Cubic Feet	Manure: Liquids Cubic Feet	Bedding: Cubic Feet	Bedding: Pounds	Solids Separated: Cubic Feet	Solids Separated: Pounds	Solids in Liquids: Cubic Feet	Solids in Liquids: Pounds	Total Solids Cubic Feet	Total Liquids Cubic Feet
October	2,527	0	0	308	2,383	317	2,210	698	8,370	507	18,267	507	18,267	507	8,093
November	5,053	0	0	293	2,306	2,211	14,903	5,075	62,100	7,395	266,220	4,102	147,665	7,395	24,858
December	4,772	0	0	308	2,383	2,285	15,400	5,244	64,170	7,642	275,094	4,239	152,587	7,642	24,806
January	4,171	0	0	308	2,383	2,285	15,400	5,244	64,170	7,642	275,094	4,239	152,587	7,642	24,204
February	3,741	0	0	278	2,152	2,064	13,909	4,737	57,960	6,902	248,472	3,828	137,821	6,902	23,104
March	3,420	0	0	308	2,383	317	2,210	698	8,370	507	18,267	507	18,267	507	8,987
April	2,784	0	0	293	2,306	307	2,138	675	8,100	491	17,677	491	17,677	491	8,243
May	2,349	0	0	0	2,383	317	2,210	698	8,370	507	18,267	507	18,267	507	7,608
June	1,633	0	0	0	2,306	307	2,138	675	8,100	491	17,677	491	17,677	491	6,798
July	630	0	0	0	2,383	317	2,210	698	8,370	507	18,267	507	18,267	507	5,889
August	699	0	0	0	2,383	317	2,210	698	8,370	507	18,267	507	18,267	507	5,958
September	1,163	0	0	293	2,306	307	2,138	675	8,100	491	17,677	491	17,677	491	6,621
Annual	32,943	0	0	2,386	28,058	11,353	77,076	25,813	314,550	33,590	1,209,247	20,417	735,027	33,590	155,169

DAILY NUTRIENT PRODUCTION

Type of Animal	Pounds/Day of Nutrients from LIQUIDS: N	LIQUIDS: P_2O_5	LIQUIDS: K_2O	Pounds/Day of Nutrients from SOLIDS: N	SOLIDS: P_2O_5	SOLIDS: K_2O	Pounds/Day of Nutrients from GRAZING: N	GRAZING: P_2O_5	GRAZING: K_2O
MILKER (Holstein)	87.21	32.50	47.78	87.21	32.50	47.78	174.42	65.00	95.56
MILKER (DRY)	4.13	2.00	2.56	12.38	6.01	7.68	16.50	8.02	10.24
HEIFERS (12-24 Months)	7.45	2.92	4.05	22.34	8.76	12.15	29.79	11.67	16.20
CALVES (1-12 Months)	1.26	0.37	0.40	3.78	1.11	1.19	5.04	1.48	1.59
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
•	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MONTHLY NUTRIENT PRODUCTION

Month	Pounds of Nutrients from LIQUIDS: N	LIQUIDS: P_2O_5	LIQUIDS: K_2O	Pounds of Nutrients from SOLIDS: N	SOLIDS: P_2O_5	SOLIDS: K_2O	Pounds of Nutrients from GRAZING: N	GRAZING: P_2O_5	GRAZING: K_2O	Pounds of Nutrients going OFF-FARM: N	OFF-FARM: P_2O_5	OFF-FARM: K_2O	Total Pounds of Nutrients from ALL SOURCES: N	ALL SOURCES: P_2O_5	ALL SOURCES: K_2O
October	541	201	296	541	201	296	5,917	2,269	3,239	0	0	0	6,998	2,671	3,831
November	3,001	1,134	1,644	3,771	1,451	2,064	0	0	0	0	0	0	6,773	2,585	3,708
December	3,101	1,172	1,698	3,897	1,500	2,133	0	0	0	0	0	0	6,998	2,671	3,831
January	3,101	1,172	1,698	3,897	1,500	2,133	0	0	0	0	0	0	6,998	2,671	3,831
February	2,801	1,058	1,534	3,520	1,355	1,926	0	0	0	0	0	0	6,321	2,413	3,461
March	541	201	296	541	201	296	5,917	2,269	3,239	0	0	0	6,998	2,671	3,831
April	523	195	287	523	195	287	5,726	2,195	3,134	0	0	0	6,773	2,585	3,708
May	541	201	296	541	201	296	5,917	2,269	3,239	0	0	0	6,998	2,671	3,831
June	523	195	287	523	195	287	5,726	2,195	3,134	0	0	0	6,773	2,585	3,708
July	541	201	296	541	201	296	5,917	2,269	3,239	0	0	0	6,998	2,671	3,831
August	541	201	296	541	201	296	5,917	2,269	3,239	0	0	0	6,998	2,671	3,831
September	523	195	287	523	195	287	5,726	2,195	3,134	0	0	0	6,773	2,585	3,708
Annual	16,278	6,128	8,916	19,358	7,398	10,598	46,763	17,928	25,597	0	0	0	82,399	31,454	45,110

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

1251508
STATE: OREGON

CLIENT: **Mountainside Farms**
ASSISTED BY: **ODA**
CHECKED BY:

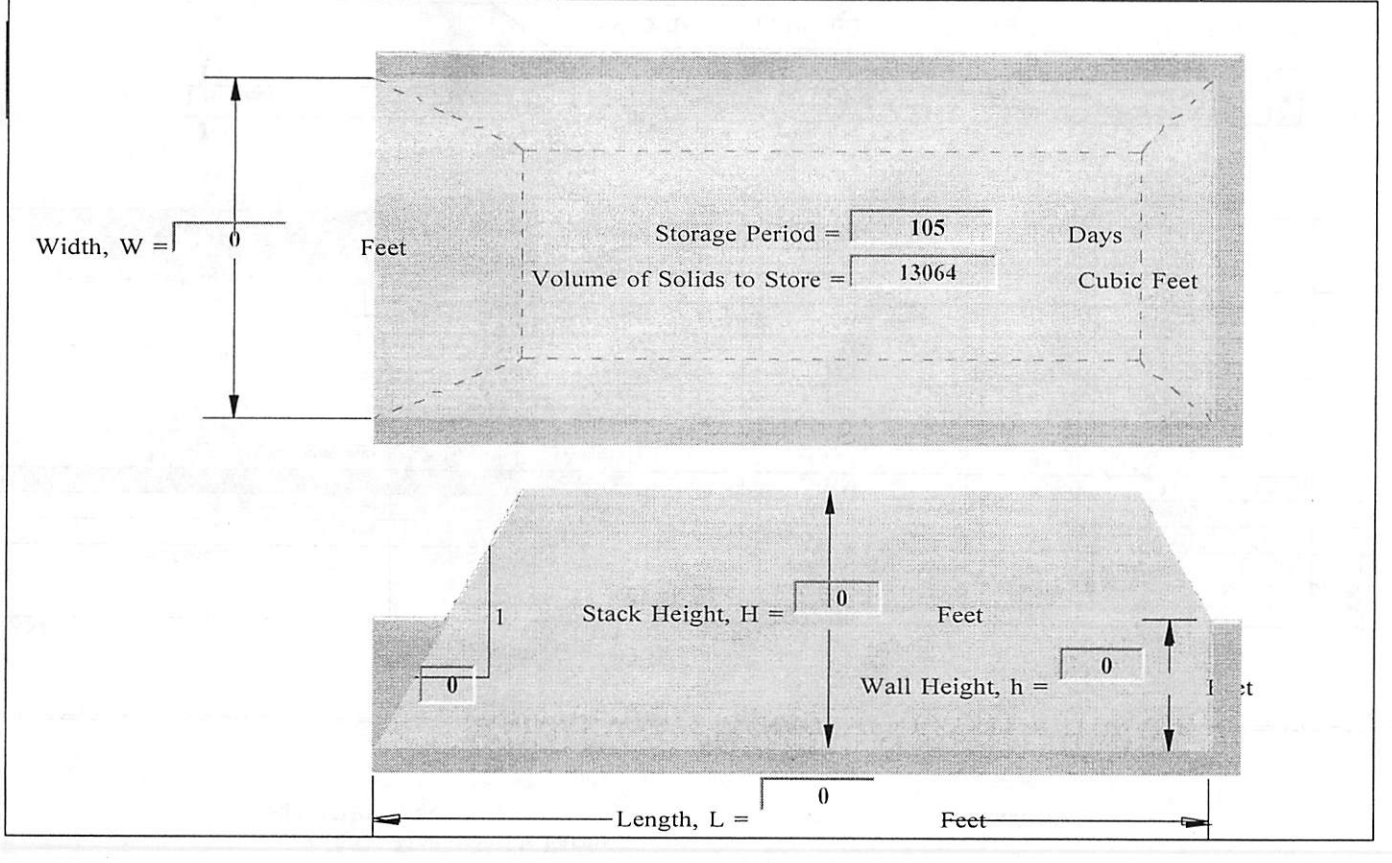
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

Solids Storage Facility Parameters	Value
Storage Period, Days=	105
Stacking Width, W in Feet=	0
Stacking Height, H in Feet=	0.00
Wall Height, h in Feet=	0.00
Stack Side Slope (X:1)=	0.00
Existing Storage, Cubic Feet=	13,440
Surface Area of Existing Storage, SF=	2,800
25 Year-24 Hour Storm Runoff, CF=	933
Volume Needed, Cubic Feet=	13,064
Design Volume, Cubic Feet=	0
Is Facility Covered?	NO

MONTHLY SOLIDS VOLUME STACKED IN FACILITY

Month	Number of Days	Manure CF	Bedding CF	Solids to Store CF	Normal Runoff CF
October	31	159	349	254	154
November	30	4433	2,963	3,698	412
December	31	4580	3,061	3,821	292
January	31	4580	3,061	3,821	340
February	28	4137	2,765	3,451	229
March	31	159	349	254	139
April	30	154	338	246	113
May	31	159	349	254	96
June	30	154	338	246	67
July	31	159	349	254	0
August	31	159	349	254	28
September	30	154	338	246	71
Annual	365	18,984	14,606	16,795	1,940



U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

1251508
STATE: OREGON

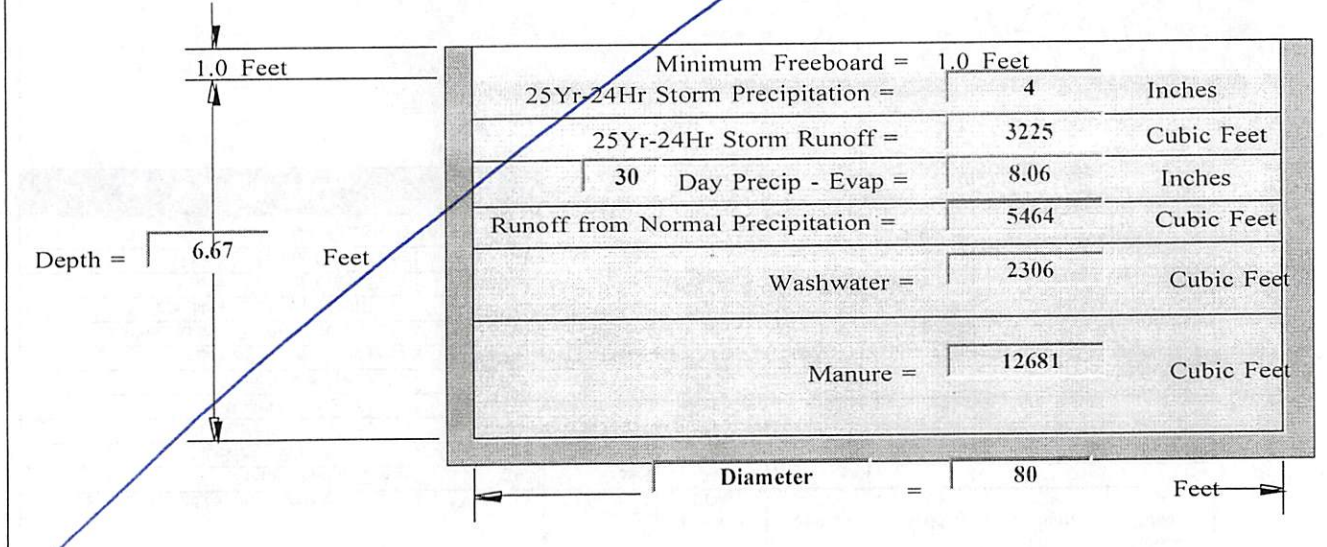
CLIENT: **Mountainside Farms**
ASSISTED BY: **ODA**
CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

TANK Tank Parameters	Value
Storage Period, Days=	30
Tank Diameter, Feet=	80
Existing Storage, Cubic Feet=	0
Surface Area of Existing Storage, SF=	0
25 Year-24 Hour Storm Runoff, CF=	3,225
Volume Needed, Cubic Feet=	33,543
Design Volume, Cubic Feet=	33,510
Is Tank Covered?	NO
Tank Dimensions?	Circular

MONTHLY INFLOWS INTO TANK

Month	Number of days	Rain-Evap on Tank CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Manure CF	Solids CF	Waste to Store CF
October	31	1,114	0	2,681	2,383	2,368	507	5,259
November	30	3,374	0	5,465	2,306	12,682	4,102	19,090
December	31	3,215	0	5,064	2,383	13,104	4,239	19,726
January	31	2,721	0	4,511	2,383	13,104	4,239	19,726
February	28	2,303	0	3,970	2,152	11,836	3,828	17,817
March	31	1,909	0	3,560	2,383	2,368	507	5,259
April	30	1,072	0	2,898	2,306	2,292	491	5,089
May	31	226	0	2,445	2,383	2,368	507	5,259
June	30	-728	0	1,699	2,306	2,292	491	5,089
July	31	-2,031	0	630	2,383	2,368	507	5,259
August	31	-1,771	0	727	2,383	2,368	507	5,259
September	30	-691	0	1,234	2,306	2,292	491	5,089
Annual	365	10,714	0	34,883	28,058	69,445	20,417	117,920



U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

1251508
STATE: OREGON

CLIENT: **Mountainside Farms**
ASSISTED BY: **ODA** CHECKED BY:

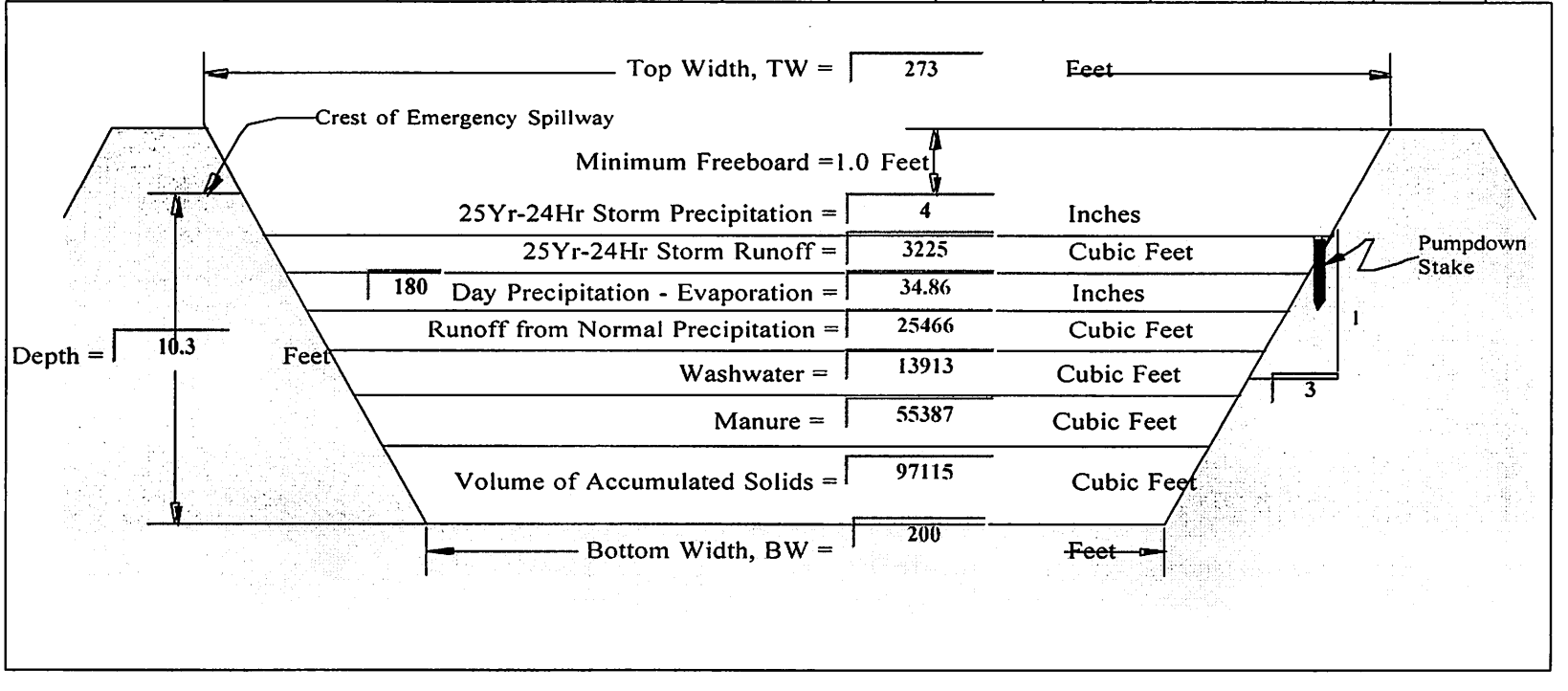
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

WASTE STORAGE POND

Pond Parameters	Value
Storage Period, Days=	180
Side Slope (X:1)=	3.00
Bottom Width, BW, Feet=	200
Bottom Length, BL, Feet=	350
Accumulated Solids Duration, Years=	2
Existing Storage, Acre Feet=	0.00
Surface Area of Existing Storage, SF=	96,250
Minimum Soil Liner Depth, Feet=	1.00
25 Year-24 Hour Storm Runoff, CF=	3,225
Top Width, TW, Feet=	273
Top Length, TL, Feet=	423
Volume Needed, Acre Feet=	20.7
Design Volume, Acre Feet=	20.9

MONTHLY INFLOWS INTO WASTE STORAGE POND

Month	Number of Days	Rain-Evap on Pond CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Manure CF	Solids CF	Waste to Store CF
October	31	25,598	21,335	2,681	2,383	2,368	507	5,259
November	30	77,563	64,648	5,465	2,306	12,682	4,102	19,090
December	31	73,907	61,600	5,064	2,383	13,104	4,239	19,726
January	31	62,551	52,135	4,511	2,383	13,104	4,239	19,726
February	28	52,928	44,115	3,970	2,152	11,836	3,828	17,817
March	31	43,882	36,575	3,560	2,383	2,368	507	5,259
April	30	24,636	20,533	2,898	2,306	2,292	491	5,089
May	31	5,197	4,331	2,445	2,383	2,368	507	5,259
June	30	-16,744	-13,956	1,699	2,306	2,292	491	5,089
July	31	-46,673	-38,901	630	2,383	2,368	507	5,259
August	31	-40,706	-33,928	727	2,383	2,368	507	5,259
September	30	-15,878	-13,234	1,234	2,306	2,292	491	5,089
Annual	365	246,259	205,253	34,883	28,058	69,445	20,417	117,920



U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version HRv3.3

1251508
STATE: OREGON

CLIENT: Mountainside Farms
ASSISTED BY: ODA

HECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 33,590 cubic feet of solids generated from the operation it will take approximately 169 trips annually. Based on applying NITROGEN, N
at agronomic rate use the application depths, travel lengths, and loads per acre listed below for each crop.

Field Number	Acres	Crop	Tractor Spreader Capacity		Spread Width Feet	NITROGEN, N Concentration in Storage Facility		Pounds of Nutrients to be Applied	Number of Applications Needed to meet Crop Demand	Tons per Acre of Solids to Apply	Travel Length per Load Needed in Feet	Loads per Acre	Assumed Solids Density lbs/CF
			Bushels	CF		PPM	Lbs/Ton						
1-9	111	Perennial Hay/Pasture(Med-High Intensity)	160	199	15	1,720	3.44	320	1.00	166.3	63	46	36
hill	64	Grass/Legume Hay/Pasture	160	199	15	1,720	3.44	136	1.00	70.4	148	20	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

To apply 4,520,278 gallons of liquids generated from the operation it will take approximately 251 hours of pumping annually. Based on applying NITROGEN, N
at agronomic rate use the application depths, set times, and travel rates listed below for each crop.

Field Number	Acres	Crop	Sprinkler Flowrate GPM	Wetted Diameter Feet	Portion of Wetted Diameter Receiving Liquids	NITROGEN, N Concentration in Storage Facility		Pounds of Nutrients to be Applied	Number of Applications Needed to meet Crop Demand	Inches of Liquids to Apply	Application Rate in Inches/Hour	Set Time Needed in Hours	Travel Rate Needed in Feet/Minute
						PPM	Lbs/1000Gal						
1-9	111	Perennial Hay/Pasture(Med-High Intensity)	300	250	3/4 Cir	158	1.32	320	1.00	14.91	0.97	25.29	0.13
hill	64	Grass/Legume Hay/Pasture	300	250	3/4 Cir	158	1.32	136	1.00	6.31	0.97	10.70	0.31

CLIENT: Mountainside Farms
ASSISTED BY: ODA

HECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

To apply 4,520,278 gallons of liquids generated from the operation it will take approximately 0 trips annually. Based on applying NITROGEN, N
at agronomic rates use the application depths, travel lengths, and loads per acre listed below for each crop.

Field Number	Acres	Crop	Tank Wagon Capacity Gallons	Spread Width Feet	NITROGEN, N Concentration in Storage Facility PPM	NITROGEN, N Concentration in Storage Facility Lbs/1000Gal	Pounds of Nutrients to be Applied	Number of Applications Needed to meet Crop Demand	Inches of Liquids to Apply	Travel Length per Load Needed in Feet	Loads per Acre
1-9	111	Perennial Hay/Pasture(Med-High Intensity)	0	15	0	0.00	320	1.00		#VALUE!	#VALUE!
hill	64	Grass/Legume Hay/Pasture	0	15	0	0.00	136	1.00		#VALUE!	#VALUE!

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

Storage Facility	Annual Volume Production	Units	Concentration of Nutrients in Storage N	P2O5	K2O	Units
Storage Pond (>50%) Dilution	4,520,278	Gallons	1.42	0.88	1.58	lbs/th Gal
Solids Storage Facility (Unroofed)	302	Tons	20.81	9.79	14.02	lbs/Ton

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET
Version HRv3.3

1251508
STATE: OREGON

CLIENT: Mountainside Farms
ASSISTED BY: ODA

CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation / Type of Storage Facility	Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
		N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
Liquids	Dairy / Storage Pond (>50%) Dilution	16,278	6,128	8,916	39%	65%	80%	6,428	3,983	7,133
Solids	Solids Storage Facility (Unroofed)	19,358	7,398	10,598	65%	80%	80%	12,583	5,919	8,478
Grazing	NONE	46,763	17,928	25,597	100%	100%	100%	46,763	17,928	25,597

NUTRIENTS AVAILABLE AFTER APPLICATION

Nutrient Source	Type of Application System	Pounds of Nutrients Available			Percent Nutrients Retained After Application			Pounds of Nutrients Retained After Application		
		N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
Liquids	Sprinkling	6,428	3,983	7,133	75%	100%	100%	4,821	3,983	7,133
Solids	Broadcast (Incorporated 7 or more days after application)	12,583	5,919	8,478	70%	100%	100%	8,808	5,919	8,478
Grazing	Grazing	46,763	17,928	25,597	85%	100%	100%	39,748	17,928	25,597

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location / Soil Drainage Class	Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
	Between Coastal and Cascade Mountains	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
Liquids	Somewhat Poorly Drained	4,821	3,983	7,133	80%	100%	100%	3,857	3,983	7,133
Solids	Somewhat Poorly Drained	8,808	5,919	8,478	80%	100%	100%	7,046	5,919	8,478
Grazing	Somewhat Poorly Drained	39,748	17,928	25,597	80%	100%	100%	31,799	17,928	25,597
							TOTAL-	*42,702*	*27,830*	*41,208*

PERCENT OF MANURE TO BE APPLIED TO FIELD AND UTILIZATION ACRES NEEDED BASED ON NITROGEN, N

Field Number	Acres	Crop	LIQUIDS Percent to be Applied	LIQUIDS Pounds of Nutrients to be Applied	LIQUIDS Acres Needed for Utilization of Nutrients	SOLIDS Percent to be Applied	SOLIDS Pounds of Nutrients to be Applied	SOLIDS Acres Needed for Utilization of Nutrients	GRAZING Percent to be Applied	GRAZING Pounds of Nutrients to be Applied	GRAZING Acres Needed for Utilization of Nutrients
1-9	111.0	Perennial Hay/Pasture(Med-High Intensity)	80%	3,100	10	80%	5,664	18	80%	25,560	80
hill	64.0	Grass/Legume Hay/Pasture	20%	757	6	20%	1,383	10	20%	6,239	46
			0%	0		0%	0		0%	0	
TOTALS-	175		100%	3,857	15	100%	7,046	28	100%	31,799	126

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET
Version HRv3.3

1251508
STATE: OREGON

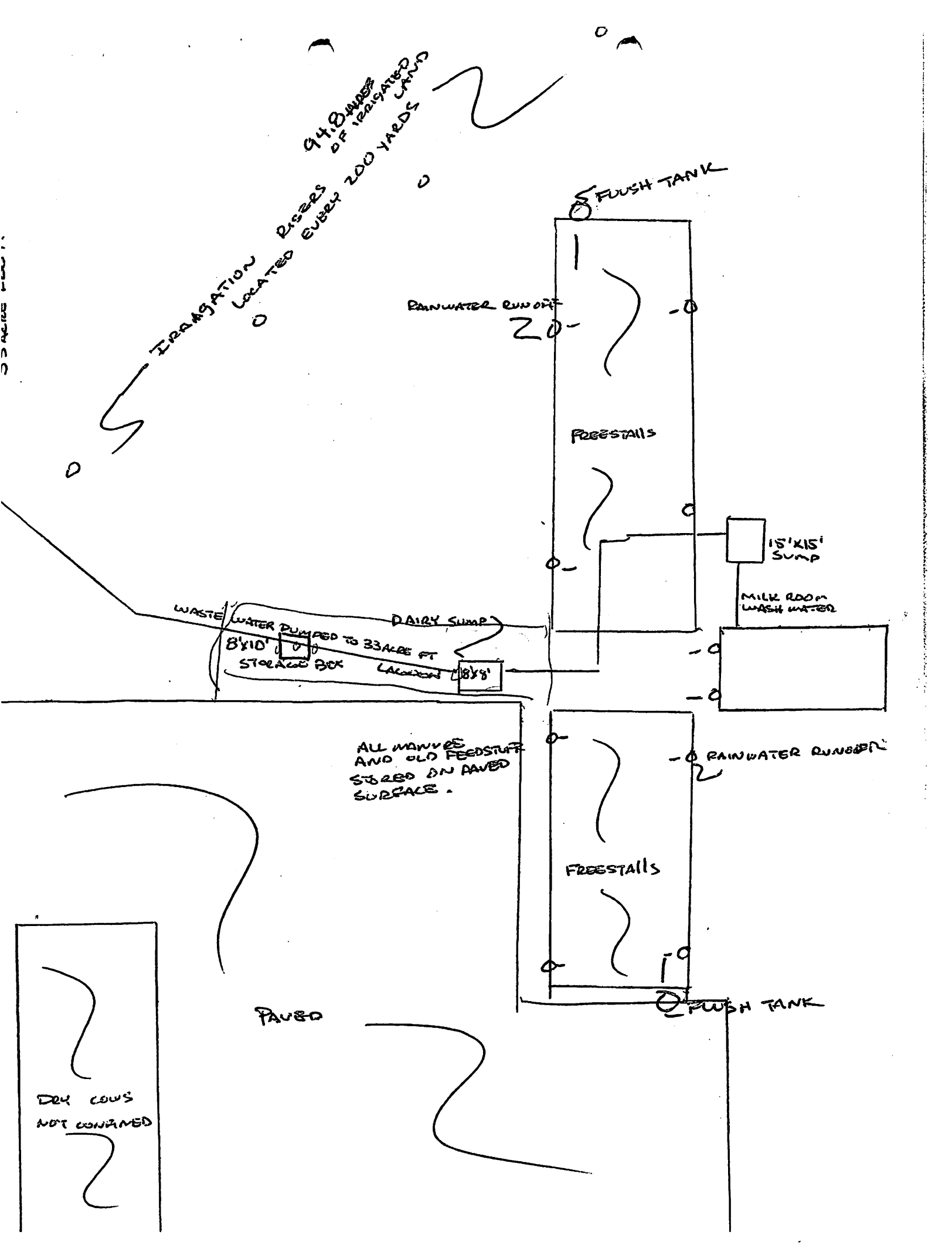
CLIENT: **Mountainside Farms**
ASSISTED BY: ODA

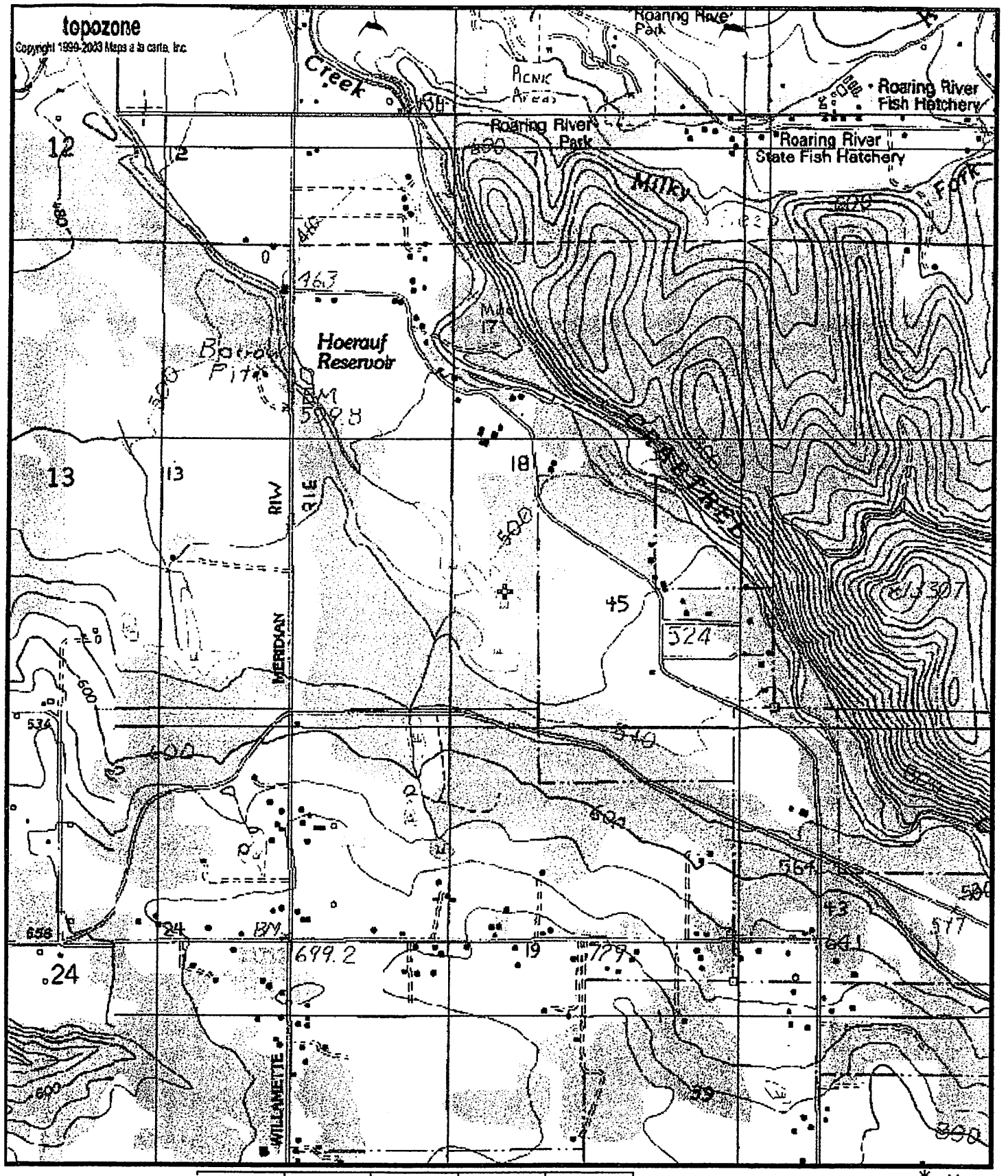
CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

			NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
Field Number	Acres	Crop	Nitrogen, N Lbs/Acre	Phosphorous, P_2O_5 Lbs/Acre	Potassium, K_2O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P_2O_5 Lbs/Acre	Potassium, K_2O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P_2O_5 Lbs/Acre	Potassium, K_2O Lbs/Acre
1-9	111.0	Perennial Hay/Pasture(Med-High Intensity)	309	202	298	320	101	266	-11	100	32
hill	64.0	Grass/Legume Hay/Pasture	131	85	126	136	51	166	-5	35	-40


94.8 ACRES OF IRRIGATED LAND
IRRIGATION RISERS LOCATED EVERY 200 YARDS
FLUSH TANK
RAINWATER RUN OFF
20'
FREESTALLS
15'X15' SUMP
MILK ROOM WASH WATER
WASTE WATER PUMPED TO 33 ACRE FT LAGOON
DAIRY SUMP
8'X10' STORAGE BOX
8'X8'
ALL MANURE AND OLD FEEDSTUFF STORED ON PAVED SURFACE.
RAINWATER RUNOFF
FREESTALLS
FLUSH TANK
PAVED
DRY COWS NOT CONFINED



Map center is UTM 10 521079E 4939671N (WGS84/NAD83)

Lacomb quadrangle

Projection is UTM Zone 10 NAD83 Datum

M=17.227

G=0.187


N
E Lacomb Rd
© 2008 Tele Atlas
Image State of Oregon
Pointer 44°36'54.42" N 122°44'05.86" W elev 148 m Streaming 100%
Eye alt 1.16 km


N
© 2008 Tele Atlas
Image State of Oregon
Google
Pointer 44°36'54.32" N 122°44'07.15" W elev 148 m Streaming 100% Eye alt 396 m

ANIMAL WASTE MANAGEMENT PLAN
MINIMUM REQUIRED ELEMENT

Operation and Maintenance

Mountainside Farms LLC
Name of Operation

Mark all that apply to your operation.

☐ Above and/or Below Ground Liquid Tank

The tank serves as a collection point for effluent to drain to or be scraped from the animal feeding areas. If the tank will provide storage capacity to the waste management system it shall be completely emptied at the beginning of the storage period and the contents applied to cropland as weather and crop conditions permit. A 1-foot free board will be maintained to prevent spillage. Continually maintain all pumps, agitators, piping valves and all other electrical and mechanical equipment in good operating condition by following manufacturer's recommendations. Float valves will be maintained in good working order. Perform daily inspections of waterlines including drinking water or cooling water lines. Repair leaking lines immediately to prevent excess water from entering the waste storage system. Depth markers are installed to assure maximum volume will be maintained and checked weekly. At least once every 5 years, the tank shall be emptied and inspected for structural damage and leakage. Any damage found shall be corrected before putting the tank back in service. Remove all foreign debris within the structure that may cause damage to pumps and agitator. If below ground, the tank lid will not be subjected to more than two, 8,000 pound wheel loads. Before entering a tank, for any reason whatever, proper ventilation shall be provided, and self-contained breathing apparatus shall be used, if required, when entering a covered tank. No one shall enter the tank unless safety ropes are used and someone else capable of providing assistance is outside of the tank. Warning: Entering Unventilated Tanks Is Extremely Dangerous.

☒ Animal Access Lanes or Walkways

Damaged components will be repaired or replaced as needed. Debris and excess manure will be removed from roadway surfaces, road ditch and drainage areas. Maintain drainage area capacities. Maintain good vegetative cover on all slopes and watercourses.

☐ Agitator

Preventative maintenance will be in accordance with the manufacturer's recommendations. Periodically examine the agitator for proper operation. Clean debris from the propeller and promptly replace any defective or damaged parts. Remove the agitator from the manure tank or pond and periodically clean and oil as needed to increase the life expectancy of the agitator. Immediately repair any vandalism or livestock damage. Do not allow livestock near the equipment during operation.

Concrete Gutters

Floor gutters and grates will be inspected periodically. All foreign material restricting flow will be removed. Damage will be repaired as needed.

Curbs

Curbs, gutters and slabs that are used to convey effluent to the below ground tank will be inspected periodically. Broken sections will be repaired or replaced. Manure or other solids will be prevented from building up next to curbs or flowing over them. If over flow is a consistent problem the curb height should be increased.

Culverts

Inspect annually or after large rainfall event. All foreign objects restricting water flow will be removed. Damaged sections will be repaired or replaced. Erosion around inlet or outlet will be corrected.

Dry Stack Storage Facility

Solid manure storage facility will be inspected annually. Broken slabs and curbs will be repaired. Repair or replace rusted or damaged areas on roof structure. Broken gutters and/or downspouts will be repaired or replaced. Check for adequacy and function of drain away from downspouts. Check side and back walls for soundness.

Fencing

Fences will be inspected periodically. Broken or decayed posts will be replaced. Sagging wire will be tightened. Broken wire will be spliced or replaced. Broken or missing insulators for electric fencing will be replaced. Vegetation will be controlled under the fences.

Filter Strips

Maintain vigorous growth of vegetative covering. This includes reseeding, fertilization and application of herbicides when necessary. Periodic mowing, harvesting or grazing may also be needed to control height. Remove all foreign debris that hinders system operation. Limit the traffic from filter strip area. Limit livestock usage to vegetative growth periods when the animals will not damage vegetative root system or compact the soil. Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage.

Gutters and Downspouts

Gutters will be inspected annually to ensure all gutters are free of foreign materials. Broken gutters or downspouts will be replaced or repaired. Gutters will be connected to downspouts. Leaky gutters and downspouts will be repaired. Weeds and sediment will be removed from downspout outlets. All downspouts will be connected to outlets, which are kept free flowing. Outlets will be inspected for rodent guards and repaired or replaced as needed.

Manure Application Equipment

All manure application equipment (including but not limited to sprinklers, big gun irrigators, spreaders and/or tank wagons) will be operated and maintained according to the manufacturer's manual. Equipment found to be broken or worn will be replaced. Equipment will be calibrated to ensure recommended rates are applied. Liquids will be drained from sprinklers or big guns prior to freezing weather. When system is flushed, rinse water is used following waste, and liquid and sediment is applied agronomically. Nozzles will be checked periodically and if worn, nozzles will be replaced. Minimize exposure to animal and organic waters and manure gasses. Wear protective clothing when appropriate. When cleaning equipment after nutrient application, remove and save wastes in an appropriate manner. Avoid applying manure near surface water and use extreme care to avoid contaminating ground water.

Manure Effluent and Irrigation Transfer Lines.

Manure, effluent and irrigation lines shall be flushed with clean water periodically to prevent particle buildup and plugging. Manure flushed from the lines will be applied agronomically so that surface and groundwater will be protected. Manure, effluent and irrigation lines shall be inspected periodically for leaks or worn out nozzles, and repairs or replacements made as needed. Special inspection shall be done to pressure relief valves, risers and control valves. Shut off valves will be inspected annually. Avoid unnecessary travel over pipelines that will damage their integrity. Equipment found to be broken or worn will be replaced. Water will be drained during cold weather to prevent frozen or broken lines. These lines can explode if not properly maintained and may cause human injury.

Pumps

Pumps will be maintained in accordance with manufacturer's operation and maintenance manual. Effluent will be drained from pumps prior to freezing weather. Pumps will be inspected periodically to identify and remove debris wrapped around impeller or worn parts. Appropriate action will be taken to repair any worn parts. Liquids will be drained from pump prior to freezing weather to prevent breakage. It is recommended to have a spare pump or back up system in case a pump must be removed for an extended time for repair.

Roofs

Roofs will be inspected annually. Rusted sections will be replaced or repaired if needed. Loose sections will be secured. All broken trusses, beams, poles, gutters and downspouts will be repaired or replaced.

Solid Manure Separator

The separator should be inspected regularly for deterioration of protective coatings and repaired as necessary. All plumbing will be inspected annually and broken lines will be replaced or repaired. Loose connections will be tightened. If applicable, electric motors, pumps and gears should be routinely maintained. Separator will be operated and maintained according to manufacturer's manual.

☑ Trough or Tank

Watering facility will be inspected periodically. Damaged tank/trough will be repaired or replaced. Float valves will be maintained in good working order. Area immediately surrounding the trough/tank will be maintained in a stable condition.

☑ Waste Storage Pond

Prior to the storage season, empty the pond to provide storage capacity for the accumulation of wastewater and precipitation during the winter storage period. Sludge and accumulated solids will be removed from the pond periodically when buildup limits storage capacity in the pond. Depth markers are installed to assure maximum volume will be maintained and checked weekly. A 2-foot free board will be maintained to prevent spillage.

Maintain all pumps, agitators, pipeline, valves, and electrical and mechanical equipment in good operating condition following the manufacturer's recommendations. Immediately repair any vandalism, vehicular, or livestock damage to any earth fill. Immediately remove any obstructions or blockage of spillways, trash racks or pipe inlets. Settlement or cracks in earthen sections should be investigated to determine cause and immediately repaired. Maintain vigorous growth of vegetative coverings on the dikes to eliminate soil erosion. Eradicate or otherwise remove all rodents or burrowing animals and repair any damage caused by their activity. Fences and/or warning signs should be maintained as necessary to unauthorized human or livestock entry. Operate systems in a manner that minimizes odor and drift.

Signature of Legally Authorized Representative: Bradley Freeman

Print Name: Bradley Freeman Date: 7-29-08

PHOSPHORUS INDEX WORKSHEET – **WESTERN** OREGON

Producer: Mountainside County: Linn Tract No. _____ Field No(s). _____ Date: _____

Soil Map Unit(s): _____ Soil Test P: 20 ppm Lab. Method: _____ Sample Depth: _____

Crop Rotation: pasture Nutrient Application Method(s) Sprinkle, broadcast, grazing

Planner: _____ Notes: _____

		PHOSPHORUS LOSS RATING					Weighted Rating Value	
TRANSPORT FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned
Soil Erosion – tons/ac/yr (RUSLE)	1.50	< 1 (0)	1 – 3 (1.5)	4 – 6 (3.0)	7 – 15 (6.0)	> 15 (12.0)	3	
Soil Erosion from Sprinkler Irrigation	0.75	No sprinkler irrigation (0)	Application rate < infiltration rate OR No visible runoff at field borders (0.75)	Application rate = infiltration rate OR Little to no visible runoff at field borders (1.5)	Application rate > infiltration rate OR Visible runoff at field borders (3.0)	Application rate > Infiltration rate OR Excessive runoff visible at field borders. Rills and gullies present. (6.0)	.75	
Runoff Class	1.00	Negligible (0)	Very low or low (1.0)	Medium (2.0)	High (4.0)	Very High (8.0)	2	
Flooding Frequency Class	0.75	None or very rare (0)	Rare (0.75)	Occasional (1.5)	Frequent (3.0)	Very Frequent (6.0)	1.5	
Distance to Perennial Surface Waters / Buffer Widths	0.75	> 500 feet OR buffer > 30 ft. wide (or meets NRCS standards) next to surface waters (0)	300 – 500 feet OR buffer 20 - 30 ft. wide next to surface waters (0.75)	200 – 299 feet OR buffer 10 -19 ft. wide next to surface waters (1.5)	100 – 199 feet AND buffer < 10 ft. wide next to surface waters (3.0)	< 100 feet AND No buffer next to surface waters (6.0)	0	
Subsurface Drainage	0.50	No Tile Drains (0)	Tile drains present Soil Test P (Bray P1) < 60 ppm (0.5)	Tile drains present Soil Test P (Bray P1) 61 - 140 ppm (1.0)	Tile drains present Soil Test P (Bray P1) 141- 190 ppm (2.0)	Tile drains present Soil Test P (Bray P1) > 190 ppm (4.0)	0	
						Transport Factors Subtotal (TFS)	7.25	

PHOSPHORUS INDEX WORKSHEET – WESTERN OREGON

Tract _____ Fields _____

SOURCE FACTORS	Factor Weight	PHOSPHORUS LOSS RATING None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Weighted Rating Value Current	Planned
Soil Test P – ppm (Bray P1)	1.00	(Soil Test P – 40) x 0.10	(26 (Soil Test P) - 40) x 0.10 = 0			Assign 0 points if Soil Test P < 40 ppm	0	
Commercial P Fertilizer Application Rate	1.00	lbs/ac P_2O_5 x 0.02	0 (lbs/ac P_2O_5) x 0.02 = 0				0	
Commercial P Fertilizer Application Method	1.00	None Applied (0)	Injected / banded deeper than 2 inches OR Incorporated within 5 days of application from March through September (1.0)	Incorporated within 5 days of application from October through February OR Surface applied March through August (2.0)	Incorporated more than 5 days after application OR Surface applied September through October (4.0)	Surface applied November through February (8.0)	0	
Organic P Source Application Rate	1.00	lbs/ac P_2O_5 x 0.02	202 (lbs/ac P_2O_5) x 0.02 = 4.04				4.04	
Organic P Source Application Method	1.00	None Applied (0)	Injected deeper than 2 inches OR Incorporated within 5 days of application from March through September (1.0)	Incorporated within 5 days of application from October through February OR Surface applied March through August (2.0)	Incorporated more than 5 days after application OR Surface applied September through October (4.0)	Surface applied November through February (8.0)	2	

Total Rating Value TFS + SFS	Site Vulnerability Class
< 13.0	Low
13.0 – 25.0	Medium
25.1 – 50.0	High
> 50.0	Very High

	Current	Planned
Transport Factors Subtotal (TFS)	7.25	
Source Factors Subtotal (SFS)	6.04	
Total Rating Value (TFS + SFS)	13.29	
Site Vulnerability Class	Medium	

ANIMAL WASTE MANAGEMENT PLAN
MINIMUM REQUIRED ELEMENT

AMENDMENT TO THE ANIMAL WASTE MANAGEMENT PLAN

Mountainside Farms — CONFINED ANIMAL FEEDING OPERATION

Bradley Freeman — CAFO OPERATOR'S NAME

35414 E Lacomb Rd, Lebanon, OR 97355 — STREET ADDRESS, CITY, STATE, ZIP

541-258-3181 — PHONE NUMBER

On December 2, 2008, Charlene Troost — INSPECTOR'S NAME

of the Oregon Department of Agriculture discussed modifications to Animal Waste Management Plan (AWMP) # 08076.

The following modifications were made to this AWMP:

1) Protocol for testing soil & manure.

2) Protocols for measuring nutrient removal/uptake.

3) Copy of phosphorus index.

CONCLUSION:

X The above amendments are accepted.

Charlene Troost
INSPECTOR'S SIGNATURE

Brad Freeman
OPERATOR'S SIGNATURE

RECEIVED
DEC 08 2008
NATURAL RESOURCES DIVISION

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Linn County Area, Oregon
Survey Area Data: Version 4, Dec 22, 2006

Date(s) aerial images were photographed: 5/23/1994; 7/7/1994; 9/15/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Linn County Area, Oregon (OR639)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
18	Camas gravelly sandy loam	0.2	0.1%
23	Clackamas gravelly silt loam	35.0	16.5%
29	Courtney gravelly silty clay loam	37.8	17.8%
43B	Hazelair silty clay loam, 2 to 7 percent slopes	46.3	21.8%
67	McBee silty clay loam	76.6	36.0%
98	Waldo silty clay loam	14.8	6.9%
101C	Willakenzie clay loam, 2 to 12 percent slopes	2.0	0.9%
Totals for Area of Interest (AOI)		212.6	100.0%

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Linn County Area, Oregon Version date: 12/22/2006 4:12:19 PM

18—Camas gravelly sandy loam

Map Unit Setting

Elevation: 120 to 700 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Camas and similar soils: 85 percent
Minor components: 5 percent

Description of Camas

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent sandy and gravelly alluvium derived from mixed sources

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability (nonirrigated): 4w

Typical profile

0 to 13 inches: Gravelly sandy loam
13 to 60 inches: Extremely gravelly coarse sand

Minor Components

Riverwash

Percent of map unit: 5 percent
Landform: Flood plains

23—Clackamas gravelly silt loam

Map Unit Setting

Elevation: 100 to 1,300 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 235 days

Map Unit Composition

Clackamas and similar soils: 85 percent
Minor components: 9 percent

Description of Clackamas

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Gravelly alluvium derived from mixed sources

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 3w

Typical profile

0 to 12 inches: Gravelly silt loam
12 to 21 inches: Gravelly silty clay loam
21 to 60 inches: Extremely gravelly clay loam

Minor Components

Awbrig

Percent of map unit: 3 percent
Landform: Terraces

Conser

Percent of map unit: 3 percent
Landform: Stream terraces

Courtney

Percent of map unit: 3 percent
Landform: Terraces

29—Courtney gravelly silty clay loam

Map Unit Setting

Elevation: 90 to 1,300 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 235 days

Map Unit Composition

Courtney and similar soils: 85 percent
Minor components: 11 percent

Description of Courtney

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Gravelly and clayey alluvium derived from mixed sources

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water capacity: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability (nonirrigated): 4w

Typical profile

0 to 17 inches: Gravelly silty clay loam
17 to 33 inches: Gravelly clay
33 to 48 inches: Very gravelly clay loam
48 to 60 inches: Extremely gravelly sand

Minor Components

Awbrig

Percent of map unit: 4 percent
Landform: Terraces

Bashaw

Percent of map unit: 4 percent
Landform: Flood plains

Conser

Percent of map unit: 3 percent
Landform: Stream terraces

43B—Hazelair silty clay loam, 2 to 7 percent slopes

Map Unit Setting

Elevation: 200 to 2,000 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 235 days

Map Unit Composition

Hazelair and similar soils: 85 percent
Minor components: 3 percent

Description of Hazelair

Setting

Landform: Low hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Stratified medium textured and moderately textured colluvium derived from mixed sources over older very clayey material over residuum weathered from sedimentary rock

Properties and qualities

Slope: 2 to 7 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 5 inches: Silty clay loam
5 to 15 inches: Silty clay
15 to 34 inches: Clay
34 to 44 inches: Weathered bedrock

Minor Components

Panther

Percent of map unit: 3 percent
Landform: Swales

67—McBee silty clay loam

Map Unit Setting

Elevation: 100 to 2,500 feet
Mean annual precipitation: 36 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 210 days

Map Unit Composition

Mcbee and similar soils: 85 percent
Minor components: 3 percent

Description of Mcbee

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Moderately fine textured alluvium derived from mixed sources

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water capacity: High (about 10.7 inches)

Interpretive groups
Land capability classification (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile
0 to 19 inches: Silty clay loam
19 to 60 inches: Silty clay loam

Minor Components

Wapato
Percent of map unit: 3 percent
Landform: Flood plains

98—Waldo silty clay loam

Map Unit Setting
Elevation: 90 to 1,000 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 235 days

Map Unit Composition
Waldo and similar soils: 85 percent
Minor components: 8 percent

Description of Waldo

Setting
Landform: Depressions on flood plains, depressions on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from mixed sources

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water capacity: High (about 10.4 inches)

Interpretive groups
Land capability classification (irrigated): 3w

Land capability (nonirrigated): 3w

Typical profile

0 to 20 inches: Silty clay loam
20 to 72 inches: Silty clay

Minor Components

Bashaw

Percent of map unit: 8 percent
Landform: Flood plains

101C—Willakenzie clay loam, 2 to 12 percent slopes

Map Unit Setting

Elevation: 300 to 1,400 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days

Map Unit Composition

Willakenzie and similar soils: 85 percent

Description of Willakenzie

Setting

Landform: Low hills
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Nose slope, interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from sedimentary rock

Properties and qualities

Slope: 2 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.9 inches)

Interpretive groups

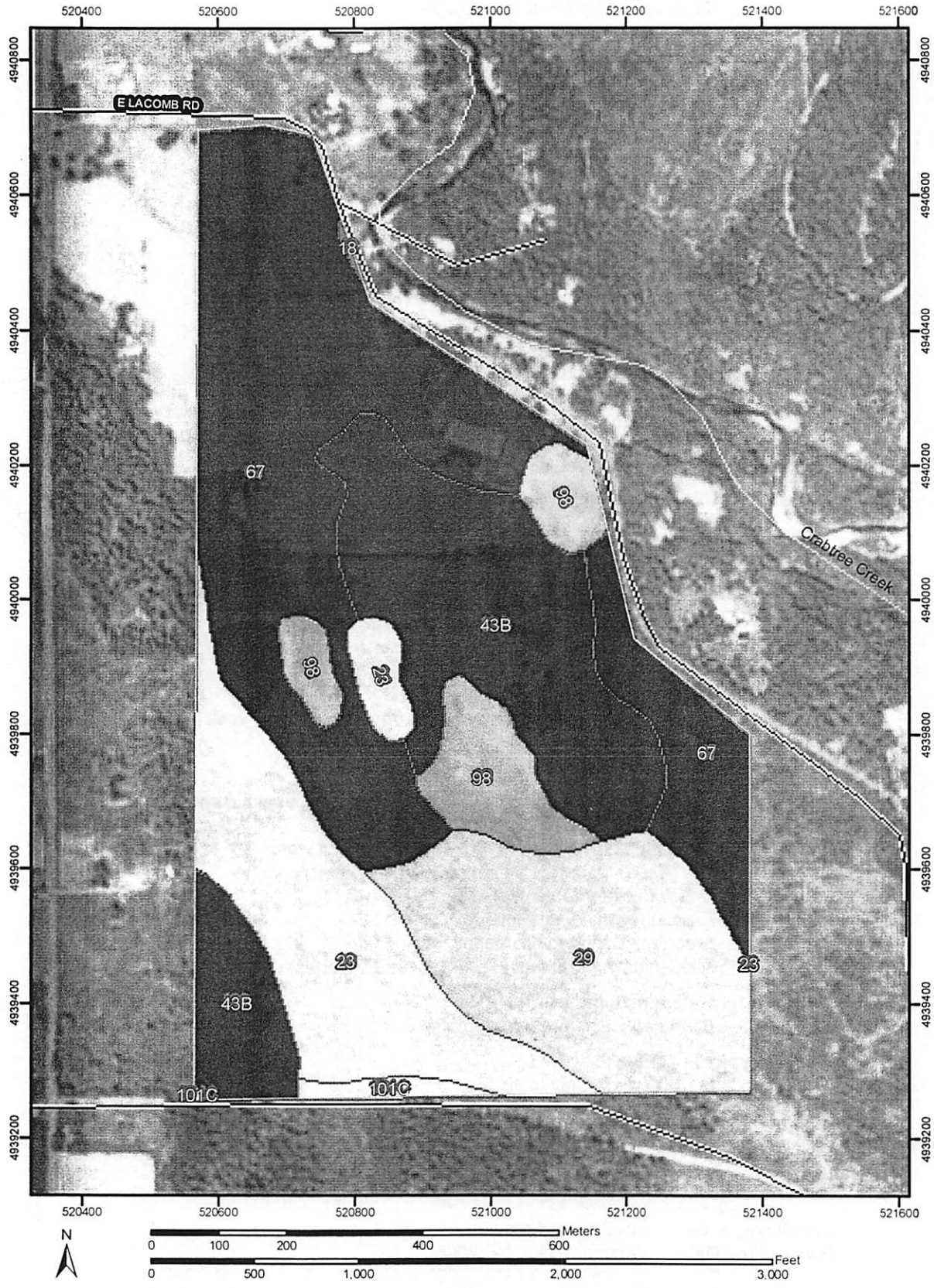
Land capability (nonirrigated): 3e

Typical profile

0 to 6 inches: Clay loam
6 to 22 inches: Silty clay loam
22 to 32 inches: Weathered bedrock

Data Source Information

Soil Survey Area: Linn County Area, Oregon
Survey Area Data: Version 4, Dec 22, 2006


520400
520600
520800
521000
521200
521400
521600
4940800
4940600
4940400
4940200
4940000
4939800
4939600
4939400
4939200
E LACOMB RD
18
67
98
Crabtree Creek
43B
98
23
67
98
23
29
23
43B
101C
101C
N
Meters
0
100
200
400
600
Feet
0
500
1,000
2,000
3,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- <= 9.44
- > 9.44 AND <= 12.09
- > 12.09 AND <= 12.1
- > 12.1 AND <= 14.74
- > 14.74 AND <= 15.97
- Not rated or not available

Political Features

Municipalities

- Cities
- Urban Areas

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails

Roads

- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Linn County Area, Oregon
Survey Area Data: Version 4, Dec 22, 2006

Date(s) aerial images were photographed: 5/23/1994; 7/7/1994; 9/15/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Yields of Irrigated Crops (Component): Pasture (AUM)

Yields of Irrigated Crops (Component): Pasture (AUM)— Summary by Map Unit — Linn County Area, Oregon				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
18	Camas gravelly sandy loam	9.44	0.2	0.1%
23	Clackamas gravelly silt loam	12.10	35.0	16.5%
29	Courtney gravelly silty clay loam	12.09	37.8	17.8%
43B	Hazelair silty clay loam, 2 to 7 percent slopes	15.45	46.3	21.8%
67	McBee silty clay loam	15.97	76.6	36.0%
98	Waldo silty clay loam	14.74	14.8	6.9%
101C	Willakenzie clay loam, 2 to 12 percent slopes		2.0	0.9%
Totals for Area of Interest (AOI)			212.6	100.0%

Description

These are the estimated average yields per acre that can be expected of selected irrigated crops under a high level of management. In any given year, yields may be higher or lower than those indicated because of variations in rainfall and other climatic factors. It is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

In the database, some states maintain crop yield data by individual map unit component and others maintain the data at the map unit level. Attributes are included in this application for both, although only one or the other is likely to have data for any given geographic area. This attribute uses data maintained at the map unit component level.

The yields are actually recorded as three separate values in the database. A low value and a high value indicate the range for the soil component. A "representative" value indicates the expected value for the component. For these yields, only the representative value is used.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby areas and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for the selected crop. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Rating Options

Crop: Pasture

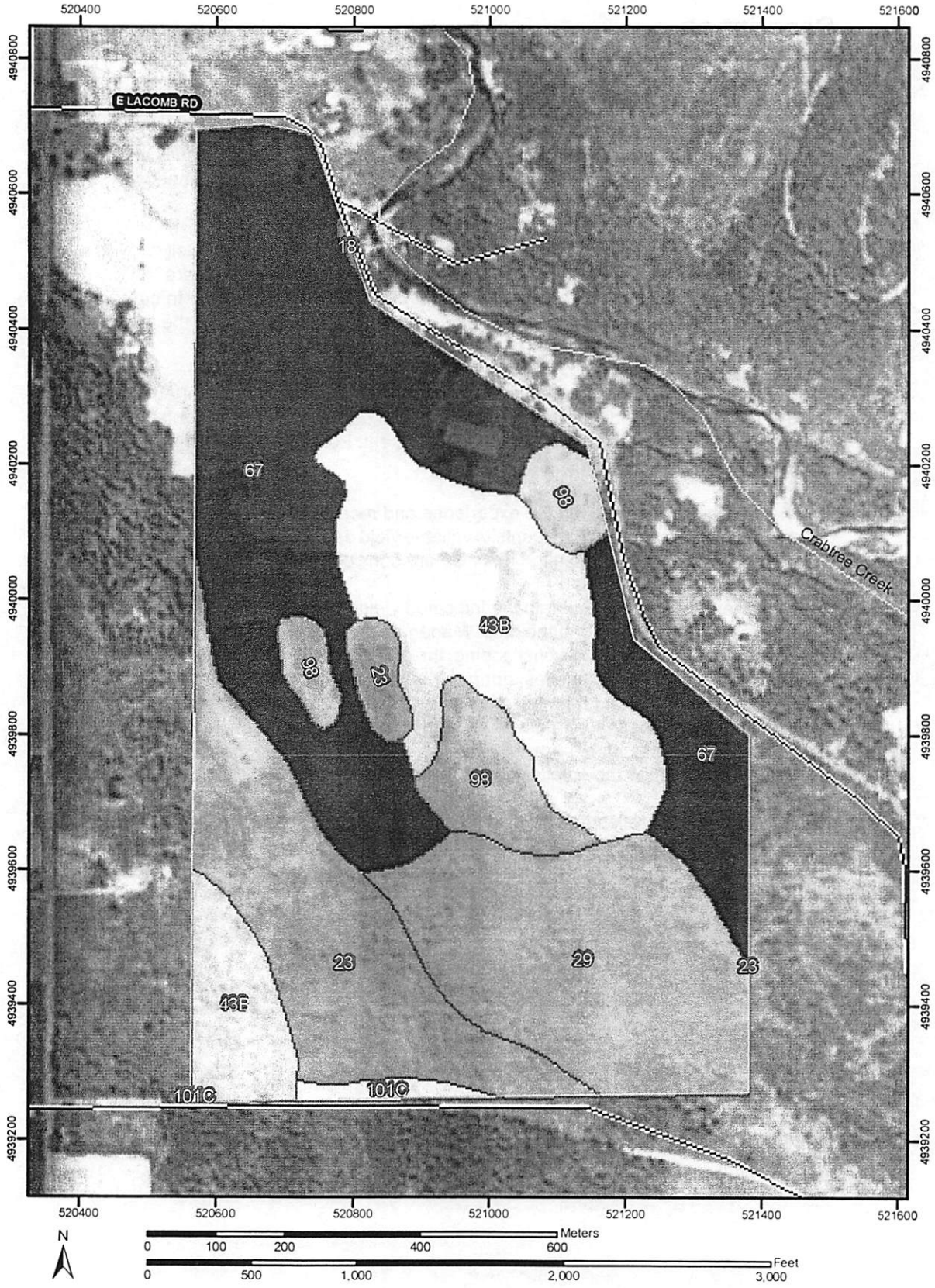
Yield Units: AUM

Aggregation Method: Weighted Average

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: Yes


520400
520600
520800
521000
521200
521400
521600
4940800
4940600
4940400
4940200
4940000
4939800
4939600
4939400
4939200
E LACOMB RD
18
67
98
Crabtree Creek
43B
98
23
67
98
23
29
23
43E
101C
101C
N
0
100
200
400
600
Meters
0
500
1,000
2,000
3,000
Feet

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- <= 1.89
- > 1.89 AND <= 6.93
- > 6.93 AND <= 7
- > 7 AND <= 8.06
- > 8.06 AND <= 9.93
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Linn County Area, Oregon
Survey Area Data: Version 4, Dec 22, 2006

Date(s) aerial images were photographed: 5/23/1994; 7/7/1994; 9/15/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Yields of Non-Irrigated Crops (Component): Pasture (AUM)

Yields of Non-Irrigated Crops (Component): Pasture (AUM)— Summary by Map Unit — Linn County Area, Oregon				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
18	Camas gravelly sandy loam	1.89	0.2	0.1%
23	Clackamas gravelly silt loam	8.06	35.0	16.5%
29	Courtney gravelly silty clay loam	8.06	37.8	17.8%
43B	Hazelair silty clay loam, 2 to 7 percent slopes	6.93	46.3	21.8%
67	McBee silty clay loam	9.93	76.6	36.0%
98	Waldo silty clay loam	8.00	14.8	6.9%
101C	Willakenzie clay loam, 2 to 12 percent slopes	7.00	2.0	0.9%
Totals for Area of Interest (AOI)			212.6	100.0%

Description

These are the estimated average yields per acre that can be expected of selected nonirrigated crops under a high level of management. In any given year, yields may be higher or lower than those indicated because of variations in rainfall and other climatic factors.

In the database, some states maintain crop yield data by individual map unit component and others maintain the data at the map unit level. Attributes are included in this application for both, although only one or the other is likely to contain data for any given geographic area. This attribute uses data maintained at the map unit component level.

The yields are actually recorded as three separate values in the database. A low value and a high value indicate the range for the soil component. A "representative" value indicates the expected value for the component. For these yields, only the representative value is used.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby areas and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for the selected crop. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Rating Options

Crop: Pasture

Yield Units: AUM

Aggregation Method: Weighted Average

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: Yes

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Report—Water Features

Water Features– Linn County Area, Oregon										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
18—Camas gravelly sandy loam										
Camas	A	—	January	—	—	—	—	None	Brief	Occasional
	A	—	February	—	—	—	—	None	Brief	Occasional
	A	—	March	—	—	—	—	None	Brief	Occasional
	A	—	April	—	—	—	—	None	Brief	Occasional
	A	—	May	—	—	—	—	None	Brief	Occasional
	A	—	November	—	—	—	—	None	Brief	Occasional
	A	—	December	—	—	—	—	None	Brief	Occasional
23—Clackamas gravelly silt loam										
Clackamas	D	—	January	0.5-1.5	0.7-1.5	—	—	None	—	None
	D	—	February	0.5-1.5	0.7-1.5	—	—	None	—	None
	D	—	March	0.5-1.5	0.7-1.5	—	—	None	—	None
	D	—	April	0.5-1.5	0.7-1.5	—	—	None	—	None
	D	—	May	0.5-1.5	0.7-1.5	—	—	None	—	None
	D	—	November	0.5-1.5	0.7-1.5	—	—	None	—	None
	D	—	December	0.5-1.5	0.7-1.5	—	—	None	—	None

Water Features– Linn County Area, Oregon										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
29—Courtney gravelly silty clay loam										
Courtney	D	—	January	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
	D	—	February	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
	D	—	March	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
	D	—	April	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
	D	—	May	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
	D	—	November	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
	D	—	December	0.0-1.5	>6.0	0.0-0.5	Long	Frequent	Very brief	Rare
43B—Hazelair silty clay loam, 2 to 7 percent slopes										
Hazelair	D	—	January	1.0-2.0	1.0-2.5	—	—	None	—	None
	D	—	February	1.0-2.0	1.0-2.5	—	—	None	—	None
	D	—	March	1.0-2.0	1.0-2.5	—	—	None	—	None
	D	—	April	1.0-2.0	1.0-2.5	—	—	None	—	None
	D	—	December	1.0-2.0	1.0-2.5	—	—	None	—	None
67—McBee silty clay loam										
Mcbee	C	—	January	2.0-3.0	>6.0	—	—	None	Brief	Occasional
	C	—	February	2.0-3.0	>6.0	—	—	None	Brief	Occasional
	C	—	March	2.0-3.0	>6.0	—	—	None	Brief	Occasional
	C	—	April	2.0-3.0	>6.0	—	—	None	—	None
	C	—	November	2.0-3.0	>6.0	—	—	None	Brief	Occasional
	C	—	December	2.0-3.0	>6.0	—	—	None	Brief	Occasional

Water Features– Linn County Area, Oregon										
Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
98—Waldo silty clay loam										
Waldo	D	—	January	0.0-0.5	1.5-2.0	—	—	None	Brief	Occasional
	D	—	February	0.0-0.5	1.5-2.0	—	—	None	Brief	Occasional
	D	—	March	0.0-0.5	1.5-2.0	—	—	None	Brief	Occasional
	D	—	April	0.0-0.5	1.5-2.0	—	—	None	Brief	Occasional
	D	—	May	0.0-0.5	1.5-2.0	—	—	None	—	None
	D	—	November	0.0-0.5	1.5-2.0	—	—	None	—	None
	D	—	December	0.0-0.5	1.5-2.0	—	—	None	—	None
101C—Willakenzie clay loam, 2 to 12 percent slopes										
Willakenzie	C	—	Jan-Dec	—	—	—	—	None	—	—

Data Source Information

Soil Survey Area: Linn County Area, Oregon
Survey Area Data: Version 4, Dec 22, 2006

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Physical Soil Properties– Linn County Area, Oregon														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
18—Camas gravelly sandy loam														
Camas	0-13	—	—	5-10	1.30-1.50	14.00-42.00	0.07-0.09	0.0-2.9	1.0-3.0	.10	.20	2	3	86
	13-60	—	—	0-5	1.40-1.60	141.00-705.00	0.03-0.05	0.0-2.9	0.0-1.0	.02	.10			
23—Clackamas gravelly silt loam														
Clackamas	0-12	—	—	15-25	1.20-1.40	4.00-14.00	0.13-0.18	0.0-2.9	3.0-5.0	.24	.32	4	7	38
	12-21	—	—	27-35	1.30-1.50	1.40-4.00	0.14-0.18	0.0-2.9	0.0-0.5	.17	.37			
	21-60	—	—	27-35	1.30-1.50	1.40-4.00	0.03-0.05	0.0-2.9	0.0-0.5	.10	.37			
29—Courtney gravelly silty clay loam														
Courtney	0-17	—	—	27-35	1.30-1.40	1.40-4.00	0.16-0.19	3.0-5.9	2.0-5.0	.20	.32	3	7	38
	17-33	—	—	50-60	1.30-1.40	0.01-0.42	0.11-0.14	6.0-8.9	0.5-2.0	.15	.32			
	33-48	—	—	27-35	1.30-1.40	1.40-4.00	0.07-0.13	3.0-5.9	0.2-1.0	.15	.37			
	48-60	—	—	0-5	1.30-1.40	42.00-141.00	0.03-0.05	0.0-2.9	0.2-0.5	.02	.15			

Physical Soil Properties– Linn County Area, Oregon														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
43B—Hazelair silty clay loam, 2 to 7 percent slopes														
Hazelair	0-5	—	—	27-40	1.20-1.40	4.00-14.00	0.16-0.18	3.0-5.9	2.0-4.0	.32	.32	3	7	38
	5-15	—	—	35-50	1.05-1.20	1.40-4.00	0.13-0.19	6.0-8.9	1.0-2.0	.28	.28			
	15-34	—	—	60-70	1.00-1.20	0.01-0.42	0.09-0.12	6.0-8.9	0.5-1.0	.24	.24			
	34-44	—	—	—	—	—	—	—	—					
67—McBee silty clay loam														
Mcbee	0-19	—	—	27-35	1.20-1.40	4.00-14.00	0.19-0.21	3.0-5.9	3.0-6.0	.28	.28	5	7	38
	19-60	—	—	25-45	1.20-1.40	4.00-14.00	0.13-0.21	3.0-5.9	0.5-4.0	.28	.28			
98—Waldo silty clay loam														
Waldo	0-20	—	—	27-40	1.10-1.30	4.00-14.00	0.18-0.21	3.0-5.9	4.0-8.0	.24	.24	5	7	38
	20-72	—	—	40-55	1.10-1.30	0.42-1.40	0.14-0.17	6.0-8.9	0.1-4.0	.28	.28			
101C—Willakenzie clay loam, 2 to 12 percent slopes														
Willakenzie	0-6	—	—	27-30	1.15-1.25	1.40-4.00	0.18-0.21	0.0-2.9	3.0-6.0	.24	.24	3	7	38
	6-22	—	—	30-35	1.15-1.30	1.40-4.00	0.15-0.18	3.0-5.9	1.0-3.0	.32	.32			
	22-32	—	—	—	—	—	—	—	—					

Data Source Information

Soil Survey Area: Linn County Area, Oregon
Survey Area Data: Version 4, Dec 22, 2006

ANIMAL WASTE MANAGEMENT PLAN AMENDMENT

Lyle Land & Livestock
Confined Animal Feeding Operation

JASON LYLE
CAFO Operator's Name

35414 E Lyons Rd
Facility Street Address, City, State, Zip
Lebanon OR 97355

541-401-0443
Phone Number

Submitted to the Oregon Dept. Of Agriculture are the following modifications to Animal Waste Management Plan (AWMP) # 08076

I would like to apply the following modifications to this AWMP:
Changing to Pastured Beef No longer milking. New Herd 1 Bull 80 Cows 5 Replacement Heifer, 50 calves 6 feeders. New Storage to 365 Days+

Operator's Signature

10/31/21
Date

CONCLUSION:

X Approved _____ Denied

Christopher Lyon
Inspector's Signature

Official Use:
MA# 1000104 Effective date: 10/31/21
Date copy sent to Operator: