

SOIL AND MANURE SAMPLING INSTRUCTIONS FOR ANIMAL WASTE MANAGEMENT SYSTEMS

SOIL SAMPLES

Job Sheet 5

Spring Soil Samples

- Spring soil samples are to be collected the last 2 weeks of March or the first 2 weeks in 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 6 to 9 inches and add to bucket.
- Mix the samples in the bucket and remove about 1 cup from the mixture and place into a sample bag.
- The bag should be labeled with ;
 - farm or operator name
 - sample date
 - field and tract (see NRCS plan map)
 - sample depth (0 to 9 inches)
 - soil type if determined
- Keep soil sample cool (small cooler with some ice) in the field 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 (see shipping instructions below).

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 ship as outlined in the spring soil sample section above.

MANURE SAMPLES

Liquid Manure Samples

- Liquid manure samples should be sampled after agitating the storage facility for the first application made in the spring (March-April) and for the last application in the fall (September-October).
- Put a bucket in the path of the gun or carefully take bucket sample of liquid manure from the liquid manure tank wagon .
- Fill a sample bottle with some of the liquid manure from the bucket and keep cool while in the field. (you can put the sample in a small cooler with some ice)
- Label the sample with the farm or operator name, date, and liquid manure sample.
- Freeze the sample until ready to ship to the lab.

MANURE SAMPLES

Solid Manure Samples

- Solid manure samples should be sampled during the first application made in the spring(March-April).
- Lay a piece of tarp or plastic on the pasture and make a pass over or next to it to obtain a representative sample from the spreader.
- Scoop up enough material to fill the sample bag about half full.
- Label the sample with the farm or operator name, date, and solid manure sample.
- Keep the sample cool while in the field. (You can put the sample in a small cooler with some ice.)
- Freeze the sample until ready to ship to the lab.

SHIPPING INSTRUCTIONS

- Nitrogen is heat sensitive. Keeping the samples cool in shipping helps to improve reliability of data.
- Ship frozen soil samples in small cooler.
- If shipping refrigerated soil samples, it is recommended that these be shipped in a small cooler with ice.
- Ship frozen liquid or solid manure samples in a small cooler.
- Ship frozen soil samples or refrigerated soil samples with frozen liquid and/or solid samples in a small cooler. Lab should send cooler back to you if request them to do so.
- Ship any or all samples on Monday, Tuesday, or Wednesday using any parcel post service.
- Include a note with the samples for the analysis needed.

Soils Analysis Needed;

pH
P---Phosphorus (Weak Bray)
K---Potassium
NH₄-N---Ammonium
NO₃-N---Nitrate

Liquid and Solid Manure Analysis Needed;

Total Nitrogen, Phosphorus, & Potassium plus Ammonium and Solids

Bart Mizee

2005 Site Map

***Map Not to Scale**



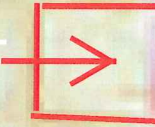
TillaBay Farms Inc. Tract 101 Farmstead Map

R 9W



50' x 60' x 10'

Below Ground Liquid Waste Storage Tank



40' x 102' x 6'
Solid Manure Storage
Facility

Free Stall
Barn

Farm Lane

Silage Bags

Long Prairie Road

Sec. 4

T 2 S

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT
Traveling Big Gun Sprinkler Calibration (Using Catch Cans)

Name: Tillabay Farms Inc. Date: 08/2012

Operator: Bart Mizee Spreader ID: _____

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.

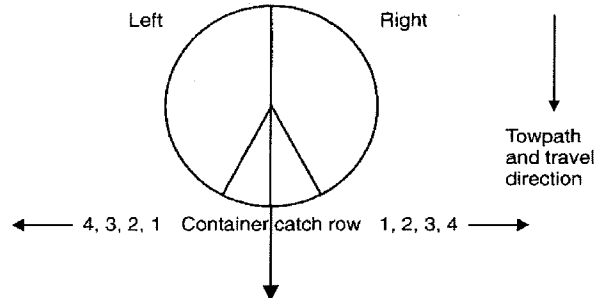
Catch Can Calibration:

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
1.							
2.							
3.							
4.							
5.							
6.							
Average							

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT
Spreader Equipment Calibrations (Using Bucket, Pan or Tarp)

Name: TillaBay Farms Inc. Date 08/12

Operator: Bart Mizze Spreader ID: _____

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	F
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:						

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT
Tank Equipment Calibration (Using a Full Tank Load)

Name: TillaBay Farms Inc. Date: 08/12

Operator Bart Mizze Spreader ID:

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	F
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 =						
10. Average Application Rate (gallons per acre) – Sum of values in cells A10 through F10 divided by the total number of calibrations completed =						

Additional Notes:

Land Use Summary

Name: TillaBay Farms, Inc

Date: 01-2013

<u>Tract</u>	<u>Field</u>	<u>Land Use</u>	<u>Acres</u>
102	1	Pasture (Irrigated)	8.3
	2	Pasture (Irrigated)	8.2
	3	Pasture (Irrigated)	6.4
	4	Pasture (Irrigated)	9.9
	5	Pasture (Irrigated)	12.5
	6	Pasture (Irrigated)	11.3
	7	Pasture (Irrigated)	11.6
	8	Pasture (Irrigated)	7.5
	9	Pasture (Irrigated)	8.6
	10	Pasture (Irrigated)	16.0
	11	Wildlife	8.3
	12	Wildlife	4.8
	F	Farmstead	3.3
	H	House	0.7
Subtotal			117.4
Total			117.4

Summary

Pasture	100.3
Wildlife	13.1
Farmstead	4.0
Total	117.4

Customer(s): **TillaBay Farms Inc.**

District: Tillamook County SWCD

Approximate Acres: **117.4**

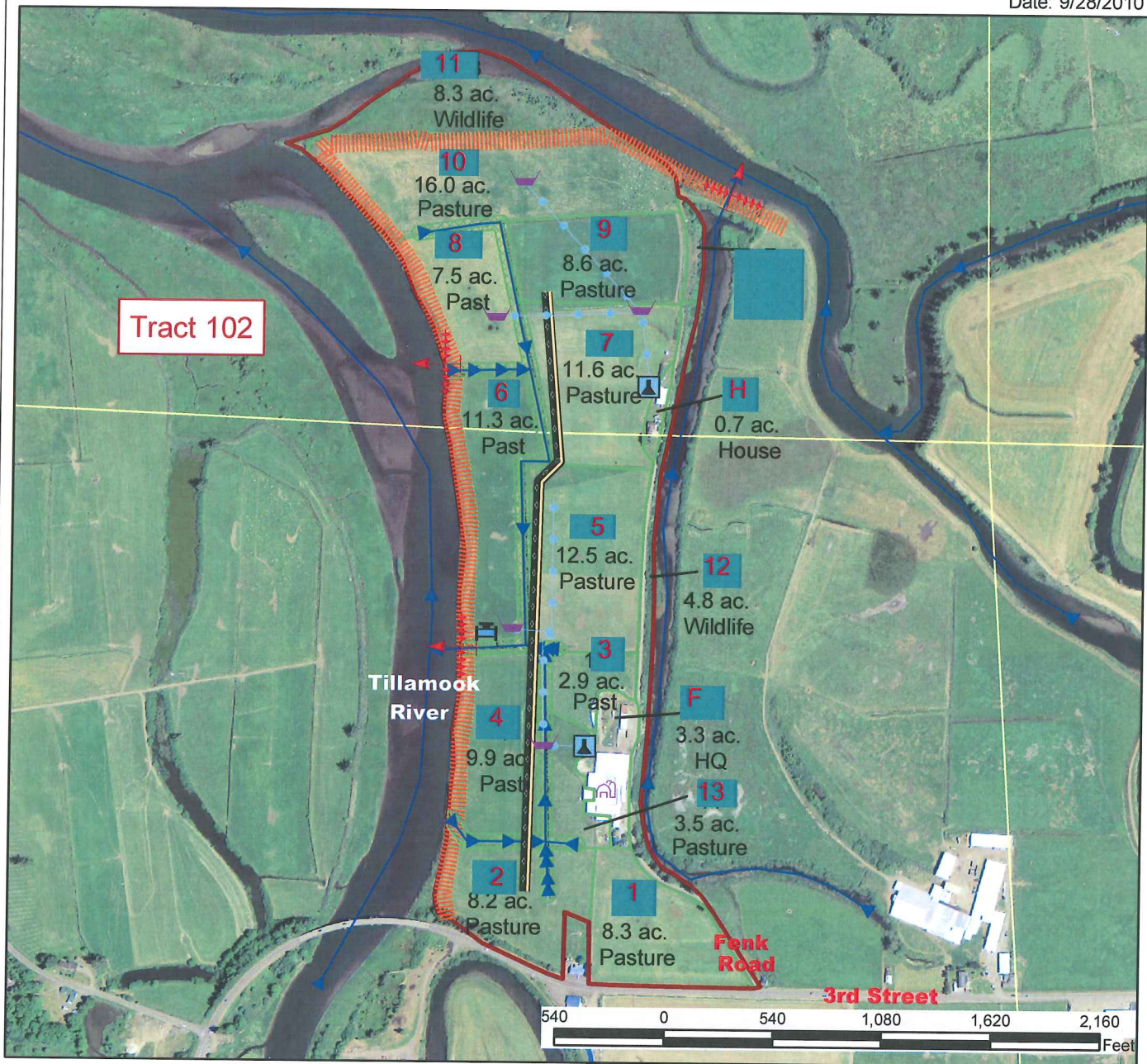
Field Office: TILLAMOOK SERVICE CENTER

Tillamook County SWCD

TILLAMOOK COUNTY, OREGON

Conservation Plan Map

Date: 9/28/2010



Legend

- Trough
- farmstead
- Well
- Pumping Plant

Tide Gate

- 1
- 2
- 3

- Buried Manure Mainline
- land_unit
- Public Land Survey
- Tract Boundary
- Dike
- Water Line
- Filter Strip
- Open Water Course



Land Use Summary

Name: TillaBay Farms Inc.

Date: 01-2013

TR011

<u>Tract</u>	<u>Field</u>	<u>Land Use</u>	<u>Acres</u>
101	1	Pasture (Irrigated)	7.8
	2	Pasture (Irrigated)	18.7
	3	Pasture (Irrigated)	6.9
	4	Crop (Out)	2.5
	5	Hay	7.2
	F	Farmstead	1.9
		Total	45.0
	<u>Summary</u>		
	Pasture	33.4	
	Crop (Nursery)	2.5	
	Hay	7.2	
	Farmstead	1.9	
	Total	45.0	

N TILLABAY FARMS INC. CONSERVATION PLAN MAP



T
R 9S
Sec. 4



River

Trask

Mill Creek

T-101

Long Prairie Road

Port of Tillamook

Map Legend

Farm Boundary

Field Boundary

Farmstead

Field No.

Field Acres

F

2

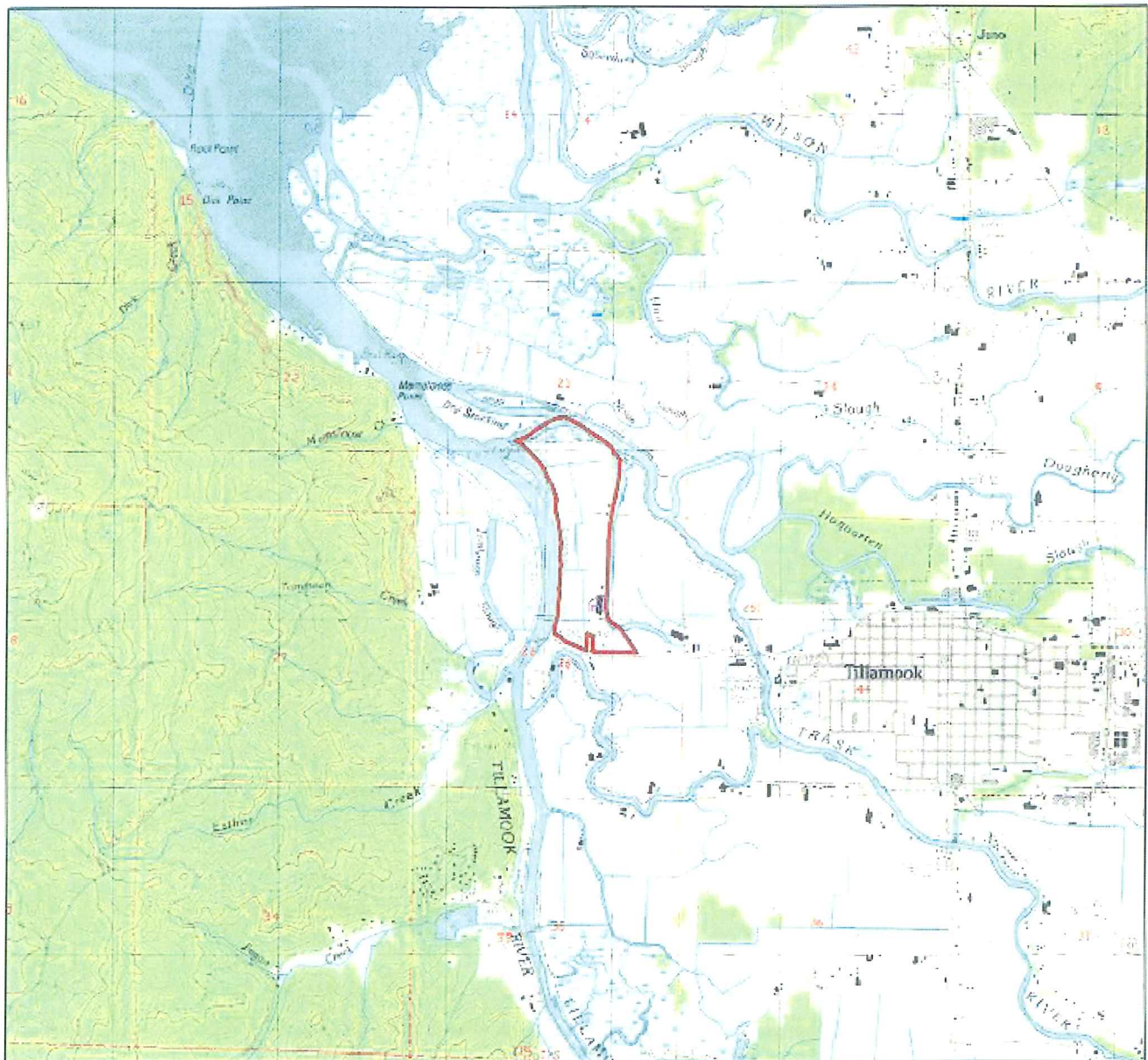
18.7 ac

TILLABAY FARMS, INC.
BART MIZEE
T1015

TILLAMOOK SERVICE CENTER
Tillamook County SWCD
TILLAMOOK COUNTY, OREGON

Tillamook County SWCD
Approximate Acres: 118.4
Date: 8/5/2005

7.5 Min. Topo Map



2,000 0 2,000 4,000 6,000 8,000
Feet

Legend

 Tract Boundary



Farmstead Lat/Long (NAD83)
45 27' 32.8" N; 123 52' 19.3" W



TillaBay Farms Inc.

TR011

TILLAMOOK SERVICE CENTER

Tillamook County SWCD

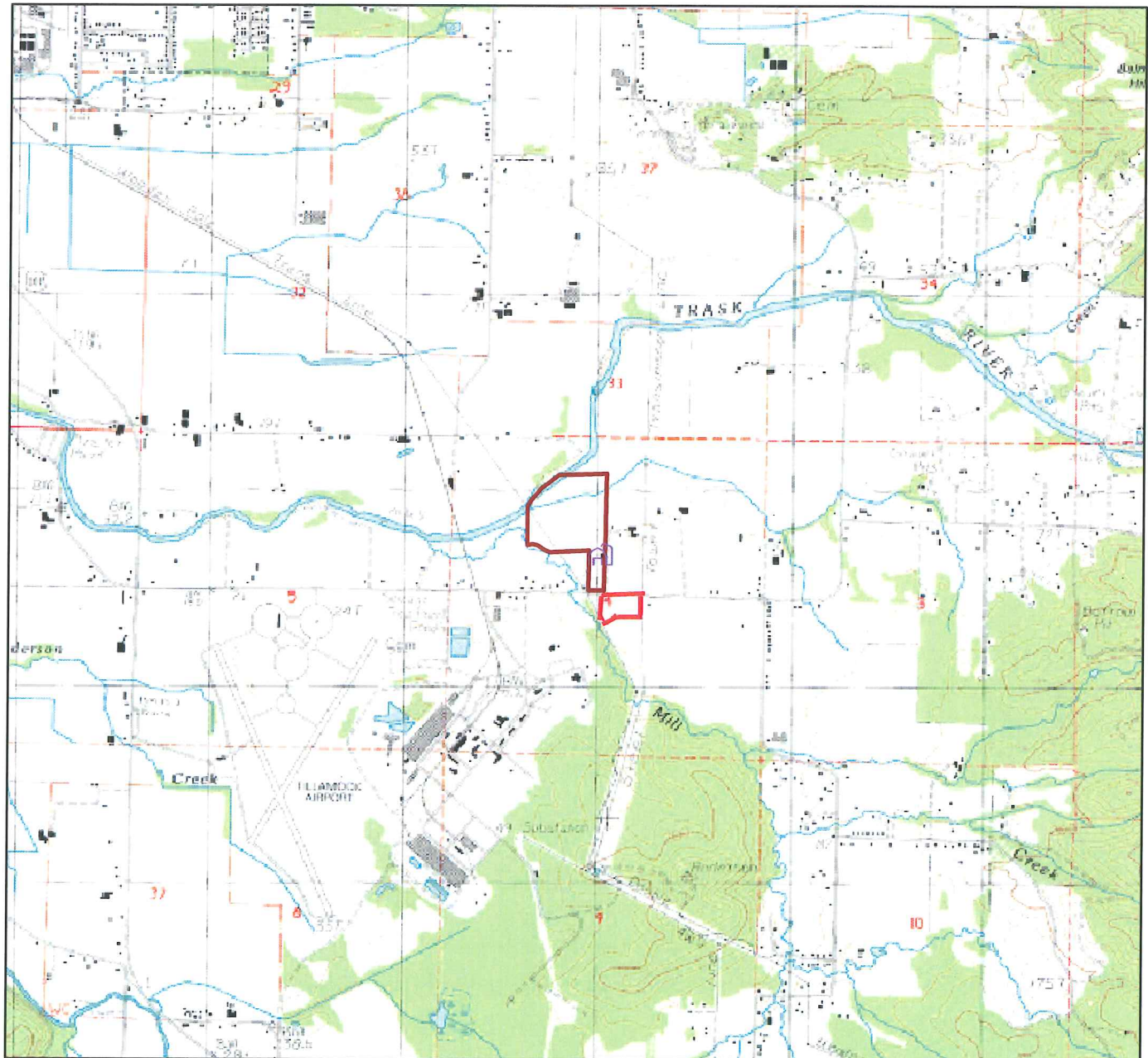
TILLAMOOK COUNTY, OREGON

Tillamook County SWCD

Approximate Acres: 39.8

Date: 4/28/2008

7.5 Min. Topo Map



1,500 0 1,500 3,000 4,500 6,000 Feet

Legend

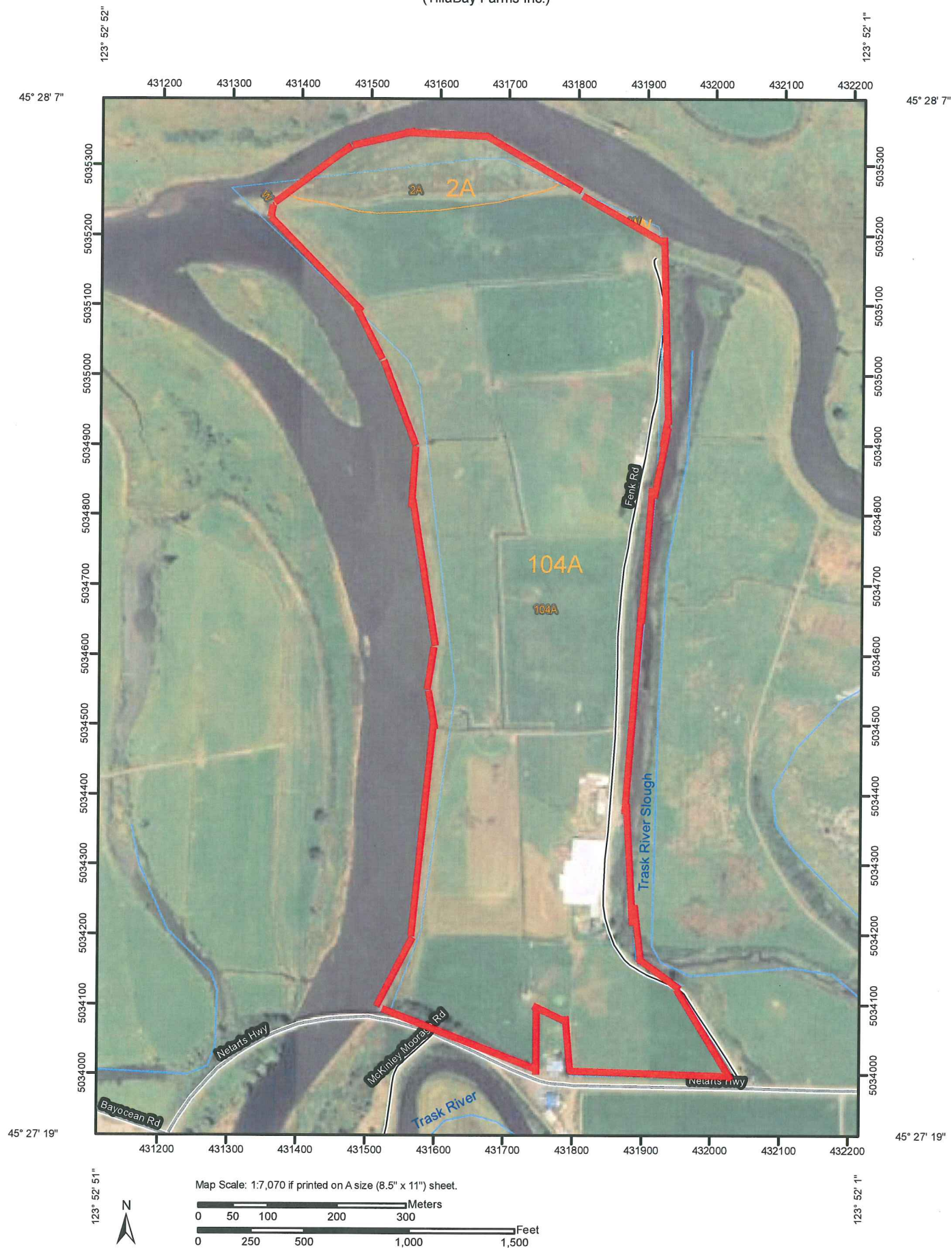
 Tract Boundaries



Farmstead Lat/Long (NAD83)
45 25' 44.8" N; 123 47' 36.2" W



Soil Map—Tillamook County, Oregon
(TillaBay Farms Inc.)



MAP LEGEND

Area of Interest (AOI)		Very Stony Spot	
	Area of Interest (AOI)		
Soils			Wet Spot
	Soil Map Units		Other
Special Point Features		Special Line Features	
	Blowout		Gully
	Borrow Pit		Short Steep Slope
	Clay Spot		Other
	Closed Depression	Political Features	
	Gravel Pit		Cities
	Gravelly Spot	Water Features	
	Landfill		Streams and Canals
	Lava Flow	Transportation	
	Marsh or swamp		Rails
	Mine or Quarry		Interstate Highways
	Miscellaneous Water		US Routes
	Perennial Water		Major Roads
	Rock Outcrop		Local Roads
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		
	Spoil Area		
	Stony Spot		

MAP INFORMATION

Map Scale: 1:7,070 if printed on A size (8.5" x 11") sheet.
The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Tillamook County, Oregon
Survey Area Data: Version 3, Feb 8, 2010

Date(s) aerial images were photographed: 7/17/2005; 7/19/2005

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

Tillamook County, Oregon (OR057)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2A	Fluvaquents-Histosols complex, 0 to 1 percent slopes	4.9	4.5%
104A	Coquille-Brenner-Nehalem association, 0 to 3 percent slopes, protected	103.5	94.4%
W	Water	1.2	1.1%
Totals for Area of Interest		109.6	100.0%

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)

Tillamook County, Oregon

Map Unit: 2A—Fluvaquents-Histosols complex, 0 to 1 percent slopes

Component: Fluvaquents (60%)

The Fluvaquents component makes up 60 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes, lowlands. The parent material consists of estuarine deposits. Depth to a root restrictive layer, strongly contrasting textural stratification, is 30 to 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is very frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Component: Histosols (35%)

The Histosols component makes up 35 percent of the map unit. Slopes are 0 to 1 percent. This component is on tidal marshes, lowlands. The parent material consists of organic material over estuarine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very 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 very frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 90 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Component: Tidal flats (2%)

Generated brief soil descriptions are created for major components. The Tidal flats soil is a minor component.

Component: Humaquepts (1%)

Generated brief soil descriptions are created for major components. The Humaquepts soil is a minor component.

Map Unit: 104A—Coquille-Brenner-Nehalem association, 0 to 3 percent slopes, protected

Component: Coquille, protected (50%)

The Coquille, protected component makes up 50 percent of the map unit. Slopes are 0 to 1 percent. This component is on estuaries, lowlands. The parent material consists of estuarine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is rarely flooded. It is frequently ponded. A seasonal zone of water saturation is at 14 inches during January, February, December. Organic matter content in the surface horizon is about 7 percent. Nonirrigated land capability classification is 4w. Irrigated land capability classification is 4w. This soil meets hydric criteria.

Component: Brenner, protected (30%)

The Brenner, protected component makes up 30 percent of the map unit. Slopes are 0 to 1 percent. This component is on lowlands, flood plains. The parent material consists of alluvium derived from igneous and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is rarely flooded. It is frequently ponded. A seasonal zone of water saturation is at 14 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 3w. Irrigated land capability classification is 3w. This soil meets hydric criteria.

Component: Nehalem, protected (15%)

The Nehalem, protected component makes up 15 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, lowlands. The parent material consists of alluvium derived from igneous and sedimentary rock. 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 high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 2w. Irrigated land capability classification is 2w. This soil does not meet hydric criteria.

Map Unit: W—Water

Component: Water (100%)

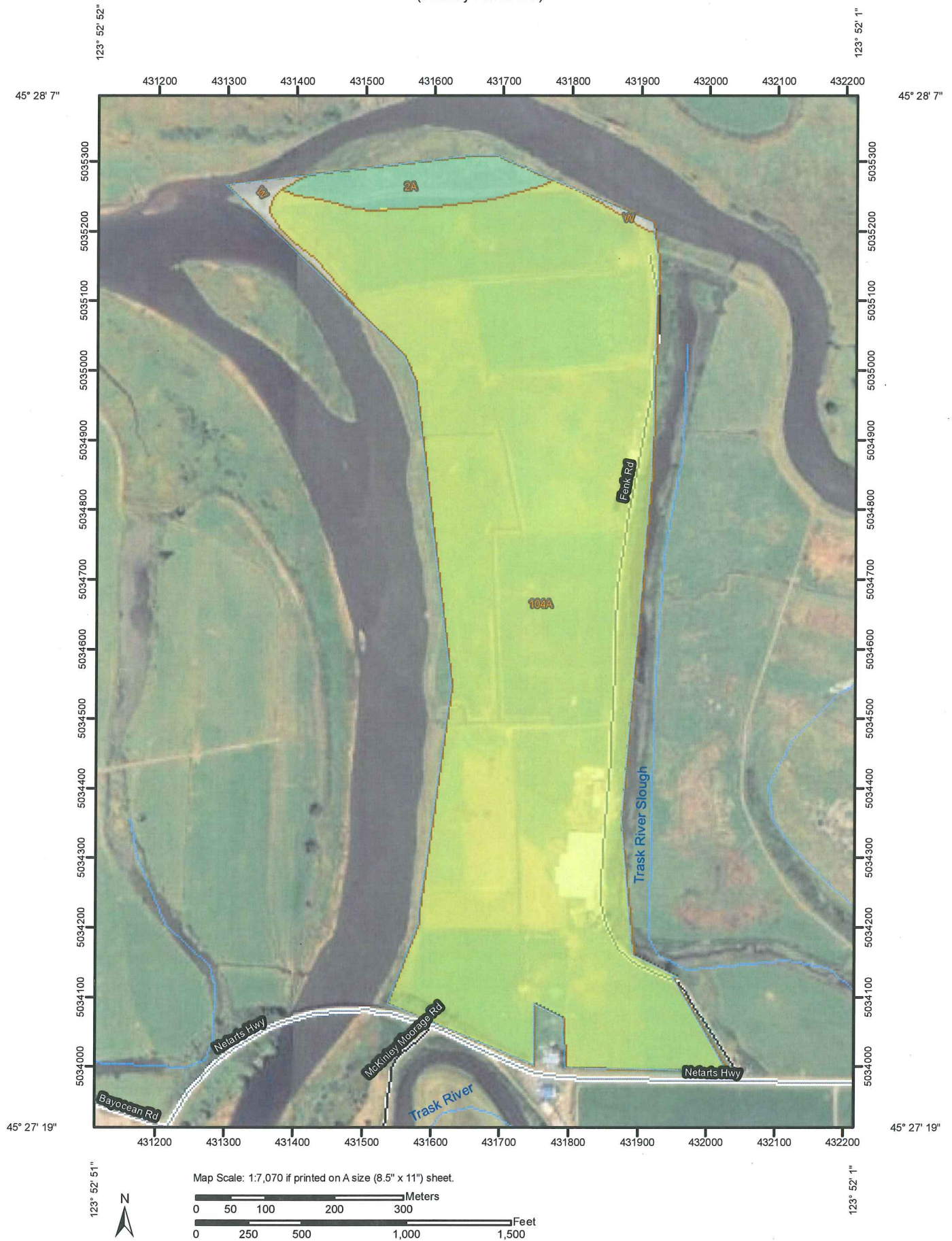
Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Data Source Information

Soil Survey Area: Tillamook County, Oregon

Survey Area Data: Version 3, Feb 8, 2010

Nonirrigated Capability Class—Tillamook County, Oregon
(TillaBay Farms Inc.)



MAP LEGEND

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

Soils

Soil Map Units

Soil Ratings

Capability Class - I

Capability Class - II

Capability Class - III

Capability Class - IV

Capability Class - V

Capability Class - VI

Capability Class - VII

Capability Class - VIII

Not rated or not available

Political Features

Cities

Water Features

Streams and Canals

Transportation

+++

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:7,070 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Tillamook County, Oregon
Survey Area Data: Version 3, Feb 8, 2010

Date(s) aerial images were photographed: 7/17/2005; 7/19/2005

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.

Nonirrigated Capability Class

Nonirrigated Capability Class— Summary by Map Unit — Tillamook County, Oregon (OR057)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2A	Fluvaquents-Histosols complex, 0 to 1 percent slopes	5	4.9	4.5%
104A	Coquille-Brenner-Nehalem association, 0 to 3 percent slopes, protected	4	103.5	94.4%
W	Water		1.2	1.1%
Totals for Area of Interest			109.6	100.0%

Description

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels-capability class, subclass, and unit. Only class and subclass are included in this data set.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

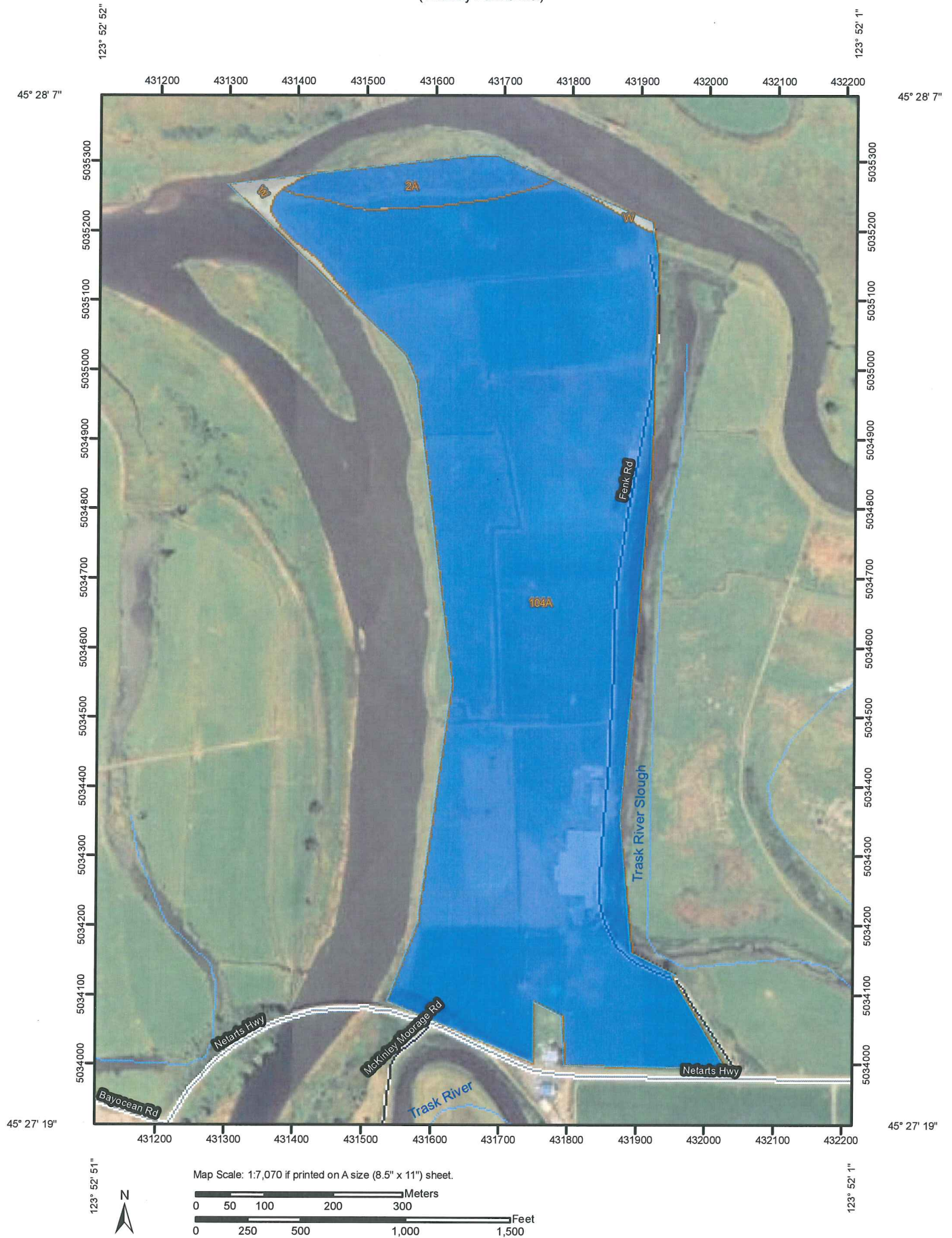
Rating Options

Aggregation Method: Dominant Condition

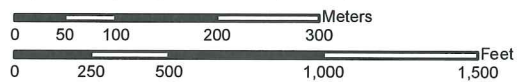
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

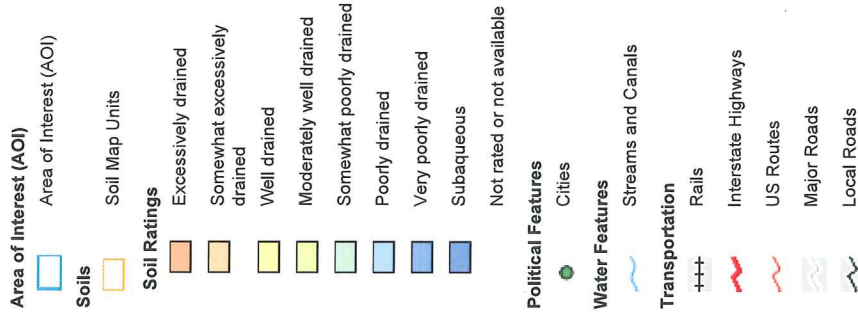
Drainage Class—Tillamook County, Oregon
(TillaBay Farms Inc.)



Map Scale: 1:7,070 if printed on A size (8.5" x 11") sheet.



MAP LEGEND



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Drainage Class

Drainage Class— Summary by Map Unit — Tillamook County, Oregon (OR057)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2A	Fluvaquents-Histosols complex, 0 to 1 percent slopes	Very poorly drained	4.9	4.5%
104A	Coquille-Brenner-Nehalem association, 0 to 3 percent slopes, protected	Very poorly drained	103.5	94.4%
W	Water		1.2	1.1%
Totals for Area of Interest			109.6	100.0%

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

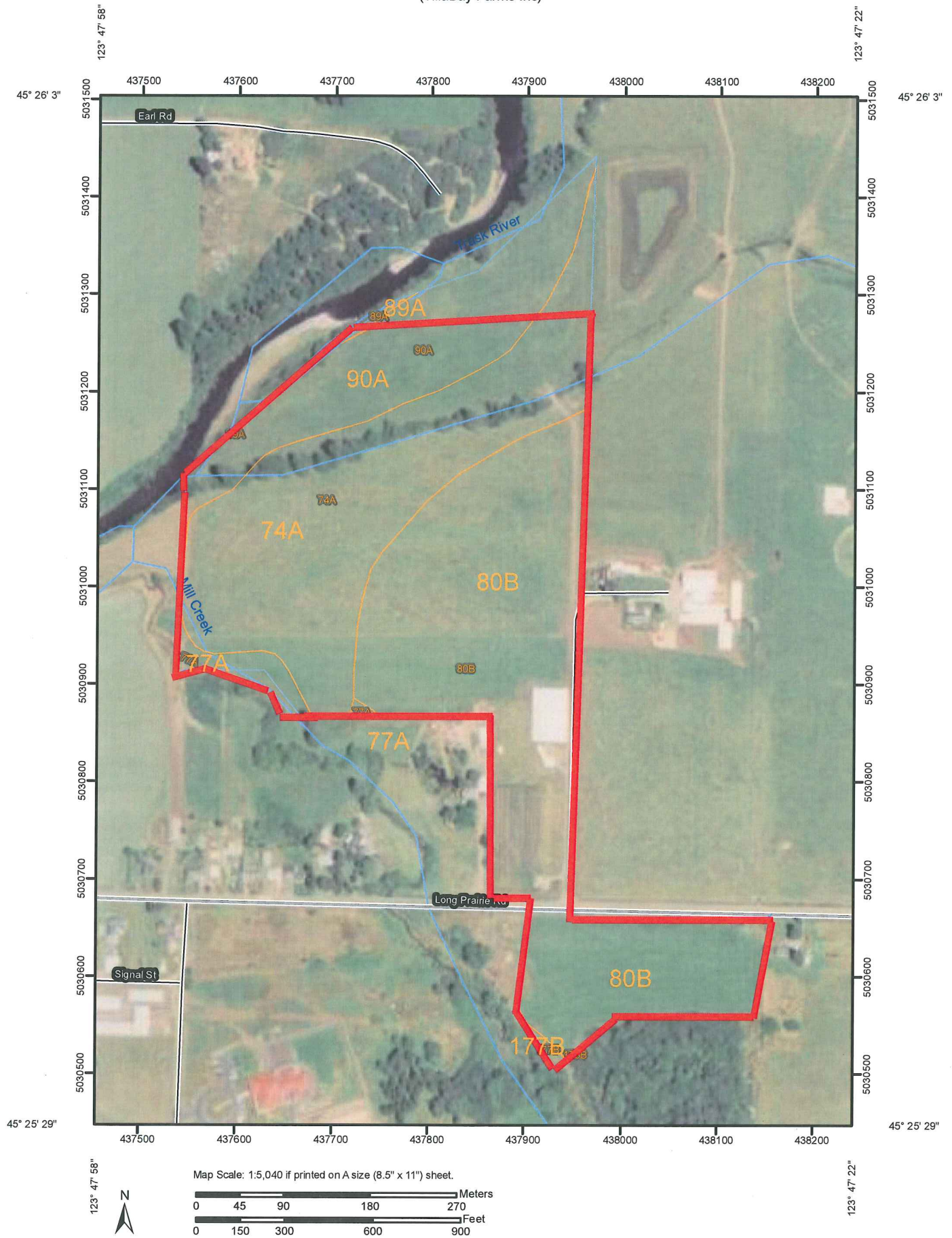
Rating Options

Aggregation Method: Dominant Condition

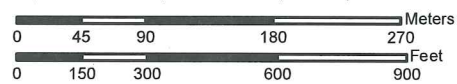
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Map—Tillamook County, Oregon
(TillaBay Farms Inc)



Map Scale: 1:5,040 if printed on A size (8.5" x 11") sheet.



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 or swamp
		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		Cities
Water Features		Streams and Canals
Transportation		Rails
		Interstate Highways
		US Routes
		Major Roads
		Local Roads

MAP INFORMATION

Map Scale: 1:5,040 if printed on A size (8.5" x 11") sheet.
The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Tillamook County, Oregon
Survey Area Data: Version 3, Feb 8, 2010

Date(s) aerial images were photographed: 7/19/2005

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

Tillamook County, Oregon (OR057)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
74A	Nehalem silt loam, 0 to 3 percent slopes	17.2	33.0%
77A	Nestucca-Brenner silt loams, 0 to 3 percent slopes	0.9	1.7%
80B	Quillamook medial silt loam, 0 to 7 percent slopes	25.0	48.1%
89A	Udifluvents-Riverwash-Water complex, 0 to 3 percent slopes	0.1	0.3%
90A	Yachats very fine sandy loam, 0 to 3 percent slopes	8.7	16.7%
173B	Tillamook-Ginger medial silt loams, 0 to 7 percent slopes	0.0	0.0%
177B	Dystrudepts-Aquepts complex, 0 to 7 percent slopes	0.1	0.2%
Totals for Area of Interest		52.0	100.0%

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)

Tillamook County, Oregon

Map Unit: 74A—Nehalem silt loam, 0 to 3 percent slopes

Component: Nehalem (80%)

The Nehalem component makes up 80 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. 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 high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 2w. Irrigated land capability classification is 2w. This soil does not meet hydric criteria.

Component: Brenner (3%)

Generated brief soil descriptions are created for major components. The Brenner soil is a minor component.

Map Unit: 77A—Nestucca-Brenner silt loams, 0 to 3 percent slopes

Component: Nestucca (55%)

The Nestucca component makes up 55 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 14 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 3w. Irrigated land capability classification is 3w. This soil does not meet hydric criteria.

Component: Brenner (40%)

The Brenner component makes up 40 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, November, December. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria.

Map Unit: 80B—Quillamook medial silt loam, 0 to 7 percent slopes

Component: Quillamook (80%)

The Quillamook component makes up 80 percent of the map unit. Slopes are 0 to 7 percent. This component is on stream terraces, river valleys. The parent material consists of silty 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 very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 17 percent. Nonirrigated land capability classification is 2e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Hebo (3%)

Generated brief soil descriptions are created for major components. The Hebo soil is a minor component.

Map Unit: 89A—Udifluvents-Riverwash-Water complex, 0 to 3 percent slopes**Component:** Udifluvents (40%)

The Udifluvents component makes up 40 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria.

Component: Riverwash (30%)

Generated brief soil descriptions are created for major soil components. The Riverwash is a miscellaneous area.

Component: Water (25%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Component: Fluvaquents (5%)

Generated brief soil descriptions are created for major components. The Fluvaquents soil is a minor component.

Map Unit: 90A—Yachats very fine sandy loam, 0 to 3 percent slopes**Component:** Yachats (85%)

The Yachats component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. 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 frequently flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 7 percent. Nonirrigated land capability classification is 3w. Irrigated land capability classification is 3w. This soil does not meet hydric criteria.

Component: Brenner (5%)

Generated brief soil descriptions are created for major components. The Brenner soil is a minor component.

Map Unit: 173B—Tillamook-Ginger medial silt loams, 0 to 7 percent slopes

Component: Tillamook (45%)

The Tillamook component makes up 45 percent of the map unit. Slopes are 0 to 7 percent. This component is on stream terraces, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well 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 moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 25 inches during January, February, March, December. Organic matter content in the surface horizon is about 17 percent. Nonirrigated land capability classification is 2e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Ginger (40%)

The Ginger component makes up 40 percent of the map unit. Slopes are 0 to 7 percent. This component is on stream terraces, river valleys. The parent material consists of alluvium derived from igneous and sedimentary rock. Depth to a root restrictive layer, strongly contrasting textural stratification, is 40 to 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is very high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 17 inches during January, February, December. Organic matter content in the surface horizon is about 15 percent. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Hebo (5%)

Generated brief soil descriptions are created for major components. The Hebo soil is a minor component.

Map Unit: 177B—Dystrudepts-Aquepts complex, 0 to 7 percent slopes

Component: Dystrudepts (65%)

The Dystrudepts component makes up 65 percent of the map unit. Slopes are 0 to 7 percent. This component is on stream terraces, river valleys. The parent material consists of alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 22 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 75 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Aquepts (30%)

The Aquepts component makes up 30 percent of the map unit. Slopes are 0 to 7 percent. This component is on flood plains, river valleys. The parent material consists of alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 8 percent. Nonirrigated land capability classification is 5e. This soil meets hydric criteria.

Component: Hebo (3%)

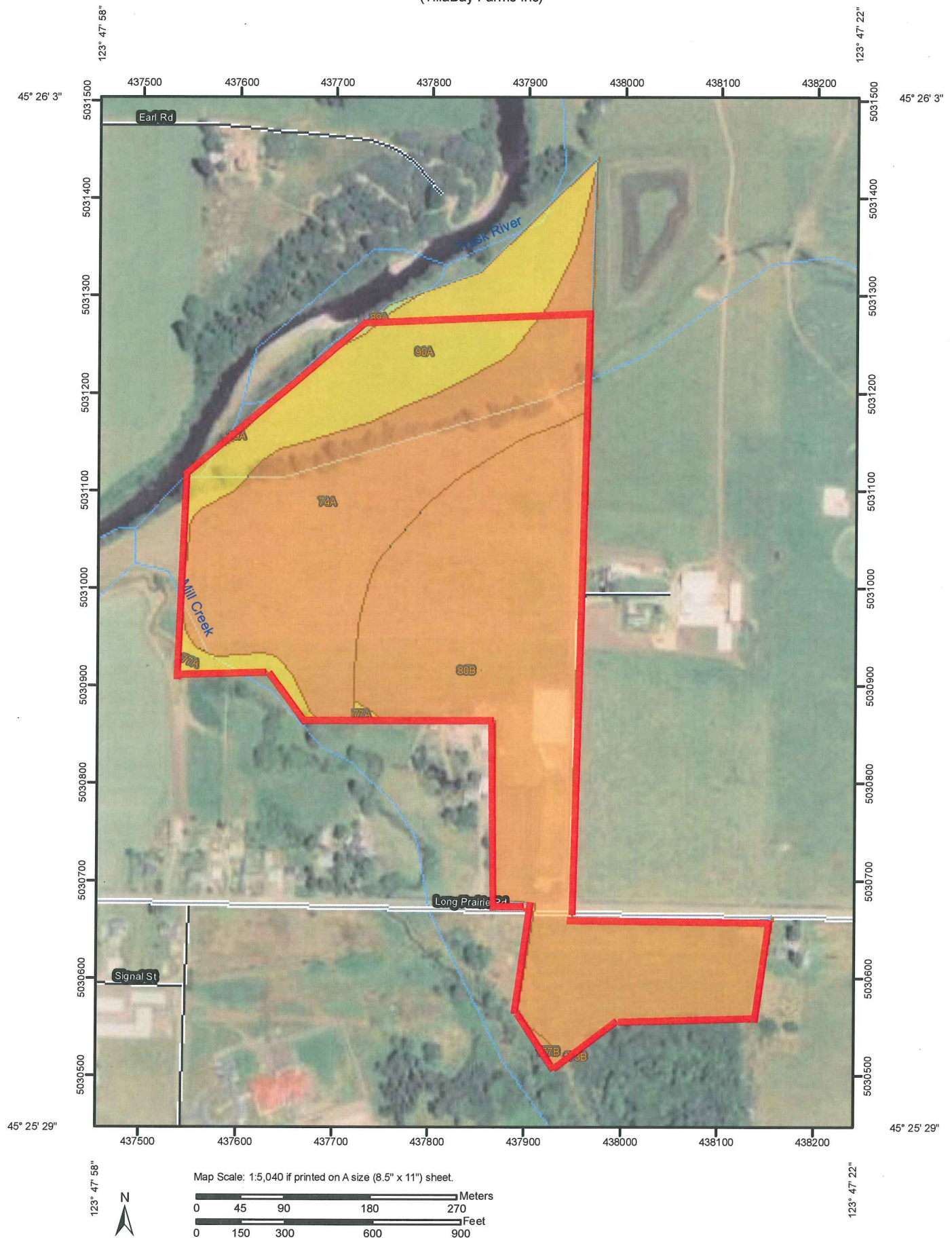
Generated brief soil descriptions are created for major components. The Hebo soil is a minor component.

Data Source Information

Soil Survey Area: Tillamook County, Oregon

Survey Area Data: Version 3, Feb 8, 2010

Nonirrigated Capability Class—Tillamook County, Oregon.
(TillaBay Farms Inc)



MAP LEGEND

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

Soils

Soil Map Units

Soil Ratings

- Capability Class - I
- Capability Class - II
- Capability Class - III
- Capability Class - IV
- Capability Class - V
- Capability Class - VI
- Capability Class - VII
- Capability Class - VIII

Not rated or not available

Political Features

Cities

Water Features

Streams and Canals

Transportation

- +++ Ralls
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:5,040 if printed on A size (8.5" x 11") sheet.
The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Tillamook County, Oregon
Survey Area Data: Version 3, Feb 8, 2010

Date(s) aerial images were photographed: 7/19/2005

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.

Nonirrigated Capability Class

Nonirrigated Capability Class— Summary by Map Unit — Tillamook County, Oregon (OR057)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
74A	Nehalem silt loam, 0 to 3 percent slopes	2	17.2	33.0%
77A	Nestucca-Brenner silt loams, 0 to 3 percent slopes	3	0.9	1.7%
80B	Quillamook medial silt loam, 0 to 7 percent slopes	2	25.0	48.1%
89A	Udifluvents-Riverwash-Water complex, 0 to 3 percent slopes	4	0.1	0.3%
90A	Yachats very fine sandy loam, 0 to 3 percent slopes	3	8.7	16.7%
173B	Tillamook-Ginger medial silt loams, 0 to 7 percent slopes	2	0.0	0.0%
177B	Dystrudepts-Aquepts complex, 0 to 7 percent slopes	2	0.1	0.2%
Totals for Area of Interest			52.0	100.0%

Description

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are included in this data set.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

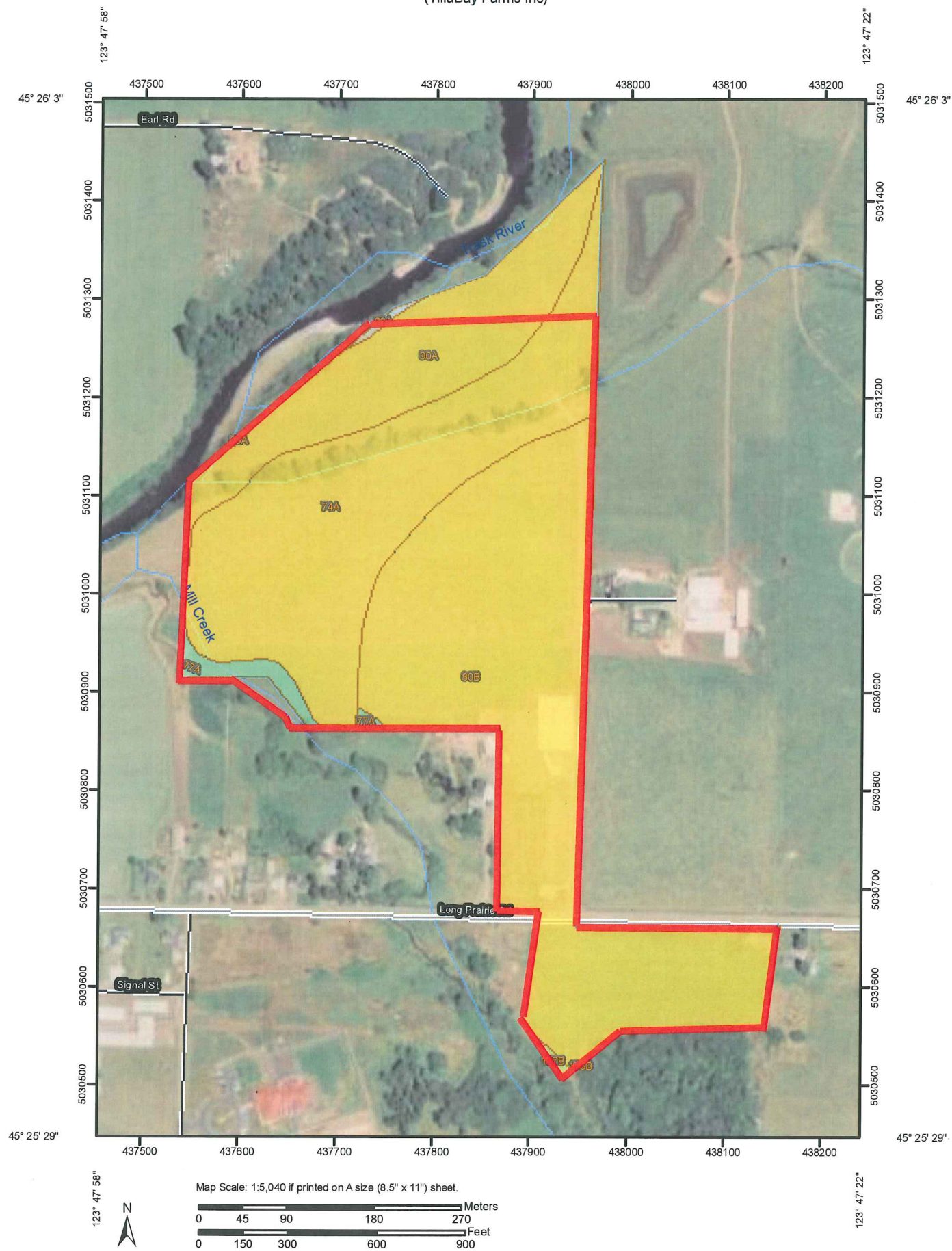
Rating Options

Aggregation Method: Dominant Condition

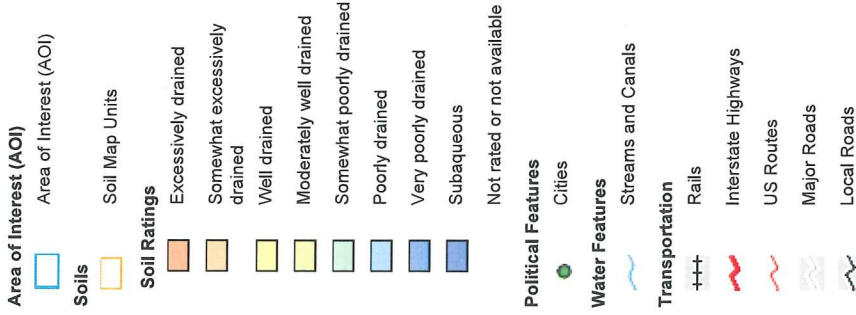
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Drainage Class—Tillamook County, Oregon
(TillaBay Farms Inc)



MAP LEGEND



MAP INFORMATION

Map Scale: 1:5,040 if printed on A size (8.5" x 11") sheet.
The soil surveys that comprise your AOI were mapped at 1:24,000.

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Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 10N NAD83

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

Soil Survey Area: Tillamook County, Oregon
Survey Area Data: Version 3, Feb 8, 2010

Date(s) aerial images were photographed: 7/19/2005

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.

Drainage Class

Drainage Class— Summary by Map Unit — Tillamook County, Oregon (OR057)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
74A	Nehalem silt loam, 0 to 3 percent slopes	Well drained	17.2	33.0%
77A	Nestucca-Brenner silt loams, 0 to 3 percent slopes	Somewhat poorly drained	0.9	1.7%
80B	Quillamook medial silt loam, 0 to 7 percent slopes	Well drained	25.0	48.1%
89A	Udifluvents-Riverwash-Water complex, 0 to 3 percent slopes		0.1	0.3%
90A	Yachats very fine sandy loam, 0 to 3 percent slopes	Well drained	8.7	16.7%
173B	Tillamook-Ginger medial silt loams, 0 to 7 percent slopes	Moderately well drained	0.0	0.0%
177B	Dystrudepts-Aquepts complex, 0 to 7 percent slopes	Moderately well drained	0.1	0.2%
Totals for Area of Interest			52.0	100.0%

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

BUSINESS NARRATIVE

This CAFO Plan is for 321-1,000 lb. animal units. The maximum livestock will be 180 lactating Holsteins, 30 dry Holstein cows, 38 Holstein heifers, and 65 Holstein calves. The number of livestock may be less in any given day, week, month, or year because of economic conditions, culling rate and/or culling rate. The lactating and dry cows at Tract 102 are normally confined for 206 days and on pasture for 159 days. The heifers at Tract 102 are normally confined for 151 days and on pasture for 214. The calves are confined for 365 days. The dry cows and heifers at Tract 101 are normally confined for 154 days and on pasture for 211 days. The confinement days may vary based on weather conditions, livestock, health, economic conditions, and/or excessive forage production during late fall, winter, and early spring. The livestock mortality rate is provided by the Tillamook County Creamery Association.

The operation consists of two Tracts. Tract 102 is the milking operation and Tract 101 is a dry cow/heifer operation. There are 100.3 acres of owned pasture land in Tract 102 that receives manure application. Tract 101 has 33.4 acres of owned pastureland and 7.2 acres of leased hay land that receives manure applications. The pastures and hay land are in fair to good condition. The target yield for the pastures is 18 tons at 30% dry matter per acre per year. The hay land target yield is 6 tons at 80% dry matter per acre per year.

Tract 102 is within the Stillwell Drainage District. The Drainage district maintains the pumps, tide-gates, and dike. It is very rare the pastures that receive manure applications in Tract 102 floods. Tract 101 has 16.9 acres that receives manure application that frequently flood.

The liquid manure at Tract 102 is transported to pasture fields with a pump through a buried manure mainline and applied with a manure gun traveler. The solid manure is transported by a tractor and manure spreader and applied. The solid manure at Tract 101 is transported to the pastures and hay land fields with a tractor and manure spreader and applied. The liquid manure produced at tract 102 and stored in the below ground liquid manure tank will be applied with a tractor and tank wagon.

The lactating and dry cow and heifer manure at Tract 102 is handled 40% solids and 60% liquids. A manure separator is used to separate the solid manure fraction from the liquid. The calf manure is handled 100% solids. The dry cow and heifer manure at Tract 101 is handled 100% solids.

At Tract 101, the milking operation, there are 4 liquid waste storage tanks and three solid manure storage facilities. The liquid waste storage tanks are: 40' x 12' x 5' below ground liquid

waste storage tank. 20' x 8' below ground liquid waste storage tank, 35' x 7.5' below ground liquid waste storage tank, and an 80' x 10' above ground liquid waste storage tank. There is a 50' x 60' x 10' below ground liquid waste storage tank a T-101. The five waste storage tanks, in combination, can store the liquid waste produced by the 252-1,000 lb. animal units at the milking operation for 97 days. There are three solid manure storage facilities at Tract 101. Those facilities are: 65' x 25' x 6', 65' x 35' x 6', and 65' x 40' x 6'. The facilities, in combination, can store the solid manure produced by the 268-1,000 lb. animal units for 340 days.

At Tract 101, the dry cow and heifer operation there is a 41' x 102' x 6' solid manure storage facility. The solid manure storage facility can store the solid manure produced by the 53-1,000 lb. animal units for over 365 days. The below ground liquid tank is used to store liquid waste produced at the milking operation (Tract 102) for application to the pasture and hay land fields in Tract 101. Manure storage days are based on the 30 year average annual precipitation recorded at KTIL Radio Station (an official weather station) in the City of Tillamook.

All conservation practices installed will be managed and maintained in accordance with the enclosed "Operation and Maintenance Worksheets".

Soils where manure is applied are: Coquille-Brenner-Nehalem association, 0-3% slopes, Yachats very fine sandy loam, Nehalem silt loam, 0-3% slopes, Quillamook medial silt loam, 0-7% slopes, and Nestucca-Brenner silt loams, 0-3% slopes, The Coquille-Brenner-Nehalem soil is very poorly drained. The Nestucca-Brenner soil is somewhat poorly drained. The Nehalem, Yachats, and Quillamook soils are well drained.

COMPREHENSIVE NUTRIENT MANAGEMENT PLAN

Cooperator: **TillaBay Farms Inc.**

Date:

Field No.	Amount	Planned	Applied
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LAND USE AND PRACTICE

Farmstead T-102

Waste Storage Facility

A 35' x 7.5' below ground liquid waste storage tank was installed. The 7,212 cubic foot below ground liquid waste storage tank, in combination with the other below ground liquid waste storage tanks, the above ground liquid waste storage tank, and the below ground liquid waste storage tank at T-101, will store the liquid waste produced by the 252-1,000 lb lactating cows, dry cows, and heifers animal units for 97 days.

F	1	x	x
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Waste Storage Facility

A 40' x 12' x 5' below ground liquid waste storage tank was installed. The 2,400 cubic foot liquid waste storage tank, in combination with the other below ground liquid waste storage tank, the above ground liquid waste storage tank, and the below ground liquid waste storage tank at T-101, will store the liquid waste produced by the 252-1,000 lb lactating cows, dry cows, and heifer animal units for 97 days.

F	1	x	x
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Waste Storage Facility

A 20' x 8' below ground liquid waste storage tank was installed. The 2,512 cubic foot below ground liquid waste storage tank, in combination with the other below ground liquid waste storage tanks, the above ground liquid waste storage tank, and the below ground liquid waste storage tank at T-101, will store the liquid waste produced by the 252-1,000 lb lactating cows, dry cows, and heifers animal units for 97 days.

F	1	x	x
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Waste Storage Facility

An 80' x 10' above ground liquid waste storage tank was installed. The 45,216 cubic foot liquid waste storage tank, in combination with the two below ground liquid waste storage tanks, and the liquid waste storage tank at T-102, will store the liquid waste produced by the 252-1,000 lb. lactating cows, dry cows, and heifer animal units for 97 days.

F	1	x	x
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Waste Storage Facility

A 65' x 25' x 6' solid manure storage facility was installed. The 9,750 cubic foot storage facility in combination with the two other solid manure storage facilities, will store the solid produced by the 321-1,000 lbs. animal units for over 365 days.

COMPREHENSIVE NUTRIENT MANAGEMENT PLAN

Cooperator: **TillaBay Farms Inc.**

Date:

Field No.	Amount	Planned	Applied
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LAND USE AND PRACTICE

Farmstead T-102

F	1	x	x
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Waste Storage Facility

A 65' x 35' x 6' solid manure storage facility was installed. The 13,650 cubic foot storage facility, in combination with the two solid manure storage facilities, will store the solid manure produced by the 321-1,000 lb animal units for over 365 days.

F	1	x	x
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Waste Storage Facility

A 65' x 40' x 6' solid manure storage facility was installed. The 15,600 cubic foot storage facility, in combination with the two solid manure storage facilities, will store the solid manure produced by the 321-1,000 lb animal units for over 365 days.

F	1	x	x
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Waste Transfer

A pumps was installed so liquid manure could be transferred from the existing below ground liquid waste storage tanks to the above ground liquid waste storage tank.

F	1	x	x
---	---	---	---

Waste Transfer

A pump /agitator was installed in the 20' x 8' below ground liquid to transfer the liquid waste to the pastures for application.

F	1	x	x
---	---	---	---

Waste Transfer

An agitator was installed in the above ground liquid waste storage storage tank to stir the manure for application and prevent solid manure buildup in the facility.

F	1	x	x
---	---	---	---

Waste Transfer

A concrete floor gutter was installed to transfer liquid waste from the animal confinement area to the 20' x 8' below ground liquid waste storage tank.

F	1	x	x
---	---	---	---

Waste Storage Facility

A 60' x 85' square foot roof was installed. The 5,100 square foot roof installed over the manure accumulation salb and the existing solid manure storage area.

F	1	x	x
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Waste Storage Facility

An 89' x 24' roof was installed over the manure accumulation area. The 2,136 and the 20' x 8' below ground liquid waste storage tank.

F	944 ft	x	x
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Roof Runoff Structure

Gutters and downspouts were installed on the animal confinement buildings.

F	150 ft	x	x
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Underground Outlet

A four inch underground outlet was installed to outlet the gutters in an area free of manure.

COMPREHENSIVE NUTRIENT MANAGEMENT PLAN

Cooperator: **TillaBay Farms Inc.**

Date:

Field No.	Amount	Planned	Applied
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LAND USE AND PRACTICE

Farmstead T-102

Manure Transfer

A manure separator was installed to remove the solid manure fraction from the liquid for storage in the solid manure storage facilities.

Manure Transfer

A buried manure mainline was installed to transfer liquid manure to the fields in a non-polluting matter.

Pipeline

A buried pipeline has been installed to convey water to the livestock.

Surface Drainage, Main or Lateral

An open ditch has been installed to collect and transport surface water from the pastures.

Fences

Fences have been installed to exclude livestock from the open watercourses.

Use Exclusion

Livestock have been excluded from the open watercourses.

Well

A well has been constructed to provide water for the livestock and irrigation water.

Farmstead T-101

Waste Storage Facility

A 102' x 40' x 6' solid manure storage facility was installed. The 24,480 cubic foot solid manure storage facility will store the solid manure produced by the 53-1,000 lb animal units for over 365 days.

Waste Storage Facility

An 50' x 60' x 10' below ground liquid waste storage tank was installed. The 30,000 cubic foot liquid waste storage tank is used to store liquid waste produced at the milking operation (T-102) for application to T-101 fields.

F	1	x	x
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F	3,200 ft	x	x
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F	3400 ft	x	x
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F	5,107 ft	x	x
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F	10,215 ft	x	x
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F	2.3 ac	x	x
---	--------	---	---

F	1	x	x
---	---	---	---

F	1	x	x
---	---	---	---

F	1	x	x
---	---	---	---

COMPREHENSIVE NUTRIENT MANAGEMENT PLAN

Cooperator: **TillaBay Farms Inc.**

Date:

Field No.	Amount	Planned	Applied
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LAND USE AND PRACTICE

Farmstead T-101

Waste Storage Facility

A 2,896 square foot roof was installed over the manure accumulation slab between the solid manure storage facility and the animal confinement building to prevent manure runoff.

Roof Runoff Structure

Gutters and downspouts were installed on the animal confinement buildings.

Underground Outlet

A four inch underground outlet was installed to outlet the gutters in an area free of manure.

Pasture T-102

Pumping Plant

A pump was installed to remove excess surface water from the winter months

Dike

A dike was installed a part of the Stillwell Drainage District to prevent excessive flooding and salt water intrusion on to the pastures.

Tidegates

Tidegates were installed as part of the field drainage system.

Tile Drainage

A tile drainage system was installed to manage the water table so manure can be applied earlier in the spring and later in the fall.

Prescribed Grazing

Pastures will be managed in accordance with the enclosed Prescribed Grazing Specification Sheet.

Filter Strip

A grass filter strip adjacent to the open watercourse will be established and maintained as part of the animal confinement operation water quality plan to prevent agricultural waste from entering the open watercourse. The grass filter strip will be implemented in accordance with the Filter Strip Specification Sheet.

F	1	1	1
F	292 ft	x	x
F	150 ft	x	x
3	1 No.	x	x
1,2,3,4,5	6,300 ft	x	x
1,2,3	3 No.	x	x
1,6,10	4,900 ft	x	x
1	100.3 ac	x	
1-6,8-11	8.1 ac	x	

COMPREHENSIVE NUTRIENT MANAGEMENT PLAN

Cooperator: **TillaBay Farms Inc.**

Date:

Field No.	Amount	Planned	Applied
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LAND USE AND PRACTICE

Pasture T-102

Nutrient Management

Manure will be used for forage production. Soil tests will be used to determine rates of application. Nutrient management will be implemented in accordance with the enclosed Nutrient Management Specification Sheet.

Waste Utilization

Manure will be applied to the pastures in accordance with the enclosed Waste Utilization Specification Sheet

Pasture T-101

Prescribed Grazing

Pastures will be managed in accordance with the enclosed Prescribed Grazing Specification Sheet.

Nutrient Management

Manure will be used for forage production. Soil tests will be used to determine rates of application. Nutrient management will be implemented in accordance with the enclosed Nutrient Management Specification Sheet.

Waste Utilization

Manure will be applied to the pastures in accordance with the enclosed Waste Utilization Specification Sheet.

Hayland T-101

Forage Harvest Management

Forage will be harvested in accordance with the enclosed Forage Harvest Management Specification Sheet

Nutrient Management

Manure will be used for forage production. Soil tests will be used to determine rates of application. Nutrient management will be implemented in accordance with the enclosed Nutrient Management Specification Sheet.

Waste Utilization

Manure will be applied to the hay lands in accordance with the enclosed Waste Utilization Specification Sheet.

1-6, 8-12	100.3 ac	x	
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1-6,8-12	100.3 ac	x	
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1,2,3	33.4 ac	x	
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1,2,3	33.4 ac	x	
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1,2,3	33.4 ac		
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5	7.2 ac	x	
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5	7.2 ac	x	
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5	7.2 ac	x	
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CERTIFICATION OF PARTICIPANTS

Bart Mize
TillaBay Farms Inc.

2-7-13
DATE

CERTIFICATION OF:

Bob
Robert A. Pedersen
CAFO PLANNER

Date 2/7/13

CONSERVATION DISTRICT

Clarence Bogner 2-13-13
TILLAMOOK COUNTY SWCD DATE

TILLAMOOK COUNTY SOIL AND WATER CONSERVATION DISTRICT:

Conservation

Development

Self Government

**Tillamook County Soil and Water Conservation District is an Equal Opportunity
Provider and Employer**

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

WASTE STORAGE FACILITY

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 26 T 2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersenn Date 01/13

T-102

- **80' x 10' Above Ground Liquid Waste Storage Tank**
- **35' x 7.5' Below Ground Liquid Waste Storage Tank**
- **20' x 8' Below Ground Liquid Waste Storage Tank**
- **40' x 12' x 5' Below Ground Liquid Waste Storage Tank**

T-101

50' x 60' x 10'

Operation and Maintenance Items

A properly operated and maintained waste storage structure is an asset to your farm. This waste storage structure was designed and installed for temporary storage of animal wastes. The estimated life span of this installation is at least 10 years. If at any time this structure is taken out of service, the Natural Resources Division of the Oregon Department of Agriculture should be contacted for guidance in decommissioning the structure to avoid environmental concerns. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Do not allow equipment that exceeds the design loading to operate within 20 feet of the structure.
- ⇒ **WARNING: ENTERING AN UNVENTILATED TANK IS EXTEREMELY "HAZARDOUS"!** Do not allow human entry into the enclosed structure without safety equipment that includes ladders and breathing apparatus.
- ⇒ Continually maintain all pumps, agitators, piping, valves and all other electrical and mechanical equipment in good operating condition by following the manufacturer's recommendations.
- ⇒ Continually maintain grounding rods and wiring for all electrical equipment in good condition.
- ⇒ A one foot free board will be maintained to prevent spillage.

- ⇒ Immediately repair any vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.
- ⇒ Pump out the facility within the first two years following construction to check for structural damage. If damage is noted, immediately seek a qualified engineer to assess the situation. Thereafter, it should be pumped out at least every four years to check for damages, remove gravel, rocks, sand, wire and other debris to maintain the designed storage capacity.
- ⇒ Immediately remove all foreign debris within the structure that may cause damage to pumps and agitator.
- ⇒ Storage facilities will be ready by November 1st to begin winter manure storage.
- ⇒ Waste spreading adjacent to open watercourse will be done in accordance with the enclosed Filter Strip Specification Sheet. Avoid applying waste during heavy rainfall events.
- ⇒ Dead animals will not be disposed of in the liquid waste storage facility.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

**WASTE TRANSFER PIPE
HIGH-PRESSURE UNDERGROUND, PLASTIC PIPELINE**

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec. 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

• ***Waste Transfer Pipe***

Operation and Maintenance Items

A properly operated and maintained waste transfer system is an asset to your farm. This waste transfer system was designed and installed for applying liquid wastes to the pasture and hayland fields. The estimated life span of this installation is at least 20 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Check to make sure all valves and air vents are set at the proper operating condition so they may provide protection to the pipeline. Remove foreign materials and vegetation that can interfere with proper valve operation.
- ⇒ Maintain the designed depth of cover over the pipeline.
- ⇒ Limit traffic over the pipeline to designated sections that were designed for traffic loads.
- ⇒ Avoid travel over pipelines by tillage equipment when the soil is saturated.
- ⇒ Avoid any sub-soiling operation that may disturb the pipeline.
- ⇒ Maintain a vigorous growth of vegetative covering. This includes reseeding, fertilization and application of herbicides when necessary. Periodic mowing may also be needed to control height of vegetation.
- ⇒ Eradicate or otherwise remove all rodents or burrowing animals that can potentially damage or displace the pipe. Immediately repair any damages caused by their activity.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

MANURE PUMP

Landowner/Operator: TillamBay Farms Inc.

Job Location: T 1S; R 10W. Sec. 26

County Tillamook SWCD Tillamook Tract No. T-102

Prepared By: Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained manure pump is an asset to your farm. The manure pump was designed to transfer the liquid waste to the pasture and haylands for application. The estimated life span of this installation is at least 10 years. The life of the manure pump can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

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

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

MANURE TANK AGITATOR

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec. 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained manure tank agitator is an asset to your farm. The manure agitator was designed and installed to stir the liquid waste and keep the solids in suspension so solid manure will not buildup in the bottom of the tank and reduce the designed storage capacity. The estimated life span of this installation is at least 10 years. The life of the manure agitator can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Preventive 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 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 equipment during operation.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

MANURE TANK AGITATOR/PUMP

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained manure tank agitator/pump is an asset to your farm. The manure agitator/pump was designed and installed to stir the liquid waste and keep the solids in suspension so solid manure will not buildup in the bottom of the tank and reduce the designed storage capacity and transfer the manure to a tank wagon or to the fields.. The estimated life span of this installation is at least 10 years. The life of the manure agitator can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Preventive 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 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 equipment during operation.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

**OPERATION AND MAINTENANCE WORKSHEET
MANURE TRANSFER**

For: Landowner/Operator Tillamook Bay Farms Inc.

Job Location: T 1S; R 10W; Sec. 26

County Tillamook SWCD Tillamook

Farm/Tract No. T 102

Prepared By Pedersen Date 01/13

Concrete Gutter

Operation and Maintenance Items

Properly operated and maintained concrete flow gutter is an asset to the farm. A concrete gutter was designed and installed to control manure runoff and direct the manure towards a storage facility. Estimated life span of this installation is at least 10 years. Facility life can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Periodically check the gutter for proper operation. Repair or replace if needed.
- ⇒ Remove any foreign debris from the concrete gutter.
- ⇒ Prevent manure from flowing over the concrete gutter

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

MANURE SEPARATOR

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained manure separator is an asset to your farm. The manure separator was designed and installed to remove solid manure from the liquid manure storage facility so solid manure will not buildup in the bottom of the tank and reduce the designed storage capacity. The estimated life span of this installation is at least 10 years. The life of the manure separator can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Preventive maintenance will be in accordance with the manufacturer's recommendations.
- ⇒ Periodically examine the separator for proper operation. Clean debris from the separator, and promptly replace any defective or damaged parts.
- ⇒ Periodically clean and oil as needed to increase the life expectancy of the separator.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

WASTE STORAGE FACILITY (SOLID MANURE STORAGE FACILITY)

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 26, T 2S; R 9W; Sec.4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date 01/13

Tract 102

- **65' x 25' x 6' Solid Manure Storage Facility**
- **65' x 35' x 6' Solid Manure Storage Facility**
- **65' x 40' x 6' Solid Manure Storage Facility**
- **Tract 101**
- **41' x 102' x 6'**

Operation and Maintenance Items

A properly operated and maintained waste storage structure is an asset to your farm. This waste storage structure was designed and installed for temporary storage of animal wastes. The estimated life span of this installation is at least 10 years. If at any time a structure is taken out of service, the Natural Resources Division of the Oregon Department of Agriculture should be contacted for guidance in decommissioning the structure to avoid environmental concerns. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Do not allow equipment that exceeds the design loading to operate within 20 feet of the structure
- ⇒ Immediately repair any vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.
- ⇒ Storage facilities will be ready by November 1st to begin winter manure storage.
- ⇒ During de-watering of the structure, ensure that waste is spread at minimum rates in areas where crops are grown. Waste spreading adjacent to open watercourse will be done in accordance with the enclosed Filter Strip Specification Sheet. Avoid applying waste during heavy rainfall events.
- ⇒ Roofs of the solid manure storage facilities will be inspected annually.

- ⇒ All roof sections that are rusted and leaking will be repaired and/or replaced.
- ⇒ Loose roof sections on the solid manure storage facilities will be secured.
- ⇒ Broken trusses, beams, poles, gutters and downspouts will be repaired or replaced on the solid waste storage facilities.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

WASTE STORAGE FACILITY (ROOF)

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23 & 26 T2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained roof is an asset to your farm. These roofs were designed and installed for preventing manure runoff from manure accumulation areas. The estimated life span of this installation is at least 10 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Roof will be inspected weekly.
- ⇒ All roof sections that are rusted and leaking will be replaced or repaired to prevent rainwater from entering the liquid waste storage system.
- ⇒ Loose roof sections will be secured.
- ⇒ Broken trusses, beams, poles, gutters and downspouts will be repaired or replaced.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

**OPERATION AND MAINTENANCE WORKSHEET
ROOF RUNOFF MANAGEMENT**

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23 and Sec 26 T2S; R 9W; Sec.4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102. 101

Prepared By Pedersen Date 01/13

- ***Gutters and Downspouts***

Operation and Maintenance Items

Properly operated and maintained roof runoff facilities are an asset to the farm. Roof runoff facilities were designed and installed to control roof runoff. Estimated life span of this installation is at least 10 years. Facility life can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Perform weekly inspections of gutters, downspouts and above ground pipelines, and appurtenances for proper operation. Repair or replace if needed.
- ⇒ Periodically remove debris from gutters, downspouts and outlet facilities.
- ⇒ Protect downspouts from damage by livestock and equipment. Repair or replace damaged components as needed.
- ⇒ Keep gutters, downspouts, conveyance pipelines and ditches and appurtenances in good operating condition.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

UNDERGROUND OUTLETS

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23 and Sec. 26 T 2 S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

• ***Gutter Outlet***

Operation and Maintenance Items

Properly operated and maintained under ground outlet for the guttering system is an asset to the farm. This outlet was designed and installed to convey roof runoff in an underground pipeline to where it can be released without causing erosion. The estimated life span of this installation is at least 10 years. The life of the practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Check all above ground connections, rodent guards, inlets and outlets to make sure they are functioning properly.
- ⇒ Maintain design depth of cover on all pipelines.
- ⇒ Avoid operation of tillage and sub-soiling equipment that could damage any component of the gutter outlet system.
- ⇒ Remove all foreign debris that hinders the gutter system operation.
- ⇒ Limit traffic over pipeline to designated sections that were designated for traffic loads.
- ⇒ Maintain vigorous growth of vegetative coverings. This includes reseeding, fertilization and application of herbicides when necessary. Periodic mowing may also be needed to control growth.
- ⇒ Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.
- ⇒ Immediately repair any vandalism, vehicular livestock damage.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

DROP INLET STRUCTURE

Land Owner/Operator TillaBay Farms Inc.

Job Location: T 2S; R 9W; Sec 4

County _____ SWCD _____ Farm/Tract No. T 101

Prepared By Pedersen Date 01/13

OPERATION AND MAINTENANCE ITEMS

A properly operated and maintained drop inlet structure for waste transfer is an asset to the farm. The structure was designed and installed to allow seepage from the solid manure storage facility where a pump will transfer the waste through a pipe to the waste collection tank. Estimated life span of this installation is at least 10 years. The life of the structure can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may also require operational items to maintain satisfactory performance. A good operation and maintenance program includes:

- ⇒ Drain all structures when not being used. Remove accumulated soil and debris and any blockage that restricts capacity.
- ⇒ Repair any cracks or breaks. If settlement is present, investigate the cause and design repairs accordingly.
- ⇒ Avoid the use of tillage equipment that accelerates soil removal. If livestock are present, prevent access to components subject to damage by livestock.
- ⇒ Check concrete surfaces for accelerated weathering, spalling, settlement, alignment or cracks. Repair immediately, as reinforcement steel can be exposed and reduce the life of the structure. Repair any vandalism, vehicular, or livestock damage.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

**MANURE TRANSFER
MANURE GUN TRAVELER**

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23 & Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained manure gun traveler is an asset to your farm. The manure gun was designed and must be operated to apply manure to the fields in a non-polluting matter. The estimated life span of this installation is at least 10 years. The life of the manure gun can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Preventive maintenance will be in accordance with the manufacturer's recommendations.
- ⇒ Liquids will be drained from the manure gun during freezing weather.
- ⇒ Nozzle will be checked periodically.
- ⇒ Worn nozzles will be replaced.
- ⇒ Manure gun traveler will be calibrated at least once a year.
- ⇒ Physically examine the manure gun for proper operation.
- ⇒ Immediately repair any vandalism or livestock damage. Do not allow livestock near equipment during operation.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

HIGH-PRESSURE UNDERGROUND, PLASTIC PIPELINE

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23 and Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

• ***Buried Manure Mainline***

Operation and Maintenance Items

A properly operated and maintained waste application system is an asset to your farm. This waste application system was designed and installed for applying liquid wastes to the pasture and hayland fields. The estimated life span of this installation is at least 20 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Check to make sure all valves and air vents are set at the proper operating condition so they may provide protection to the pipeline. Remove foreign materials and vegetation that can interfere with proper valve operation.
- ⇒ Maintain the designed depth of cover over the pipeline.
- ⇒ Limit traffic over the pipeline to designated sections that were designed for traffic loads.
- ⇒ Avoid travel over pipelines by tillage equipment when the soil is saturated.
- ⇒ Avoid any sub-soiling operation that may disturb the pipeline.
- ⇒ Maintain a vigorous growth of vegetative covering. This includes reseeding, fertilization and application of herbicides when necessary. Periodic mowing may also be needed to control height of vegetation.
- ⇒ Eradicate or otherwise remove all rodents or burrowing animals that can potentially damage or displace the pipe. Immediately repair any damages caused by their activity.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT
OREGON

OPERATION AND MAINTENANCE WORKSHEET
STRUCTURE FOR WATER CONTROL - CULVERT

Land Owner/Operator Tillamook Bay Farms Inc.

Job Location T 2S; R 9 W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-101

Prepared By Pedersen Date 01/13

OPERATION AND MAINTENANCE ITEMS

A properly operated and maintained culvert is an asset to the farm. The structure was designed and installed to control water flows,, discharge and direction of flow. Estimated life span of this installation is at least 10 years. The life of the structure can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may also require operational items to maintain satisfactory performance. A good operation and maintenance program includes:

- ⇒ Remove accumulated soil and debris and any blockage that restricts capacity.
- ⇒ Repair any cracks or breaks. If settlement is present, investigate the cause and design repairs accordingly.
- ⇒ Prevent access to components subject to damage by livestock.
- ⇒ Check culvert for settlement, alignment or rusted out sections. Repair any vandalism, vehicular, or livestock damage.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

WATERING FACILITY

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23,26 T 2S; 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Properly operated and maintained water troughs and tanks are an asset to the farm. This practice was designed and installed to provide a source of water to the grazing units so livestock do not need access to open watercourse for drinking water. Practice will prevent pollution and prevent streambank erosion and riparian habitat damage due to livestock access. The estimated life span of this installation is at least 10 years. The life of the practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ 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.
- ⇒ 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.
- ⇒ Maintain vigorous growth of vegetative coverings. This includes reseeding, fertilization and application of herbicides when necessary. Periodical mowing may also be needed to control growth.
- ⇒ Check periodically to see if debris has fallen into the troughs and tanks which may restrict inflow or planned function 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.
- ⇒ Maintain, when necessary, coverings and insulation to prevent damage by 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 to inlets, outlets, valves, and other appurtenances.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

PIPELINE

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23 & 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Properly operated and maintained pipeline is an asset to the farm. This pipeline was designed and installed to provide a source of water to the grazing units so livestock do not need access to open watercourse for drinking water. Practice will prevent pollution and prevent streambank erosion and riparian habitat damage due to livestock access. The estimated life span of this installation is at least 10 years. The life of the practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Check to make sure all valves and air vents are set at the proper operating conditions so they provide protection to the pipeline.
- ⇒ Maintain the design depth of cover over the pipeline. Limit traffic over the pipeline to designated sections that were designed for traffic loads.
- ⇒ Maintain vigorous growth of vegetation coverings. This includes reseeding, fertilization and application of herbicides when necessary. Periodically mowing may also be needed to control vegetative height.
- ⇒ Remove all foreign debris that hinders system application.
- ⇒ Drain the system and components in areas that are subject to 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 to inlets, outlets, valves, and other appurtenances.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

NUTRIENT MANAGEMENT

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec. 23, 26 T 2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Waste Utilization can provide economic and resource benefits if applied properly which are assets to the dairy operation. Proper waste utilization requires certain operational procedures to be followed and evaluated on an annual basis.

- ⇒ Manure application equipment is calibrated at least once per year to ensure uniform distribution and accurate application rates.
- ⇒ Records are maintained of manure applications.
- ⇒ Manure application equipment is cleaned up and residual material from the equipment is disposed of properly and in a place where surface runoff does not occur.
- ⇒ Nutrient management plans are reviewed annually and adjustments are made as needed.
- ⇒ Unnecessary exposure to manure is avoided. Protective clothing is worn when necessary.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

WASTE UTILIZATION

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec. 23, 26, T 2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Waste Utilization can provide economic and resource benefits if applied properly which are assets to the dairy operation. Proper waste utilization requires certain operational procedures to be followed and evaluated on an annual basis.

- ⇒ Manure application equipment is calibrated at least once per year to ensure uniform distribution and accurate application rates.
- ⇒ Records are maintained of manure applications.
- ⇒ Manure application equipment is cleaned up and residual material from the equipment is disposed of properly and in a place where surface runoff does not occur.
- ⇒ Nutrient management plans are reviewed annually and adjustments are made as needed.
- ⇒ Unnecessary exposure to manure is avoided. Protective clothing is worn when necessary.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

PRESCRIBED GRAZING

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec23,26 T 2S; R 9W; Sec 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102,101

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Prescribed Grazing can provide economic and resource benefits if applied properly which are assets to the dairy operation. Proper Prescribed Grazing requires certain operational procedures to be followed and evaluated on an annual basis.

- ⇒ Pastures are reestablished when forage production falls below planned yield threshold.
- ⇒ A rotational grazing system is used to maintain plant vigor.
- ⇒ Pastures are clipped and dragged during the growing season to maintain plant vigor and spread the livestock droppings to prevent grass from becoming rank.
- ⇒ Manure and commercial fertilizer applied in accordance with soil and forage tests.
- ⇒ Pasture weeds are controlled.
- ⇒ Pasture grasses are not grazed below 2 inches during the growing season
- ⇒ Livestock are removed when the soils become wet in the fall.
- ⇒ Excess vegetation will be taken of a ensilage and/or hay.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

FORAGE HARVEST MANAGEMENT

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 2S; R 9W; Sec 4

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Forage Harvest Management can provide economic and resource benefits. If applied properly, is an assets to the dairy operation. Forage Harvest Management requires certain operational procedures to be followed and evaluated on an annual basis.

- ⇒ Before forage harvest, clear fields of debris that could damage machinery, or if ingested by livestock, lead to sickness (for example, hardware disease) or death.
- ⇒ Monitor weather conditions and take action accordingly before and after cutting to optimize forage wilting or cutting time to preserve feed quality and prevent forage swaths or windrows from smothering underlying plants.
- ⇒ Inspect and repair harvesting equipment following manufacturer's preventive maintenance procedures.
- ⇒ All shields shall be in place during machine operation to prevent injury or death. Shut off machinery before working or unplugging moving parts.
- ⇒ Select equipment sizes and capabilities that will in a timely and economically feasible manner handle the acreage normally harvested.
- ⇒ Operate all forage harvesting equipment at the optimum setting and speeds to minimize loss of leaves.
- ⇒ Set shear-plate on forage chopper to the proper theoretical cut for the crop being harvested. Keep knives well sharpened. Do not use re-cutters or screens unless forage moisture levels fall below recommended levels for optimum chopping action.
- ⇒ Regardless of silage/haylage storage method, ensure good compaction and an air-tight seal to exclude oxygen and mold formation.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

SUBSURFACE DRAINAGE (Tile Drainage)

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; SE ¼ Sec 23 & NE ¼ Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Amy Krahn Date 01/13

Operation and Maintenance Items

Properly operated and maintain subsurface drainage system is an asset to the farm. The drainage system was designed and installed to remove excess subsurface water with a system of buried conduits. The estimated life span of this installation is at least 10 years. The life of the practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Maintain the designed depth of cover. All settlement or cracks in the soil should be investigated to determine the cause and immediately repaired.
- ⇒ Avoid travel by heavy equipment over drain-lines when the soil is saturated except at designated crossings. Avoid travel over pipelines by tillage equipment when the soil is saturated. Limit traffic to sections that were designed for traffic loads.
- ⇒ Remove all foreign debris and trash that hinders system operation.
- ⇒ Immediately remove any obstructions or blockage of, trash racks, drain inlets or drain outlets.
- ⇒ Maintain all outlets, rodent guards, inlets and access man-holes in good operating condition.
- ⇒ Eradicate or otherwise remove all rodents and/or burrowing animals that have or can potentially damage any part of the system. Immediately repair any damage caused by their activity.
- ⇒ Immediately repair any vandalism, vehicular or livestock damage to any outlets and appurtenances.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

STRUCTURE FOR WATER CONTROL (Tidegate)

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; SE ¼ Sec 23 & NE ¼ Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained Tide Gate for water control is an asset to the farm. This design and installation is to provide directional control of the water. The estimated life span of this installation is at least 10 years. The life of this structure can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require performance of periodic maintenance and may also require operational items to maintain satisfactory performance. A good operation and maintenance program includes:

- ⇒ Structures will be inspected annually.
- ⇒ Rip Rap around the outlet will be replaced as needed
- ⇒ Gates will be kept free of debris.
- ⇒ Worn bushings and other parts will be replaced.
- ⇒ Rodents will be controlled.
- ⇒ Repair any cracks or breaks. If settlement is present, investigate the cause and design repairs accordingly.
- ⇒ Repair any vandalism, vehicular, or livestock damage.

NOTE: Replacement of gates in the future should consider "Fish friendly" aluminum types.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

**OPERATION AND MAINTENANCE WORKSHEET
DIKE**

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; SE ¼ Sec 23 & NE ¼ Sec 26

County Tillamook SWCD Tillamook County

Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained dike or levee is an asset to your farm. This structure was designed and installed to prevent inundation of farmland and help control flooding. The estimated life span of this practice is at least 10 years. The life of this practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic maintenance and may also require operation items to maintain satisfactory performance. Some recommendations to assist you develop a good operation and maintenance program:

- ⇒ Periodically inspect flap gates, control gates, valves and other appurtenances for proper functioning, and their ability to maintain the water level to designed elevations. Immediately remove any blockage or debris that could cause malfunction. At approximately intervals exercise gates and valves to help assure proper function.
- ⇒ Periodically check elevations of earthfills and restore to grade and shape, if necessary. All settlement or cracks in the soil should be investigated to determine the cause and immediately repair.
- ⇒ Maintain vigorous growth of vegetative coverings. This includes reseeding, fertilization, and application of herbicides when necessary. Fertilize the established stands with at least 200 pounds of 21-0-0 per acre or equivalent annually or as needed to maintain a uniform vigorous stand. Avoid excess travel and uncontrolled grazing on any portion of the dike system that will harm or destroy vegetative cover. Periodically mowing or controlled grazing may also be needed to control vegetative height.
- ⇒ Maintain installed fences to prevent unauthorized human access or uncontrolled grazing of dike surface. Livestock can be used to control vegetation height, providing grazing is controlled to short periods of time when damage to the dike surface and vegetation will not result.
- ⇒ Check all rock riprap and erosion control matting sections for accelerated weathering and displacement of material. Replace to original shape and grade if necessary.
- ⇒ Immediately repair any vandalism, vehicular, or livestock damage to any earthfills, spillways, outlets or other appurtenance.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

**SURFACE DRAINAGE MAIN OR LATERAL
Field Ditch**

For: Landowner/Operator TillaBay Farms Inc.

Job Location: T 1S; R 10W; Sec.23,26

County Tillamook SWCD Tillamook Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

Properly operated and maintain drainage system is an asset to the farm. The drainage system was installed to remove excess surface and subsurface water. The estimated life span of this installation is at least 10 years. The life of the practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Maintain cross-section and gradient by controlling channel erosion and bank sloughing.
- ⇒ Control the growth of undesirable vegetative materials by use of herbicides and/or mowing.
- ⇒ Remove all foreign debris and trash that hinders system operation.
- ⇒ Install and maintain fences to prevent livestock access when adjacent fields are used for pasture.
- ⇒ Eradicate or otherwise remove all rodents and/or burrowing animals that have or can potentially damage any part of the system. Immediately repair any damage caused by their activity.
- ⇒ Immediately repair any vandalism, vehicular or livestock damage.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

FENCING

For: Landowner/Operator TillaBay Farms Inc.

Job Location: T 1S; R 10W; Sec 23, Sec 26 T 2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained fence is an asset to the farm. This practice was designed and installed to provide so livestock do not need access to open watercourse for drinking water Practice will prevent pollution and prevent streambank erosion and riparian habitat damage due to livestock access. The estimated life span of this installation is at least 5 years. The life of the practice can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require periodic maintenance and may require operational items to maintain satisfactory performance. A good operation and maintenance plan includes:

- ⇒ Regular inspections of fences should be part of the on-going management program.
- ⇒ Inspection of fences after storm event is needed to facilitate the intended use of the fence
- ⇒ Broken or damaged posts will be replaced
- ⇒ Sagging wire will be tightened.
- ⇒ Broken or missing insulators will be replaced.
- ⇒ Any broken wires will be spliced or replaced.
- ⇒ Vegetation will be controlled under the fences.

TILLAMOOK COUNTY
SLUUGH AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

USE EXCLUSION WORKSHEET

For: Landowner/Operator TillaBay Farms Inc.

Job Location: T 1S; R 10W; Sec 23, Sec 26 T 2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102, 101

Prepared By Pedersen Date: 01/13

Operation and Maintenance Items

A properly operated and maintained livestock exclusion practice will keep livestock out of the sloughs and open ditches and improve water quality. The estimated life span of the practices is 5 years. The life span can be assured and usually increased by developing and carrying out a good operation and maintenance program.

⇒ The fence barrier along the stream will be periodically inspected and remedial repairs will be performed as needed.

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

OPERATION AND MAINTENANCE WORKSHEET

FILTER STRIP

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; SE ¼ Sec 23 & NE ¼ Sec 26

County Tillamook SWCD Tillamook County Farm/Tract No. T-102

Prepared By Pedersen Date 01/13

Operation and Maintenance Items

A properly operated and maintained vegetated filter strip is an asset to your farm. This vegetative filter strip was designed and installed to remove sediment and pollutants from runoff. The estimated life span of this practice is at least 10 years. The life of this practice can be assured and usually increased by developing and carrying out a good operation and maintenance program

This practice will require you to perform periodic maintenance and may also require operation items to maintain satisfactory performance. Some recommendations to assist you develop a good operation and maintenance program:

- ⇒ Maintain vigorous growth of vegetative covering. This includes reseeding, commercial fertilization and application of herbicides when necessary. Periodic mowing or grazing may also be needed to control height.
- ⇒ Where the filter strip is used to trap nutrients, periodic grazing or mechanical harvesting and removal of vegetation is needed.
- ⇒ Remove all foreign debris that hinders system operation.
- ⇒ Limit the traffic and do not use as a roadway.
- ⇒ Limit livestock usage to vegetative growth periods when they will not damage vegetative root system or compact the soil.
- ⇒ Immediately repair any vandalism, vehicular, or livestock damage.
- ⇒ Eradicate or remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations

ASSISTED BY: **Pedersen**

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=										Manure CF/D/AU	Annual	
				Nutrient Production						(lbs./day)		K	P		Days Confined	Days Grazed
				(lbs./day/1000 lb. Animal Unit)												
				N	P	K	N	P	K							
MILKER (Holstein)	▼	180	1,250	225.0	0.72	0.13	0.33	162.00	28.31	74.75	1.78	206	159			
MILKER (DRY)	▼	15	1,250	18.8	0.30	0.04	0.10	5.63	0.79	1.88	0.92	206	159			
HEIFERS (12-24 Months)	▼	8	1,000	8.0	0.27	0.05	0.12	2.13	0.36	0.96	0.90	151	214			
CALVES (1-12 Months)	▼	65	250	16.3	0.42	0.05	0.11	6.83	0.88	1.79	1.34	365	0			
MILKER (DRY)	▼	15	1,300	19.5	0.30	0.04	0.10	5.85	0.82	1.95	0.92	154	211			
HEIFERS (12-24 Months)	▼	30	1,100	33.0	0.27	0.05	0.12	8.78	1.50	3.96	0.90	154	211			
	▼															
	▼															
	▼															
	▼															
Totals/Averages-		313	1,025	320.5	0.60	0.10	0.27	191.2	32.7	85.3	1.5					

GRAZING PERIOD

[illegible]

CLIENT: **Tillabay Farms Inc. T-102, 101 All Operations**

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

WEATHER STATION		TILLAMOOK 1 W		Lot Runoff Factors as a Percent of Monthly Precipitation	
Month	25Yr-24Hr	Monthly Average in Inches		Paved	Unpaved
		Precipitation	Evaporation		
October		7.16	1.42	50%	20%
November		13.71	0.75	60%	25%
December		13.94	0.60	60%	25%
January		13.09	0.48	60%	25%
February		10.79	0.78	50%	25%
March		9.90	1.26	45%	15%
April		6.81	1.90	40%	15%
May		4.84	3.22	40%	10%
June		3.41	3.40	35%	10%
July		1.64	3.91	30%	0%
August		1.42	3.52	40%	10%
September		3.68	2.54	45%	15%
Annual		90.39	23.78		

AREAS CONTRIBUTING RUNOFF TO LIQUID STORAGE FACILITY

[illegible]

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- per Wash- Day	Total Water Use per Day, Gallons	Total Water Use per Day, Cubic Feet
Animal Washwater	180.0	2	0.20	72	9.6
Equipment Wash		2	650.00	1300	173.8
Flushwater		0	0.00	0	0.0
Miscellaneous		2	25.00	50	6.7
Total>>>>>>>>>>>>>>	>>>>>>>>>>>>>>	>>>>>>>>>>>>>>	>>>>>>>>>>>>>>	1422	190.1

CROP DATA

Field Number	Acres	Crop	Percent Dry Matter (DM)	Yield Units	Target Yield	Nitrogen N	Phosphorous P2O5	Potassium K2O
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	6.00	278	88	231
			▼					
			▼					
			▼					
Off Farm			▼					

CLIENT: **Tillabay Farms Inc. T-102, 101 All Operations**

ASSISTED BY: **Pedersen**

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	3.10	0.26	58	698
MILKER (DRY)	Free Stall	►	Sawdust	►	12.00	3.10	0.10	2	58
HEIFERS (12-24 Months)	Loose Housing	►	Sawdust	►	12.00	3.10	0.26	2	25
CALVES (1-12 Months)	Confined	►	Loose Straw	►	2.50	9.30	3.72	60	151
MILKER (DRY)	Free Stall	►	Loose Straw	►	2.50	2.60	1.04	20	51
HEIFERS (12-24 Months)	Free Stall	►	Loose Straw	►	2.50	2.60	1.04	34	86
		►		►					
		►		►					
		►		►					
		►		►					

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)	Press Type (Screw or Roller)	▶	44	65	379	20	139	36	1,570
MILKER (DRY)	Press Type (Screw or Roller)	▶	2	2	16	1	3	36	56
HEIFERS (12-24 Months)	Dry Scrape System	▶	4	6	4	3	2	36	133
CALVES (1-12 Months)	Dry Scrape System	▶	82	0	0	0	0	36	2,960
MILKER (DRY)	Dry Scrape System	▶	38	0	0	0	0	36	1,376
HEIFERS (12-24 Months)	Dry Scrape System	▶	64	0	0	0	0	36	2,305
		▶							
		▶							
		▶							
		▶							
		▶							
Total Solids			233	73	400	93	143		8,400

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

Month	Runoff in Cubic Feet				Facility Water Use Cubic Feet	Manure		Bedding		Solids Separated		Solids in Liquids		Total Solids Cubic Feet	Total Liquids Cubic Feet
	Roof Area Square Feet 0	Paved Slab Area Square Feet 0	Unpaved Lot Area Square Feet 0	Silage Pit Surface Area, SF 0		Solids Cubic Feet	Liquids Cubic Feet	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Pounds		
October	0	0	0	480	5,893	1,512	5,735	2,836	16,781	3,307	119,035	1,136	40,907	3,307	13,709
November	0	0	0	456	5,703	3,703	11,101	5,314	32,042	7,000	252,006	2,199	79,175	7,000	20,759
December	0	0	0	480	5,893	3,826	11,471	5,491	33,110	7,233	260,406	2,273	81,814	7,233	21,046
January	0	0	0	480	5,893	3,826	11,471	5,491	33,110	7,233	260,406	2,273	81,814	7,233	21,046
February	0	0	0	433	5,323	3,456	10,361	4,959	29,905	6,533	235,205	2,053	73,897	6,533	20,209
March	0	0	0	480	5,893	2,398	5,735	3,852	19,320	5,208	187,494	1,136	40,907	5,208	13,709
April	0	0	0	456	5,703	1,844	3,275	3,173	13,382	4,407	158,647	610	21,951	4,407	10,449
May	0	0	0	0	5,893	1,167	3,385	2,432	11,712	2,969	106,885	630	22,683	2,969	10,203
June	0	0	0	0	5,703	1,130	3,275	2,354	11,334	2,873	103,437	610	21,951	2,873	9,993
July	0	0	0	0	5,893	1,167	3,385	2,432	11,712	2,969	106,885	630	22,683	2,969	10,203
August	0	0	0	0	5,893	1,167	3,385	2,432	11,712	2,969	106,885	630	22,683	2,969	10,203
September	0	0	0	456	5,703	1,130	3,275	2,354	11,334	2,873	103,437	610	21,951	2,873	10,449
Annual	0	0	0	3,720	69,389	26,327	75,855	43,117	235,455	55,576	2,000,727	14,789	532,417	55,576	171,978

DAILY NUTRIENT PRODUCTION

Type of Animal	Pounds/Day of Nutrients from LIQUIDS				Pounds/Day of Nutrients from SOLIDS				Pounds/Day of Nutrients from GRAZING			
	N	P ₂ O ₅	K ₂ O	Solids	N	P ₂ O ₅	K ₂ O	Solids	N	P ₂ O ₅	K ₂ O	Solids
MILKER (Holstein)	97.20	38.91	54.04	64.80	2.25	0.72	0.90	5.63	162.00	64.85	90.07	2.26
MILKER (DRY)	3.38	1.08	1.36	0.69	0.85	0.33	0.46	2.13	0.83	1.16	0.00	0.00
HEIFERS (12-24 Months)	1.28	0.50	0.69	0.00	6.83	2.01	2.15	0.00	0.00	0.00	0.00	0.00
CALVES (1-12 Months)	0.00	0.00	0.00	0.00	5.85	1.88	2.35	5.85	1.88	2.35	0.00	0.00
MILKER (DRY)	0.00	0.00	0.00	0.00	8.78	3.44	4.77	8.78	3.44	4.77	0.00	0.00
HEIFERS (12-24 Months)	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	0.00	0.00	0.00	0.00	0.00	0.00

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY NUTRIENT PRODUCTION

Month	Pounds of Nutrients from LIQUIDS			Pounds of Nutrients from SOLIDS			Pounds of Nutrients from GRAZING			Pounds of Nutrients going OFF-FARM			Total Pounds of Nutrients from ALL SOURCES		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
October	1,579	628	869	1,264	481	646	3,085	1,211	1,670	0	0	0	5,927	2,319	3,186
November	3,056	1,215	1,683	2,681	1,030	1,400	0	0	0	0	0	0	5,736	2,244	3,083
December	3,157	1,255	1,739	2,770	1,064	1,447	0	0	0	0	0	0	5,927	2,319	3,186
January	3,157	1,255	1,739	2,770	1,064	1,447	0	0	0	0	0	0	5,927	2,319	3,186
February	2,852	1,134	1,571	2,502	961	1,307	0	0	0	0	0	0	5,354	2,095	2,877
March	1,579	628	869	1,536	580	779	2,813	1,112	1,537	0	0	0	5,927	2,319	3,186
April	905	360	499	1,028	380	504	3,803	1,504	2,080	0	0	0	5,736	2,244	3,083
May	935	372	515	835	310	410	4,157	1,637	2,260	0	0	0	5,927	2,319	3,186
June	905	360	499	808	300	397	4,023	1,584	2,187	0	0	0	5,736	2,244	3,083
July	935	372	515	835	310	410	4,157	1,637	2,260	0	0	0	5,927	2,319	3,186
August	935	372	515	835	310	410	4,157	1,637	2,260	0	0	0	5,927	2,319	3,186
September	905	360	499	808	300	397	4,023	1,584	2,187	0	0	0	5,736	2,244	3,083
Annual	20,901	8,310	11,511	18,672	7,090	9,554	30,217	11,906	16,442	0	0	0	69,790	27,306	37,507

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

TANK		MONTHLY INFLOWS INTO TANK									
Tank Parameters	Value	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	
Storage Period, Days=	97	October	31	2,403	0	0	5,893	6,200	1,136	13,230	
Tank Diameter, Feet=	80	November	30	5,426	0	0	5,703	12,000	2,199	19,903	
		December	31	5,585	0	0	5,893	12,400	2,273	20,566	
Existing Storage, Cubic Feet=	42,124	January	31	5,279	0	0	5,893	12,400	2,273	20,566	
Surface Area of Existing Storage, SF=	0	February	28	4,191	0	0	5,323	11,200	2,053	18,576	
25 Year-24 Hour Storm Runoff, CF=	0	March	31	3,617	0	0	5,893	6,200	1,136	13,230	
Volume Needed, Cubic Feet=	87,345	April	30	2,056	0	0	5,703	3,561	610	9,874	
Design Volume, Cubic Feet=	45,221	May	31	678	0	0	5,893	3,680	630	10,203	
Is Tank Covered?	NO	June	30	4	0	0	5,703	3,561	610	9,874	
Tank Dimensions?	Circular	July	31	-950	0	0	5,893	3,680	630	10,203	
		August	31	-879	0	0	5,893	3,680	630	10,203	
		September	30	477	0	0	5,703	3,561	610	9,874	
		Annual	365	27,887	0	0	69,389	82,123	14,789	166,302	

1.0 Feet

Depth = 9 Feet

Minimum Freeboard = 1.0 Feet

25Yr-24Hr Storm Precipitation = 6 Inches

25Yr-24Hr Storm Runoff = 0 Cubic Feet

97 Day Precip - Evap = 41.25 Inches

Runoff from Normal Precipitation = 0 Cubic Feet

Washwater = 18731 Cubic Feet

Manure = 39413 Cubic Feet

Diameter = 80 Feet

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations

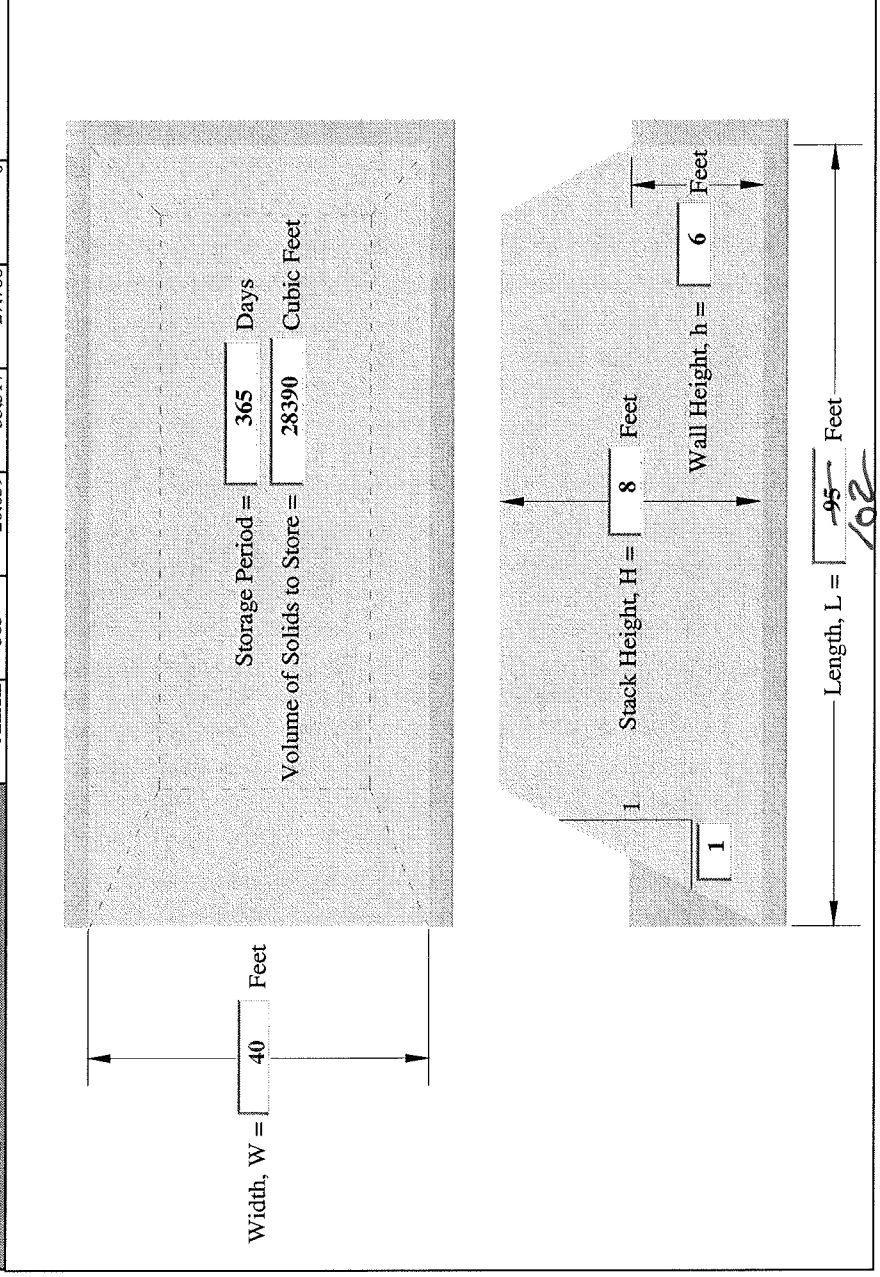
ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

MONTHLY SOLIDS VOLUME STACKED IN FACILITY

Solids Storage Facility Parameters	Value	Month	Number of Days	Manure CF	Bedding CF	Solids to Store CF	Normal Runoff CF
Storage Period, Days=	365	October	31	1048	2,259	1,653	0
Stacking Width, W in Feet=	40	November	30	2804	4,196	3,500	0
Stacking Height, H in Feet=	8.00	December	31	2897	4,336	3,617	0
Wall Height, h in Feet=	6.00	January	31	2897	4,336	3,617	0
Stack Side Slope (X:1)=	1.00	February	28	2617	3,917	3,267	0
Existing Storage, Cubic Feet=	0	March	31	1934	3,274	2,604	0
Surface Area of Existing Storage, SF=	0	April	30	1558	2,849	2,203	0
25 Year-24 Hour Storm Runoff, CF=	0	May	31	872	2,097	1,485	0
Volume Needed, Cubic Feet=	28,390	June	30	844	2,030	1,437	0
Design Volume, Cubic Feet=	28,694	July	31	872	2,097	1,485	0
Is Facility Covered? YES		August	31	872	2,097	1,485	0
		September	30	844	2,030	1,437	0
		Annual	365	20,059	35,517	27,788	0



OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 55,576 cubic feet of solids generated from the operation it will take approximately 241 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		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
			Capacity Bushels	CF		PPM	Lbs/Ton						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	278	1.00	35.5	339	9	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 108 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						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	1,207	10.07	278	1.00	1.70	1.09	3.84	0.85
					►								
					►								
					►								

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

To apply		1,452,536 gallons of liquids generated from the operation it will take approximately				363 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		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	
					PPM	Lbs/1000Gal						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10,07	313	1.00	0.69	622	4.7	
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10,07	313	1.00	0.69	622	4.7	
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10,07	313	1.00	0.69	622	4.7	
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10,07	313	1.00	0.69	622	4.7	
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10,07	313	1.00	0.69	622	4.7	
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10,07	278	1.00	0.61	700	4.1	

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

Storage Facility	Annual Volume Production	Units	Concentration of Nutrients in Storage			
			N	P ₂ O ₅	K ₂ O	Units
Tank (Uncovered)	1,452,536	Gallons	10.07	4.86	6.74	lbs/ft ³ Gal
Solids Storage Facility (Roofed)	500	Tons	14.00	6.38	8.60	lbs/Ton

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TiliaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation	Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Dairy									
	Type of Storage Facility									
	Tank (Uncovered)	20,901	8,310	11,511	70%	85%	85%	14,631	7,063	9,784
Solids	Solids Storage Facility (Roofed)	18,672	7,090	9,554	75%	90%	90%	14,004	6,381	8,599
Grazing	NONE	30,217	11,906	16,442	100%	100%	100%	30,217	11,906	16,442

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	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Sprinkling	14,631	7,063	9,784	75%	100%	100%	10,973	7,063	9,784
Solids	Broadcast (Incorporated 7 or more days after application)	14,004	6,381	8,599	70%	100%	100%	9,803	6,381	8,599
Grazing	Grazing	30,217	11,906	16,442	85%	100%	100%	25,684	11,906	16,442

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location	Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Coast									
	Soil Drainage Class									
	Somewhat Poorly Drained	10,973	7,063	9,784	80%	100%	100%	8,778	7,063	9,784
Solids	Somewhat Poorly Drained	9,803	6,381	8,599	80%	100%	100%	7,842	6,381	8,599
Grazing	Somewhat Poorly Drained	25,684	11,906	16,442	80%	100%	100%	20,547	11,906	16,442
TOTAL								37,168	25,351	34,825

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

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
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	8%	702	2	6%	471	2	29%	5,939	19
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	8%	702	2	9%	706	2	8%	1,644	5
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	55%	4,828	15	56%	4,392	14	47%	9,657	31
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	19%	1,668	5	19%	1,490	5	13%	2,671	9
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	5%	439	1	5%	392	1	3%	616	2
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	5%	439	2	5%	392	1	0%	0	0
Off Farm			0%	0		0%	0		0%	0	
TOTALS	140.9		100%	8,778	28	100%	7,842	25	100%	20,547	66

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	311	192	265	313	99	260	-2	93	5
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	308	211	290	313	99	260	-5	112	30
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	280	193	266	313	99	260	-34	94	5
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	220	155	212	313	99	260	-93	56	-48
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	210	149	205	313	99	260	-103	50	-56
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	115	93	128	278	88	231	-163	5	-104
Off Farm											

CLIENT: TillaBay Farms Inc. Milking Operation T-102

ASSISTED BY: **Pedersen**

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=								Manure CF/D/AU	Annual			
				Nutrient Production				80					Days Confined	Days Grazed		
				(lbs./day/1000 lb. Animal Unit)		(lbs./day)		N	P	K	N				P	K
				N	P	K	N									
MILKER (Holstein)	▼	180	1,250	225.0	0.72	0.13	0.33	162.00	28.31	74.75	1.78	206	159			
MILKER (DRY)	▼	15	1,250	18.8	0.30	0.04	0.10	5.63	0.79	1.88	0.92	206	159			
HEIFERS (12-24 Months)	▼	8	1,000	8.0	0.27	0.05	0.12	2.13	0.36	0.96	0.90	151	214			
CALVES (1-12 Months)	▼	65	250	16.3	0.42	0.05	0.11	6.83	0.88	1.79	1.34	365	0			
	▼															
	▼															
	▼															
	▼															
	▼															
	▼															
Totals/Averages-		268	938	268.0	0.66	0.11	0.30	176.6	30.3	79.4	1.7					

GRAZING PERIOD

[illegible]

CLIENT: **TillaBay Farms Inc. Milking Operation T-102**
ASSISTED BY: **Pedersen**

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

WEATHER STATION		TILLAMOOK 1 W		▼
Month	25Yr-24Hr	6.00	Lot Runoff Factors as a Percent of Monthly Precipitation	
	Monthly Average in Inches		Paved	Unpaved
	Precipitation	Evaporation		
October	7.16	1.42	50%	20%
November	13.71	0.75	60%	25%
December	13.94	0.60	60%	25%
January	13.09	0.48	60%	25%
February	10.79	0.78	50%	25%
March	9.90	1.26	45%	15%
April	6.81	1.90	40%	15%
May	4.84	3.22	40%	10%
June	3.41	3.40	35%	10%
July	1.64	3.91	30%	0%
August	1.42	3.52	40%	10%
September	3.68	2.54	45%	15%
Annual	90.39	23.78		

AREAS CONTRIBUTING RUNOFF TO LIQUID STORAGE FACILITY

[illegible]

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- per Day	Total Water Use per Day, Gallons	Total Water Use per Day, Cubic Feet
Animal Washwater	180.0	2	0.20	72	9.6
Equipment Wash		2	650.00	1300	173.8
Flushwater		0	0.00	0	0.0
Miscellaneous		2	25.00	50	6.7
Total				1422	190.1

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
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	▼ 30 %	Ton	18.00	313	99	260
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	▼ 30 %	Ton	18.00	313	99	260
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	▼ 30 %	Ton	18.00	313	99	260
			▼					
			▼					
			▼					
			▼					
			▼					
			▼					
Off Farm			▼					

CLIENT: **TillaBay Farms Inc. Milking Operation T-102**

ASSISTED BY: **Pedersen**

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

BEDDING VOLUME

[illegible]

SOLIDS SEPARATION FACTOR

[illegible]

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

2/12/2013

Version 3.6

CLIENT: TillaBay Farms Inc. Milking Operation T-102

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

Month	Runoff in Cubic Feet			Facility Water Use Cubic Feet	Manure		Bedding		Solids Separated		Solids in Liquids		Total Solids		Total Liquids Cubic Feet
	Roof Area Square Feet	Unpaved Lot Area Square Feet	Silage Pit Surface Area, SF		Solids Cubic Feet	Liquids Cubic Feet	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Pounds	
October	0	0	401	5,893	1,512	5,735	2,836	16,781	3,307	119,035	1,136	40,907	3,307	40,907	13,631
November	0	0	381	5,703	2,274	11,101	3,676	27,947	3,933	141,586	2,199	79,175	3,933	79,175	20,684
December	0	0	401	5,893	2,350	11,471	3,798	28,878	4,064	146,306	2,273	81,814	4,064	81,814	20,967
January	0	0	401	5,893	2,350	11,471	3,798	28,878	4,064	146,306	2,273	81,814	4,064	81,814	20,967
February	0	0	362	5,323	2,122	10,361	3,430	26,083	3,671	132,147	2,053	73,897	3,671	73,897	20,136
March	0	0	401	5,893	1,512	5,735	2,836	16,781	3,307	119,035	1,136	40,907	3,307	40,907	13,631
April	0	0	381	5,703	1,130	3,275	2,354	11,334	2,873	103,437	610	21,951	2,873	21,951	10,374
May	0	0	0	5,893	1,167	3,385	2,432	11,712	2,969	106,885	630	22,683	2,969	22,683	10,203
June	0	0	0	5,703	1,130	3,275	2,354	11,334	2,873	103,437	610	21,951	2,873	21,951	9,993
July	0	0	0	5,893	1,167	3,385	2,432	11,712	2,969	106,885	630	22,683	2,969	22,683	10,203
August	0	0	0	5,893	1,167	3,385	2,432	11,712	2,969	106,885	630	22,683	2,969	22,683	10,203
September	0	0	381	5,703	1,130	3,275	2,354	11,334	2,873	103,437	610	21,951	2,873	21,951	10,374
Annual	0	0	3,111	69,389	19,010	75,855	34,730	214,489	39,872	1,435,381	14,789	532,417	39,872	532,417	171,369

DAILY NUTRIENT PRODUCTION

Type of Animal	Pounds/Day of Nutrients from LIQUIDS			Pounds/Day of Nutrients from SOLIDS			Pounds/Day of Nutrients from GRAZING		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
MILKER (Holstein)	97.20	38.91	54.04	64.80	25.94	36.03	162.00	64.85	90.07
MILKER (DRY)	3.38	1.08	1.36	2.25	0.72	0.90	5.63	1.80	2.26
HEIFERS (12-24 Months)	1.28	0.50	0.69	0.85	0.33	0.46	2.13	0.83	1.16
CALVES (1-12 Months)	0.00	0.00	0.00	6.83	2.01	2.15	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	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

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Milking Operation T-102

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY NUTRIENT PRODUCTION

Month	Pounds of Nutrients from LIQUIDS			Pounds of Nutrients from SOLIDS			Pounds of Nutrients from GRAZING			Pounds of Nutrients going OFF-FARM			Total Pounds of Nutrients from ALL SOURCES		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
October	1,579	628	869	1,264	481	646	2,631	1,046	1,449	0	0	0	5,474	2,154	2,965
November	3,056	1,215	1,683	2,242	870	1,186	0	0	0	0	0	0	5,297	2,085	2,869
December	3,157	1,255	1,739	2,317	899	1,226	0	0	0	0	0	0	5,474	2,154	2,965
January	3,157	1,255	1,739	2,317	899	1,226	0	0	0	0	0	0	5,474	2,154	2,965
February	2,852	1,134	1,571	2,092	812	1,107	0	0	0	0	0	0	4,944	1,946	2,678
March	1,579	628	869	1,264	481	646	2,631	1,046	1,449	0	0	0	5,474	2,154	2,965
April	905	360	499	808	300	397	3,584	1,425	1,974	0	0	0	5,297	2,085	2,869
May	935	372	515	835	310	410	3,703	1,472	2,039	0	0	0	5,474	2,154	2,965
June	905	360	499	808	300	397	3,584	1,425	1,974	0	0	0	5,297	2,085	2,869
July	935	372	515	835	310	410	3,703	1,472	2,039	0	0	0	5,474	2,154	2,965
August	935	372	515	835	310	410	3,703	1,472	2,039	0	0	0	5,474	2,154	2,965
September	905	360	499	808	300	397	3,584	1,425	1,974	0	0	0	5,297	2,085	2,869
Annual	20,901	8,310	11,511	16,425	6,274	8,460	27,125	10,783	14,937	0	0	0	64,451	25,366	34,908

CLIENT: TillaBay Farms Inc. Milking Operation T-102
 ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

TANK

MONTHLY INFLOWS INTO TANK

Tank Parameters	Value	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
Storage Period, Days=	97	October	31	2,403	0	0	5,893	6,200	1,136	13,230
Tank Diameter, Feet=	80	November	30	5,426	0	0	5,703	12,000	2,199	19,903
		December	31	5,585	0	0	5,893	12,400	2,273	20,566
Existing Storage, Cubic Feet=	42,124	January	31	5,279	0	0	5,893	12,400	2,273	20,566
Surface Area of Existing Storage, SF=	0	February	28	4,191	0	0	5,323	11,200	2,053	18,576
25 Year-24 Hour Storm Runoff, CF=	0	March	31	3,617	0	0	5,893	6,200	1,136	13,230
Volume Needed, Cubic Feet=	87,097	April	30	2,056	0	0	5,703	3,561	610	9,874
Design Volume, Cubic Feet=	44,973	May	31	678	0	0	5,893	3,680	630	10,203
Is Tank Covered?	NO	June	30	4	0	0	5,703	3,561	610	9,874
Tank Dimensions?	Circular	July	31	-950	0	0	5,893	3,680	630	10,203
		August	31	-879	0	0	5,893	3,680	630	10,203
		September	30	477	0	0	5,703	3,561	610	9,874
		Annual	365	27,887	0	0	69,389	82,123	14,789	166,302

Addition Liquid Waste Storage Tanks
 20'x8' below ground
 35'x7.5' below ground
 40'x12'x5' below ground
 Tank 101
 50'x60'x10' below ground

1.0 Feet

Depth = 8.95 Feet

Minimum Freeboard = 1.0 Feet

25Yr-24Hr Storm Precipitation =	6	Inches
25Yr-24Hr Storm Runoff =	0	Cubic Feet
97 Day Precip - Evap =	41.25	Inches
Runoff from Normal Precipitation =	0	Cubic Feet
Washwater =	18731	Cubic Feet
Manure =	39413	Cubic Feet

Diameter = 80 Feet

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Milking Operation T-102

ASSISTED BY: Pedersen

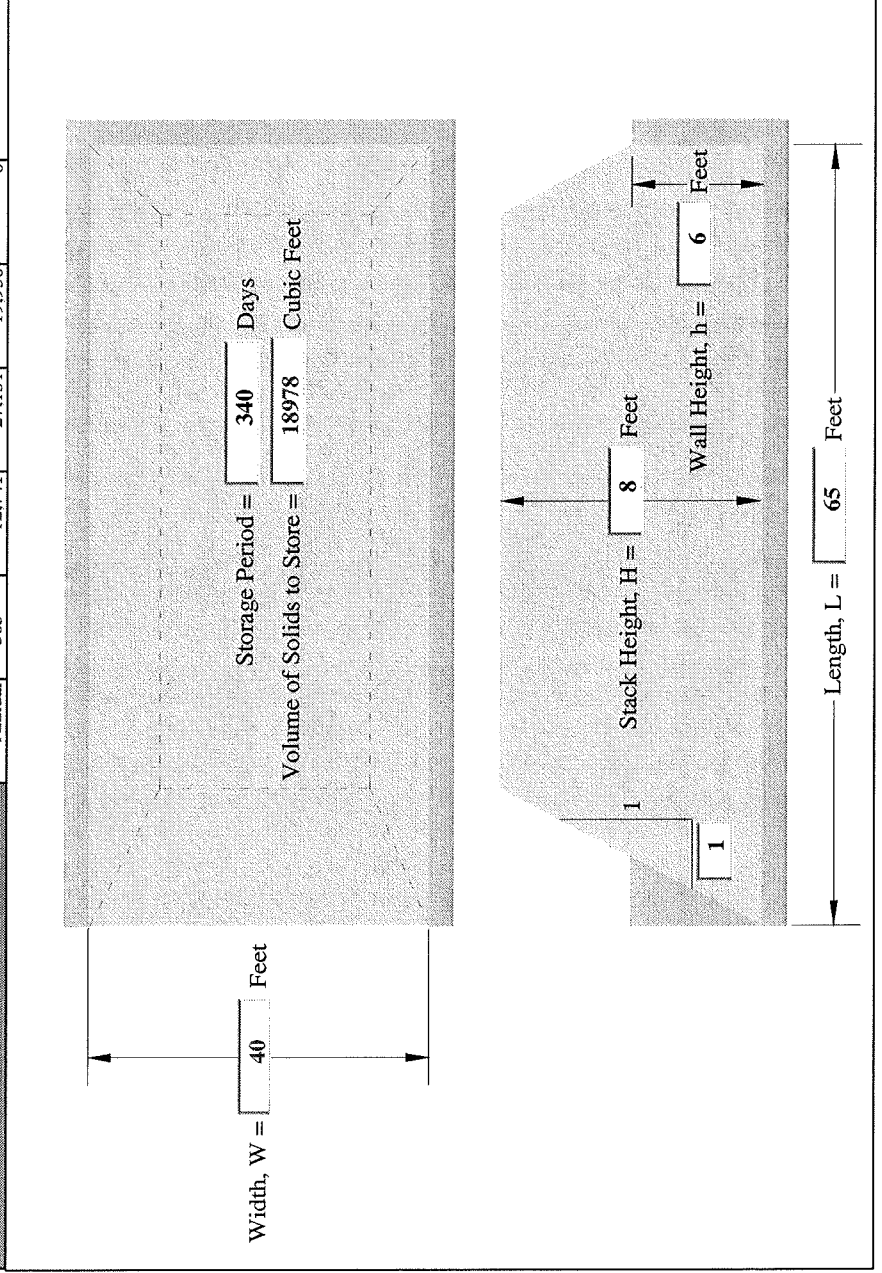
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

MONTHLY SOLIDS VOLUME STACKED IN FACILITY

Solids Storage Facility Parameters	Value	Month	Number of Days	Manure CF	Bedding CF	Solids to Store CF	Normal Runoff CF
Storage Period, Days=	340	October	31	1048	2,259	1,653	0
Stacking Width, W in Feet=	40	November	30	1375	2,558	1,966	0
Stacking Height, H in Feet=	8.00	December	31	1420	2,644	2,032	0
Wall Height, h in Feet=	6.00	January	31	1420	2,644	2,032	0
Stack Side Slope (X:1)=	1.00	February	28	1283	2,388	1,835	0
Existing Storage, Cubic Feet=	0	March	31	1048	2,259	1,653	0
Surface Area of Existing Storage, SF=	0	April	30	844	2,030	1,437	0
25 Year-24 Hour Storm Runoff, CF=	0	May	31	872	2,097	1,485	0
Volume Needed, Cubic Feet=	18,978	June	30	844	2,030	1,437	0
Design Volume, Cubic Feet=	19,214	July	31	872	2,097	1,485	0
Is Facility Covered? YES	▼	August	31	872	2,097	1,485	0
		September	30	844	2,030	1,437	0
		Annual	365	12,741	27,131	19,936	0

Additional solid manure
Storage Facilities
35' x 65' x 6'
25' x 60' x 6'



OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Milking Operation T-102

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 39,872 cubic feet of solids generated from the operation it will take approximately 173 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						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	8,582	17.16	313	1.00	43.4	277	10	36
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	8,582	17.16	313	1.00	43.4	277	10	36
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	8,582	17.16	313	1.00	43.4	277	10	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 108 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						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	111	0.93	313	1.00	27.62	1.09	62.47	0.05
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	111	0.93	313	1.00	27.62	1.09	62.47	0.05
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	111	0.93	313	1.00	27.62	1.09	62.47	0.05

CLIENT: TillaBay Farms Inc. Milking Operation T-102
ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

[illegible]

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

	Annual Volume Production	Concentration of Nutrients in Storage			
		N	P ₂ O ₅	K ₂ O	Units
Storage Facility					
Tank (Uncovered)	1,452,536	10.07	4.86	6.74	lbs/4 Gal
Solids Storage Facility (Roofed)	359	17.16	7.87	10.61	lbs/Ton

CLIENT: TillaBay Farms Inc. Milking Operation T-102

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation	Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Dairy									
	Type of Storage Facility									
	Tank (Uncovered)	20,901	8,310	11,511	70%	85%	85%	14,631	7,063	9,784
Solids	Solids Storage Facility (Roofed)	16,425	6,274	8,460	75%	90%	90%	12,319	5,646	7,614
Grazing	NONE	27,125	10,783	14,937	100%	100%	100%	27,125	10,783	14,937

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	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Sprinkling	14,631	7,063	9,784	75%	100%	100%	10,973	7,063	9,784
Solids	Broadcast (Incorporated 7 or more days after application)	12,319	5,646	7,614	70%	100%	100%	8,623	5,646	7,614
Grazing	Grazing	27,125	10,783	14,937	85%	100%	100%	23,056	10,783	14,937

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location	Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Coast									
	Soil Drainage Class									
	Poorly Drained	10,973	7,063	9,784	60%	100%	100%	6,584	7,063	9,784
Solids	Poorly Drained	8,623	5,646	7,614	60%	100%	100%	5,174	5,646	7,614
Grazing	Poorly Drained	23,056	10,783	14,937	60%	100%	100%	13,834	10,783	14,937
							TOTAL-	25,591	23,492	32,335

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

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
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	23%	1,514	5	23%	1,190	4	23%	3,182	10
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	10%	658	2	10%	517	2	10%	1,383	4
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	67%	4,411	14	67%	3,467	11	67%	9,268	30
Off Farm			0%	0		0%	0		0%	0	
TOTALS-	100.3		100%	6,584	21	100%	5,174	17	100%	13,834	44

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Milking Operation T-102
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	257	236	325	313	99	260	-56	137	64
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	258	237	327	313	99	260	-55	138	66
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	254	233	321	313	99	260	-59	134	61
Off Farm											

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101

ASSISTED BY: **Pedersen**

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

ANIMAL INVENTORY

Type of Animal	Number of Animals	Average Weight (lbs.)	Animal Units (1,000 lb.)	Nutrient Production						Manure CF/D/AU	Annual	
				(lbs./day/1000 lb. Animal Unit)			(lbs./day)				Days Confined	Days Grazed
				N	P	K	N	P	K			
MILKER (DRY)	15	1,300	19.5	0.30	0.04	0.10	5.85	0.82	1.95	0.92	154	211
HEIFERS (12-24 Months)	30	1,100	33.0	0.27	0.05	0.12	8.78	1.50	3.96	0.90	154	211
Totals/Averages-	45	1,200	52.5	0.28	0.04	0.11	14.6	2.3	5.9	0.9		

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 (DRY)	100%	0%	0%	0%	0%	40%	50%	100%	100%	100%	100%	100%	
	15	15	15	15	15	15	15	15	15	15	15	15	135
HEIFERS (12-24 Months)	100%	0%	0%	0%	0%	40%	50%	100%	100%	100%	100%	100%	
	30	30	30	30	30	30	30	30	30	30	30	30	228
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CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101

ASSISTED BY: **Pedersen**

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

AREAS CONTRIBUTING RUNOFF TO LIQUID STORAGE FACILITY

[illegible]

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- per Day	Total Water Use per Day, Gallons	Total Water Use per Day, Cubic Feet
Animal Washwater	0.0	0	0.00	0	0.0
Equipment Wash		0	0.00	0	0.0
Flushwater		0	0.00	0	0.0
Miscellaneous		0	0.00	0	0.0
Total>>>>	>>>>	>>>>	>>>>	0	0.0

CROP DATA

Field Number	Acres	Crop	Percent Dry Matter (DM)	Yield Units	Target Yield	Nutrients Removed in Pounds per Acre		
						Nitrogen N	Phosphorous P ₂ O ₅	Potassium K ₂ O
T-101 1	7.8	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
2	18.7	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	18.00	313	99	260
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	▼	Ton	6.00	278	88	231
			▼					
			▼					
			▼					
			▼					
			▼					
Off Farm			▼					

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

BEDDING VOLUME

[illegible]

SOLIDS SEPARATION FACTOR

Type of Animal	Type of Separator	Separation Factor %	Volume of Solids Separated CF/Day	Volume of Liquids in Solids 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 (DRY)	Dry Scrape System	▶ 100%	38	0	0	0	18	36	1,376
HEIFERS (12-24 Months)	Dry Scrape System	▶ 100%	64	0	0	0	30	36	2,305
		▶							
		▶							
		▶							
		▶							
		▶							
		▶							
		▶							
Total Solids>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	102	0	0	0	48		3,681

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

Month	Runoff in Cubic Feet				Facility		Manure		Bedding		Solids Separated		Solids in Liquids		Total Solids	
	Roof Area	Paved	Unpaved	Silage Pit	Water Use	Cubic Feet	Solids	Liquids	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Cubic Feet
	Square Feet	Slab Area	Lot Area	Surface Area, SF												
October	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November	0	0	0	0	0	0	1,429	0	1,638	4,095	3,067	110,419	0	0	3,067	0
December	0	0	0	0	0	0	1,477	0	1,693	4,232	3,169	114,100	0	0	3,169	0
January	0	0	0	0	0	0	1,477	0	1,693	4,232	3,169	114,100	0	0	3,169	0
February	0	0	0	0	0	0	1,334	0	1,529	3,822	2,863	103,058	0	0	2,863	0
March	0	0	0	0	0	0	886	0	1,016	2,539	1,902	68,460	0	0	1,902	0
April	0	0	0	0	0	0	715	0	819	2,048	1,534	55,210	0	0	1,534	0
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual	0	0	0	0	0	0	7,318	0	8,387	20,966	15,704	565,346	0	0	15,704	0

DAILY NUTRIENT PRODUCTION

Type of Animal	Pounds/Day of Nutrients from LIQUIDS				Pounds/Day of Nutrients from SOLIDS				Pounds/Day of Nutrients from GRAZING			
	N	P ₂ O ₅	K ₂ O	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	K ₂ O
	0.00	0.00	0.00		5.85	1.88			5.85	1.88		
MILKER (DRY)	0.00	0.00	0.00	0.00	8.78	3.44	4.77	8.78	3.44	4.77	8.78	4.77
HEIFERS (12-24 Months)	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	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

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101

ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY NUTRIENT PRODUCTION

Month	Pounds of Nutrients from LIQUIDS			Pounds of Nutrients from SOLIDS			Pounds of Nutrients from GRAZING			Pounds of Nutrients going OFF-FARM			Total Pounds of Nutrients from ALL SOURCES		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
October	0	0	0	0	0	0	453	165	221	0	0	0	453	165	221
November	0	0	0	439	159	214	0	0	0	0	0	0	439	159	214
December	0	0	0	453	165	221	0	0	0	0	0	0	453	165	221
January	0	0	0	453	165	221	0	0	0	0	0	0	453	165	221
February	0	0	0	410	149	199	0	0	0	0	0	0	410	149	199
March	0	0	0	272	99	132	181	66	88	0	0	0	453	165	221
April	0	0	0	219	80	107	219	80	107	0	0	0	439	159	214
May	0	0	0	0	0	0	453	165	221	0	0	0	453	165	221
June	0	0	0	0	0	0	439	159	214	0	0	0	439	159	214
July	0	0	0	0	0	0	453	165	221	0	0	0	453	165	221
August	0	0	0	0	0	0	453	165	221	0	0	0	453	165	221
September	0	0	0	0	0	0	439	159	214	0	0	0	439	159	214
Annual	0	0	0	2,247	817	1,094	3,092	1,124	1,505	0	0	0	5,339	1,940	2,599

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101

ASSISTED BY: Pedersen

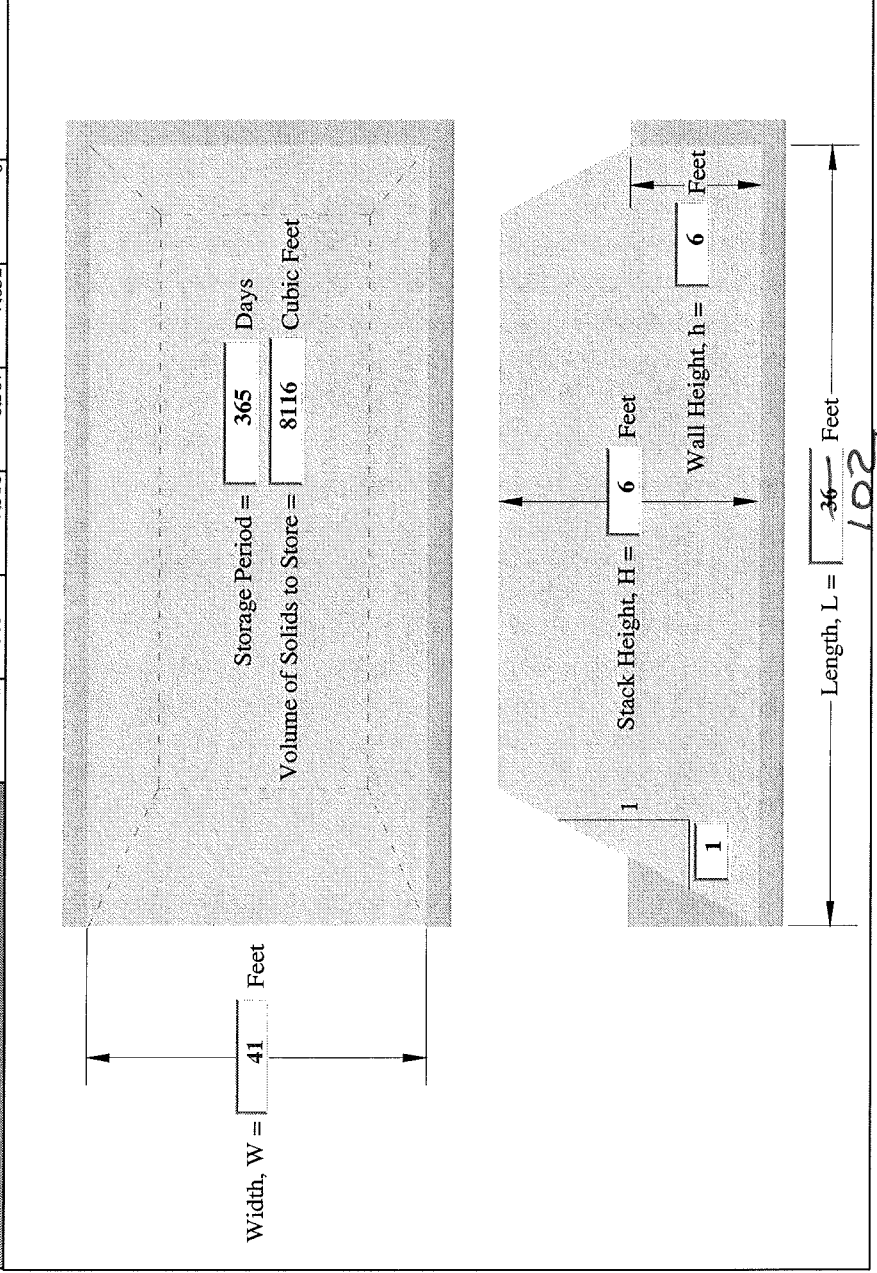
Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

MONTHLY SOLIDS VOLUME STACKED IN FACILITY

Solids Storage Facility Parameters	Value	Month	Number of Days	Manure CF	Bedding CF	Solids to Store CF	Normal Runoff CF
Storage Period, Days=	365	October	31	0	0	0	0
Stacking Width, W in Feet=	41	November	30	1429	1,638	1,534	0
Stacking Height, H in Feet=	6.00	December	31	1477	1,693	1,585	0
Wall Height, h in Feet=	6.00	January	31	1477	1,693	1,585	0
Stack Side Slope (X:1)=	1.00	February	28	1334	1,529	1,431	0
Existing Storage, Cubic Feet=	0	March	31	886	1,016	951	0
Surface Area of Existing Storage, SF=	0	April	30	715	819	767	0
25 Year-24 Hour Storm Runoff, CF=	0	May	31	0	0	0	0
Volume Needed, Cubic Feet=	8,116	June	30	0	0	0	0
Design Volume, Cubic Feet=	8,118	July	31	0	0	0	0
Is Facility Covered? YES	▼	August	31	0	0	0	0
		September	30	0	0	0	0
		Annual	365	7,318	8,387	7,852	0



OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 15,704 cubic feet of solids generated from the operation it will take approximately 68 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						
T-101 1	7.8	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	2,981	5.96	313	1.00	93.8	128	23	36
2	18.7	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	2,981	5.96	313	1.00	93.8	128	23	36
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	2,981	5.96	313	1.00	93.8	128	23	36
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	2,981	5.96	278	1.00	83.4	144	20	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

To apply 326,100 gallons of liquids generated from the operation it will take approximately 18 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						
T-101 1	7.8	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	0	0.00	313	1.00		1.45	#VALUE!	#VALUE!
2	18.7	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	0	0.00	313	1.00		1.45	#VALUE!	#VALUE!
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/4 Circle	0	0.00	313	1.00		2.91	#VALUE!	#VALUE!
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	0	0.00	278	1.00		1.45	#VALUE!	#VALUE!

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101
ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

To apply 326,100 gallons of liquids generated from the operation it will take approximately 82 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		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
					PPM	Lbs/1000Gal					
T-101 1	7.8	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	0	0.00	313	1.00		#VALUE!	#VALUE!
2	18.7	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	0	0.00	313	1.00		#VALUE!	#VALUE!
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	0	0.00	313	1.00		#VALUE!	#VALUE!
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	0	0.00	278	1.00		#VALUE!	#VALUE!

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

Storage Facility	Annual Volume Production	Units	Concentration of Nutrients in Storage			
			N	P2O5	K2O	Units
	326,100	Gallons	0.00	0.00	0.00	lbs/4 Gal
Solids Storage Facility (Roofed)	141	Tons	5.96	2.60	3.48	lbs/Ton

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation		Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
	Dairy	►	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Tank (Covered)	►	0	0	0	80%	90%	90%	0	0	0
Solids	Solids Storage Facility (Roofed)	►	2,247	817	1,094	75%	90%	90%	1,685	735	984
Grazing	NONE	►	3,092	1,124	1,505	100%	100%	100%	3,092	1,124	1,505

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	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	▼	0	0	0						
Solids	▼	1,685	735	984	75%	100%	100%	0	0	0
Grazing	▼	3,092	1,124	1,505	85%	100%	100%	2,629	1,124	1,505

NUTRIENTS AVAILABLE AFTER DENTRIFICATION

Nutrient Source	Location		Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
	Coast	Soil Drainage Class	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids											
		Somewhat Poorly Drained	►	0	0	80%	100%	100%	0	0	0
Solids											
		Somewhat Poorly Drained	►	1,180	735	80%	100%	100%	944	735	984
Grazing											
		Somewhat Poorly Drained	►	2,629	1,124	80%	100%	100%	2,103	1,124	1,505
									3,046	1,859	2,490
								TOTAL			

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

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
T-101 1	7.8	Perennial Hay/Pasture(Med-High Intensity)	0%	0	0	20%	185	1	23%	484	2
2	18.7	Perennial Hay/Pasture(Med-High Intensity)	0%	0	0	47%	443	1	56%	1,178	4
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	0%	0	0	17%	164	1	21%	442	1
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	0%	0	0	16%	152	1	0%	0	0
Off Farm			100%	0	0	0%	0		0%	0	
TOTALS-	40.6		100%	0	0	100%	944	3	100%	2,103	7

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. Dry Cow/Heifer Operation T-101
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre
T-101 1	7.8	Perennial Hay/Pasture(Med-High Intensity)	86	52	69	313	99	260	-227	-47	-191
2	18.7	Perennial Hay/Pasture(Med-High Intensity)	87	52	70	313	99	260	-227	-47	-190
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	88	53	71	313	99	260	-225	-46	-190
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	21	16	22	278	88	231	-257	-72	-209
Off Farm											

DATE: March 07, 2011
REPORT: S 9441
GROWER: TILLA-BAY FARMS, INC.
ADDRESS: 620 FENK ROAD, TILLAMOOK, OR 97141
SAMPLED:
FIELD: 1,2,3
CROP: PASTURE

FAX TO CLIENT: 503/842-5627

COPY



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323 Sixth St. • P.O. Box 1350 • Umatilla, OR 97882
Ph: 541-922-4894 • 800-537-1129 • Fax: 541-922-5496

SOIL ANALYSIS REPORT

Lab No.	Depth Foot	pH	S.Salt mmbos	O.M. %	P ppm	K ppm	Ca meq	Mg meq	NITROGEN				S ppm	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	CEC meq	Na meq	Total Bases	Base Sat.%	SMP Buf.pH	MOISTURE		
									NO3 #/A	NH4 #/A														Total	Avail. Inches	TKN %
4641	1	5.6			39	1963	15.8	6.7	330	275											27.5	6.0				

TOTAL BROADCAST FERTILITY NEEDS:

NITROGEN: LBS PER ACRE N
PHOSPHORUS: LBS PER ACRE P205
POTASSIUM: LBS PER ACRE K2O
SULFUR: LBS PER ACRE ACTUAL S
BORON: LBS PER ACRE ACTUAL B
ZINC: LBS PER ACRE ACTUAL Zn
MAGNESIUM: LBS PER ACRE ACTUAL Mg
OTHERS:

TOTAL: 330 275

TOTAL INCHES:

YIELD GOAL/ACRE:

ACRES: PREVIOUS CROP:
GYPSUM REQUIREMENT:
LIME REQUIREMENT:
DOLOMITE REQUIREMENT:

TONS PER ACRE 6-INCHES
TONS PER ACRE 6-INCHES
TONS PER ACRE 6-INCHES

SOIL TEXTURE ANALYSIS:

CLASS:
% SAND:
% SILT:
% CLAY:

PREPLANT:

SIDEDRESS:

PLANT TISSUE ANALYSIS REPORT

Lab No.	FIELD: DESCRIPTION:	Total N %	Nitrate N ppm	S %	P %	K %	Ca %	Mg %	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	Chloride ppm	Na ppm	Moisture %
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PHOSPHORUS INDEX WORKSHEET – WESTERN OREGON

Producer: Tillabay Farms Inc.

County: Tillamook

Tract No. 102

Field No(s). 1,2,3

Date: March 7, 2011

Soil Map Unit(s): 104ACoquille, Brenner-Nehalem association, 0-3% slopes

Soil Test P: 39 ppm

Lab. Method: Weak Bray

Sample Depth: 1 ft

Crop Rotation: Permanent Pasture

Nutrient Application Method(s) Solid Manure Spreader, Manure Gun Traveler

Planner: Pedersen

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)	0	0
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)	0.75	0.75
Runoff Class	1.00	Negligible (0)	Very low or low (1.0)	Medium (2.0)	High (4.0)	Very High (8.0)	1.0	1.0
Flooding Frequency Class	0.75	None or very rare (0)	Rare (0.75)	Occasional (1.5)	Frequent (3.0)	Very Frequent (6.0)	0.75	0.75
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)	1.5	1.5
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)	0.5	0.5
Transport Factors Subtotal (TFS)							4.5	4.5

Tract 102 Fields 1,2,3

PHOSPHORUS LOSS RATING					Weighted Rating Value			
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned
Soil Test P – ppm (Bray P1)	1.00	(Soil Test P – 39) / 10 (39 - 40) x .10 = 0 Soil Test P Assign 0 points if Soil Test P < 40 ppm					0	0
Commercial P Fertilizer Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $\text{lbs/ac P}_2\text{O}_5$ $\times 0.02 =$					0	0
Commercial P Fertilizer Application Method	1.00	None Applied	Injected / banded deeper than 2 inches OR Incorporated within 5 days of application from March through September	Incorporated within 5 days of application from October through February OR Surface applied March through August	Incorporated more than 5 days after application OR Surface applied September through October	Surface applied November through February	0	0
Organic P Source Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $192 \times 0.02 = 3.84 \text{ lbs/ac P}_2\text{O}_5$					3.84	3.84
Organic P Source Application Method	1.00	None Applied	Injected deeper than 2 inches OR Incorporated within 5 days of application from March through September	Incorporated within 5 days of application from October through February OR Surface applied March through August	Incorporated more than 5 days after application OR Surface applied September through October	Surface applied November through February	2.0	2.0

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)	4.5	4.5
Source Factors Subtotal (SFS)	5.84	5.84
Total Rating Value (TFS + SFS)	10.34	10.34
Site Vulnerability Class	Low	Low

DATE: March 07, 2011 FAX TO CLIENT: 503/842-5627
 REPORT: S9441
 GROWER: TILLA-BAY FARMS, INC.
 ADDRESS: 620 FENK ROAD, TILLAMOOK, OR 97141
 SAMPLED:
 FIELD: 4
 CROP: PASTURE



Agri-Check
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 Ph: 541-922-4894 • 800-537-1129 • Fax: 541-922-5496

SOIL ANALYSIS REPORT

Lab No.	Depth Foot	pH	S.Salt mmhos	O.M. %	P ppm	K ppm	Ca meq	Mg meq	NITROGEN		S ppm	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	CEC meq	Na meq	Total Bases	Base Sat. %	SMP But.pH	MOISTURE		TKN %	Cl ppm
									NO3 #/A	NH4 #/A												Total Avail. Inches	%		
4642	1	5.6			54	1920	17.7	8.5	340	160												31.1	5.8		

 TOTAL BROADCAST FERTILITY NEEDS:

NITROGEN: LBS PER ACRE N
 PHOSPHORUS: LBS PER ACRE P205
 POTASSIUM: LBS PER ACRE K2O
 SULFUR: LBS PER ACRE ACTUAL S
 BORON: LBS PER ACRE ACTUAL B
 ZINC: LBS PER ACRE ACTUAL Zn
 MAGNESIUM: LBS PER ACRE ACTUAL Mg
 OTHERS:

TOTAL: 340 160
 YIELD GOAL/ACRE:
 ACRES:
 PREVIOUS CROP:
 LIME REQUIREMENT:
 DOLOMITE REQUIREMENT:
 TONS PER ACRE 6-INCHES
 TONS PER ACRE 6-INCHES
 TONS PER ACRE 6-INCHES

SIDEDRESS:

PLANT TISSUE ANALYSIS REPORT

Lab No.	FIELD: DESCRIPTION:	Total N %	Nitrate N ppm	S %	P %	K %	Ca %	Mg %	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	Chloride ppm	Na ppm	Moisture %
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Tract 102 Fields 1,2,3

Tract 102		Fields 1,2,3		PHOSPHORUS LOSS RATING						Weighted Rating Value	
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned			
Soil Test P – ppm (Bray P1)	1.00	(Soil Test P – 40 / 10 (54 - 40) X .10 = 1.4 Assign 0 points if Soil Test P < 40 ppm Soil Test P					1.4	1.4			
Commercial P Fertilizer Application Rate	1.00	lbs/ac P ₂ O ₅ x 0.02 lbs/ac P ₂ O ₅ _____ x 0.02 =						0	0		
Commercial P Fertilizer Application Method	1.00	None Applied	Injected / banded deeper than 2 inches OR Incorporated within 5 days of application from March through September	Incorporated within 5 days of application from October through February OR Surface applied March through August	Incorporated more than 5 days after application OR Surface applied September through October	Surface applied November through February					
		(0)	(1.0)	(2.0)	(4.0)	(8.0)	0	0			
Organic P Source Application Rate	1.00	lbs/ac P ₂ O ₅ x 0.02 211 x 0.02 = 4.22 lbs/ac P ₂ O ₅						4.22	4.22		
Organic P Source Application Method	1.00	None Applied	Injected deeper than 2 inches OR Incorporated within 5 days of application from March through September	Incorporated within 5 days of application from October through February OR Surface applied March through August	Incorporated more than 5 days after application OR Surface applied September through October	Surface applied November through February					
		(0)	(1.0)	(2.0)	(4.0)	(8.0)	2.0	2.0			

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)		4.5	4.5
Source Factors Subtotal (SFS)		7.62	7.62
Total Rating Value (TFS + SFS)		12.12	12.12
Site Vulnerability Class		Low	Low

Tilla Bay Farms

RUDY FENK
TR011

TILLAMOOK SERVICE CENTER
USDA - NRCS
TILLAMOOK COUNTY, OREGON

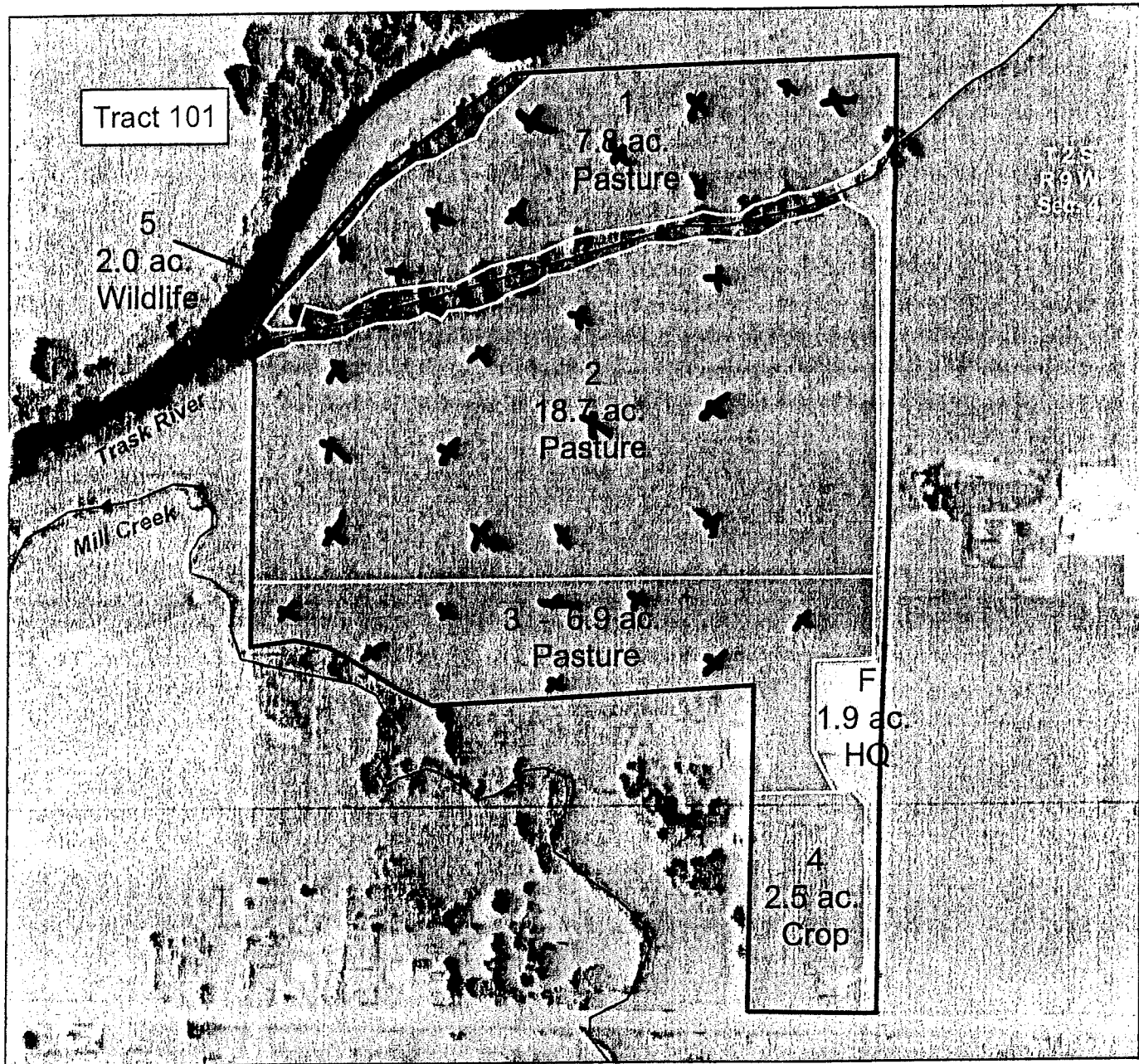
2006 Soil Test Sites

Tillamook SWCD

Approximate Acres: 39.8

Date: 3/13/2006

Conservation Plan Map



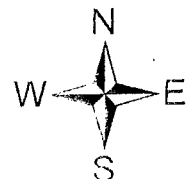
Legend

Tract Boundaries

Public Land Survey

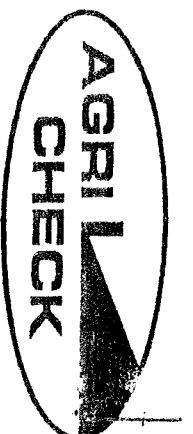
Planned Land Units

Open Water Course



50-APR-06
5/1/06

AGRI-CHECK, INC.
Agricultural Testing Laboratory
3223 Sixth St. - P.O. Box 1350
Umatilla, OR 97882
800-537-1129 * 541-922-4894



NOTE: East of Cascades Bicarb P & K extraction/SMP=1/4 SMP Buffer pH; West of Cascades Weak Bray P and Acetate K extractions. Fertility recommendations may change after application of gypsum or lime

Tract 101 Fields 1

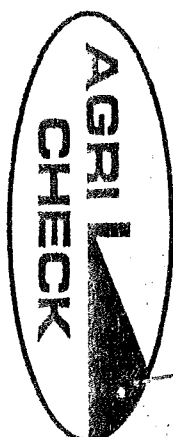
PHOSPHORUS LOSS RATING					Weighted Rating Value			
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned
Soil Test P – ppm (Bray P1)	1.00	(Soil Test P – 40) / 10 (15 - 40) X .10 = _____ Assign 0 points if Soil Test P < 40 ppm					0	0
Commercial P Fertilizer Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ _____ $\text{lbs/ac P}_2\text{O}_5 \times 0.02 =$ _____					0	0
Commercial P Fertilizer Application Method	1.00	None Applied	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	0
Organic P Source Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $147 \times 0.02 = 2.94$ $\text{lbs/ac P}_2\text{O}_5$					2.94	2.94
Organic P Source Application Method	1.00	None Applied	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)	2.0	2.0

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)	3.0
Source Factors Subtotal (SFS)	4.94
Total Rating Value (TFS + SFS)	7.94
Site Vulnerability Class	Low

DATE: March 24, 2006
REPORT: S5585
GROWER: RUDY & RUTH FENK
ADDRESS: 40 FENK RD, TILLAMOOK, OR 97141
SAMPLED:
FIELD: F-2 T-101
CROP:

AGRI-CHECK, INC.
Agricultural Testing Laboratory
323 Sixth St. - P.O. Box 1350
Umatilla, OR 97882
800-537-1129 * 541-922-4894



SOIL ANALYSIS REPORT

Lab No.	Depth Foot	pH	S.Salt mmbhos	O.M. %	P ppm	K ppm	Ca meq	Mg meq	NITROGEN										MOISTURE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
									NO3 #/A	NH4 #/A	S ppm	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	CEC meq	Na meq	Total Bases	Base Sat. %	SMP Buf.pH	Total %	TKN %	Avail. Inches	Cl ppm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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TOTAL BROADCAST FERTILITY NEEDS:

NITROGEN: LBS PER ACRE N
PHOSPHORUS: LBS PER ACRE P205
POTASSIUM: LBS PER ACRE K2O
SULFUR: LBS PER ACRE ACTUAL S
BORON: LBS PER ACRE ACTUAL B
ZINC: LBS PER ACRE ACTUAL Zn
MAGNESIUM: LBS PER ACRE ACTUAL Mg
OTHERS:

TOTALS:

YIELD GOAL/ACRE:
ACRES:
PREVIOUS CROP:
GYPSUM REQUIREMENT:
LIME REQUIREMENT:
DOLOMITE REQUIREMENT:
PREPLANT:

SIDEDRESS:

TOTAL INCHES:

SOIL TEXTURE ANALYSIS:

CLASS:
% SAND:
% SILT:
% CLAY:

PLANT TISSUE ANALYSIS REPORT

Lab No.	FIELD DESCRIPTION:	Total N %		Nitrate N ppm		S %		P %		K %		Ca %		Mg %		B ppm		Zn ppm		Mn ppm		Cu ppm		Fe ppm		Chloride ppm		Na ppm		Moisture %	

NOTE: East of Cascades Bicarb P & K extraction/SMP=1/4 SMP Buffer pH; West of Cascades Weak Bray P and Acetate K extractions. Fertility recommendations may change after application of gypsum or lime.

Producer: Tiliabay Farms Inc	County: Tillamook	Tract No. 101	Field No(s). 2	Date: 03/24/2006
Soil Map Unit(s): 80B Quillamook medial silt loam 0-7% slopes	Soil Test P: 18 ppm	Lab. Method: Weak Bray	Sample Depth: 6-12 inches	
Crop Rotation: Permanent Pasture	Nutrient Application Method(s) Manure spreader, Tank Wagon			
Planner: Cummings	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)	0	0
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)	0	0
Runoff Class	1.00	Negligible (0)	Very low or low (1.0)	Medium (2.0)	High (4.0)	Very High (8.0)	1.0	1.0
Flooding Frequency Class	0.75	None or very rare (0)	Rare (0.75)	Occasional (1.5)	Frequent (3.0)	Very Frequent (6.0)	0	0
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	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	0
Transport Factors Subtotal (TFS)							1.0	1.0

Tract 101 Fields 2

PHOSPHORUS LOSS RATING						Weighted Rating Value				
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned		
Soil Test P – ppm (Bray P1)	1.00	(Soil Test P – 40) / 10 (18 - 40) x .10 = _____ Assign 0 points if Soil Test P < 40 ppm						0	0	
Commercial P Fertilizer Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ _____ $\text{lbs/ac P}_2\text{O}_5 \times 0.02 =$ _____						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	0	
Organic P Source Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ _____ $\text{lbs/ac P}_2\text{O}_5 \times 0.02 = 2.94$							2.94	2.94
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)	2.0	2.0	

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)	1.0	1.0
Source Factors Subtotal (SFS)	4.94	4.94
Total Rating Value (TFS + SFS)	5.94	5.94
Site Vulnerability Class	Low	Low

Date: 03/24/2006

Sample Depth: 6-12 inches

Nutrient Application Method(s) Manure spreader, Tank Wagon

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)	0	0
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)	0	0
Runoff Class	1.00	Negligible (0)	Very low or low (1.0)	Medium (2.0)	High (4.0)	Very High (8.0)	1.0	1.0
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	1.5
Distance to Perennial Surface Waters / Buffer Widths	0.75	> 500 feet OR buffer > 30 ft. wide (or meets NFCS 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	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	0
Transport Factors Subtotal (TFS)							2.5	2.5

Tract 101 Fields 2

PHOSPHORUS LOSS RATING						Weighted Rating Value				
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned		
Soil Test P – ppm (Bray P-1)	1.00	(Soil Test P – 40) / 10 (18 - 40) x .10 = _____ Assign 0 points if Soil Test P < 40 ppm						0	0	
Commercial P Fertilizer Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $\frac{\text{lbs/ac P}_2\text{O}_5}{\text{lbs/ac P}_2\text{O}_5} \times 0.02 = \text{_____}$						0	0	
Commercial P Fertilizer Application Method	1.00	None Applied		Injected / banded deeper than 2 inches OR Incorporated within 5 days of application from March through September	Incorporated within 5 days of application from October through February OR Surface applied March through August	Incorporated more than 5 days after application OR Surface applied September through October	Surface applied November through February	0	0	
Organic P Source Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $\frac{\text{lbs/ac P}_2\text{O}_5}{\text{lbs/ac P}_2\text{O}_5} \times 0.02 = 2.94$							2.94	2.94
Organic P Source Application Method	1.00	None Applied		Injected deeper than 2 inches OR Incorporated within 5 days of application from March through September	Incorporated within 5 days of application from October through February OR Surface applied March through August	Incorporated more than 5 days after application OR Surface applied September through October	Surface applied November through February	2.0	2.0	

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)	2.5	2.5
Source Factors Subtotal (SFS)	4.94	4.94
Total Rating Value (TFS + SFS)	7.44	7.44
Site Vulnerability Class	low	low

DATE: March 24, 2006
 REPORT: S5585
 GROWER: RUDY & RUTH FENK
 ADDRESS: 40 FENK RD; TILLAMOOK, OR 97141
 SAMPLED:
 FIELD: F-3 T-101
 DROP:

AGRI-CHECK, INC.
 Agricultural Testing Laboratory
 323 Sixth St. - P.O. Box 1350
 Umatilla, OR 97882
 800.537.1129 * 541.922.4894



SOIL ANALYSIS REPORT

Lab No.	Depth Foot	pH	S.Salt mmhos	O.M. %	P ppm	K ppm	Ca meq	Mg meq	NITROGEN		S ppm	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	CEC meq	Na meq	Total Bases	Base Sat %	SMP	TKN %	Cl ppm
									NO3 #/A	NH4 #/A													
8448		5.8			9	478	10.0	1.9															
											7.2	0.1											13.1

TOTAL BROADCAST FERTILITY NEEDS:

NITROGEN: LBS PER ACRE N
 PHOSPHORUS: LBS PER ACRE P2O5
 POTASSIUM: LBS PER ACRE K2O
 SULFUR: LBS PER ACRE ACTUAL S
 BORON: LBS PER ACRE ACTUAL B
 ZINC: LBS PER ACRE ACTUAL Zn
 MAGNESIUM: LBS PER ACRE ACTUAL Mg
 OTHERS:

TOTALS: YIELD GOAL/ACRE:
 ACRES:
 PREVIOUS CROP:
 GYPSUM REQUIREMENT:
 LIME REQUIREMENT:
 DOLOMITE REQUIREMENT:

TONS PER ACRE 6-INCHES
 TONS PER ACRE 6-INCHES
 TONS PER ACRE 6-INCHES

SOIL TEXTURE ANALYSIS:
 CLASS:
 % SAND:
 % SILT:
 % CLAY:

COMMENTS:

SIDEDRESS:

PLANT TISSUE ANALYSIS REPORT

Lab No.	FIELD: DESCRIPTION:	Total N %	Nitrate N ppm	S %	P %	K %	Ca %	Mg %	B ppm	Zn ppm	Mn ppm	Cu ppm	Fe ppm	Chloride ppm	Na ppm	Moisture %

NOTE: East of Cascades Bicarb P & K extraction/SMP=1/4 SMP Buffer pH; West of Cascades Weak Bray P and Acetate K extractions. Fertility recommendations may change after application of gypsum or lime.

October 2001

Date: 03/24/2006

Sample Depth: 6-12 inches

Nutrient Application Method(s) Manure spreader, Tank Wagon

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)	0	0
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)	0	0
Runoff Class	1.00	Negligible (0)	Very low or low (1.0)	Medium (2.0)	High (4.0)	Very High (8.0)	1.0	1.0
Flooding Frequency Class	0.75	None or very rare (0)	Rare (0.75)	Occasional (1.5)	Frequent (3.0)	Very Frequent (6.0)	0	0
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	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	0
Transport Factors Subtotal (TFS)							1.0	1.0

Tract 101 Fields 3

PHOSPHORUS LOSS RATING					Weighted Rating Value			
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned
Soil Test P – ppm (Bray P1)	1.00	$(\text{Soil Test P} - 40) / 10$ $(9 - 40) \times .10 = \underline{\hspace{2cm}}$ Assign 0 points if Soil Test P < 40 ppm Soil Test P					0	0
Commercial P Fertilizer Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $\text{lbs/ac P}_2\text{O}_5 \times 0.02 = \underline{\hspace{2cm}}$					0	0
Commercial P Fertilizer Application Method	1.00	None Applied	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	0
Organic P Source Application Rate	1.00	$\text{lbs/ac P}_2\text{O}_5 \times 0.02$ $\text{lbs/ac P}_2\text{O}_5 \times 0.02 = \underline{\hspace{2cm}}$ $149 \times 0.02 = 2.98$					2.98	2.94
Organic P Source Application Method	1.00	None Applied	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)	2.0	2.0

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)	1.0	1.0
Source Factors Subtotal (SFS)	4.94	4.94
Total Rating Value (TFS + SFS)	5.94	5.94
Site Vulnerability Class	Low	Low

Tract 101 Fields 3

Tract 101		Fields 3		PHOSPHORUS LOSS RATING							Weighted Rating Value	
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned				
Soil Test P – ppm (Bray P-1)	1.00	(Soil Test P – 40) / 10 (9-40) x .10 = _____ Assign 0 points if Soil Test P < 40 ppm Soil Test P					0	0				
Commercial P Fertilizer Application Rate	1.00	lbs/ac P ₂ O ₅ x 0.02 _____ lbs/ac P ₂ O ₅ x 0.02 = _____					0	0				
Commercial P Fertilizer Application Method	1.00	None Applied	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	0				
Organic P Source Application Rate	1.00	lbs/ac P ₂ O ₅ x 0.02 _____ lbs/ac P ₂ O ₅ 149 x 0.02 = 2.98					2.98	2.98				
Organic P Source Application Method	1.00	None Applied	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)	2.0	2.0				

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)		5.0	5.0
Source Factors Subtotal (SFS)		4.98	4.98
Total Rating Value (TFS + SFS)		9.98	9.98
Site Vulnerability Class		Low	Low

Producer: Tiliabay Farms Inc	County: Tiliamook	Tract No. 101	Field No(s). 3	Date: 03/24/2006
Soil Map Unit(s): 74A Nehalem silt loam 0-3% slopes	Soil Test P: 9 ppm	Lab. Method: Weak Bray	Sample Depth: 6-12 inches	
Crop Rotation: Permanent Pasture		Nutrient Application Method(s) Manure spreader, Tank Wagon		
Planner: Cummings	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)	0	0
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)	0	0
Runoff Class	1.00	Negligible (0)	Very low or low (1.0)	Medium (2.0)	High (4.0)	Very High (8.0)	1.0	1.0
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	1.5
Distance to Perennial Surface Waters / Buffer Widths	0.75	> 500 feet OR buffer > 30 ft. wide (or meets NFCS 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	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	0
Transport Factors Subtotal (TFS)							2.5	2.5

Tract 101 Fields 3

Tract 101		Fields 3		PHOSPHORUS LOSS RATING						Weighted Rating Value	
SOURCE FACTORS	Factor Weight	None (0)	Low (1)	Medium (2)	High (4)	Very High (8)	Current	Planned			
Soil Test P – ppm (Bray P1)	1.00	(Soil Test P – 40) / 10 (9-40) x .10 = _____ Soil Test P Assign 0 points if Soil Test P < 40 ppm					0	0			
Commercial P Fertilizer Application Rate	1.00	lbs/ac P₂O₅ x 0.02 _____ lbs/ac P₂O₅ x 0.02 = _____					0	0			
Commercial P Fertilizer Application Method	1.00	None Applied	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	0			
Organic P Source Application Rate	1.00	lbs/ac P₂O₅ x 0.02 _____ 149 x 0.02 = 2.98					2.98	2.98			
Organic P Source Application Method	1.00	None Applied	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)	2.0	2.0			

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)		2.5	2.5
Source Factors Subtotal (SFS)		4.98	4.98
Total Rating Value (TFS + SFS)		7.48	7.48
Site Vulnerability Class		Low	Low

NUTRIENT MANAGEMENT DESIGN AND SPECIFICATIONS

Producer:	TillaBay Farms Inc. T-102, 101 All Op	Tract(s):	102	Field(s):	T102 1,2,3
Assisted by:	Pedersen	Date:	March 7, 2011		

PURPOSE (Check all that apply)			
Budget and supply for plant production	☒	Utilize manure/organic materials as a nutrient source	☒
Minimize agricultural non-point source pollution (water quality)	☒	Maintain or improve soil condition	☒

Table 1. Field Conditions and Recommendations

CROP SEQUENCE/ROTATION (circle current crop)							EXPECTED YIELD		
Perennial Hay/Pasture(Med-High Intensity)							18		
CURRENT SOIL TEST LEVELS (ppm or lb/ac)									
N		P			K		pH	S.O.M.%	EC
NA		39			1963		5.6		
RECOMMENDED NUTRIENTS/AMENDMENTS TO MEET EXPECTED YIELD									
N (lbs/ac)		P ₂ O ₅ (lbs/ac)		K ₂ O (lbs/ac)		LIME	Other		Other
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B	3-4 tons			
313		99		260					

Table 2. Nutrient Sources

Credits		N		P ₂ O ₅		K ₂ O	
		pounds per acre					
1. Nitrogen credits from previous legume crop		0					
2. Residual from long-term manure application		0					
3. Irrigation water		0		0		0	
4. Other (e.g., atmospheric deposition)		0		0		0	
5. Total Credits-		0		0		0	
Plant-Available Nutrients Applied to Field		N		P ₂ O ₅		K ₂ O	
(Circle column that is landuser's decision)		Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
6. Credits (from row 5, above)		0	0	0	0	0	0
7. Fertilizer	Starter						
	Other Commercial Fertilizer	21		0		0	
8. Manure / Organic Materials (Source-) Dairy		311	0	192	0	265	0
9. Subtotal (sum of lines 6, 7 and 8)		332	0	192	0	265	0
10. Nutrients Recommended (from Table 1)		313	0	99	0	260	0
11. Nutrient Status (subtract line 10 from line 9)		19	0	93	0	5	0
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.							
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.							

PLANNED NUTRIENT APPLICATIONS

Amount to be Applied (lb/ac)	N	313	P ₂ O ₅	99	K ₂ O	260
Method, Form, and Timing of Application						
The 1963 ppm of potassium in the soil is excessive. High potassium levels in the soil may cause livestock health problems. Recommend forage tests to evaluate the potassium level in the forage. The 39 ppm of phosphorus is medium. Recommend an additional 21 lbs of nitrogen be applied to achieve the 18 tons at 30% dry matter per acre per year. See attached letter from the Dairy Extension Agent. Manure should be applied in split applications. Apply 50-70 lbs of nitrogen per acre per application. No manure shall be applied to high risk runoff fields during the wet season. Apply nutrient material uniformly to the application areas. See attached Nutrient Specification Sheet, the Manure Distribution Sheet Section, for the manure application rates per field. Recommend soil test in mid September to mid October to evaluate how well the biosolid application rate matches the nitrogen needs of the forage. SEE ATTACHED WASTE SPECIFICATION SHEET FOR ADDITIONAL MANURE APPLICATION GUIDANCE.						

NUTRIENT MANAGEMENT DESIGN AND SPECIFICATIONS

Producer: TillaBay Farms Inc. T-102, 101 All Op	Tract(s): 102	Field(s): 4
Assisted by: Pedersen	Date: March 7, 2011	

PURPOSE (Check all that apply)			
Budget and supply for plant production	x	Utilize manure/organic materials as a nutrient source	x
Minimize agricultural non-point source pollution (water quality)	x	Maintain or improve soil condition	x

Table 1. Field Conditions and Recommendations

CROP SEQUENCE/ROTATION (circle current crop)					EXPECTED YIELD
Perennial Hay/Pasture(Med-High Intensity)					18
CURRENT SOIL TEST LEVELS (ppm or lb/ac)					
N	P	K	pH	S.O.M.%	EC
NA	54	1920	5.6		
RECOMMENDED NUTRIENTS/AMENDMENTS TO MEET EXPECTED YIELD					
N (lbs/ac)		P₂O₅ (lbs/ac)		K₂O (lbs/ac)	LIME
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
313		99		260	4-5 tons

Table 2. Nutrient Sources

Credits		N		P ₂ O ₅		K ₂ O	
		pounds per acre					
1. Nitrogen credits from previous legume crop		0					
2. Residual from long-term manure application		0					
3. Irrigation water		0		0		0	
4. Other (e.g., atmospheric deposition)		0		0		0	
5. Total Credits-		0		0		0	
Plant-Available Nutrients Applied to Field		N		P ₂ O ₅		K ₂ O	
(Circle column that is landuser's decision)		Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
6. Credits (from row 5, above)		0	0	0	0	0	0
7. Fertilizer	Starter						
	Other Commercial Fertilizer	22		0		0	
8. Manure / Organic Materials (Source-) Dairy		308	0	211	0	290	0
9. Subtotal (sum of lines 6, 7 and 8)		330	0	211	0	290	0
10. Nutrients Recommended (from Table 1)		313	0	99	0	260	0
11. Nutrient Status (subtract line 10 from line 9)		17	0	112	0	30	0
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.							
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.							

PLANNED NUTRIENT APPLICATIONS

Amount to be Applied (lb/ac)	N	P ₂ O ₅	K ₂ O
	313	197	271
Method, Form, and Timing of Application			
The 1920 ppm of potassium in the soil is excessive. High potassium levels in the soil may cause livestock health problems. Recommend forage tests to evaluate the potassium level in the forage. The 54 ppm of phosphorus is high. Recommend an additional 22 lbs of nitrogen be applied to achieve the 18 tons at 30% dry matter per acre per year. See attached letter from the Dairy Extension Agent. Manure should be applied in split applications. Apply 50-70 lbs of nitrogen per acre per application. No manure shall be applied to high risk runoff fields during the wet season. Apply nutrient material uniformly to the application areas. See attached Nutrient Specification Sheet, the Manure Distribution Sheet Section, for the manure application rates per field. Recommend soil test in mid September to mid October to evaluate how well the biosolid application rate matches the nitrogen needs of the forage. SEE ATTACHED WASTE SPECIFICATION SHEET FOR ADDITIONAL MANURE APPLICATION GUIDANCE.			

NUTRIENT MANAGEMENT DESIGN AND SPECIFICATIONS

Producer: TillaBay Farms Inc. T-102, 101 All Op	Tract(s): 102	Field(s): 5-10
Assisted by: Pedersen	Date: February 12, 2013	

PURPOSE (Check all that apply)			
Budget and supply for plant production	x	Utilize manure/organic materials as a nutrient source	x
Minimize agricultural non-point source pollution (water quality)	x	Maintain or improve soil condition	x

Table 1. Field Conditions and Recommendations

CROP SEQUENCE/ROTATION (circle current crop)						EXPECTED YIELD
Perennial Hay/Pasture(Med-High Intensity)						18
CURRENT SOIL TEST LEVELS (ppm or lb/ac)						
N	P	K	pH	S.O.M. %	EC	
RECOMMENDED NUTRIENTS/AMENDMENTS TO MEET EXPECTED YIELD						
N (lbs/ac)		P ₂ O ₅ (lbs/ac)		K ₂ O (lbs/ac)		LIME
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B	Other
313		99		260		

Table 2. Nutrient Sources

Credits		N		P ₂ O ₅		K ₂ O	
		pounds per acre					
1. Nitrogen credits from previous legume crop		0					
2. Residual from long-term manure application		0					
3. Irrigation water		0		0		0	
4. Other (e.g., atmospheric deposition)		0		0		0	
5. Total Credits-		0		0		0	
Plant-Available Nutrients Applied to Field		N		P ₂ O ₅		K ₂ O	
(Circle column that is landuser's decision)		Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
6. Credits (from row 5, above)		0	0	0	0	0	0
7. Fertilizer							
Starter							
Other							
8. Manure / Organic Materials (Source-) Dairy		280	0	193	0	266	0
9. Subtotal (sum of lines 6, 7 and 8)		280	0	193	0	266	0
10. Nutrients Recommended (from Table 1)		313	0	99	0	260	0
11. Nutrient Status (subtract line 10 from line 9)		-33	0	94	0	6	0
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.							
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.							

PLANNED NUTRIENT APPLICATIONS

Amount to be Applied (lb/ac)	N	280	P ₂ O ₅	193	K ₂ O	0
Method, Form, and Timing of Application						
No soil tests available. Recommend soil test be taken to evaluate the nutrient levels in the soil. See attached letter from the Dairy Extension Agent. Manure should be applied in split applications. Apply 50-70 lbs of nitrogen per acre per application. No manure shall be applied to high risk runoff fields during the wet season. Apply nutrient material uniformly to the application areas. See attached Nutrient Specification Sheet, the Manure Distribution Sheet Section, for the manure application rates per field. Recommend soil test in mid September to mid October to evaluate how well the biosolid application rate matches the nitrogen needs of the forage. SEE ATTACHED WASTE SPECIFICATION SHEET FOR ADDITIONAL MANURE APPLICATION GUIDANCE.						

NUTRIENT MANAGEMENT DESIGN AND SPECIFICATIONS

Producer: **TillaBay Farms Inc. T-102, 101 All Op**Tract(s): **101**Field(s): **T101 1,2**Assisted by: **Pedersen**Date: **March 24, 2006**

PURPOSE (Check all that apply)			
Budget and supply for plant production	☒	Utilize manure/organic materials as a nutrient source	☒
Minimize agricultural non-point source pollution (water quality)	☒	Maintain or improve soil condition	☒

Table 1. Field Conditions and Recommendations

CROP SEQUENCE/ROTATION (circle current crop)					EXPECTED YIELD
Perennial Hay/Pasture(Med-High Intensity)					18
CURRENT SOIL TEST LEVELS (ppm or lb/ac)					
N	P	K	pH	S.O.M.%	EC
NA	15 18	479 846	6.2 6.1		
RECOMMENDED NUTRIENTS/AMENDMENTS TO MEET EXPECTED YIELD					
N (lbs/ac)		P ₂ O ₅ (lbs/ac)	K ₂ O (lbs/ac)	LIME	Other
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
313		99		260	

Table 2. Nutrient Sources

Credits		N		P ₂ O ₅		K ₂ O	
		pounds per acre					
1. Nitrogen credits from previous legume crop		0					
2. Residual from long-term manure application		0					
3. Irrigation water		0		0		0	
4. Other (e.g., atmospheric deposition)		0		0		0	
5. Total Credits-		0		0		0	
Plant-Available Nutrients Applied to Field		N		P ₂ O ₅		K ₂ O	
(Circle column that is landuser's decision)		Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
6. Credits (from row 5, above)		0	0	0	0	0	0
7. Fertilizer	Starter						
	Other Commercial Fertilizer or Additional Manure	103		0		0	
8. Manure / Organic Materials (Source-) Dairy		220	0	155	0	212	0
9.							

PLANNED NUTRIENT APPLICATIONS

Amount to be Applied (lb/ac)	N	P ₂ O ₅	K ₂ O
	313	147	202
Method, Form, and Timing of Application			
Recommend new soil tests. The 479 ppm of potassium is high. The 846 ppm of potassium in the soil is excessive. High potassium levels in the soil may cause livestock health problems. Recommend forage tests to evaluate the potassium level in the forage. The 15 and 18 ppm of phosphorus is low. Recommend an additional 103 lbs of nitrogen be applied to achieve the 18 tons at 30% dry matter per acre per year. See attached letter from the Dairy Extension Agent. Manure should be applied in split applications. Apply 50-70 lbs of nitrogen per acre per application. No manure shall be applied to high risk runoff fields during the wet season. Apply nutrient material uniformly to the application areas. See attached Nutrient Specification Sheet, the Manure Distribution Sheet Section, for the manure application rates per field. Recommend soil test in mid September to mid October to evaluate how well the biosolid application rate matches the nitrogen needs of the forage. SEE ATTACHED WASTE SPECIFICATION SHEET FOR ADDITIONAL MANURE APPLICATION GUIDANCE.			

NUTRIENT MANAGEMENT DESIGN AND SPECIFICATIONS

Producer: TillaBay Farms Inc. T-102, 101 All Op	Tract(s): 101	Field(s): 3
Assisted by: Pedersen	Date: March 24, 2006	

PURPOSE (Check all that apply)			
Budget and supply for plant production	x	Utilize manure/organic materials as a nutrient source	x
Minimize agricultural non-point source pollution (water quality)	x	Maintain or improve soil condition	x

Table 1. Field Conditions and Recommendations

CROP SEQUENCE/ROTATION (circle current crop)						EXPECTED YIELD	
Perennial Hay/Pasture(Med-High Intensity)						18	
CURRENT SOIL TEST LEVELS (ppm or lb/ac)							
N		P		K		pH	
NA		9		478		5.8	
S.O.M. %		EC					
RECOMMENDED NUTRIENTS/AMENDMENTS TO MEET EXPECTED YIELD							
N (lbs/ac)		P ₂ O ₅ (lbs/ac)		K ₂ O (lbs/ac)		LIME	
Other		Other		Other		Other	
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
313		99		260			

Table 2. Nutrient Sources

Credits		N		P ₂ O ₅		K ₂ O	
		pounds per acre					
1. Nitrogen credits from previous legume crop		0					
2. Residual from long-term manure application		0					
3. Irrigation water		0		0		0	
4. Other (e.g., atmospheric deposition)		0		0		0	
5. Total Credits-		0		0		0	
Plant-Available Nutrients Applied to Field		N		P ₂ O ₅		K ₂ O	
(Circle column that is landuser's decision)		Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
6. Credits (from row 5, above)		0	0	0	0	0	0
7. Fertilizer	Starter						
	Other Commercial fertilizer or Additional manure	103		0		0	
8. Manure / Organic Materials (Source-) Dairy		210	0	149	0	205	0
9. Subtotal (sum of lines 6, 7 and 8)		313	0	149	0	205	0
10. Nutrients Recommended (from Table 1)		313	0	99	0	260	0
11. Nutrient Status (subtract line 10 from line 9)		0	0	50	0	-55	0
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.							
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.							

PLANNED NUTRIENT APPLICATIONS

Amount to be Applied (lb/ac)		N	313	P ₂ O ₅	149	K ₂ O	205
Method, Form, and Timing of Application							
Recommend new soil tests. The 478 ppm of potassium is high. High potassium levels in the soil may cause livestock health problems. Recommend forage tests to evaluate the potassium level in the forage. The 9 ppm of phosphorus is low. Recommend an additional 103 lbs of nitrogen be applied to achieve the 18 tons at 30% dry matter per acre per year. See attached letter from the Dairy Extension Agent. Manure should be applied in split applications. Apply 50-70 lbs of nitrogen per acre per application. No manure shall be applied to high risk runoff fields during the wet season. Apply nutrient material uniformly to the application areas. See attached Nutrient Specification Sheet, the Manure Distribution Sheet Section, for the manure application rates per field. Recommend soil test in mid September to mid October to evaluate how well the biosolid application rate matches the nitrogen needs of the forage. SEE ATTACHED WASTE SPECIFICATION SHEET FOR ADDITIONAL MANURE APPLICATION GUIDANCE.							

NUTRIENT MANAGEMENT DESIGN AND SPECIFICATIONS

Producer: TillaBay Farms Inc. T-102, 101 All Op	Tract(s): 101	Field(s): 5
Assisted by: Pedersen		Date: February 12, 2013

PURPOSE (Check all that apply)			
Budget and supply for plant production	x	Utilize manure/organic materials as a nutrient source	x
Minimize agricultural non-point source pollution (water quality)	x	Maintain or improve soil condition	x

Table 1. Field Conditions and Recommendations

CROP SEQUENCE/ROTATION (circle current crop)						EXPECTED YIELD
Perennial Hay/Pasture(Med-High Intensity)						6
CURRENT SOIL TEST LEVELS (ppm or lb/ac)						
N		P		K	pH	S.O.M. %
RECOMMENDED NUTRIENTS/AMENDMENTS TO MEET EXPECTED YIELD						
N (lbs/ac)		P ₂ O ₅ (lbs/ac)		K ₂ O (lbs/ac)		LIME
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B	Other
278		88		231		

Table 2. Nutrient Sources

Credits		N		P ₂ O ₅		K ₂ O	
		pounds per acre					
1. Nitrogen credits from previous legume crop		0					
2. Residual from long-term manure application		0					
3. Irrigation water		0		0		0	
4. Other (e.g., atmospheric deposition)		0		0		0	
5. Total Credits-		0		0		0	
Plant-Available Nutrients Applied to Field		N		P ₂ O ₅		K ₂ O	
(Circle column that is landuser's decision)		Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
6. Credits (from row 5, above)		0	0	0	0	0	0
7. Fertilizer							
Starter							
Other							
8. Manure / Organic Materials (Source-) Dairy		115	0	93	0	128	0
9. Subtotal (sum of lines 6, 7 and 8)		115	0	93	0	128	0
10. Nutrients Recommended (from Table 1)		278	0	88	0	231	0
11. Nutrient Status (subtract line 10 from line 9)		-163	0	5	0	-103	0
If line 11 is a negative number, this is the amount of additional nutrients needed to meet the crop recommendation.							
If line 11 is a positive number, this is the amount by which the available nutrients exceed the crop requirements.							

PLANNED NUTRIENT APPLICATIONS

Amount to be Applied (lb/ac)	N	115	P ₂ O ₅	93	K ₂ O	128
Method, Form, and Timing of Application						
No soil tests available. Recommend soil test be taken to evaluate the nutrient levels in the soil. See attached letter from the Dairy Extension Agent. Manure should be applied in split applications. Apply 50-70 lbs of nitrogen per acre per application. No manure shall be applied to high risk runoff fields during the wet season. Apply nutrient material uniformly to the application areas. See attached Nutrient Specification Sheet, the Manure Distribution Sheet Section, for the manure application rates per field. Recommend soil test in mid September to mid October to evaluate how well the biosolid application rate matches the nitrogen needs of the forage. SEE ATTACHED WASTE SPECIFICATION SHEET FOR ADDITIONAL MANURE APPLICATION GUIDANCE.						

May 28, 2002

Bob Pedersen
Tillamook NRCS Field Office
6415 Signal St.
Tillamook, OR 97141



OREGON
STATE
UNIVERSITY

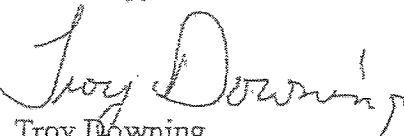
2204 Fourth Street
Tillamook, Oregon
97141

Dear Bob,

Over the past five years, I have had the opportunity to study nutrient cycling dynamics on dairies in the Tillamook area. It has been observed that pastures will vary in productivity based on environment, grazing management and soil fertility. Nitrogen utilization has been a major focus of my work looking specifically at nitrogen up takes by the pasture plant. I have seen pastures remove as little as 200 lbs of N per acre a year to as high as 750. Average pastures on dairies will use between 300 and 400 lbs of nitrogen per acre each year.

With this understanding, it makes logical sense to me to use nitrogen utilization numbers in our animal waste management planning of 300 pounds nitrogen per year as a reasonable starting point. I think this is a conservative guess and would not hesitate adjusting this number if the landowner has other data indicating they are using N at higher levels. For example, yield data, grazing rotation records with removal data, and/or soil test data.

Sincerely,


Troy Downing
Area Dairy Extension Agent

Telephone
303-842-3433



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TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

**NUTRIENT MANAGEMENT SPECIFICATION SHEET
PLANNED HERD SIZE**

Landowner/Operator: TillaBay Farms Inc.

Job Location: T 1S; 10 W; Sec.23,26 T 2S; R 9W; Sec. 4

County: Tillamook SWCD Tillamook Farm/Tract No. T-102,101

Field No. T-102 Fields: 1-6, 8-12 **T-101** Fields: 1-3, 4

Prepared By: Pedersen

Date: 01/13

⇒ **Purpose:**

- ⇒ To budget and supply nutrients for plant production.
- ⇒ To minimize agricultural non-point source pollution of surface and ground water resources.
- ⇒ To maintain or improve the physical, chemical and biological condition of soil.

Specifications:

The target yield for the pastures is 18 tons at 30% dry matter per acre per year is planned to utilize the nitrogen in the manure applied to the pastures. The target yield for the hay land in Tract 101 is 6 tons at 80% dry matter per acre per year.

- ⇒ Manure will be applied in accordance with soil tests.
- ⇒ Soil tests are taken at least every 3 years.
- ⇒ No more than 313 lbs. of nitrogen is applied per acre per year to the pasture fields in Tracts 102 and 101. No more than 278 lbs. of nitrogen per acre per year for Tract 101 hay land field. Manure will be applied to the fields in accordance with the below Nutrient Distribution. Higher nitrogen rates will not be applied unless soil and forage tests justifies higher rates.

Manure and Liquid Manure Application Equipment to be used: 1,914-1,000 lb. animal units, 4,300 gallon tank wagon, manure gun traveler and 560 bushel spreader.

1 Acre Inch = 27,154 gallons

- ⇒ Records are maintained of manure and/or commercial fertilizer applications.
- ⇒ Nutrient management plans are reviewed annually and adjustments are made as needed.
- ⇒ Manure is not applied where it is likely to enter an open watercourse. See enclosed Filter Strip Specification Sheet.

DESIGN APPROVAL:

Design approved by: /s/ Robert A. Pedersen

Date: 2/7/13

Job Title: CAFO PLANNER

CLIENTS ACKNOWLEDGEMENT STATEMENT:

The client acknowledges that:

- a. They have received a copy of this specification and under-stands the contents and requirements.
- b. The following information must be provided NRCS by the client before this practice can be certified as applied:

- ☒ Nutrient management application records including soil, water, plant and organic by-product test results.
- ☒ Documentation showing amount, rate, form and application method of nutrient applied
- ☒ Annual review of nutrient management including adjustments made.

- c. It shall be the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances and laws pertaining to the application of this practice.

- d. Maintain records of nutrient application as required by state and local regulations.

Accepted by: /s/ Bart Mijer

Date: 2-7-13

CERTIFICATION:

I have completed a review of the nutrient management and the specification's application and certify this practice has been applied.

Certification by: /s/ _____

Date: _____

Job Title: _____

Existing Manure Nutrient (Nitrogen) Distribution

Field #	Grazing cycles/yr	# of N supplied by livestock per field/yr	# of N supplied by livestock/ac/yr	Loads of solids /yr	#of N per field/year solids	# of N per acre per year of solids	Hours of pumping per field per year	# of N per field/year from liquid manure	# of N/acre/year from liquid manure	Gallons of liquid manure per field per year	# of N per field/year from liquid manure	# of N/acre/year from liquid manure	Total # of N/acre /year
T-102													
1	9	2,157	260	6	170	21	3.1	254	31	42,066	0	0	312
2	9	2,133	260	5	169	21	3.1	251	31	41,601	0	0	312
3	9	1,669	261	4	132	21	2.4	197	31	32,536	0	0	313
4	9	1,644	166	22	706	71	8.6	702	62	116,203	0	0	296
5	9	1,787	143	25	813	65	11.0	893	64	147,796	0	0	272
6	9	1,613	143	23	733	65	9.9	806	61	133,415	0	0	269
7	9	1,661	143	23	755	65	10.2	830	64	137,410	0	0	272
8	9	1,072	143	15	488	65	6.6	536	65	88,677	0	0	273
9	9	1,226	143	17	558	65	7.5	613	61	101,460	0	0	269
10	9	2,298	144	32	1,054	65	14.2	1,150	60	190,137	0	0	269
Subtotals		17,260		172	5,569		76.6	6,232		1,031,301			
T-101													
1	10	785	101	13	438	56	0	0	0	72,598	490	63	220
2	10	1,886	101	32	1,051	56	0	0	0	174,333	1,178	63	220
3	10	616	89	12	392	57	0	0	0	72,627	439	64	210
5	0	0	0	12	392	54	0	0	0	72,626	439	61	115
Subtotals		3,287		69	2,273			0		421,235	2,546		
TOTALS		20,547		241	7,842		76.6	6,232		1,452,536	2,370		

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 55,576 cubic feet of solids generated from the operation it will take approximately at agronomic rate use the application depths, travel lengths, and loads per acre listed below for each crop.													
Field Number	Acres	Crop	Tractor Spreader		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
			Capacity Bushels	CF		PPM	Lbs/Ton						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	313	1.00	40.0	301	10	36
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	6,999	14.00	278	1.00	35.5	339	9	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

108 hours of pumping annually. Based on applying 1,452,536 gallons of liquids generated from the operation it will take approximately at agronomic rate use the application depths, set times, and travel rates listed below for each crop.														NITROGEN, N
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							
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	1,207	10.07	313	1.00	1.91	1.09	4.32	0.76
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	1,207	10.07	278	1.00	1.70	1.09	3.84	0.85
						▼								
						▼								
						▼								

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 363 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		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
					PPM	Lbs/1000Gal					
T102 1.2.3	22.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10.07	313	1.00	0.69	622	4.7
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10.07	313	1.00	0.69	622	4.7
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10.07	313	1.00	0.69	622	4.7
T101 1.2	26.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10.07	313	1.00	0.69	622	4.7
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10.07	313	1.00	0.69	622	4.7
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	1,207	10.07	278	1.00	0.61	700	4.1

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

	Annual Volume Production	Units	Concentration of Nutrients in Storage		
			N	P ₂ O ₅	K ₂ O
Storage Facility					
Tank (Uncovered)	1,452,536	Gallons	10.07	4.86	6.74
Solids Storage Facility (Roofed)	500	Tons	14.00	6.38	8.60

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation		Pounds of Nutrients Available				Percent Nutrients Retained				Pounds of Nutrients Retained After Storage			
		▼	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O			
Dairy	Type of Storage Facility													
Liquids	Tank (Uncovered)	▼	20,901	8,310	11,511	70%	85%	85%	14,631	7,063	9,784			
Solids	Solids Storage Facility (Roofed)	▼	18,672	7,090	9,554	75%	90%	90%	14,004	6,381	8,599			
Grazing	NONE	▼	30,217	11,906	16,442	100%	100%	100%	30,217	11,906	16,442			

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	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Sprinkling	▼	14,631	7,063	9,784	75%	100%	100%	10,973	7,063	9,784
Solids	Broadcast (Incorporated 7 or more days after application)	▼	14,004	6,381	8,599	70%	100%	100%	9,803	6,381	8,599
Grazing	Grazing	▼	30,217	11,906	16,442	85%	100%	100%	25,684	11,906	16,442

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location		Pounds of Nutrients Available						Percent Nutrients Retained After Denitrification						Pounds of Nutrients Retained After Denitrification						
	Coast	Soil Drainage Class	N			P ₂ O ₅			K ₂ O			N			P ₂ O ₅			K ₂ O			
Liquids		Somewhat Poorly Drained	▼		10,973		7,063		9,784		80%		100%		100%		8.778		7,063		9,784
Solids		Somewhat Poorly Drained	▼		9,803		6,381		8,599		80%		100%		100%		7,842		6,381		8,599
Grazing		Somewhat Poorly Drained	▼		25,684		11,906		16,442		80%		100%		100%		20,547		11,906		16,442
																	37,168		25,351		34,825
																	TOTAL				

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

PERCENT OF ACREAGE TO BE APPLIED TO FIELD AND UTILIZATION ACRES NEEDED BASED ON			LIQUIDS						SOLIDS			GRAZING		
			Field Number	Acres	Crop	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
T102 1,2,3 4	22.9	Perennial Hay/Pasture(Med-High Intensity)	8%	702	2	6%	471	2	29%	5,959	19			
	9.9	Perennial Hay/Pasture(Med-High Intensity)	8%	702	2	9%	706	2	8%	1,644	5			
	67.5	Perennial Hay/Pasture(Med-High Intensity)	55%	4,828	15	56%	4,392	14	47%	9,657	31			
	26.5	Perennial Hay/Pasture(Med-High Intensity)	19%	1,668	5	19%	1,490	5	13%	2,671	9			
	6.9	Perennial Hay/Pasture(Med-High Intensity)	5%	439	1	5%	392	1	3%	616	2			
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	5%	439	2	5%	392	1	0%	0	0			
Off Farm			0%	0		0%	0		0%	0	60			
TOTALS-	140.9		100%	8,778	28	100%	7,842	25	100%	20,547	60			

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	311	192	265	313	99	260	-2	93	5
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	308	211	290	313	99	260	-5	112	30
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	280	193	266	313	99	260	-34	94	5
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	220	155	212	313	99	260	-93	56	-48
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	210	149	205	313	99	260	-103	50	-56
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	115	93	128	278	88	231	-163	5	-104
Off Farm											

Existing Manure Nutrient (Phosphorous)Distribution

Field #	Grazing cycles/yr	# of P supplied by livestock per field/yr	# of P supplied by livestock/ac/yr	Loads of solids /yr	#of P per field/year solids	# of P per acre per year of solids	Hours of pumping per field per year	# of P per field/year from liquid manure	# of P/acre/year from liquid manure	Gallons of liquid manure per field per year	# of P per field/year from liquid manure	# of P/acre/year from liquid manure	Total # of N/acre /year
T-102													
1	9	1,250	151	6	139	17	3.1	205	25	42,066	0	0	193
2	9	1,236	151	5	137	17	3.1	202	25	41,601	0	0	193
3	9	967	151	4	107	17	2.4	158	25	32,536	0	0	193
4	9	953	96	22	574	58	8.6	565	58	116,203	0	0	21~
5	9	1,035	83	25	661	53	11.0	719	58	147,796	0	0	194
6	9	940	83	23	600	53	9.9	653	58	133,415	0	0	194
7	9	963	83	23	614	53	10.2	668	58	137,410	0	0	194
8	9	621	83	15	397	53	6.6	431	58	88,677	0	0	194
9	9	711	83	17	454	53	7.5	493	57	101,460	0	0	193
10	9	1,326	83	32	847	53	14.2	921	58	190,137	0	0	194
Subtotals		10,002		172	4,530		76.6	5,015		1,031,301		0	
T-101													
1	10	455	58	13	356	46	0	0	0	72,598	395	51	155
2	10	1,093	58	32	856	46	0	0	0	174,333	947	51	155
3	10	357	52	12	319	46	0	0	0	72,627	353	51	149
5	0	0	0	12	319	44	0	0	0	72,626	353	49	93
Subtotals		1,905		69	1,850		0	0		421,235	2,048		
TOTALS		11,907		241	6,380		76.6	5,105		1,452,536	2,048		

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 55,576 cubic feet of solids generated from the operation it will take approximately 241 trips annually. Based on applying PHOSPHOROUS, P2O5 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	PHOSPHOROUS, P2O5 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						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	3,189	6.38	99	1.00	15.5	776	4	36
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	3,189	6.38	99	1.00	15.5	776	4	36
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	3,189	6.38	99	1.00	15.5	776	4	36
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	3,189	6.38	99	1.00	15.5	776	4	36
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	3,189	6.38	99	1.00	15.5	776	4	36
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	3,189	6.38	88	1.00	13.8	873	3	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 81 hours of pumping annually. Based on applying PHOSPHOROUS, P2O5													
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	PHOSPHOROUS, P2O5 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						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	▼	583	4.86	99	0.75	1.45	1.27	2.57
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	▼	583	4.86	99	0.75	1.45	1.27	2.57
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	▼	583	4.86	99	0.75	1.45	1.27	2.57
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	▼	583	4.86	99	0.75	1.45	1.27	2.57
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	▼	583	4.86	99	0.75	1.45	1.27	2.57
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	300	250	1/2 Circle	▼	583	4.86	88	0.67	1.45	1.13	2.89
						▼							
						▼							
						▼							

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 363 trips annually. Based on applying PHOSPHOROUS, P2O5 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	PHOSPHOROUS, P2O5 Concentration in Storage Facility		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
					PPM	Lbs/1000Gal					
TI02 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	583	4.86	99	1.00	0.75	571	5.1
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	583	4.86	99	1.00	0.75	571	5.1
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	583	4.86	99	1.00	0.75	571	5.1
TI01 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	583	4.86	99	1.00	0.75	571	5.1
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	583	4.86	99	1.00	0.75	571	5.1
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	583	4.86	88	1.00	0.67	642	4.5

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

Storage Facility	Annual Volume Production	Units	Concentration of Nutrients in Storage			
			N	P ₂ O ₅	K ₂ O	Units
Tank (Uncovered)	1,452,536	Gallons	10.07	4.86	6.74	lbs/100 Gal
Solids Storage Facility (Roofed)	500	Tons	14.00	6.38	8.60	lbs/Ton

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 3.6

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation	Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Dairy									
	Type of Storage Facility									
	Tank (Uncovered)	20,901	8,310	11,511	70%	85%	85%	14,631	7,063	9,784
Solids	Solids Storage Facility (Roofed)	18,672	7,090	9,554	75%	90%	90%	14,004	6,381	8,599
Grazing	NONE	30,217	11,906	16,442	100%	100%	100%	30,217	11,906	16,442

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	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Sprinkling	14,631	7,063	9,784	75%	100%	100%	10,973	7,063	9,784
Solids	Broadcast (Incorporated 7 or more days after application)	14,004	6,381	8,599	70%	100%	100%	9,803	6,381	8,599
Grazing	Grazing	30,217	11,906	16,442	85%	100%	100%	25,684	11,906	16,442

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location	Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Soil Drainage Class	10,973	7,063	9,784	80%	100%	100%	8,778	7,063	9,784
Solids	Somewhat Poorly Drained	9,803	6,381	8,599	80%	100%	100%	7,842	6,381	8,599
Grazing	Somewhat Poorly Drained	25,684	11,906	16,442	80%	100%	100%	20,547	11,906	16,442
							TOTAL-	37,168	25,351	34,825

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

PHOSPHOROUS, P₂O₅

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
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	8%	565	6	6%	383	4	29%	3,453	35
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	8%	565	6	9%	574	6	8%	953	10
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	55%	3,885	39	56%	3,573	36	47%	5,596	57
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	19%	1,342	14	19%	1,212	12	13%	1,548	16
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	5%	353	4	5%	319	3	3%	357	4
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	5%	353	4	5%	319	4	0%	0	0
Off Farm			0%	0			0		0%	0	
TOTALS-	140.9		100%	7,063	72	100%	6,381	65	100%	11,906	120

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P ₂ O ₅ Lbs/Acre	Potassium, K ₂ O Lbs/Acre
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	311	192	265	313	99	260	-2	93	5
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	308	211	290	313	99	260	-5	112	30
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	280	193	266	313	99	260	-34	94	5
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	220	155	212	313	99	260	-93	56	-48
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	210	149	205	313	99	260	-103	50	-56
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	115	93	128	278	88	231	-163	5	-104
Off Farm											

Existing Manure Nutrient (Potassium) Distribution

Field #	Grazing cycles/yr	# of K supplied by livestock per field/yr	# of K supplied by livestock/ac/yr	Loads of solids /yr	# of K per field/yr solids	# of K per acre per year of solids	Hours of pumping per field per year	# of K per field/yr from liquid manure	# of K/acre/year from liquid manure	Gallons of liquid manure per field per year	# of K per field/yr from liquid manure	# of K/acre/year from liquid manure	Total # of N/acre /year
T-102													
1	9	1,726	208	6	187	22	3.1	284	34	42,066	0	0	264
2	9	1,707	208	5	185	22	3.1	280	34	41,601	0	0	264
3	9	1,335	208	4	144	22	2.4	219	34	32,536	0	0	264
4	9	1,315	133	22	774	78	8.6	783	79	116,203	0	0	264
5	9	1,430	114	25	891	71	11.0	996	80	147,796	0	0	265
6	9	1,298	115	23	809	72	9.9	904	80	133,415	0	0	267
7	9	1,329	115	23	828	71	10.2	926	80	137,410	0	0	266
8	9	858	114	15	534	71	6.6	597	80	88,677	0	0	266
9	9	981	114	17	612	71	7.5	683	79	101,460	0	0	264
10	9	1,832	114	32	1,141	71	14.2	1,275	80	190,137	0	0	265
Subtotals		13,811		172	6,105		76.6	6,945		1,031,301		0	
T-101													
1	10	628	81	13	480	61	0	0	0	72,598	547	70	212
2	10	1,509	81	32	1,154	62	0	0	0	174,333	1,312	71	214
3	10	493	71	12	430	62	0	0	0	72,627	489	71	204
5	0	0	0	12	430	60	0	0	0	72,626	489	68	128
Subtotals		2,630		69	2,494		0	0		421,235	2,837		
TOTALS		16,441		241	8,599		76.6	6,945		1,452,536	2,837		

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TRACTOR SPREADER APPLICATION OF SOLIDS

To apply 55,576 cubic feet of solids generated from the operation it will take approximately 241 trips annually. Based on applying POTASSIUM, K2O 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	POTASSIUM, K2O 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						
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	4,298	8.60	260	1.00	30.3	397	7	36
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	4,298	8.60	260	1.00	30.3	397	7	36
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	4,298	8.60	260	1.00	30.3	397	7	36
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	4,298	8.60	260	1.00	30.3	397	7	36
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	4,298	8.60	260	1.00	30.3	397	7	36
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	185	230	15	4,298	8.60	231	1.00	26.9	447	6	36

MANAGEMENT CRITERIA FOR BIG GUN SPRINKLER APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 108 hours of pumping annually. Based on applying POTASSIUM, K2O 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	POTASSIUM, K2O 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							
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	807	6.74	260	1.00	1.42	1.09	3.22	1.01
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	807	6.74	260	1.00	1.42	1.09	3.22	1.01
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	807	6.74	260	1.00	1.42	1.09	3.22	1.01
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	807	6.74	260	1.00	1.42	1.09	3.22	1.01
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	807	6.74	260	1.00	1.42	1.09	3.22	1.01
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	225	250	1/2 Circle	▼	807	6.74	231	1.00	1.27	1.09	2.86	1.14
						▼								
						▼								
						▼								

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM APPLICATION

MANAGEMENT CRITERIA FOR TANK WAGON APPLICATION OF LIQUIDS

To apply 1,452,536 gallons of liquids generated from the operation it will take approximately 363 trips annually. Based on applying POTASSIUM, K2O 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	POTASSIUM, K2O Concentration in Storage Facility		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
					PPM	Lbs/1000Gal					
T102 1.2.3	22.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	807	6.74	260	1.00	1.42	301	9.7
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	807	6.74	260	1.00	1.42	301	9.7
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	807	6.74	260	1.00	1.42	301	9.7
T101 1.2	26.5	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	807	6.74	260	1.00	1.42	301	9.7
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	807	6.74	260	1.00	1.42	301	9.7
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	4,000	15	807	6.74	231	1.00	1.27	338	8.6

COMPUTED NUTRIENT CONCENTRATIONS IN STORAGE

Storage Facility	Annual Volume Production	Units	Concentration of Nutrients in Storage			
			N	P2O5	K2O	Units
Tank (Uncovered)	1,452,536	Gallons	10.07	4.86	6.74	lbs/th Gal
Solids Storage Facility (Roofed)	500	Tons	14.00	6.38	8.60	lbs/Ton

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

Version 3.6

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation	Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Dairy									
	Type of Storage Facility									
	Tank (Uncovered)	20,901	8,310	11,511	70%	85%	85%	14,631	7,063	9,784
Solids	Solids Storage Facility (Roofed)	18,672	7,090	9,554	75%	90%	90%	14,004	6,381	8,599
Grazing	NONE	30,217	11,906	16,442	100%	100%	100%	30,217	11,906	16,442

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	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Sprinkling	14,631	7,063	9,784	75%	100%	100%	10,973	7,063	9,784
Solids	Broadcast (Incorporated 7 or more days after application)	14,004	6,381	8,599	70%	100%	100%	9,803	6,381	8,599
Grazing	Grazing	30,217	11,906	16,442	85%	100%	100%	25,684	11,906	16,442

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location	Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Liquids	Soil Drainage Class	10,973	7,063	9,784	80%	100%	100%	8,778	7,063	9,784
Solids	Somewhat Poorly Drained	9,803	6,381	8,599	80%	100%	100%	7,842	6,381	8,599
Grazing	Somewhat Poorly Drained	25,684	11,906	16,442	80%	100%	100%	20,547	11,906	16,442
TOTAL-								37,168	25,351	34,825

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

POTASSIUM, K₂O

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
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	8%	783	3	6%	516	2	29%	4,768	18
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	8%	783	3	9%	774	3	8%	1,315	5
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	55%	5,381	21	56%	4,815	19	47%	7,728	30
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	19%	1,859	7	19%	1,634	6	13%	2,137	8
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	5%	489	2	5%	430	2	3%	493	2
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	5%	489	2	5%	430	2	0%	0	0
Off Farm			0%	0		0%	0		0%	0	
TOTALS-	140.9		100%	9,784	38	100%	8,599	33	100%	16,442	63

CLIENT: TillaBay Farms Inc. T-102, 101 All Operations
 ASSISTED BY: Pedersen

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P2O5 Lbs/Acre	Potassium, K2O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P2O5 Lbs/Acre	Potassium, K2O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P2O5 Lbs/Acre	Potassium, K2O Lbs/Acre
T102 1,2,3	22.9	Perennial Hay/Pasture(Med-High Intensity)	311	192	265	313	99	260	-2	93	5
4	9.9	Perennial Hay/Pasture(Med-High Intensity)	308	211	290	313	99	260	-5	112	30
5-10	67.5	Perennial Hay/Pasture(Med-High Intensity)	280	193	266	313	99	260	-34	94	5
T101 1,2	26.5	Perennial Hay/Pasture(Med-High Intensity)	220	155	212	313	99	260	-93	56	-48
3	6.9	Perennial Hay/Pasture(Med-High Intensity)	210	149	205	313	99	260	-103	50	-56
5	7.2	Perennial Hay/Pasture(Med-High Intensity)	115	93	128	278	88	231	-163	5	-104
Off Farm											

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

WASTE UTILIZATION SPECIFICATION SHEET

Client TillaBay Farms Inc.

Location: T 1S; R 10W; Sec. 23,26 T 2S; R 9W; Sec. 4

Tillamook SWCD

Tract No. 102,101

Prepared By Pedersen

Date 01/2013

Perform the following operations:

- ☐ Have your technical assistance provider review the resource management system plan for your operation at least once every 5 years.
- ☐ Maintain records for all waste applications.
- ☐ Calibrate application equipment to apply wastes in accordance with the recommended amount and timing specified on the nutrient budget specification sheet, NRCS practice code 590, for the crop being grown.
- ☐ Chemical analysis of soils, plant tissue and waste should be used annually to monitor and adjust amounts of waste applied. Refer to Oregon State University Extension Service publication EC1478, "Soil Test Interpretation Guide" for guidance in getting soil tested and interpreting soil test results. Refer to Oregon State University Extension publication EM8585, "Manure Application Rates for Forage Production" and EM8768, "Calculating Dairy Manure Nutrient Application Rates" for guidance in getting animal waste tested for nutrient concentrations and computing application rates.
- ☐ Apply waste in a manner that will cover no more than 25 percent of the leaf surface with solids unless clean water applications are planned immediately after wastes are applied. For pasture/hayland it is best to apply waste 7 days after harvesting forage by haying or grazing.
- ☐ To reduce odor problems, apply waste in mid morning when temperatures are warming and air is rising rather than in the afternoon or evening when air is cooling and settling. Avoid applications during periods of fog.
- ☐ Do not apply waste directly into an open watercourse or where waste is likely to enter an open watercourse. Observe all waste application setbacks identified in the resource management system plan.
- ☐ Do not apply waste to fields where there is no growing crop. If applications are needed during fall and winter periods due to unforeseen circumstances, such as the storage facilities being full, use the following guidelines for waste applications:
 - a) Only spread waste on fields that are growing a crop, preferably grass.
 - b) Increase all waste application setbacks identified in the resource management system plan by at least 15 feet.
 - c) Don't apply waste during any rainfall event that will cause runoff.
 - d) Use maximum travel rates for the traveling big gun sprinkler and solids spreader.
 - e) Use soil tests, such as the Pre-side dress Soil Nitrate test, to determine if additional applications of waste are needed on those fields receiving emergency winter applications.
- ☐ Do not apply waste to fields with frozen or snow covered soil conditions unless provisions are made to control runoff.
- ☐ Do not spread waste on fields where soils are saturated, ponded, flooded and/or during times when waste is likely to runoff into open watercourses.
- ☐ Be aware of the location of sensitive areas, concerns of neighbors or concerns of the public which require special application procedures
- ☐ Handle all waste material with caution. Wear appropriate protective clothing.
- ☐ Clean up residual materials from equipment and dispose of properly.
- ☐ Equipment used in waste utilization should be regularly inspected and maintained as needed in accordance with equipment operation and maintenance guidelines from the manufacturer or provided by NRCS.

Additional Guidance and Notes: Any manure discharge into an open water course will be reported to Oregon Department of Agriculture (ODA) within 24 hours. Within 5 days a written statement describing the manure discharge will be submitted to ODA. Annual CAFO permit reports will be submitted on time to ODA.

When applying waste during the irrigation season, use the enclosed "Estimating Soil Moisture by Feel and Appearance" to monitor the soil moisture to prevent over application of irrigation water and/or manure that may leach nitrates below the root zone.

DESIGN APPROVAL:Design Approved by: /s/ Robert A. Pedersen

Date:

2/7/13Job Title: CAFO PLANNER

CLIENTS ACKNOWLEDGEMENT STATEMENT:

The Client acknowledges that:

- a. They have received a copy of the specification and understand the contents and requirements.
- b. The following information must be provided to SWCD by the client before this practice can be certified as applied:
 - ☐ Waste application records which include the date, crop, type of waste applied, and amount of waste applied.
 - ☐ Calibration records for waste application equipment.
 - ☐ Analysis of nutrient concentrations in solid and liquid wastes.
- c. It shall be the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances and laws pertaining to the application of this practice.

Accepted by: /s/

Bart Mizee

Date:

2-7-13

CERTIFICATION:

I HAVE COMPLETED A REVIEW OF THE INFORMATION PROVIDED BY THE CLIENT AND CERTIFY THIS PRACTICE HAS BEEN APPLIED.

Certification by: /s/

Date:

Job title:

EMERGENCY RESPONSE PLAN

In Case of a Storage Facility Spill, Leak, or Failure

- a. Stop all other activities to address the emergency.
- b. Stop all flow into the storage facility.
- c. If the storage facility is at maximum capacity or overtopping, draw the waste level in the facility down by making an application to the emergency application area shown on the plan map in accordance with the Waste Utilization instructions found in the Operations section of this plan.
- d. Assess the extent of the emergency and determine how much help is needed to correct the problem.
- e. Call for help & excavator if needed.
- f. If possible, use a skid loader or tractor with blade to contain or divert spill or leak away from environmentally sensitive areas.
- g. If containment material is needed, excavate soil from appropriate areas away from the storage facility.
- h. If possible, begin applying the stored waste to the utilization fields at the prescribed application rates described in Section 6 of this plan.
- i. Complete the clean-up and repair the necessary components.

In Case of a Manure/Waste Discharge

- a. Stop all other activities to deal with the emergency.
- b. Call for help if needed.
- c. Call sheriffs office if spilled on road for traffic control and clean the spill immediately from the road and roadside if needed.
- d. Contain the spill or runoff from entering the stream or waterway using straw bales, saw dust, or soil material.
- e. If flow is coming from a tile, plug the tile with a tile plug immediately.
- f. Assess the extent of the emergency and determine how much help is needed.

Contacts to be made within 24 Hours of a Discharge (SEE NEXT PAGE FOR REQUIREMENTS FOR FILING A WRITTEN REPORT)

Organization	Phone
Oregon Department of Agriculture	1-503-986-4700
Oregon Emergency Response System (ORES)	1-800-452-0311

Be prepared to provide the following information:

- a. Your Name (See next page)
- b. Farm Identification (See next page)
- c. Description of emergency.
- d. Estimate of the amounts, area covered, and distance traveled.
- e. Has manure reached surface waters or major field drains?
- f. Is there any obvious damage: employee injury, fish kill, or property damage?
- g. What is currently in progress to contain situation?

EMERGENCY RESPONSE PLAN

Emergency Contact Information

Farm Name	TillaBay Farms Inc.
Address	620 Fenk Road Tillamook, Oregon 97141
Farm Phone	503-801-3734
Permit #	
DIRECTIONS TO FARM	0.6 miles west of Tillamook on Netarts highway, turn right on Fenk Road. Only dairy on the road.
Emergency Phone Numbers:	
Bart Mizze	503-842-6332
home	
cell	503-801-3734
FIRE or AMBULANCE	911

If a Discharge Occurs a Written Report is to be made by Owner or Operator to Oregon Department of Agriculture within 5 Days that contains the following information:

- A description and cause of the discharge.
- The period of discharge including exact dates, times and duration of discharge.
- An estimate of discharge volume.
- Name or location of receiving water.
- Corrective steps taken, if appropriate, to reduce, eliminate or prevent reoccurrence of the discharge.

Flooding Frequency Class—Tillamook County, Oregon
(TillaBay Farms Inc.)



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 None

 Very Rare

 Rare

 Occasional

 Frequent

 Very Frequent

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

MAP INFOR

Map Scale: 1:7,070 if printed on A s

The soil surveys that comprise your

Warning: Soil Map may not be valid

Enlargement of maps beyond the sc
misunderstanding of the detail of ma
placement. The maps do not show t
soils that could have been shown at

Please rely on the bar scale on each
measurements.

Source of Map: Natural Resource
Web Soil Survey URL: <http://webs>
Coordinate System: UTM Zone 10

This product is generated from the U
the version date(s) listed below.

Soil Survey Area: Tillamook Coun
Survey Area Data: Version 3, Feb

Date(s) aerial images were photogra

The orthophoto or other base map o
compiled and digitized probably diffe
imagery displayed on these maps. A
of map unit boundaries may be evid

Flooding Frequency Class

Flooding Frequency Class— Summary by Map Unit — Tillamook County, Oregon (OR057)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2A	Fluvaquents-Histosols complex, 0 to 1 percent slopes	Very frequent	4.9	4.5%
104A	Coquille-Brenner-Nehalem association, 0 to 3 percent slopes, protected	Rare	103.5	94.4%
W	Water	None	1.2	1.1%
Totals for Area of Interest			109.6	100.0%

Description

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.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding 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.

"Very frequent" means that flooding 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.

Rating Options

Aggregation Method: Dominant Condition

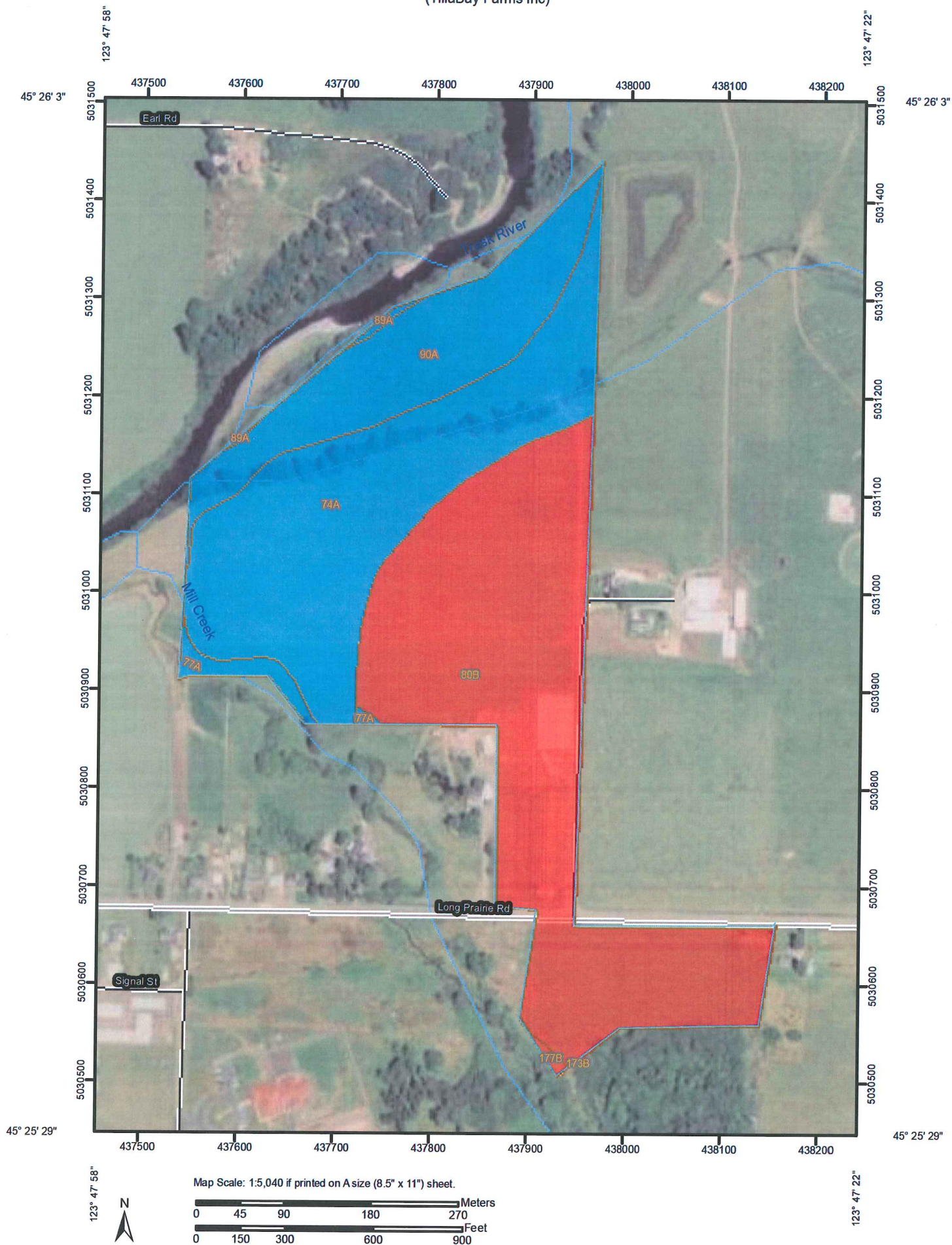
Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

Mapping Frequency Class—Tillamook County, Oregon
(TillaBay Farms Inc)



MAP LEGEND

Area of Interest (AOI)

-  Area of Interest (AOI)

Soils

-  Soil Map Units

Soil Ratings

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

Political Features

-  Cities

Water Features

-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

MAP INFOR

Map Scale: 1:5,040 if printed on A s

The soil surveys that comprise your

Warning: Soil Map may not be valid

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misunderstanding of the detail of ma
placement. The maps do not show t
soils that could have been shown at

Please rely on the bar scale on each
measurements.

Source of Map: Natural Resource
Web Soil Survey URL: <http://webso>
Coordinate System: UTM Zone 10

This product is generated from the U
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Soil Survey Area: Tillamook Coun
Survey Area Data: Version 3, Feb

Date(s) aerial images were photogra

The orthophoto or other base map o
compiled and digitized probably diffe
imagery displayed on these maps. A
of map unit boundaries may be evid

Flooding Frequency Class

Flooding Frequency Class— Summary by Map Unit — Tillamook County, Oregon (OR057)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
74A	Nehalem silt loam, 0 to 3 percent slopes	Frequent	17.2	33.0%
77A	Nestucca-Brenner silt loams, 0 to 3 percent slopes	Frequent	0.9	1.7%
80B	Quillamook medial silt loam, 0 to 7 percent slopes	None	25.0	48.1%
89A	Udifluvents-Riverwash-Water complex, 0 to 3 percent slopes	Frequent	0.1	0.3%
90A	Yachats very fine sandy loam, 0 to 3 percent slopes	Frequent	8.7	16.7%
173B	Tillamook-Ginger medial silt loams, 0 to 7 percent slopes	None	0.0	0.0%
177B	Dystrudepts-Aquepts complex, 0 to 7 percent slopes	None	0.1	0.2%
Totals for Area of Interest			52.0	100.0%

Description

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.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding 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.

"Very frequent" means that flooding 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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

PRESCRIBED GRAZING SPECIFICATION SHEET

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec 23, Sec 26 T 2S R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102,101

Field No.: T-102: Fields: 1-10 T-101 Fields: 1-3

Prepared By Pedersen Date 01/13

⇒ **Purpose:**

- ⇒ Improve or maintain the health and vigor of the forage stand.
- ⇒ Maintain and improve water quality.
- ⇒ Maintain or improve animal health and productivity.
- ⇒ Attain grazing and management efficiency to promote economic stability.

Specifications:

- ⇒ Pastures are managed to assure at least 18 tons at 30% dry matter is produced per acre per year.
- ⇒ Pastures are reestablished when forage yields fall below 14 tons at 30% dry matter per acre per year.
- ⇒ A rotational grazing system is used. A 21-day re-growth period is used during the normal years. During low rainfall years, the re-growth period varies between 30 to 35 days.
- ⇒ Noxious weeds such as Tansy Ragwort and Canada thistle are controlled in accordance with an Integrated Pesticide Management Plan.
- ⇒ Pastures are clipped and dragged at least twice during the growing season.
- ⇒ Manure and commercial fertilizer applications are based on soil tests. Soil tests will be taken at least every 3 years. Nitrogen applications will not exceed 313 lbs. of nitrogen per acre per year unless soil tests and forage production justifies higher application rates.
- ⇒ Manure is applied to pastures in accordance with the enclosed Waste Utilization Specification and Nutrient Management Specification Sheets.
- ⇒ Spring grazing is delayed until the grasses have at least 6 inches of growth and the soil is firm.
- ⇒ Pastures are not grazed below 2 inches any time during the growing season.
- ⇒ Excess forage may be cut for ensilage.
- ⇒ Livestock are removed from the pastures in the fall when the ground becomes wet and the grasses have at least 3 inches of growth going into the winter.

DESIGN APPROVAL:

Design approved by: /s/ Robert A. Pedersen

Date: 2/7/13

Job Title: CAFO PLANNER

CLIENTS ACKNOWLEDGEMENT STATEMENT:

The client acknowledges that:

- a. They have received a copy of this specification and understands the contents and requirements.
- b. It shall be the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances and laws pertaining to the application of this practice.

Accepted by: /s/ Bart Mize

Date: 2-7-13

CERTIFICATION;

I have completed a review of the prescribed grazing practice and the specification's application and certify this practice has been applied.

Certification by: /s/ _____

Date: _____

Job Title: _____

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

FORAGE HARVEST MANAGEMENT SPECIFICATION SHEET

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 2S; R 9W; Sec.4

County Tillamook SWCD Tillamook County Farm/Tract No. T-101

Field No.: 5

Prepared By Pedersen Date 01/13

⇒ **Purpose:**

- ⇒ Improve or maintain the health and vigor of the forage stand.
- ⇒ Maintain and improve water quality.
- ⇒ Maintain or improve animal health and productivity.
- ⇒ Attain management efficiency to promote economic stability.

Specifications:

- ⇒ Hayland fields are managed to assure at least 6 tons of dry matter is produced per acre per year.
- ⇒ Hayland fields are reestablished when forage yields fall below 4 tons of dry matter per acre per year.
- ⇒ Harvesting newly seeded fields are delayed until the grasses have at least 8 inches of growth and are firmly rooted.
- ⇒ Harvesting established stands are delayed until grasses have at least 6 inches of growth and ground is firm.
- ⇒ Grasses are not cut if the grass height is less than 2 inches.
- ⇒ Harvesting is not done when the fields are saturated or ponded.
- ⇒ Noxious weeds such as Tansy Ragwort and Canada thistle are controlled in accordance with an Integrated Pesticide Management Plan.
- ⇒ Manure and commercial fertilizer applications are based on soil tests. Soil tests will be taken at least every 3 years. Nitrogen applications will not exceed 278 lbs. of nitrogen per acre per year unless soil tests and forage production justifies higher application rates.
- ⇒ Forage Tissue Tests will be taken at least once during the growing season.
- ⇒ Manure is applied to hay land fields in accordance with the enclosed Waste Utilization Specification and Nutrient Management Specification Sheets

DESIGN APPROVAL:

Design approved by: /s/ Robert A. Pedersen

Date: 2/7/13

Job Title: CAFO PLANNER

CLIENTS ACKNOWLEDGEMENT STATEMENT:

The client acknowledges that:

- a. They have received a copy of this specification and understand the contents and requirements.
- b. It shall be the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances and laws pertaining to the application of this practice.

Accepted by: /s/ Bart M. Jee

Date: 2-7-13

CERTIFICATION;

I have completed a review of the forage harvest management practice and the specification's application and certify this practice has been applied.

Certification by: /s/ _____

Date: _____

Job Title: _____

TILLAMOOK COUNTY
SOIL AND WATER CONSERVATION DISTRICT

FILTER STRIP SPECIFICATION SHEET

For: Landowner/Operator TillaBay Farms, Inc.

Job Location: T 1S; R 10W; Sec. 23,26 T 2S; R 9W; Sec. 4

County Tillamook SWCD Tillamook County Farm/Tract No. T-102,101

Field No.: T-102 Fields: 1-10+ T-101 Fields: 1,2,3

Prepared By Pedersen Date 01/13

Purpose: To reduce manure runoff into an adjacent open watercourse and the resulting fecal and organic contamination in the watercourse.

Specifications:

- ⇒ A grass filter strip will be maintained adjacent to all open water courses that flow through the farm. From April to October a five foot wide grass filter strip will be maintained for solid manure applications with a manure spreader and liquid manure applications with a manure tank wagon. A 20 foot wide grass filter strip will be maintained when liquid manure is applied with a manure gun traveler during April to October. During any winter month manure applications, a 10 foot wide grass filter strip will be maintained when solid manure is applied with a manure spreader or when liquid manure is applied with a manure tank wagon. A 30 foot wide grass filter strip will be maintained if manure is applied with a manure gun traveler during the winter months.
- ⇒ No manure will be applied to the filter strip area.
- ⇒ Noxious weeds such as Tansy Ragwort and Canada thistle are controlled in accordance with an Integrated Pesticide Management Plan.
- ⇒ Excessive accumulation of sediment and/or manure will be removed. The filter strip will be harrowed at least once each year prior to May 1st to shape and maintain at least a 1 % grade sloping away from the existing open water courses. Filter strip grade will be maintained to allow the runoff to occur along the entire length of the filter strip and not occur in only certain areas of the filter strip.
- ⇒ Depressions will be prevented from forming in the filter strip area where manure and sediment can be trapped.
- ⇒ Debris will not be allowed to accumulate in the filter strip.
- ⇒ Filter strips will be clipped, dragged, and or grazed at least twice during the growing season.
- ⇒ Grass will be at least 3 inches high by October 15th.

DESIGN APPROVAL

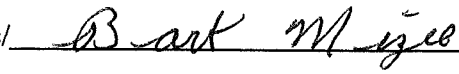
Design approved by:  Robert A. Pedersen Date: 2/7/13

Job Title: CAFO PLANNER

Client Acknowledgement Statement:

The client acknowledges that:

- a. They have received a copy of this specification and under-stands the contents and requirements.
- b. It shall be the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances and laws pertaining to the application of this practice.

Accepted by: /s/  Date: 2-7-13

Certification:

I have completed a review and checked out the filter strip practice specifications and certify that the practice has been applied in accordance with specifications.

Certified by: /s/ _____ Date: _____

Job Title: _____

To see the following reference/educational materials for this AWMP please refer to hard copy in the Operator's file:

Estimating Soil Moisture By Feel and Appearance

Soil and Manure Sampling Instructions for Animal Waste Management Systems

Calculating Dairy Manure Nutrient Application Rates

Estimating Plant-available Nitrogen form Manure

Post-Harvest Soil Nitrate Testing for Manured Cropping Systems West of the Cascades

Soil Test Interpretation Guide

Manure Application Rates for Forage Production