MA No. 1000047
AWMP No. 14018

Brevon Farms

AWMP

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March 2014

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Farm Contact Information:	Brevon Farms Brent and Yvonne Carroll 50901 Umapine Road Milton-Freewater, OR 97862 541-861-2009
Physical Location:	Brevon Farms 50901 Umapine Road Milton-Freewater, OR 97862 541-861-2009
Animal Feeding Operation: **Type and Size:**	Small Confined CAFO Dairy – 100 mature and 90 young stock

Owner/Operator

As the owner/operator of this AWMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of this AWMP are needed. I understand that I am responsible for keeping all the necessary records associated with the implementation of this AWMP.

Signature: Yvonne C Carroll Date: 03-05-2014

Name: Brent or Yvonne Carroll for Brevon Farms

Brevon Farms is owned and operated by Brent and Yvonne Carroll. This dairy facility is permitted for 190 dairy animals with a herd composition of 100 mature animals and 90 young stock. Brevon Farms plans to begin making cheese in 2014; the whey will be fed to the cows and the wash water from equipment clean up will collected with the parlor wash water. The land base available for manure application consists of 28 acres.

Manure Management

Sampling

Soil samples will be collected and analyzed for nitrogen and phosphorous a minimum of once every five (5) years from ground that has been fertilized with manure.

Frozen Soil Application Procedures

Manure and wastewater will be applied to land that is not saturated at agronomic rates. In the event that an application needs to take place on frozen ground, use the following guidelines:

- Apply only enough wastewater or solids containing manure to address storage limitations until suitable soil conditions for application are available.
- Minimize applications to 5 wet tons per acre or less of solids containing manure and 6,788 gallons (.25 inch) per acre or less of wastewater.
- Apply to alternating strips to reduce the risk of contaminated runoff reaching surface water sources.
- Apply to field of established hay, pasture, or fields containing at least 90% cover and are the furthest from open water sources.
- Do not apply wastewater or solids containing manure within 200 feet of surface water sources, drainage ways, wells, or inlets to subsurface drainage systems.
- Runoff control systems such as earthen dikes must be in place where applications will be made to fields with slopes greater than 5%.

Manure and Wastewater Application Setbacks

Time of Year/Dates	Solid Manure	Liquid Manure/Processed Waste Water
Dry Season (April-October)	25’	25’
Wet Season (November-March)	50’	50’
Frozen Soil	200’	200’

Liquids

The liquid manure, wash water and contaminated runoff are stored in concrete storage facilities and a Wastewater Storage Pond (WSP). The storage capacities are: Concrete Tank - 1,500 gallons, Concrete Waste Storage Facility (WSF) #1 - 5,000 gallons, WSF # 2 and 3 - 10,000 gallons each, and the WSP - 1.6 acre-feet or 521,361 gallons. ORAWM estimates that the WSP will provide 152 days of storage for wash water, normal runoff, manure, accumulated solids and a 25-year, 24-hour rainfall event. The

tanks provide storage for 60 days of wash water, manure, normal runoff and a rainfall event of up to 1.4 inches.

The 25-year, 24-hour rainfall event is estimated to produce 30,070 ft^3 of liquid runoff from the 246,550 ft^2 of paved and unpaved open lot areas. In the event of the 25-year, 24-hour rainfall event (or a rainfall event greater than 1.4 inches), the facility will transfer liquids to the evaporation pond or apply the liquids to the fields at agronomic rates. If the ground is frozen, the Frozen Soil Application Procedures will be followed.

The solids in the concrete tanks will be cleaned out and handled as solids, which will be exported, composted, or applied to the land base. The liquid portion in the tanks will either be transferred to the evaporation pond, or applied agronomically to the land base.

Storm Water and Processed Waste Water Generated Annually

Source	Quantity (gallons)
Paved Slab (4,400 ft^2)	11,079
Unpaved Slab (242,150 ft^2)	56,829
Parlor and Cheese-making Wash Water	131,400
Total	**199,308**

Liquid manure is applied to the pasture with the use of a 3,600-gallon honey wagon at agronomic rates.

Solid Manure

The solid manure is stored in the dry lots where the animals are housed when they are not grazing. ORAWM estimates a total of 365 days of storage for the 3 dry lots. The solid manure is periodically mounded up in the dry lots to also serve as the bedding source. The calves along with the fresh and sick pens are bedded with straw. Lot 3 may also be used as a composting/solid manure storage area. Excess manure and/or compost will be applied at agronomic rates or exported. Approximately 35 - 95% of the solids produced annually are exported.

Grazing

The milk cows are on pasture from April 1st through November 15th for 20 hours per day, or 84% of the time. The dry cows are on pasture from April first through November 15th for 24 hours per day, or 100% of the time. The heifers are not grazed on site. They are exported off farm from April first through November 15th.

Grazing

Animal	# of Animals	% Time on Pasture	Duration
Milk Cows	85	84	April 1-November 15
Dry Cows	15	100	April 1-November 15

Animal Mortality
All animal mortalities will be composted on site.

Crop System

The land base consists of 28 acres of irrigated pasture. Soils will be sampled to a depth of the first twelve inches at a minimum of once every five years and analyzed for nitrogen and phosphorous. The pasture is estimated to yield 6.5 ton/acre on a 100% dry matter basis.

Land Base

Field Number	Acres	Crop	N Removed (lbs/acre)	P_2O_5 Removed (lbs/acre)	Total N Removed (lbs)	Total P_2O_5 Removed (lbs)
1	28	Pasture	346	128	9,688	3,584
Total	28			**Total**	9,688	3,584

Manure Storage

Storage Type:	Capacity	Estimated Storage Period
Solid Storage	182,564 ft^3 or 5,072 ton	365 days
Liquid Storage: WSFs and concrete tank)	3,542 ft^3 or 26,500 gal	60 days
Liquid Storage: WSP	1.6 AF or 521,361 gal	152 days

Nutrient Balance
See ORAWM, Section 7.

Record Keeping and Reporting

Monitoring:

At a minimum of once of every five years collect and analyze representative soil samples for phosphorus and nitrogen content from all fields where manure, litter and other process wastewaters are applied.

The following documents provide protocols for testing: manure, litter and process waste water; measuring crop nutrient removals; soil testing to evaluate nutrient application and crop uptake, and calculating manure application rates.

1. PNW 570-E, Monitoring Soil Nutrients Using a Management Unit Approach
2. E306, Manure Sampling & Analysis
3. EM 8768, Calculating Dairy Manure Nutrient Application Rates.
4. EM 8832-E, Post-harvest Soil Nitrate Testing for Manured Copping Systems West of the Cascades

Inspections:

a) Periodically inspect:
   a. Storm water diversion devices, runoff diversion structures, animal waste storage structures, and devices channeling contaminated storm water to wastewater and manure storage and containment structures.
   b. Water lines, including drinking water or cooling lines.
   c. Liquid impoundments for manure and process wastewater.
b) When equipment is in use, periodically inspect the equipment used for land application of manure, litter, or process wastewater.

Record Keeping:

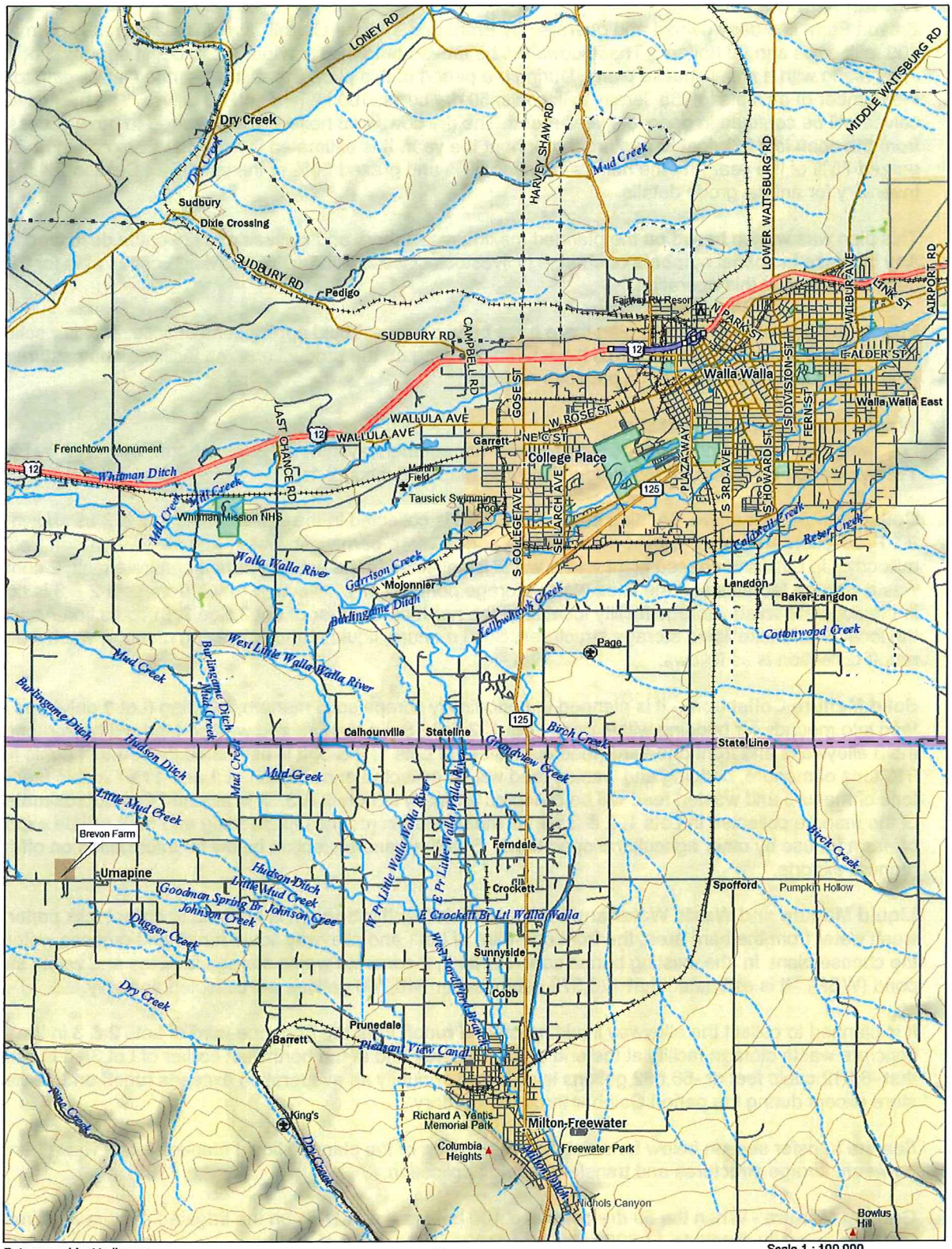
a) Applications of manure, litter and process waste will be kept, including the date and the amount of N and P applied during each application.
b) Records of exporting manure, litter and process waste will also be kept.

Reporting to Oregon Department of Agriculture (ODA):

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

Section 1. Background and Site Information

Location Map for Brevon Farm

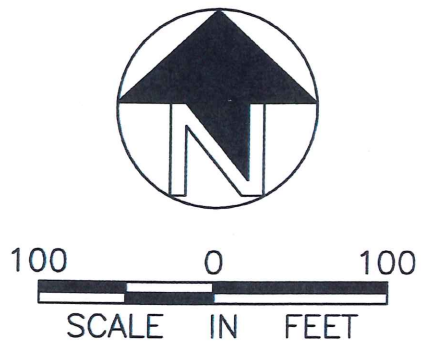


Section 2. Manure and Wastewater Handling and Storage

2.1. Map(s) of Production Area

Owner/Operator: Brent and Yvonne Carroll
Farm Name: Brevon Farm
County: Umatilla State: Oregon
Approximate Acres: 8.2 Acres Date: February, 2012
Location: Section 24 , T 6 N, R 34 E from the W.M.

Assisted By: Bruce D. Wilson, H&R Engineering LLC



Map Legend

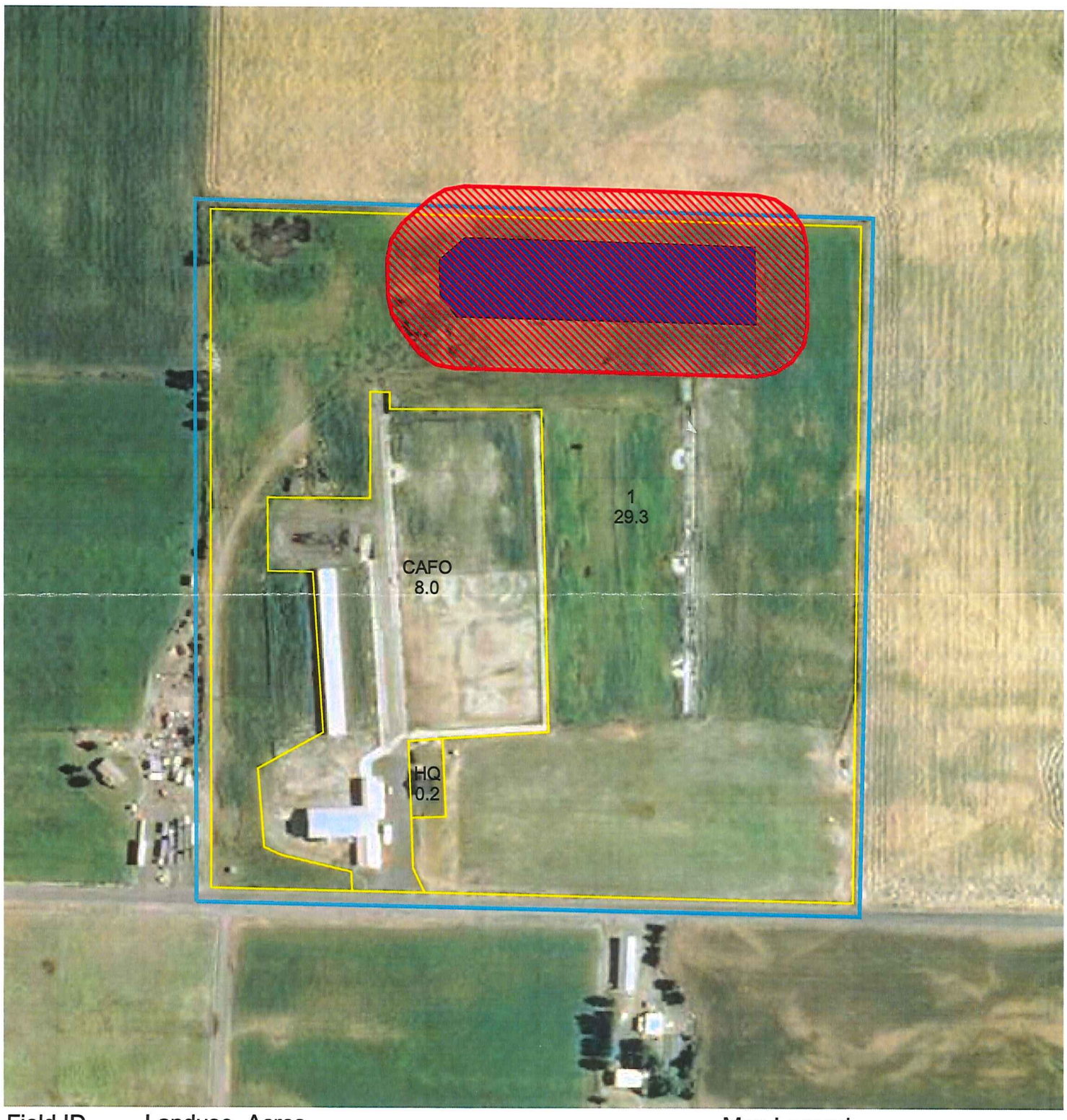
- Roofed Areas
- Fence
- Buried Manure Transfer Pipeline
- Buried Irrigation Pipeline
- Hudson Bay Buried Irrigation Pipeline
- Drainage
- Planned Underground Outlets
- Planned Roof Runoff (Gutters)
- Concrete Waste Storage Facilities (WSF)
- Buried Concrete Tank
- Above Ground Diesel Fuel Tank
- Water Facilities
- Irrigation Well & Pump
- Existing Irrigation Riser

Section 4. Land Treatment

4.1. Map(s) of Fields and Conservation Practices

Land Treatment Area Map
for
Brevon Farm Dairy

Section 24, Township 6 North, Range 34 East from the Willamette Meridian



Field ID	Landuse, Acres
CAFO HQ	Headquarters, 8.2 Acres
1	Hay & Pasture Land, 29.3 Acres

Map Legend

Field ID
Acres - Field Label and Field Boundary

- 35 foot Vegetated Setback

- Planned Groundwater Recharge Pond

N
W E
S

Scale 0 250 500 750 Feet

Section 5. Soil and Risk Assessment Analysis

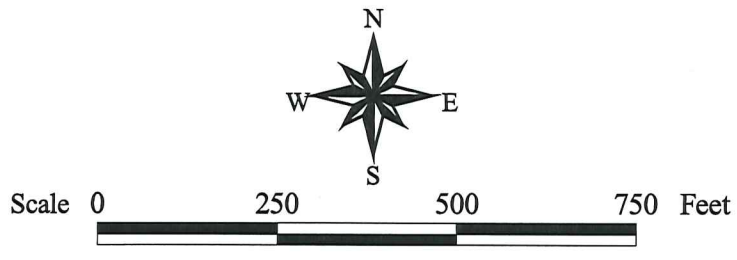
5.1 Soil Map(s)

Soil Map
for
Brevon Farm Dairy

Section 24, Township 6 North, Range 34 East from the Willamette Meridian

Soil Map Units

106A- Umapine silt loam, reclaimed, 0 to 3 percent slopes
128A- Yakina silt loam, 0 to 3 percent slopes



Flood Boundary Map for Brent and Yvonne Carroll Dairy:

Flood Boundary Map Legend and Information

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Ratings

- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent

Political Features

Municipalities

- Cities
- Urban Areas

Water Features

- Water
- 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.

Date(s) aerial images were photographed: 5/23/1994; 6/20/1994

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.

Operation and Maintenance

Wastewater Collection Tanks

Inspect the wastewater collection tank weekly to insure structural integrity. If the structural integrity of the tank is compromised, immediately empty the tank to determine the cause and make necessary repairs before putting the tank back into service. Do not allow equipment that exceeds the design limit of the tank on or within 20 feet of the structure.

Keep pumps, agitators, piping, valves and all other electrical and mechanical equipment in good condition by following the manufacturer's recommendations. Maintain grounding rods and wiring for all electrical equipment in good condition. Immediately remove all foreign debris within the structure that may cause damage to pumps or agitators.

Pump the wastewater collection tank completely empty during the summer months and cleanout any debris and other solid materials that may have accumulated in the tank. Inspect the tank for structural damage and if structural damage to the tank is discovered, see the services of a qualified engineer to assess the damage and recommend necessary repairs before putting the tank back into service.

Do not dispose of animal carcasses in the wastewater collection tank. It is against the law to do so.

Maintain all fences, railings, and/or warning signs to provide warning and/or prevent unauthorized human or livestock entry. Immediately repair vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances. Maintain lids, grates and shields on openings.

Provide proper ventilation before entering the tank, for any reason what so ever. Provide and use self – contained breathing apparatus (scuba) equipment when entering a tank. No persons should enter the tank unless safety ropes are used and someone else capable of providing rescue assistance is outside the tank.

Do not assume any tanks, including open top tanks, are well ventilated.

Wastewater Storage Ponds

Emptying of the waste storage pond should begin in the spring and continue through the spring and summer months as weather conditions permit. To function properly and have the greatest management flexibility, the waste storage ponds must be as empty as possible in the fall before the fall and winter weather begins. Any annual sludge buildup in the waste storage ponds must be removed to maintain design capacity and applied to land application areas.

Inspect the waste storage ponds weekly to insure structural integrity. If the structural integrity of a waste storage pond embankment is compromised, immediately draw the liquid level down below the damaged area to determine the cause. Seek the services of

a qualified engineer to assess the damage and recommend necessary repairs before allowing wastewater levels above the damaged area.

Pump the wastewater storage pond to the lowest level possible during the summer months and inspect the embankments for structural damage. If structural damage to the embankment of a wastewater storage pond is discovered, seek the services of a qualified engineer to assess the damage and recommend necessary repairs before allowing wastewater levels above the damaged area.

Do not permit livestock access to the pond or on pond embankments. Control undesirable vegetation growth by spraying or mowing. Control rodents as necessary. Check elevations of earthfills periodically and restore to grade and shape as necessary. Fill and reseed eroded embankment areas or repair with well-graded rock riprap. Safety feature such as signs and fences should be kept in good order.

Do not dispose of animal carcasses in any settling basin or wastewater storage pond. It is against the law to do so.

Solids Storage Facility

Emptying of the solids storage facilities should begin in the spring and continue through the spring and summer months as weather conditions permit. To function properly and have the greatest management flexibility, the solids storage facilities must be as empty as possible in the fall before the fall and winter weather begins.

Periodically inspect concrete and asphalt slabs, walls and curbs and repair or replace broken sections as needed. Cleanup any spillage of manure and organics from outside of the solids storage area and place them back in the solids storage facility.

Maintain all fences, railings, and/or warning signs to provide warning and/or prevent unauthorized human or livestock entry. Immediately repair vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.

Building Roofs

Inspect building roofs annually as a minimum. Repair and/or replace all rusted sections and secure loose sections as needed. Immediately replace all broken trusses, rafters, beams, and poles as needed. Immediately determining the cause and necessary modifications(s) to prevent reoccurring structural failure is essential.

Composting Facility

Take a representative sample of the raw compost mixture and have a laboratory determine the moisture, pH, carbon and nitrogen content.

The carbon to nitrogen ratio should range between 25 and 40 to 1. Make adjustments as needed to the ingredients of the raw compost mixture as necessary to achieve a carbon to nitrogen ratio within the acceptable range.

The moisture content should be between 40 and 60 percent. Add water or drier material to adjust the moisture content. Care must be taken to see that the carbon to nitrogen ratio of the mix is still in the 25 – 40 to 1 range after adjusting the moisture content.

The pH preferably should range between 6.5 and 8 however composting may be achieved between a pH of 5.5 and 9.0.

Check pile temperature using thermometer probe on a daily basis. The pile temperature should be checked at a point one-third the distance for the outside of the pile to center of the mass. Initially it will take approximately 2 to 3 days for the compost to get above 105 degrees F. Compost temperatures should peak between 130 and 140 degrees F in 5 and 7 days. When the temperature of the compost material falls below 110 degrees F the compost needs to be aerated by turning or other means. Failure to achieve the desired temperatures may result in the incomplete destruction of pathogens and week seeds and can cause fly and odor problems.

Odors given off by the composting operation is a good indicator of how the compost operation is proceeding. Foul odors may mean that the process has turned from aerobic to anaerobic. Anaerobic conditions are the result of insufficient oxygen in the compost. This may be caused by excessive moisture in the compost or the need for turning or aerating of the compost material.

For a well-managed windrow or static pile composting operation, the composting time during the summer months should range from 14 days to a month. To ensure finished compost, observe that the composted material has little or no trace of the original raw material and has little odor. The material should be black to brown in color. Particle size should be consistent and soil-like in texture.

All materials that are not considered feedstock for the composting process (i.e. plastic ear tags, plastic gloves, etc…) are to be collected and transported to a permitted landfill by a garbage collection service or other means. It is anticipated that there will be no other material that will require offsite disposal.

Periodically inspect concrete and asphalt slabs, walls and curbs and repair or replace broken sections as needed. Cleanup any spillage of composted material from outside of the composting area and place them back in the composting facility.

Maintain all fences, railings, and/or warning signs to provide warning and/or prevent unauthorized human or livestock entry. Immediately repair vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.

Fences

Do not allow livestock access to open watercourses and drainage ways. Provide off stream watering facilities where possible and limit access to designated watering areas.

Inspect fences periodically and repair or replace broken or decayed posts and tighten sagging wire as needed. Broken wire can be spliced or replaced. Replace broken or missing insulators on electric fences as needed and repair or replace inoperative electric fence controllers.

Insure gates and other appurtenances are in good working order. Replace or repair components as needed.

Irrigation System

Maintain traveling gun type sprinklers (and hose reel, if used) by oiling and greasing moving parts and the engine in accordance with the manufacturer's recommendations to help ensure trouble free operation. Prevent livestock access to equipment during operation.

Clean plugged nozzles and replace if worn or defective.

Promptly repair all leaks by replacing valves, fittings, gaskets, and worn or damaged parts.

Livestock Watering Facilities

Check all above ground connections, valves, gates, rodent guards, inlets and outlets to make sure they are functioning properly. Check troughs and tanks for leaks or cracks and repair or replace immediately, if necessary.

Make certain the area adjacent to the trough is well protected with gravel, paving, or good cover. Be sure that the outlet pipe has a free outlet and is not causing any serious erosion problems. Check periodically to see if debris has fallen into the trough or tank, which may restrict inflow or planned functions of the outflow system.

Clean the entire system periodically and remove moss, algae growth, and/or sludge. Chemicals such as copper sulfate and chlorine can be used to prevent moss and algae growth. Local rules and regulations are to be followed when using chemicals to make sure they are safe for animals.

Where necessary maintain coverings and insulation to prevent damage from freezing.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity. Immediately repair any vandalism, vehicular or livestock damage.

Pipelines

Flush pipelines used for liquid waste applications with clean water following waste application, or as needed, to prevent particle buildup.

Drain the pipeline and components in areas that are subject to freezing. If parts of the pipeline cannot be drained, a non-toxic antifreeze solution may be added.

Check to make sure all valves and air vents are set a t the proper operating condition so they can provide protection to the pipeline. Inspect pipelines for sign of failure. Inspect risers and valves periodically for leaks or worn gaskets. Repair or replace pipeline, risers and valves as needed.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activities.

Pumps

Operate and maintain pumps in accordance with good judgment and manufacture's manuals and recommendations.

Drain liquid manure from pumps during cold weather to prevent freezing. If parts of the system cannot be drained, a non-toxic antifreeze solution may be added. Inspect pumps periodically and remove debris wrapped around shafts and impellers. Maintain foot valves and check valves for proper operation.

For proper operation of electric motors and controls, maintain lubrication for all bearings, keep electric panel free from obstructions and debris. Maintain electrical safety devices, assure all electrical contacts are tight, and lock main electrical switch to "OFF" position during non-use season. Maintain adequate shade and ventilation for pump motors.

For proper operation of pumps, maintain lubrication for all bearings and pump shafts, assure belts are adjusted properly, maintain safety covering devices on open shafts and belt drives, check to make sure all safety valves and devices are set at proper operating conditions so they may provide protection to the pump and power unit. For centrifugal pumps, periodically measure tolerance between pump impeller and pump casing (i.e. wearing) and replace wear ring as needed to help restore new pump operating characteristics.

Use portable pressure gauge (preferably a liquid filled gauge) to monitor pump performance.

Operate and maintain agitators in accordance with the manufacture's manual and recommendations. Inspect all plumbing annually as a minimum. Replace, tighten, or repair broken or loose connections and lines as needed.

Solid/Liquid Separation Facility

Inspect the solid/liquid separation facility daily to ensure the facility is operating properly and there has been no damage to the structural components. Clean screens and outlets if they have become clogged or their capacity is not adequate for proper operation of the facility.

Inspect the capacity of settling basins daily to ensure adequate capacity is available for separated solids.

During daily inspections if it is determined that the maximum capacity of the settling basin has been reached, divert flows to another basin. Remove all accumulated solids from the basin and store them in a designated solids storage area or haul them to the application area for utilization. When removing solids from earthen basins take care not to disturb the earthen liner.

Prevent any spillage or leakage onto roadways when transferring solids from the solid/liquid separation facility to the solids storage area and to utilization areas.

Wells

Protect the area immediately surrounding the well from being damaged by agriculture machinery, vehicles, or livestock. All fences, railings, and/or warning signs shall be maintained to provide warning and/or prevent unauthorized human or livestock entry.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity. Immediately repair any vandalism, vehicular, or livestock damage.

Check metal surfaces for rust and other damage especially sections in contact with earth fill and other materials. Repair or replace damaged section and apply paint as a protective covering.

Keep all surface water from entering or accumulating at the immediate vicinity of the well site.

Chemical Handling Checklist

The following measures shall be taken to prevent chemicals from contaminating process water or storm water storage and treatment systems:

1. Make sure all chemicals are stored in proper containers. Expired chemicals and empty containers are to be properly disposed of in accordance with state and federal regulations. Pesticides and associate refuse are to be disposed of in accordance with the FIFRA label.
2. Chemical storage areas are to be self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.
3. Chemical storage areas are to be covered to prevent chemical contact with rain or snow.
4. Emergency procedures and equipment are to be in place to contain and clean up chemical spills.
5. Chemical handling and equipment wash areas are to be designed and constructed to prevent contamination of surface waters, waste water, and storm water storage and treatment systems.

The timing and frequency of manure applications for utilization by crops shown in the Planned Crops and Fertilizer Recommendations table on page 89 are based on information provided in Oregon State University Extension publications located in Section 10.3.

The following table shows the potential crops that may be grown on this farm. The formulas for determining the total nutrient application rate per unit yield for each crop shown in following table are as follows:

Total N to apply in pounds = N in pounds per ton (lb/t) from the table for the crop grown X percent (%) dry matter (DM) of harvested crop/100 X planned or measured yield in tons

Total P_2O_5 to apply in pounds = P in pounds per ton (lb/t) from the table for the crop grown X 2.291 P_2O_5/P X percent (%) dry matter (DM) of harvested crop/100 X planned or measured yield in tons

Nitrogen, phosphorus and potassium removal of common perennial and annual forage crops.

Crop*	Cuttings (no.)	DM[1] (%)	CP[1] (%)	N (lb/t)	P (lb/t)	K (lb/t)	AH[1] (t/a)
Red clover	1	100	18	58	8	48	16
Alfalfa hay	3	100	20	64	8	42	16
Perennial grass (low intensity)	1-2	100	10	32	6	38	13
Perennial grass (medium to low intensity	2-3	100	12	38	6	38	15
Perennial grass (medium intensity)	4-5	100	15	48	7	38	17
Perennial grass (medium to high intensity)	5-6	100	18	58	8	40	20
Perennial grass (high intensity)	6-8	100	20	64	8	40	23
Annual ryegrass	1	100	12	38	6	38	13
Annual ryegrass	2	100	15	48	7	40	20
Corn silage	1	100	8	25	4	20	30
Small grains (boot stage)	2	100	12	38	5	32	16
Small grains (soft dough)	1	100	8	25	5	20	13
Sudangrass	1	100	6	40	5	12	16
Triticale	1	100	6	51	7	12	16

*Crop removal information taken from OSU Extension Publications EM 8585-E, PNW 331, and EM 8793.

[1]DM = dry matter; CP = crude protein; AH = as harvested

Manure Nutrient Analyses

Manure Source	Dry Matter (%)	Total N	NH_4-N	Total P_2O_5	Total K_2O	Avail. P_2O_5	Avail. K_2O	Units	Analysis Source and Date
Waste Wtr Storage		5.3		4.6	8.5	4.6	8.5	Lb/1000Gal	ORAWM ver.3.8 N,P,K & Measured Manure Production
Milk Cow; Lot 1		27.4		12.8	26.5	12.8	26.5	Lb/Ton	ORAWM ver.3.8 N,P,K & Measured Manure Production
Other Cow; Lots 2 &		11.2		4.8	6.8	4.8	6.8	Lb/Ton	ORAWM ver.3.8 N,P,K & Measured Manure Production
Grzd Pasture		36.2	7.2	17.4	21.3	17.4	21.3	Lb/1000Gal	MMP for N,P,K and ORAWM ver.3.8 Meas. Manure Prod.

(1) Entered analysis may be the average of several individual analyses.
(2) Oregon assumes that 100% of manure phosphorus and 100% of manure potassium is crop available. First-year per-acre nitrogen availability for individual manure applications is given in the Planned Nutrient Applications table. For more information about nitrogen availability in Oregon, see Waste Utilization Jobsheet 633 OR-JS, Oregon USDA-NRCS, May 2003 (http://efotg.sc.egov.usda.gov/references/public/OR/633js042707.pdf).

Typical Nutrient Retention After Application Losses

Application Method	Percent of original nutrient content of manure retained after application losses		
	N	**P_2O_5**	**K_2O**
Injection	95%	100%	100%
Sprinkling	75%	100%	100%
Broadcast (Incorporated 1 day after application)	90%	100%	100%
Broadcast (Incorporated 4 days after application)	80%	100%	100%
Broadcast (Incorporated 7 or more days after application)	70%	100%	100%

The Oregon Department of Agriculure Confined Animal Feeding Program and the Oregon Natural Resources Conservation Service (NRCS) Nutrient Management conservation practice standard 590 all require that a phosphorus (P) index be prepared to determine the potential for phosphorus transport off of the fields used for manure application.

The P index ratings for all fields are shown in the table below and are based on the Eastern Oregon phosphorus index described on page 122. The P index ratings indicate that there is currently a low risk of phosphorus transport from Field 1. Based on the application plan for manure over the next 4 years, the P index rating indicates that there will continue to be a low risk of phosphorus transport from Field 1.

The RUSLE2 calculations and indicate that the erosion in the fields where manure will be applied is within the average annual soil loss tolerance (T) therefore erosion will not contribute significantly to phosphorus transport.

According to the Oregon NRCS Nutrient Management conservation practice standard 590, fields ranked in the medium or low risk category may receive organic (manure) or inorganic (commercial fertilizer) applications at nitrogen-based rates.

Oregon Phosphorus Index (East)

Field	Crop Year	Transport Factor Sum	Source Factor Sum	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk
HQ	2013	*Not Applicable*				
HQ	2014	*Not Applicable*				
HQ	2015	*Not Applicable*				
HQ	2016	*Not Applicable*				
CAFO	2013	*Not Applicable*				
CAFO	2014	*Not Applicable*				
CAFO	2015	*Not Applicable*				
CAFO	2016	*Not Applicable*				
1	2013	0.50	21.42	3.80	10.71	Low
1	2014	0.50	21.16	3.80	10.58	Low
1	2015	0.50	21.10	3.80	10.55	Low
1	2016	0.50	20.16	3.80	10.08	Low

Notes:

5.4. Nitrogen and Phosphorus Risk Analysis

Leaching Index

Water that moves through soils can contain soluble nutrients that can degrade groundwater sources. The leaching index provides a way to determine if soils in a management area or field are susceptible to leaching nutrients to groundwater sources. The methodology for the Oregon leaching index was based on research done by J.R. Williams and D.E. Kissel which is published in the book "Managing Nitrogen for Groundwater Quality and Farm Profitability" edited by R.F. Follet. Appropriate management considerations and land treatment practices should be established based on the leaching index rating to limit the amount of soluble nutrients that could be leached to groundwater in a management area or field.

The leaching index ratings shown in Table 5.4 are taken from Leaching Index Interpretations Table and indicate the soils in the fields where manure will be applied from the Brevon Farm have a low potential for leaching soluble nutrients. To minimize the leaching potential of soluble nutrients intensive nutrient and irrigation water management should be practiced on these fields.

Soil Leaching Index Information

Field	Soil Survey	Map Unit	Soil Component Name	Surface Texture	Slope Range (%)	Bedrock Depth (in.)	Drainage	Hydro-logic Group	Leaching Index
HQ	667	106A	Umapine	SIL	0-3%		SPoor	C	<2
CAFO	667	106A	Umapine	SIL	0-3%		SPoor	C	<2
1	667	128A	Yakima	SIL	0-3%		Well	B	<2

Leaching Index Interpretation

Rating	Interpretation
Low (<2)	Soils have a low potential to leach mobile nutrients below the root zone unless irrigation applications are not managed properly.
Medium (2 to 10)	Soils may leach mobile nutrients below the root zone. Irrigation water management should be practiced on these soils if crops are irrigated and land treatments to minimize the potential for leaching losses should be considered.
High (>10)	Soils have a high potential to leach mobile nutrients below the root zone. Intensive irrigation water management should be practiced on these soils if crops are irrigated. Intensive nutrient management should also be practiced on these soils with special considerations for the method, rate, and timing of nutrient applications to reduce the potential of nutrient losses to ground water. Land treatments to minimize the potential for leaching losses should also be considered.

5.5. Additional Field Data Required by Risk Assessment Procedure

Field	Distance to Water (Feet)	Buffer Width (Feet)	Type of Artificial Drainage
HQ		None	None
CAFO		None	None
1	35	35	None

SOILS-

Refer to Section 5 of the Brevon Farm Comprehensive Nutrient Management Plan (CNMP) for soils information.

CROPS-

CROP	MATURE ROOT DEPTH (INCHES)	MAXIMUM ALLOWED DEPLETION	CRITICAL PERIOD
Grass Pasture/Hay	**30**	**50%**	**July**

Above data are from EM8713, *Western Oregon Irrigation Guides*, June 1998, OSU: Corvallis, OR and NRCS *Irrigation Guide (National Engineering Handbook, Part 652)*.

IRRIGATION WATER SUPPLY-

Description of Oregon Water Right:	Certificate 76251
Description of Irrigation Water Supply (Well, Stream, Irrigation District, etc.):	2 Wells
Supply Flowrate (gpm or cfs):	0.24 CFS or 108 GPM
Annual Volume Available (Acre-ft.):	87.9 AF
Water Delivery Schedule:	On Demand
Method(s) of Water Measurement:	Unknown

IRRIGATION SYSTEM-

System	System Capacity (gpm)	Nozzle Size (in)	Pressure (psi)	Spacing (ft)	Application Rate (in/hr)	System Efficiency (%)
Kline System	210	1/8	45 to 55	40x60	0.7 to 0.8	75

Conservation Practice Worksheet — OR IWM-W9.2.xls

Natural Resources Conservation Service, Oregon — February 2007

Irrigation Water Application – How Much, When, System Capacity

Client: Brevon Farms — **Date:** 2/7/14

System Type: sprinkle irrigation

Field ID:	Field 1
Crop:	Pasture/Hay
Soil Map Unit Name:	Yakima silt loam
Soil texture:	silt loam
Soil Depth (in):	60
Managed Root Zone Depth (in):	36
Management Allowed Deficit (%):	50%
Irrigated Area (acres):	28
System Application Efficiency (%):	70%
Hours of Operation per Day (hr):	12

Soil Profile Depth Zones	Upper Limit (in)	Lower Limit (in)	AWC (in/in)	AWC in soil zone (in)
	0	7	0.19	1.3
	7	22	0.20	3.0
	22	60	0.04	1.3
Total Soil Water Capacity (in): in the soil profile				**5.7**

Irrigation Requirement HOW MUCH water to apply?	Month APR	Month MAY	Month JUN	Month JUL	Month AUG	Month SEP	Month OCT
Managed Root Zone Depth (in):	36	36	36	36	36	36	36
Soil Water Capacity in Root Zone (in):	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Management Allowed Deficit (%):	50%	50%	50%	50%	50%	50%	50%
Maximum Net Irrigation Requirement (in):	**2.41**	**2.41**	**2.41**	**2.41**	**2.41**	**2.41**	**2.41**
Irrigation Timing WHEN to apply water?							
Daily Crop Water Use (in/day):	0.13	0.18	0.21	0.27	0.23	0.16	0.08
Maximum Irrigation Frequency (days):	18.5	13.4	11.5	8.9	10.5	15.1	30.1
Actual Irrigation Period (days):							
Actual NET Irrigation Application (in):	**2.41**	**2.41**	**2.41**	**2.41**	**2.41**	**2.41**	**2.41**
Percent of Root Zone Capacity Applied (%):	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**	**50%**
Expected number of irrigations per month:	**1.5**	**2.1**	**2.4**	**3.2**	**2.7**	**1.8**	**0.9**
System Capacity	***NOTE: Actual precipitation will affect the timing and number of irrigations.***						
System Application Efficiency (%):	70%	70%	70%	70%	70%	70%	70%
Frequency Factor, k_f:	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GROSS Irrigation Application (in):	**3.44**	**3.44**	**3.44**	**3.44**	**3.44**	**3.44**	**3.44**
Hours of System Operation per Day (hr):	12.0	12.0	12.0	12.0	12.0	12.0	12.0
System flow rate to meet peak demand:	**407.7 gpm**		**14.6 gpm/acre**				
Percent run time at peak system flow rate:	**48%**	**67%**	**78%**	**100%**	**85%**	**59%**	**30%**
GROSS Monthly Application (in):	**5.11**	**7.31**	**8.26**	**10.97**	**9.34**	**6.29**	**3.25**
GROSS Monthly Application (ac-ft):	**11.93**	**17.06**	**19.27**	**25.60**	**21.80**	**14.68**	**7.58**
GROSS Annual Application:	**50.54 inches**		**117.92 ac-ft**				

6.3. Soil Test Data

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Na	Units	Soil pH	Buffer pH	CEC (meq/ 100g)	NO_3-N (ppm)	EC (mmhos/ cm)
HQ									ppm					
CAFO									ppm					
1	2010	2.3	Olsen	96	1,059	4	11		ppm	7.6				

Projected P and K Levels*

Field ID	P Level at Start of Plan (ppm)	Excess P_2O_5 Applied (lbs)	P Level at End of Plan (ppm)	K Level at Start of Plan (ppm)	Excess K_2O Applied (lbs)	K Level at End of Plan (ppm)
HQ			0			0
CAFO			0			0
1	96	612	157	1,059	596	1,134

**These projected levels include the application of wastewater, and manure distributed by grazing animals only. All solid manure is exported off-farm or used in the lots for manure mound bedding areas. No commercial fertilizer application is included in the projection.*

5.2. The predominate soil types located in the fields for the Brevon Farm are shown in the table below.

Soil Information

Field	Soil Survey	Map Unit	Soil Component Name	Surface Texture	Slope Range (%)	OM Range (%)	Bedrock Depth (in.)	Drainage	Annual Flooding	Hydro-logic Group
HQ	667	106A	Umapine	SIL	0-3%	0.5-1%		SPoor	Rare	C
CAFO	667	106A	Umapine	SIL	0-3%	0.5-1%		SPoor	Rare	C
1	667	128A	Yakima	SIL	0-3%	2-3%		Well	Rare	B

Following are descriptions and rating tables for agricultural uses of the soils:

General Description of the Soil Map Units:

Map Unit Description (Brief, Generated)–Umatilla County Area, Oregon B-Y Carroll Dairy

Map Unit Description (Brief, Generated)

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.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

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

Report—Map Unit Description (Brief, Generated)

Umatilla County Area, Oregon

Map Unit: 106A—Umapine silt loam, reclaimed, 0 to 3 percent slopes

Component: Umapine (80%)

The Umapine component makes up 80 percent of the map unit. Slopes are 0 to 3 percent. Thiscomponent is on terraces, valleys. The parent material consists of silty alluvium. Depth to a rootrestrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 36 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 1 percent. This component is in the R011XY003OR Sodic Bottom ecological site. Nonirrigated land capability classification is 4s. Irrigated land capability classification is 3w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent. The soil has a slightly saline horizon within 30 inches of the soil surface. The soil has a moderately sodic horizon within 30 inches of the soil surface.

Map Unit: 128A—Yakima silt loam, 0 to 3 percent slopes

Component: Yakima (80%)

The Yakima component makes up 80 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, valleys. The parent material consists of mixed alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during January, February, March. Organic matter content in the surface horizon is about 2 percent. This component is in the R010XY120OR Loamy Fan 9-12 Pz ecological site. Nonirrigated land capability classification is 4s. Irrigated land capability classification is 2s. This soil does not meet hydric criteria.

Data Source Information

Soil Survey Area: Umatilla County Area, Oregon
Survey Area Data: Version 7, Feb 9, 2010

Report—Physical Soil Properties

Physical Soil Properties– Umatilla 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*					
106A—Umapine silt loam, reclaimed, 0 to 3 percent slopes														
Umapine	0-7	-14-	-73-	10-13- 15	1.30-1.40	4.00-14.00	0.18-0.20	0.0-2.9	0.5-1.0	.55	.55	5	4L	86
	7-60	-14-	-71-	10-15- 20	1.30-1.40	4.00-14.00	0.18-0.21	0.0-2.9	0.0-0.5	.64	.64			
128A—Yakima silt loam, 0 to 3 percent slopes														
Yakima	0-10	-34-	-58-	5- 9- 12	1.10-1.30	4.00-14.00	0.19-0.23	0.0-2.9	2.0-3.0	.43	.43	3	5	56
	10-22	-34-	-59-	5- 8- 10	1.10-1.35	4.00-14.00	0.18-0.22	0.0-2.9	1.0-2.0	.32	.43			
	22-60	-96-	- 2-	0- 3- 5	1.45-1.75	141.00-705.00	0.03-0.04	0.0-2.9	0.0-1.0	.10	.20			

Data Source Information

Soil Survey Area: Umatilla County Area, Oregon
Survey Area Data: Version 7, Feb 9, 2010

Report—Water Features

Water Features– Umatilla 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*				
106A—Umapine silt loam, reclaimed, 0 to 3 percent slopes										
Umapine	C	—	January	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	February	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	March	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	April	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	May	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	June	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	November	2.0-4.0	>6.0	—	—	None	—	Rare
	C	—	December	2.0-4.0	>6.0	—	—	None	—	Rare
128A—Yakima silt loam, 0 to 3 percent slopes										
Yakima	B	—	January	4.0-6.0	>6.0	—	—	None	—	Rare
	B	—	February	4.0-6.0	>6.0	—	—	None	—	Rare
	B	—	March	4.0-6.0	>6.0	—	—	None	—	Rare
	B	—	April	—	—	—	—	None	—	Rare
	B	—	May	—	—	—	—	None	—	Rare
	B	—	December	—	—	—	—	None	—	Rare

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Permanent high production irrigated pasture is maintained with annual no-till planting into the existing orchardgrass stand with ryegrass and brassica. Liquid manure applications are made prior to the first spring grazing and after each grazing period. Estimate 2% solids in liquids and apply 5,000 gallons/acre. 8.3lb/gal. x 1000gal. x 2% x 50% effect factor = 83lbs/1000gal. applied. Livestock are rotated using portable fencing.

profiles\BY_Carroll Dairy; Irr.Pasture, CMZ50

Inputs:
Location: Oregon\Umatilla County\OR_Umatilla_Req_13
Soil: 106A UMAPINE SILT LOAM, RECLAIMED, 0 TO 3 PERCENT SLOPES\UMAPINE silt loam 80%
Slope length (horiz): 200 ft
Avg. slope steepness: 3.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: c.Other Local Mgt Records\Carroll Dairies; Permanent Irr. Pasture interseeded/manure appl., CMZ50

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
3/15/0	Manure spreader, liquid		56
3/15/0	Begin new growth	Tall fescue pasture, regrowth after grazing	56
5/15/0	Graze, rotational	Tall fescue pasture, regrowth after grazing	44
5/16/0	Manure spreader, liquid		49
7/15/0	Graze, rotational	Tall fescue pasture, regrowth after grazing	41
7/16/0	Manure spreader, liquid		47
9/15/0	Graze, rotational	Tall fescue pasture, regrowth after grazing	41
9/16/0	Manure spreader, liquid		47
10/15/0	Graze, rotational	Tall Fescue pasture, senesc to regrowth	42
10/16/0	Manure spreader, liquid		48

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 0.00074 t/ac/yr

Wind Erosion Prediction System (WEPS) was not run as field is in permanent pasture annually inter-seeded with a no-till drill. No wind erosion present.

5.3. Predicted Soil Erosion

Average water, wind, irrigation, gully and ephemeral soil loss

Field	Predominant Soil Type	Slope (%)	Water (Ton/A/Yr)	Wind (Ton/A/Yr)	Irrigation (Ton/A/Yr)	Gully (Ton/A/Yr)	Ephemeral (Ton/A/Yr)	Total (Ton/A/Yr)	T Factor (Ton/A/Yr)
HQ	106A (Umapine SIL)	3.0	0.0	0.0	0.0	0.0	0.0	0.0	5
CAFO	106A (Umapine SIL)	3.0	0.0	0.0	0.0	0.0	0.0	0.0	5
1	128A (Yakima SIL)	3.0	0.1	0.0	0.0	0.0	0.0	0.1	3

Animal Mortality Facility (No) (PS316)

Field(s): CAFO

Status: Planned **Units: 1 No.**

Description: A covered composting storage area is planned that will process animal carcasses into stable organic matter to be used a soil amendment and nutrients for crop and hay land fields. The facility will have a capacity of approximately 2,600 cubic feet or 47 tons that will provide a treatment and storage area for animal carcasses.

Operation and Maintenance: The animal mortality facility shown on the facility map has a design capacity of 2,600 cubic feet or 47 tons to store and dispose of animal mortalities by composting. Refer to Section 3 for guidance on what steps to take for a catastrophic animal mortality event.

Having dead animals sent to an acceptable disposal site is the best method to deal with animal mortalities. A list of landfills and phone numbers can be found on the internet at http://www.deq.state.or.us/lq/sw/disposal/permittedfacilities.htm. If a local landfill is not permitted to accept animal carcasses, the Oregon Department of Environmental Quality (DEQ) may grant an exception. Phone numbers to local DEQ offices can be found in most phone books or on the internet at http://www.deq.state.or.us/about/locations.htm.
Under no circumstances are animal mortalities to be disposed of in any type of liquid manure storage facility.

Animal mortalities will be disposed of by composting at the Carroll Heifer Ranch, across the road at 50924 Umapine Road until the Brevon Farm animal mortality facility is constructed and is operational.

Acceptable methods and guidance for disposing of animal mortalities are:

Composting- Composting animal mortalities requires a composting plan be prepared and submitted to the Oregon Department of Agriculture, Natural Resources Division. A composting plan consists of a site plan drawing of the composting facility, a description of how any runoff from the facility will be contained, a description of the composting process to be used and how the compost will be used. The composting facility for animal mortalities must have a concrete floor or similar impervious surface to prevent nutrient leaching. A roof covering the animal mortality composting facility is recommended to control moisture added by rainfall and rainfall runoff. Assistance to develop a composting plan is available from the Natural Resources Division of the Oregon Department of Agriculture, (503) 986-4700. A permit is also needed from the Department of Environmental Quality (DEQ) if animal mortalities will be imported from other farms for composting.

Rapid composting of dead animals occurs when the carbon to nitrogen (C:N) ratio of the compost mix ranges between 10 and 20 to 1. To achieve the recommended C:N ratio, build the initial compost pile by placing 18 inches of sawdust or other bulking agent on the floor of the composting area. The bulking agent should extend beyond the perimeter of the animal to be composted by at least 2 feet. If using a compost bin the bulking material should extend at least 1 foot beyond the perimeter of the animal being composted. Using a bulking agent such as sawdust will absorb any liquids as the animal decomposes during the composting process.

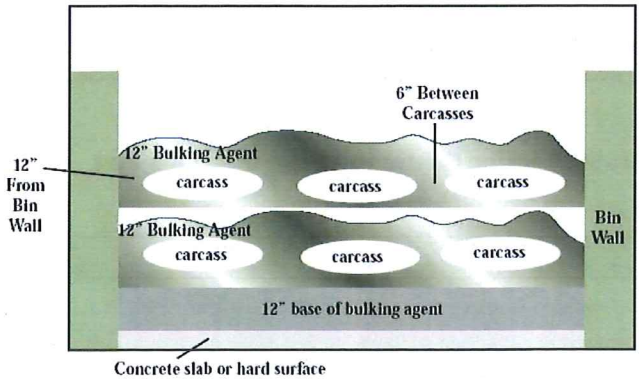
Once the bulking agent has been placed on the floor of the composting area, place the animal carcass on top. To decrease composting time and prevent bloating the body cavity should be cut open. Cover the carcass with 1 to 3 feet of separated manure solids or other material that has a moisture content between 30 to 60 percent and a C:N ratio of not more than 30 to 1. Use 1 foot of material for small carcasses and 3 feet for large carcasses such as cattle. Be careful not to add material that is to wet as it will hinder the composting process and cause odors. Small animals can be layered in a compost pile by placing 12 inches of the bulking agent between layers as shown in the figure below. Be sure the total height of the compost pile does not exceed 7 feet in height as it may spontaneously combust causing a fire.

The first heating or primary composting cycle will take approximately 15 to 90 days depending on the size of the animal being composted. Refer to the table below for estimated primary composting times. Check pile temperature using thermometer probe on a daily basis. The pile temperature should be checked at multiple points around the compost pile and at a point approximately 3 feet into the pile. The temperature of the compost pile should reach 130 degrees Fahrenheit (F) within a few days. Temperatures should peak between 130 and 150 degrees F in 3 to 4 days. When the temperature of the compost pile falls below 130 degrees F, the compost needs to be aerated by turning or other means. Be sure carcasses remain covered with the bulking agent after

being aerated. It is important to maintain a temperature above 130 degrees F for at least 7 days during the primary composting cycle as failure to do so may result in the incomplete destruction of pathogens and can cause fly and odor problems. After aerating the compost pile, the secondary composting times will be similar to the first.

CAUTION: It is unclear whether prions that are the proteins that cause Bovine Spongiform Encephalitis (BSE or Mad Cow Disease) are destroyed in the composting process. Animals showing signs of Mad Cow Disease and those with anthrax should not be composted and must be reported to the Oregon Department of Agriculture, Animal Health and Identification Division at (503) 986-4680 for guidance on disposal.

After aerating the compost pile by turning or other means, be sure to check the moisture content and add water if necessary being careful not to add to much water. The compost pile should feel moist to the touch but you should not be able to squeeze any water out of it.



Primary Composting Times

Carcass Size (lb)	*Estimated Primary Composting Days*
0-10	15
10-25	22
25-300	45
300-750	60
750-1400	90

Odors given off by the composting operation is a good indicator of how the compost operation is proceeding. Foul odors may mean that the process has turned from aerobic to anaerobic. Anaerobic conditions are the result of insufficient oxygen in the compost. This may be caused by excessive moisture in the compost or the need for turning or aerating of the compost pile.

After the composting process is finished, it may be used as a bulking agent for a new compost pile. A rule of thumb is to use 50 percent of the composted material for a bulking agent but you may want to use more or less depending on how degraded the bulking agent is in the finished compost. Using finished compost in a new compost pile reduces the amount of bulking agent needed for the new pile and provides microbial inoculants to get the composting process started.

Finished compost can also be applied to crop and pasture land fields for utilization of the nutrients and organics in the composted material. Compost from animal mortalities should not be applied to crops that will be consumed directly by humans. The nutrient content of the composted material should be determined and application equipment calibrated to ensure nutrients contained in the composted material are not over applied.

Natural Disposal- To allow nature to take its course the dead animal needs to be transported to a location at least ½ mile from any off-farm dwelling and at least ¼ mile from any water way in accordance with ORS 601.140. Once this criteria is met the carcass can be left to degrade naturally with the help of scavengers. This method is not an acceptable means of disposal for a large number of animal mortalities or for byproducts generated during butchering.

Landfill- Dead animals may be transported to a permitted landfill that accepts animal carcasses for disposal. Be sure to call the chosen landfill first to insure a landfill will accept your animal carcasses. Refer to the website given previously for permitted landfills to call. Contact the landfill operator and the DEQ at (800) 452-4011 if the landfill you would like to use is not a permitted facility to see if an exception may be granted for the disposal of animal carcasses.

Incineration- Dead animals may be burned as a method of disposal and as a method to control diseases. The economics of incineration and availability of incineration units usually make this option undesirable. A permit is needed from the Oregon Department of Environmental Quality (DEQ) Air Quality program to operate an incineration unit. Contact your DEQ at (800) 452-4011 for guidance on incineration of animal carcasses.

Burial- Dead animals may be buried in accordance with ORS 601.090(7) as a method of disposal. Large animals such as an adult cow will require a hole approximately 2 feet by 7 feet by 8 feet deep. Be sure to select a site that doesn't have a water table to insure the bottom of the hole will be dry. The animal carcass should be covered with

hydrated lime and covered with at least 4 feet of soil mounded 2 feet above the natural ground line to allow for settling as the carcass decomposes. Burial sites should be located at least 500 feet down slope from surface waters or wells.

Burial is not an acceptable method of disposal for animal byproducts generated from butchering. Burial of large numbers of animal mortalities is not acceptable unless performed in accordance with a Catastrophic Animal Mortality Management Plan. Burial of imported animal mortalities is subject to disposal regulations and the Oregon Department of Environmental Quality (DEQ), the Oregon Department of Agriculture (ODA) and the local land use planning authority should be contacted.

Periodically inspect concrete and asphalt slabs, walls and curbs and repair or replace broken sections as needed. Immediately move any animal mortalities and refuse from outside of the facility and place them back in the facility.

Maintain all fences, railings, and/or warning signs to provide warning and/or prevent unauthorized human or livestock entry. Immediately repair vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.

Specification: Prior to construction contact the local USDA Service Center to obtain drawings and specifications for this practice.

Sampling Soil

Spring Soil Samples:

- Spring soil samples are to be collected the last 2 weeks of March or the first 2 weeks of April when soils are not saturated
- Soil samples are to be collected on fields that have not received manure applications within the last 30 days.
- Collect several samples (about 10 one-fourth cup samples) of soils from just below the thin sod layer to a depth of 12 inches and add to bucket.
- Mix the samples in the bucket and remove quantity required by lab for analysis and place into a sample bag.
- The bag should be labeled with:
    - Farm or operator name
    - Sample date
    - Field name
    - Sample depth (0 to 12 inches)
- Keep soil sample cool (small cooler with some ice) in the filed until sample can be put in refrigerator or into freezer. Soil can be stored in refrigerator for up to 1 week or can be stored in a freezer for longer periods.
- Ship samples to lab.

Fall Soil Samples

- Fall soil samples are to be collected during the last 2 weeks in September or the first 2 weeks in October on soils that are not saturated.
- Soil samples are to be collected on fields that have received normal manure applications during the current year.
- Sample soils and shop as outlined in the spring soil sample section above.

SAMPLING LIQUID MANURE

Liquid manure samples submitted for analysis should meet the following requirements:

- Manure samples submitted to a laboratory should represent the average composition of the material that will be applied to the field.
- Place sample in a sealed, clean plastic container with about a 1-pint volume. Glass is not suitable because it is breakable and may contain contaminants.
- Leave at least 1 inch of air space in the plastic container to allow for expansion caused by the release of gas from the manure material.
- Refrigerate or freeze samples that cannot be shipped on the day they are collected, minimizing chemical reactions and pressure buildup from gases.

Following are guidelines for obtaining liquid manure samples:

Wastewater: Premixing the surface liquid in the storage structure is not needed, provided it is the only component that is being pumped. Operators with multistage systems should draw samples from the storage structure they intend to pump for application to crops.

Samples should be collected using a clean, plastic container similar to the one shown in figure for liquid manure sampling on the next page. One pint of material should be taken from at least eight sites around the storage structure and then mixed in the larger clean, plastic container. Effluent should be collected at least 6 feet from the storage structure's edge at a depth of about a foot. Shallower samples from storage structure may be less representative than deep samples because oxygen transfer near the surface sometimes alters the chemistry of the solution. Floating debris and scum should be avoided.

One pint of mixed material should be sent to the lab. Galvanized containers should never be used for collection, mixing, or storage due to the risk of contamination from metals like zinc in the container. These recommendations are adequate for making applications that draw the liquid level in the storage structure down a few feet. If an entire storage structure is to be emptied, more frequent sampling with many more sampling points is recommended.

Slurry: Manure materials applied as a slurry from a storage structure should be mixed prior to sampling. A liquid sampling device can be used to obtain a sample from agitated storage structure. If you wish to sample a storage structure without agitation, you must use a composite sampling device as the one shown in the figure on the next page.

Samples should be collected from approximately eight areas around the storage structure and mixed thoroughly in a clean, plastic container. An 8- to 10-foot section of 0.5- to 0.75-inch plastic pipe can also be used: extend the pipe into the pit with ball plug open, pull up the ball plug (or press your thumb over the end to form an air lock), and remove the pipe from the manure, releasing the air lock to deposit the manure in the plastic container.

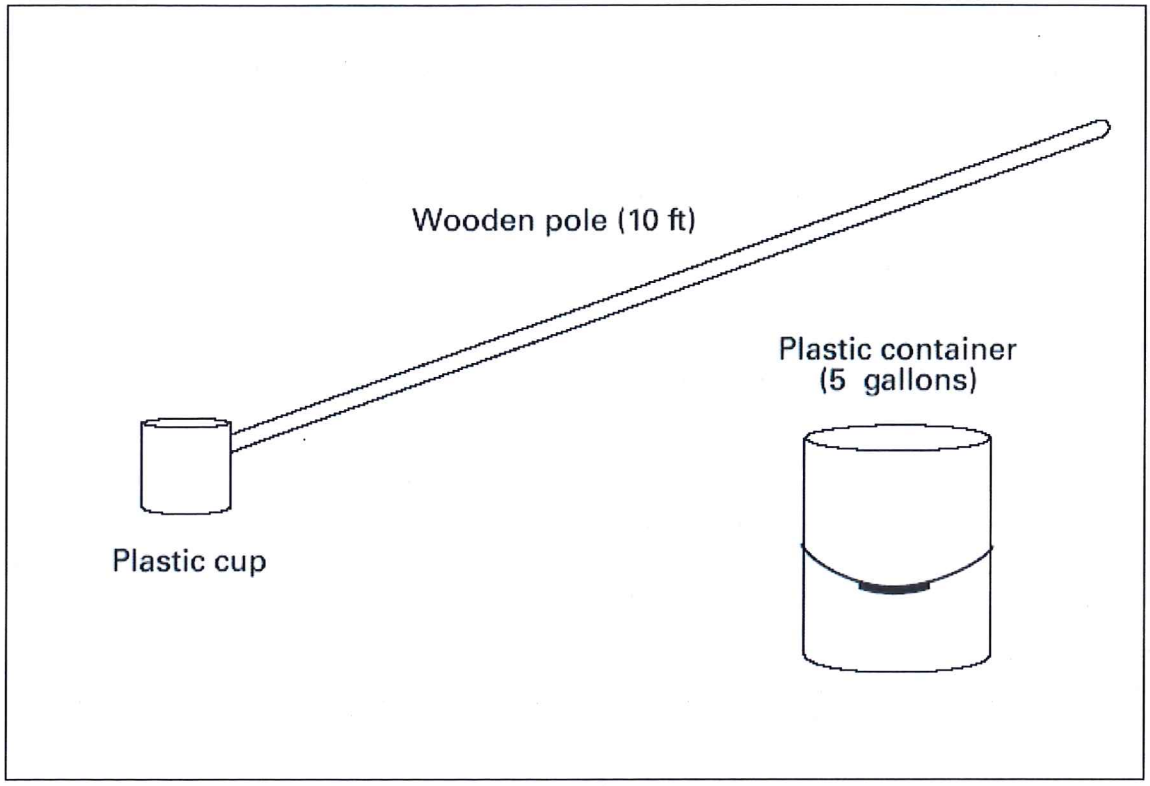
One pint of mixed material should be sent to the lab. Galvanized containers should never be used for collection, mixing, or storage due to the risk of contamination from metals like zinc in the container.

Sludge: Sludge is somewhat more difficult to obtain a representative sample. Two common methods are used.

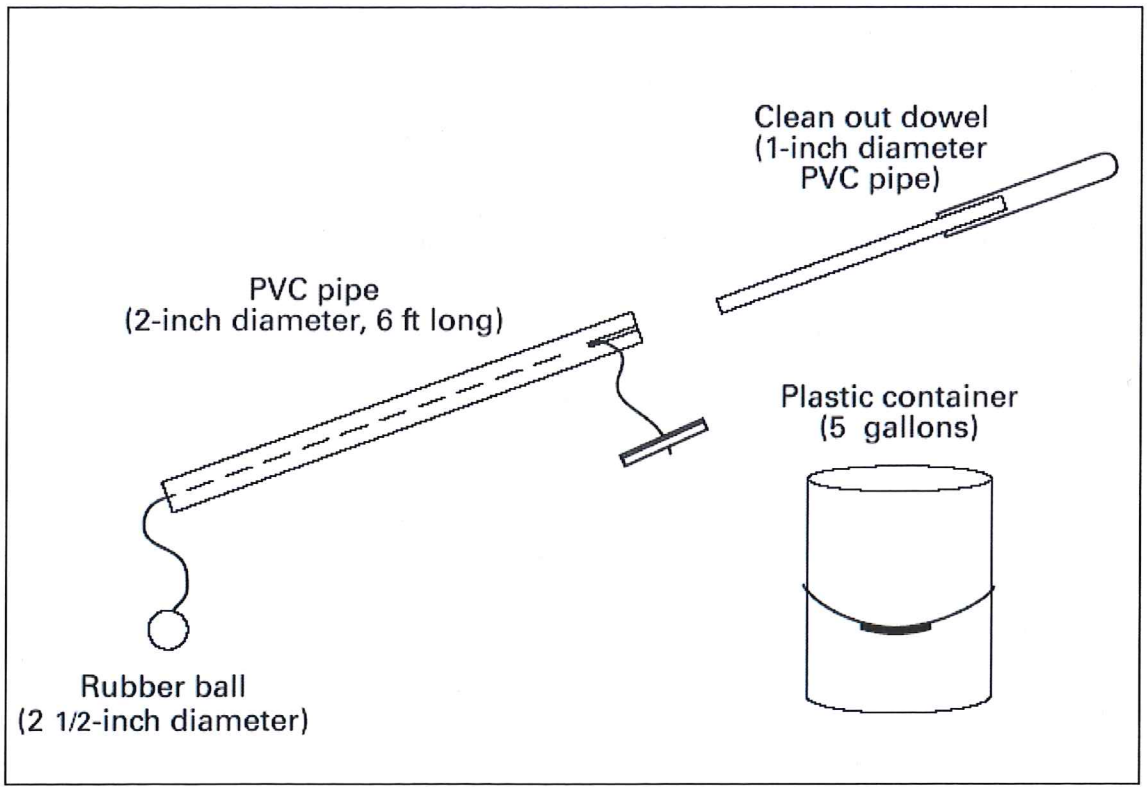
One method requires pumping the storage structure down to the sludge layers. Then, during sludge agitation, a composite sampling device as shown in the figure on the next page can be used to obtain a sample.

The other method requires insertion of a probe to the bottom of the storage structure to obtain a column of material. The sludge component of this column is then released into a clean plastic bucket, and several (12-20) other sampling points around the storage structure are likewise collected to obtain a composite, representative sample.

For analysis, most labs require at least 1 pint of material in a plastic container. The sample should not be rinsed into the container because doing so dilutes the mixture and distorts nutrient evaluations. However, if water is typically added to the manure prior to land application, a proportionate quantity of water should be added to the sample.



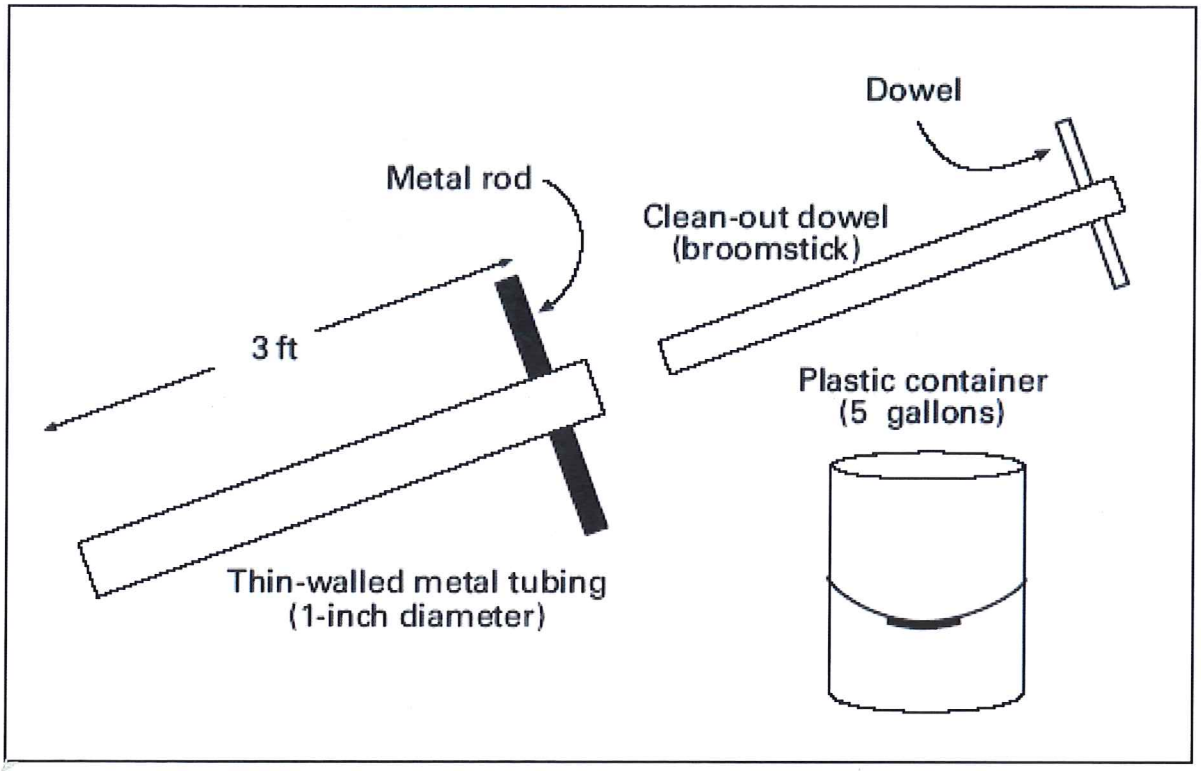
Typical Sampling Equipment for Liquids



Typical Sampling Equipment for Obtaining Composite Samples

SAMPLING SOLID MANURE

Solid manure samples should represent the manure's average moisture content. A 1-quart sample is adequate for analysis. Samples should be taken from approximately eight different areas in the manure pile at a depth of 18 inches, placed in a clean plastic container, and thoroughly mixed. Approximately 1 quart of the mixed sample should be placed in a plastic bag, sealed, and shipped directly to the lab. It is recommended to ship the samples early in the week so it doesn't sit in a post office or shipping area of the laboratory for several days. Samples stored for more than two days should be refrigerated. The figure below shows a device that can be constructed and used for sampling solid manure.



Typical Solids Sampling Equipment

APPLICATION EQUIPMENT CALIBRATION

The worksheets on the following pages can be used to calibrate manure application equipment so that manure is applied at the proper rate to achieve the planned application rates.

SPREADER EQUIPMENT CALIBRATION

(Using Bucket, Pan or Tarp)

Name:_____ Date:_____

Perform the following operations to calibrate the solids spreader equipment:

- ✓ Place buckets, pans, or tarps in the application area to collect the applied or spread waste material.
- ✓ Spread waste material over the application area using the spreading pattern normally used in the field. Make sure the spreader is traveling at the speed it typically travels over the collection area. Record engine rpm and gear settings used.
- ✓ Collect and weigh the waste material and calculate the average application rate. Use this worksheet to record the weights and calculations.

Note: Use Tarps instead of buckets or pans when using dry stack manure or separated solids as the variability in the weight will be less.

Data and Calculations:

Steps	ID of Bucket, Pan or Tarp				
	A	B	C	D	E
1. Date of calibration test-					
2. Engine RPM during spreading -					
3. Gear selected during spreading -					
4. Weight of empty bucket (lb) =					
5. Weight of bucket with waste (lb) =					
6. Weight of Waste (lb) - line 5 – line 4 =					
7. Collection Area (sq ft) - Area of the top of the bucket, pan or tarp used to collect the waste =					
8. Waste Applied (lb/sq ft) - line 6 ÷ line 7 =					
9. Covert to tons per acre - line 8 x 21.78 =					
10. Average Application Rate (tons per acre)- Sum of values in cells A9 through F9 divided by the total number of calibrations completed =					

Additional Notes:

SPREADER EQUIPMENT CALIBRATION

(Using a Full Spreader Load)

Name:_____ Date:_____

Perform the following operations to calibrate the solids spreader equipment:

- ✓ Determine the weight of the waste material loaded in the spreader by using truck scales to weigh the spreader equipment when it is empty and full.
- ✓ Spread the loaded spreader on the field using consistent speed and spreader settings to cover the field uniformly. Spread in a rectangular pattern so the area calculation will be simple. Record engine rpm and gear settings used.
- ✓ Measure the length and width covered by the full load and compute the application rate in tons per acre using this worksheet.

Data and Calculations:

Steps	ID of Calibration Test				
	A	B	C	D	E
1. Date of calibration test-					
2. Engine RPM during spreading -					
3. Gear selected during spreading -					
4. Weight of empty spreader (lb) =					
5. Weight of loaded spreader (lb) =					
6. Weight of Waste in spreader (lb) - line 5 – line 4 =					
7. Length of spreading area (ft) =					
8. Width of spreading area (ft) =					
9. Area spread (sq ft) - line 7 x line 8 =					
10. Waste applied (lb/sq ft) – line 6 ÷ line 9=					
11. Convert to tons per acre - Line 10 x 21.78=					
12. Average Application Rate (tons per acre) – Sum of values in cells A11 through F11 divided by the total number of calibrations completed =					

Additional Notes:

TANK EQUIPMENT CALIBRATION

(Using a Full Tank Load)

Name:_____ Date:_____

Perform the following operations to calibrate the tank equipment:

- ✓ Determine the maximum capacity of the tank equipment from the manufacturer's maintenance manual or the owners manual for the equipment.
- ✓ Fill the tank and reduce the volume of the tank by the appropriate amount if the tank is not filled to its maximum capacity. Normally a tank spreader is only filled to about 80 percent of its maximum capacity and therefore the maximum rated capacity of the tank should be multiplied by 0.8 to reflect the volume of the loaded tank during the calibration exercise.
- ✓ Spread the loaded tank on the field using consistent speed and settings to cover the field uniformly. Try to spread in a rectangular pattern so the area calculation will be simple. Record engine rpm and gear settings used.

Data and Calculations:

Steps	ID of Calibration Test				
	A	B	C	D	E
1. Date of calibration test-					
2. Engine RPM during spreading-					
3. Gear selected during spreading-					
4. Maximum rated capacity of tank (gallons) =					
5. Volume of filled tank (gallons)- Line 4 x ____ % of tank filled ÷ 100% =					
6. Length of spreading area (ft) =					
7. Width of spreading area (ft) =					
8. Area spread (sq ft)- line 6 x line 7 =					
9. Waste applied (gal/sq ft)- line 5 ÷ line 8 =					
10. Convert to gallons per acre - Line 9 x 43,560 =					
11. Average Application Rate (gallons per acre) – Sum of values in cells A10 through F10 divided by the total number of calibrations completed =					

Additional Notes:

TRAVELING BIG GUN SPRINKLER CALIBRATION

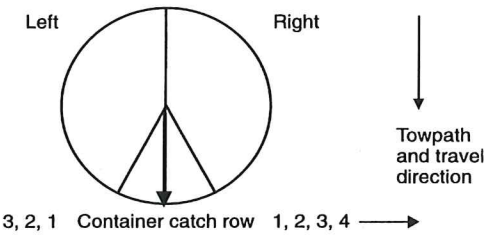
Name:_____ Date:_____

Perform the following operations to calibrate the traveling big gun sprinkler:

- ✓ Use 5 to 10 catch cans to collect the sprinkler-irrigated waste. Use straight-sided buckets for catch cans. Two pound coffee cans work well. Make sure all of the catch cans have the same diameter.
- ✓ Place one of the catch cans on a level surface and fill it with water to a known depth (1-3 inches). Pour the water from the catch can into a large measuring cup. Determine how many measuring cups of water are equal to an inch of water in the catch can.
- ✓ Place at least five catch cans across the towpath of the big gun sprinkler. Try to space the catch cans uniformly from the center of the towpath to the outer edge of the wetted area of the sprinkler. Stake the catch can in place or put a rock in the bottom of the catch can to keep it upright. Allow the traveling big gun sprinkler to completely pass over the catch cans. Use the measuring cup previously used to calibrate the catch cans to measure the amount of liquid collected in each can and convert the volume to inches. Be sure to add together the amount measured from the catch cans that would receive overlap from the adjacent towpath. For example, if catch can #4 will receive liquids from the adjacent towpaths, add the amount from container #4 on the left to container #4 on the right side to compute the total amount applied at the location of container #4 on the right and left sides of the towpath.

Catch Can Calibration:

Example:	1 inch =	5	Cups
	1 cup =	0.2	Inches
Your Catch Cans:	1 inch =	_____	Cups
	1 cup =		Inches



Travel Rate Setting During Test:

Data and Calculations:

Catch Can ID	Volume of Liquid							
	Cups	Inches	Cups	Inches	Cups	Inches	Cups	Inches
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
Average =								

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 4.7

CLIENT: Brent and Yvonne Carroll Dairy

ASSISTED 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= 60						Manure CF/D/AU	Annual		
				Nutrient Production									
				(lbs./day/1000 lb. Animal Unit)			(lbs./day)						
				N	P	K	N	P	K		Days Confined	Days Grazed	Days Off Farm
MILKER (Holstein)	85	750	63.8	0.68	0.11	0.31	43.35	7.31	19.85	1.63	171	194	0
MILKER (DRY)	15	850	12.8	0.30	0.04	0.10	3.83	0.54	1.28	0.92	136	229	0
HEIFERS (12-24 Months)	40	500	20.0	0.27	0.05	0.12	5.32	0.91	2.40	0.90	151	0	214
CALVES (1-12 Months)	50	300	15.0	0.42	0.05	0.11	6.30	0.81	1.65	1.34	365	0	0
Totals/Averages-	190	600	111.5	0.53	0.09	0.23	58.8	9.6	25.2	1.4			

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)	85%	40%	0%	0%	0%	0%	85%	85%	85%	85%	85%	85%	
	85	85	85	85	85	85	85	85	85	85	85	85	405
MILKER (DRY)	100%	50%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	
	15	15	15	15	15	15	15	15	15	15	15	15	96
HEIFERS (12-24 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	0	40	40	40	40	40	0	0	0	0	0	0	0
CALVES (1-12 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	50	50	50	50	50	50	50	50	50	50	50	50	0
													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>>>	67	32	0	0	0	0	67	67	67	67	67	67	500
Total AUM's>>>>>>>>>>	-67	-32	0	0	0	0	-67	-67	-67	-67	-67	-67	-500

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

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ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

WEATHER STATION: MILTON FREEWATER

Month	25Yr-24Hr	1.80	Lot Runoff Factors as a Percent of Monthly Precipitation	
	RCN=	95.00		
	Average Monthly Inches			
	Precipitation	Evaporation	Paved	Unpaved
October	1.16	2.75	30%	5%
November	1.62	1.26	38%	0%
December	1.73	0.84	27%	0%
January	1.64	0.87	27%	0%
February	1.17	1.31	25%	0%
March	1.41	2.54	23%	0%
April	1.20	3.90	20%	5%
May	1.28	5.30	32%	10%
June	1.15	6.66	35%	5%
July	0.37	8.86	32%	0%
August	0.44	7.93	28%	0%
September	0.73	5.07	35%	10%
Annual	13.9	47.29		

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	4,400
Unpaved Lot Area >>>	242,150
Roof Area >>	0
Surface Area of Silage Storage Facility>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> Does Silage Seepage Drain to Storage Facility? (Y/N) NO	0
Total Runoff Area Contributing to Liquid Storage Facility>>>>>>>>>>>>>>>	246,550

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	85.0	0	0.00	0	0.0
Equipment Wash		2	180.00	360	48.1
Flushwater		0	0.00	0	0.0
Miscellaneous		0	0.00	0	0.0
Total>>				360	48.1

CROP DATA

Field Number	Acres	Crop	Percent Dry Matter (DM)	Yield Units	Target Yield	Nutrients Removed in Pounds per Acre: Nitrogen N	Phosphorous P_2O_5	Potassium K_2O
1	28.0	Perennial Hay/Pasture(Med-High Intensity)	85%	Ton	6.50	320	101	266
Off Farm								
Total Acres-	28.0							

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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)	Confined	Chopped Straw	7.00	5.50	0.79	50	351
MILKER (DRY)	Confined	Soil	75.00	0.00	0.00	0	0
HEIFERS (12-24 Months)	Confined	Soil	75.00	0.00	0.00	0	0
CALVES (1-12 Months)	Confined	Chopped Straw	7.00	2.70	0.39	6	41

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)	Dry Scrape System	85%	131	23	16	88	9	36	4,716
MILKER (DRY)	Dry Scrape System	100%	12	0	0	12	0	36	422
HEIFERS (12-24 Months)	Dry Scrape System	100%	18	0	0	18	0	36	648
CALVES (1-12 Months)	Dry Scrape System	100%	26	0	0	20	0	36	932
Total Solids>>>			187	23	16	138	9		6,719

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Version 4.7

CLIENT: **Brent and Yvonne Carroll Dairy**
ASSISTED BY: **0**

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

Month	Runoff in Cubic Feet: Roof Area Square Feet 0	Runoff in Cubic Feet: Paved Slab Area Square Feet 4,400	Runoff in Cubic Feet: Unpaved Lot Area Square Feet 242,150	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	0	128	1,170	0	1,492	130	977	412	2,886	1,412	50,820	108	3,870	1,412	2,897
November	0	226	0	0	1,444	406	2,786	1,075	7,526	3,851	138,625	416	14,981	3,851	2,086
December	0	171	0	0	1,492	604	4,166	1,732	12,125	5,785	208,274	717	25,801	5,785	2,380
January	0	162	0	0	1,492	604	4,166	1,732	12,125	5,785	208,274	717	25,801	5,785	2,371
February	0	107	0	0	1,348	545	3,763	1,565	10,952	5,226	188,119	647	23,304	5,226	2,102
March	0	119	0	0	1,492	604	4,166	1,732	12,125	5,785	208,274	717	25,801	5,785	2,328
April	0	88	1,211	0	1,444	126	946	399	2,793	1,366	49,180	104	3,745	1,366	2,847
May	0	150	2,583	0	1,492	130	977	412	2,886	1,412	50,820	108	3,870	1,412	4,333
June	0	148	1,160	0	1,444	126	946	399	2,793	1,366	49,180	104	3,745	1,366	2,856
July	0	43	0	0	1,492	130	977	412	2,886	1,412	50,820	108	3,870	1,412	1,643
August	0	45	0	0	1,492	130	977	412	2,886	1,412	50,820	108	3,870	1,412	1,645
September	0	94	1,473	0	1,444	126	946	399	2,793	1,366	49,180	104	3,745	1,366	3,115
Annual	**0**	**1,481**	**7,597**	**0**	**17,567**	**3,658**	**25,793**	**10,682**	**74,774**	**36,177**	**1,302,385**	**3,956**	**142,406**	**36,177**	**30,601**
Annual Gallons	**0**	**11,079**	**56,829**	**0**	**131,400**	**27,364**	**192,929**	**79,902**		**270,607**		**29,589**		**270,607**	**228,897**

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	Grazing Manure Gallons/Yr	Confined Manure Cubic Feet/Yr
MILKER (Holstein)	6.50	2.51	3.59	36.85	14.23	20.33	43.35	16.74	23.92	150,897	17,801
MILKER (DRY)	0.00	0.00	0.00	3.83	1.23	1.54	3.83	1.23	1.54	20,093	1,595
HEIFERS (12-24 Months)	0.00	0.00	0.00	5.32	2.08	2.89	0.00	0.00	0.00	0	2,718
CALVES (1-12 Months)	0.00	0.00	0.00	6.30	1.86	1.99	0.00	0.00	0.00	0	7,337
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
									Total-	**170,989**	**29,451**

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 4.7

CLIENT: **Brent and Yvonne Carroll Dairy**
ASSISTED BY: **0**

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY NUTRIENT PRODUCTION

Month	Pounds of Nutrients from LIQUIDS			Pounds of Nutrients from SOLIDS			Pounds of Nutrients from GRAZING			Total Pounds of Nutrients from ALL SOURCES		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
October	30	12	17	367	124	156	1,261	479	678	1,658	614	851
November	117	45	65	1,069	393	535	578	219	310	1,764	657	910
December	202	78	111	1,621	601	829	0	0	0	1,823	679	940
January	202	78	111	1,621	601	829	0	0	0	1,823	679	940
February	182	70	100	1,464	543	749	0	0	0	1,646	613	849
March	202	78	111	1,621	601	829	0	0	0	1,823	679	940
April	29	11	16	355	120	151	1,220	464	656	1,604	595	823
May	30	12	17	367	124	156	1,261	479	678	1,658	614	851
June	29	11	16	355	120	151	1,220	464	656	1,604	595	823
July	30	12	17	367	124	156	1,261	479	678	1,658	614	851
August	30	12	17	367	124	156	1,261	479	678	1,658	614	851
September	29	11	16	355	120	151	1,220	464	656	1,604	595	823
Annual	**1,113**	**430**	**614**	**9,928**	**3,593**	**4,850**	**9,281**	**3,526**	**4,990**	**20,322**	**7,549**	**10,454**

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 4.7

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ASSISTED BY: **0**

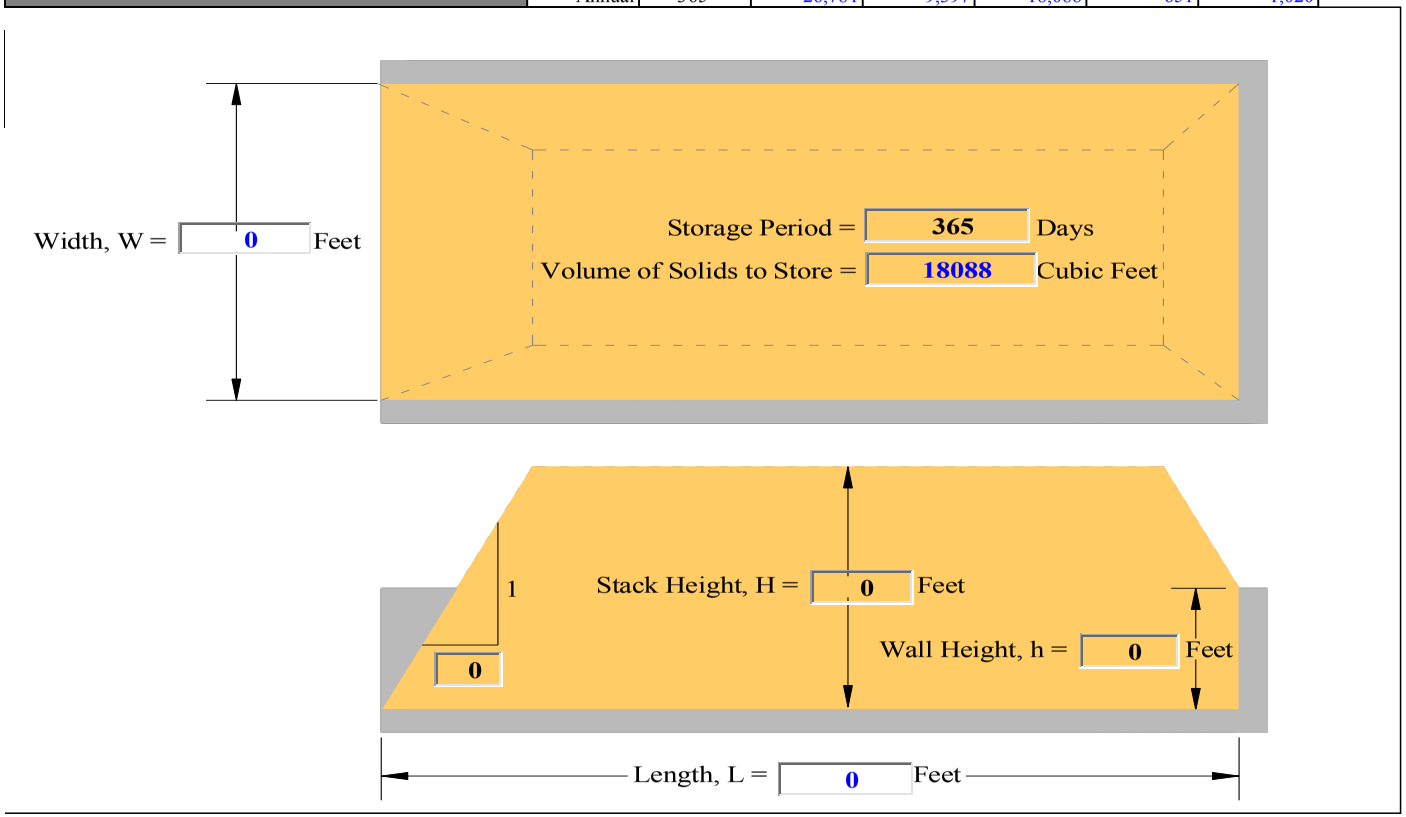
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

Solids Storage Facility Parameters	Value
Storage Period, Days=	365
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=	182,564
Surface Area of Existing Storage, SF=	32,500
25 Year-24 Hour Storm Runoff, CF=	3,502
Volume Needed, Cubic Feet=	18,088
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	Solids to Store Tons	Normal Runoff CF
October	31	1034	377	706	25	157
November	30	2911	940	1,925	69	0
December	31	4286	1,499	2,893	104	0
January	31	4286	1,499	2,893	104	0
February	28	3871	1,354	2,613	94	0
March	31	4286	1,499	2,893	104	0
April	30	1001	365	683	25	163
May	31	1034	377	706	25	347
June	30	1001	365	683	25	156
July	31	1034	377	706	25	0
August	31	1034	377	706	25	0
September	30	1001	365	683	25	198
Annual	365	26,781	9,397	18,088	651	1,020



OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 4.7

CLIENT: **Brent and Yvonne Carroll Dairy**
ASSISTED BY: **0**

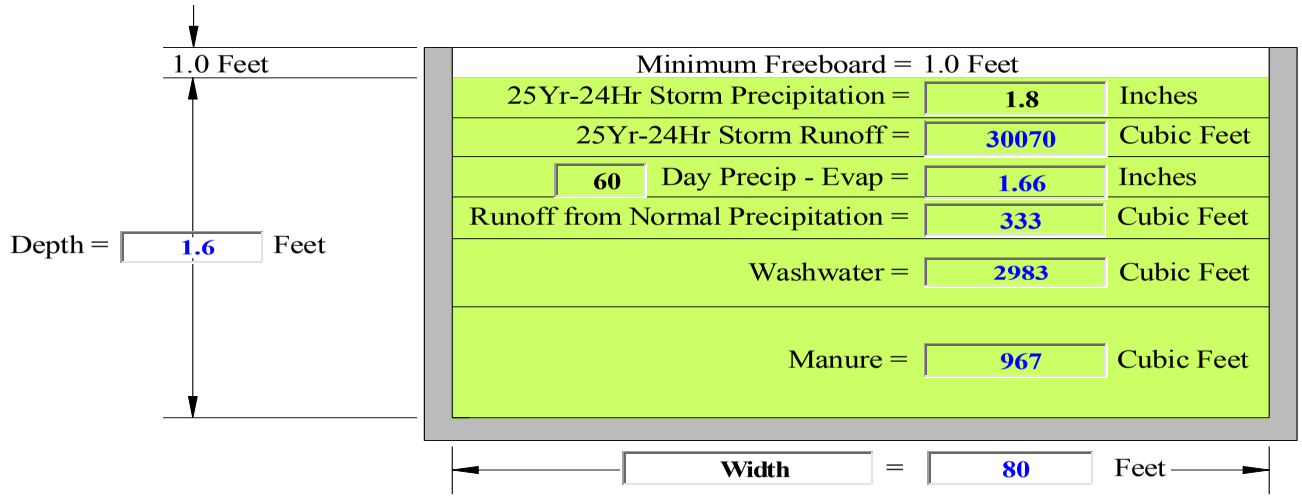
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

TANK

Tank Parameters	Value
Storage Period, Days=	60
Tank Width, Feet=	80
Tank Length, Feet=	80
Existing Storage, Cubic Feet=	26,500
Surface Area of Existing Storage, SF=	0
25 Year-24 Hour Storm Runoff, CF=	30,070
Volume Needed, Cubic Feet=	36,665
Design Volume, Cubic Feet=	10,165
Is Tank Covered?	NO
Tank Dimensions?	Rectangular

MONTHLY INFLOWS INTO TANK

Month	Number of days	Rain-Evap on Tank CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Solids CF	Waste to Store CF	Waste to Store Gallons
October	31	-848	0	1,455	1,492	108	2,207	16,506
November	30	192	0	226	1,444	416	2,278	17,039
December	31	475	0	171	1,492	717	2,855	21,354
January	31	411	0	162	1,492	717	2,782	20,809
February	28	-75	0	107	1,348	647	2,028	15,167
March	31	-603	0	119	1,492	717	1,725	12,903
April	30	-1,440	0	1,461	1,444	104	1,569	11,738
May	31	-2,144	0	3,080	1,492	108	2,535	18,965
June	30	-2,939	0	1,464	1,444	104	73	545
July	31	-4,528	0	43	1,492	108	-2,885	-21,582
August	31	-3,995	0	45	1,492	108	-2,350	-17,579
September	30	-2,315	0	1,764	1,444	104	998	7,463
Annual	365	-17,808	0	10,098	17,567	3,956	13,813	103,327



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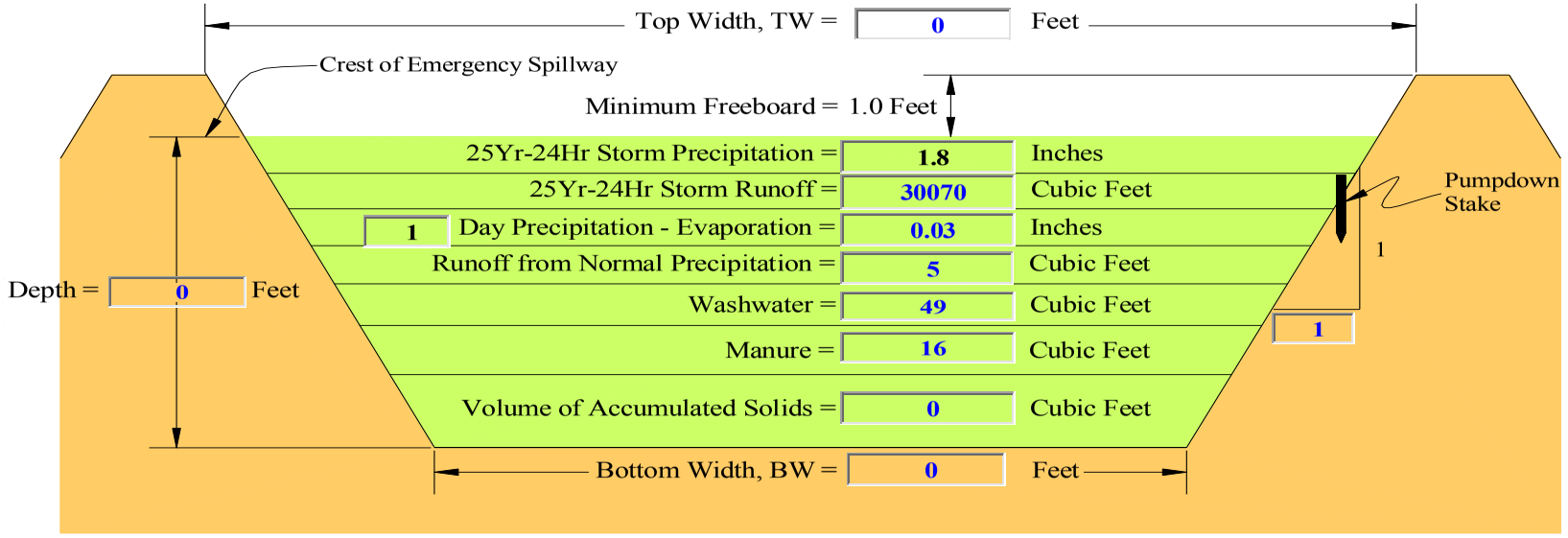
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

WASTE STORAGE POND | **MONTHLY INFLOWS INTO WASTE STORAGE POND**

Pond Parameters	Value	Month	Number of Days	Rain-Evap on Pond CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Solids CF	Waste to Store CF	Waste to Store Gallons
Storage Period, Days=	1	October	31	0	0	1,455	1,492	108	3,054	22,849
Side Slope (X:1)=	1.00	November	30	0	0	226	1,444	416	2,086	15,602
Bottom Width, BW, Feet=	0	December	31	0	0	171	1,492	717	2,380	17,804
Bottom Length, BL, Feet=	0	January	31	0	0	162	1,492	717	2,371	17,737
Accumulated Solids Duration, Years=	0	February	28	0	0	107	1,348	647	2,102	15,725
Existing Storage, Acre Feet=	1.00	March	31	0	0	119	1,492	717	2,327	17,411
Surface Area of Existing Storage, SF=	1	April	30	0	0	1,461	1,444	104	3,009	22,508
Minimum Soil Liner Depth, Feet=	1.00	May	31	0	0	3,080	1,492	108	4,679	35,001
25 Year-24 Hour Storm Runoff, CF=	30,070	June	30	0	0	1,464	1,444	104	3,011	22,524
Top Width, TW, Feet=	0	July	31	0	-1	43	1,492	108	1,642	12,284
Top Length, TL, Feet=	0	August	31	0	-1	45	1,492	108	1,644	12,298
Volume Needed, Acre Feet=	0.7	September	30	0	0	1,764	1,444	104	3,312	24,775
Design Volume, Acre Feet=	0.0	Annual	365	0	-3	10,098	17,567	3,956	31,618	236,520



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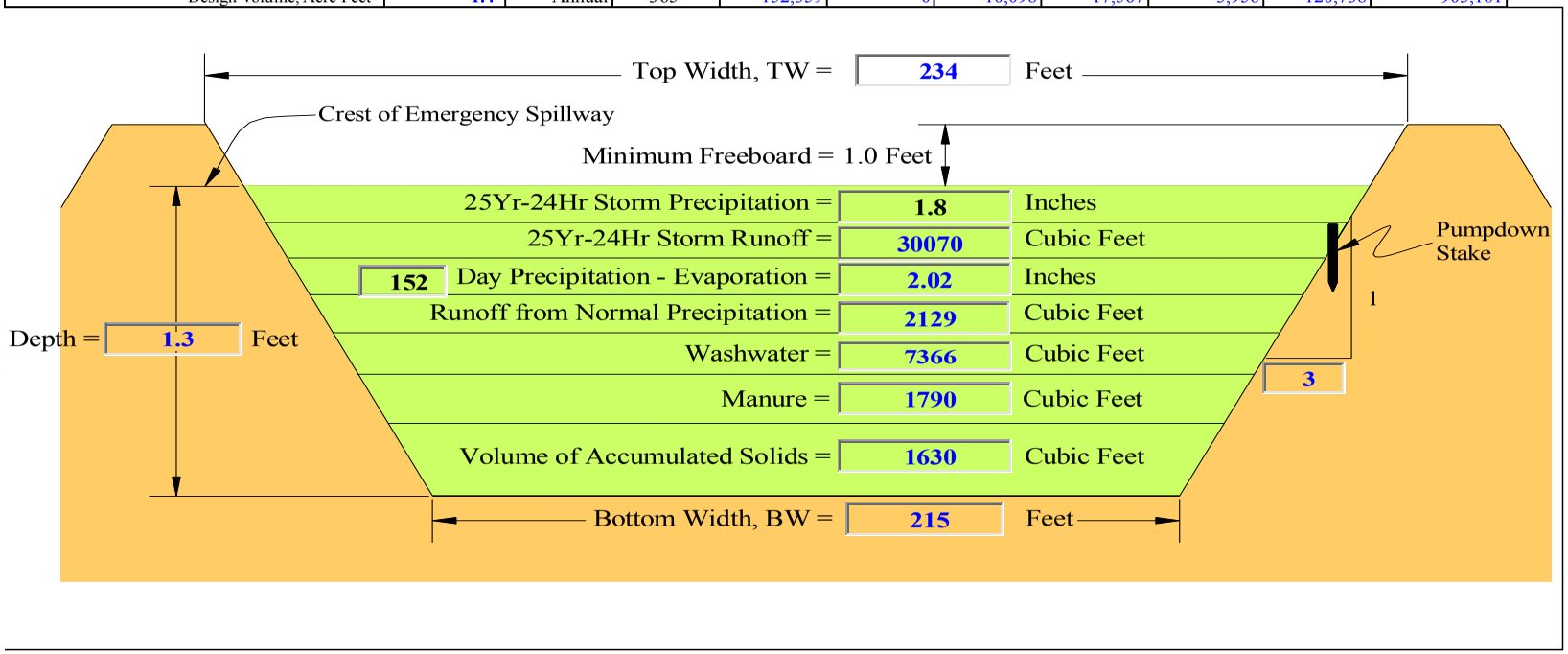
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

EVAPORATION POND

Evaporation Pond Parameters	Value
Storage Period, Days=	152
Side Slope (X:1)=	3.00
Bottom Width, BW, Feet=	215
Bottom Length, BL, Feet=	215
Accumulated Solids Duration, Years=	1
Existing Storage, Acre Feet=	0.00
Surface Area of Existing Storage, SF=	0
Minimum Soil Liner Depth, Feet=	1.00
25 Year-24 Hour Storm Runoff, CF=	30,070
Top Width, TW, Feet=	234
Top Length, TL, Feet=	234
Volume Needed, Acre Feet=	1.4
Design Volume, Acre Feet=	1.4

MONTHLY INFLOWS INTO EVAPORATION POND

Month	Number of Days	Rain-Evap on Pond CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Solids CF	Waste to Store CF	Waste to Store Gallons
October	31	-7,255	0	1,455	1,492	108	-4,201	-31,423
November	30	1,643	0	226	1,444	416	3,728	27,890
December	31	4,061	0	171	1,492	717	6,441	48,182
January	31	3,514	0	162	1,492	717	5,885	44,019
February	28	-639	0	107	1,348	647	1,463	10,947
March	31	-5,156	0	119	1,492	717	-2,829	-21,159
April	30	-12,320	0	1,461	1,444	104	-9,311	-69,651
May	31	-18,343	0	3,080	1,492	108	-13,664	-102,214
June	30	-25,142	0	1,464	1,444	104	-22,131	-165,549
July	31	-38,740	0	43	1,492	108	-37,097	-277,505
August	31	-34,177	0	45	1,492	108	-32,532	-243,358
September	30	-19,803	0	1,764	1,444	104	-16,491	-123,362
Annual	365	-152,359	0	10,098	17,567	3,956	-120,738	-903,181



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ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation / Type of Storage Facility	Pounds of Nutrients Available N	Pounds of Nutrients Available P_2O_5	Pounds of Nutrients Available K_2O	Percent Nutrients Retained After Storage N	Percent Nutrients Retained After Storage P_2O_5	Percent Nutrients Retained After Storage K_2O	Pounds of Nutrients Retained After Storage N	Pounds of Nutrients Retained After Storage P_2O_5	Pounds of Nutrients Retained After Storage K_2O
	Dairy									
Liquids	Storage Pond (>50%) Dilution	1,113	430	614	37%	85%	85%	412	365	522
Solids	Solids Storage Facility (Unroofed)	9,928	3,593	4,850	65%	80%	80%	6,453	2,875	3,880
Grazing	NONE	9,281	3,526	4,990	100%	100%	100%	9,281	3,526	4,990

NUTRIENTS AVAILABLE AFTER APPLICATION

Nutrient Source	Type of Application System	Pounds of Nutrients Available N	Pounds of Nutrients Available P_2O_5	Pounds of Nutrients Available K_2O	Percent Nutrients Retained After Application N	Percent Nutrients Retained After Application P_2O_5	Percent Nutrients Retained After Application K_2O	Pounds of Nutrients Retained After Application N	Pounds of Nutrients Retained After Application P_2O_5	Pounds of Nutrients Retained After Application K_2O
Liquids	Sprinkling	412	365	522	75%	100%	100%	309	365	522
Solids	Broadcast (Incorporated 7 or more days after application)	6,453	2,875	3,880	70%	100%	100%	4,517	2,875	3,880
Grazing	Grazing	9,281	3,526	4,990	85%	100%	100%	7,889	3,526	4,990

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location / Soil Drainage Class	Pounds of Nutrients Available N	Pounds of Nutrients Available P_2O_5	Pounds of Nutrients Available K_2O	Percent Nutrients Retained After Denitrification N	Percent Nutrients Retained After Denitrification P_2O_5	Percent Nutrients Retained After Denitrification K_2O	Pounds of Nutrients Retained After Denitrification N	Pounds of Nutrients Retained After Denitrification P_2O_5	Pounds of Nutrients Retained After Denitrification K_2O
	East of Cascade Mountains / East of Cascade Mountains									
Liquids	Moderately Well Drained	309	365	522	91%	100%	100%	281	365	522
Solids	Moderately Well Drained	4,517	2,875	3,880	91%	100%	100%	4,111	2,875	3,880
Grazing	Moderately Well Drained	7,889	3,526	4,990	91%	100%	100%	7,179	3,526	4,990
							TOTAL-	***11,571***	***6,766***	***9,392***

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ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

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

Field Number	Acres	Crop	LIQUIDS			SOLIDS			GRAZING		
			Percent to be Applied	Pounds of Nutrients to be Applied	Acres Needed for Utilization of Nutrients	Percent to be Applied	Pounds of Nutrients to be Applied	Acres Needed for Utilization of Nutrients	Percent to be Applied	Pounds of Nutrients to be Applied	Acres Needed for Utilization of Nutrients
1	28.0	Perennial Hay/Pasture(Med-High Intensity)	100%	281	1	35%	1,439	4	100%	7,179	22
Off Farm			0%	0		65%	2,672		0%	0	
TOTALS-	**28**		**100%**	**281**	**1**	**100%**	**4,111**	**4**	**100%**	**7,179**	**22**

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			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	28.0	Perennial Hay/Pasture(Med-High Intensity)	318	175	245	320	101	266	-3	74	-21
Off Farm											