Nutrient Management Plan

For Oregon Trail Cattle Feeders

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GENERAL INFORMATION

2021 Operation Information for Oregon Trail Cattle Feeders

Calendar Year: 2021 **Reporting period:** January 1 through December 31, 2021

Name:	John Hepton		
Business	Oregon Trail Cattle Feeders		
Mailing	909 N Robinson Blvd, Nampa, ID, 83687		
Facility	2423 12th Avenue E, Vale, OR	**County:**	Malheur
Telephone	(208)250-0710	**Cell Phone**	null
E-mail	John.Hepton@performixnutrition.com		

Permitted and Actual number of animals by type at the CAFO averaged over the year [S4.D.2(a)/S4.D.2(a)(ii) of

Animal Type	Average Weight (Lbs)	Days on Farm		Permitted	Actual
		Start Month	End Month		
Finishing Cattle	750	January	December	25000	14000
			Total Animals -	25,000	14,000

Manure Solids Generated -	8,465,810 CF
Bedding Generated -	0 CF
Imported Solids -	0 CF
Total Solids Generated -	8,465,810 CF
Total Solids to Store based on a Volume Reduction Factor of 0.75 -	2,116,456 CF

Manure Liquids Generated -	0 CF
Rainfall-Evaporation on Storage plus Runoff Generated -	628,500 CF
Process Water Generated -	0 CF
Imported Liquids -	0 CF
Total Liquids to Store -	628,500 CF

Liquids Applied to Land -	0 CF
Solids Applied to Land -	1,668,983 CF
Grazing Manure Applied to Land -	0 CF
Liquids Exported -	0 CF
Solids Exported -	6,796,833 CF
Acres of Land for Land Application Covered by NMP -	914.2 AC
Acres of Land Under Operator Control Used for Manure Applications -	880.4 AC

GENERAL INFORMATION

2021 Storage Facilities for Oregon Trail Cattle Feeders

Facility Name	Description	Type	Storage Period (days)	Diameter (ft)	Top Length (ft)	Top Width (ft)	Depth (ft)	Side slope Z	Free board (ft)	Volume (CF)	Uncovered Surface Area (SF)
Lagoon #1	Runoff Storage Lagoon	Liquid	10		150	10	3			4,500	1,500
Lagoon #2	Runoff Storage Lagoon	Liquid	13		100	20	3			6,000	2,000
Lagoon #3	Runoff Storage Lagoon	Liquid	10		80	15	4			4,800	1,200
Pens	Feedlot Pens	Solid	365		7,546	533	1	1	0	4,013,940	4,022,018

GENERAL INFORMATION

2021 Storage Period Calculations for Oregon Trail Cattle Feeders

Solids Storage

Storage Unroofed Surface Area, SF	4022018	Manure Solids, CF/Day =	23,194	Volume Reduction Factor =	0.75
Available Storage, CF =	4013940			Solids Storage Period, Days =	365

Month	Number Of Days	Manure Lost In Grazing	Filtered Solids (CF)	Bedding (CF)	Solids Removal Factor (Pct)	Imported Solids (CF)	Solids To Store (CF)	Storage Volume Needed, CF
October	31	0	719014	0	100	0	179754	179754
November	30	0	695820	0	100	0	173955	353709
December	31	0	719014	0	100	0	179754	533463
January	31	0	719014	0	100	0	179754	713217
February	28	0	649432	0	100	0	162358	875575
March	31	0	719014	0	100	0	179754	1055329
April	30	0	695820	0	100	0	173955	1229284
May	31	0	719014	0	100	0	179754	1409038
June	30	0	695820	0	100	0	173955	1582993
July	31	0	719014	0	100	0	179754	1762747
August	31	0	719014	0	100	0	179754	1942501
September	30	0	695820	0	100	0	173955	2116456
Annual	**365**	**0**	**8465810**	**0**	**100**	**0**	**2116456**	

Liquids Storage

Climate Station: MALHEUR BRANCH EXP S

Storage Unroofed Surface Area, SF =	4700	25Yr-24Hr Storm Precip, In =	2	Total 25Yr-24Hr Storm Storage Needed, CF	604,008
Available Liquid Storage, CF =	15300	25Yr-24H4 Storm Runoff, CF =	0	Storage Period without 25yr-24hr Storm =	33
Unroofed Runoff Area, SF =	0	25Yr-24Hr Storm on Unroofed Storages, CF =	604,008	Storage Period with 25yr-24hr Storm =	0

Month	Number Of Days	Rainfall (Inches)	Evaporation (Inches)	Rain-Evap on Storages (CF)	Rainfall Runoff (CF)	Manure (CF)	Process Water (CF)	Imported Liquids (CF)	Monthly Liquids to Store (CF)	Total Storage Volume Needed (CF)
October	31	0.65	1.98	-521	0	0	0	0	-521	-521
November	30	1.19	0.5	231536	0	0	0	0	231536	231015
December	31	1.38	0.71	224825	0	0	0	0	224825	455840
January	31	1.29	0.74	184558	0	0	0	0	184558	640398
February	28	1.04	1.09	-20	0	0	0	0	-20	640379
March	31	1.08	2.06	-384	0	0	0	0	-384	639995
April	30	0.84	3.79	-1155	0	0	0	0	-1155	638840
May	31	0.98	5.12	-1622	0	0	0	0	-1622	637218
June	30	0.76	6.08	-2084	0	0	0	0	-2084	635134
July	31	0.36	7.62	-2844	0	0	0	0	-2844	632291
August	31	0.38	6.51	-2401	0	0	0	0	-2401	629890
September	30	0.48	4.03	-1390	0	0	0	0	-1390	628500
Annual	**365**	**10.43**	**40.23**	**628500**	**0**	**0**	**0**	**0**	**628500**	

GENERAL INFORMATION

2021 Manure Nutrient Balance for Oregon Trail Cattle Feeders

Manure Nutrients in

Nutrient Concentrations:	Nitrogen (Total N)	Phosphorus (P_2O_5)	Potassium (K_2O)	Units
Liquid Manure-	0.00	0.00	0.00	lbs/1000 Gal
Solid Manure-	7.40	10.20	19.80	lbs/Ton

Manure Nutrient

Nutrients Generated:	N Generated (lbs) after Losses	P_2O_5 Generated (lbs) after Losses	K_2O Generated (lbs) after Losses
Liquid Manure-	0 lbs	0 lbs	0 lbs
Solid Manure-	1127646 lbs	1554323 lbs	3017215 lbs
Grazing Manure-	0 lbs	0 lbs	0 lbs
Total-	**1127646 lbs**	**1554323 lbs**	**3017215 lbs**

Exported Nutrients:	N Exported (lbs) after Losses	P_2O_5 Exported (lbs) after Losses	K_2O Exported (lbs) after Losses
Liquid Manure-	0 lbs	0 lbs	0 lbs
Solid Manure-	905338 lbs	1247899 lbs	2422391 lbs
Total-	**905338 lbs**	**1247899 lbs**	**2422391 lbs**

Crop Nutrient Removal:	N Utilized (lbs)	P_2O_5 Utilized (lbs)	K_2O Utilized (lbs)
Total-	**235407 lbs**	**78769 lbs**	**184486 lbs**

Net Nutrients:	Nutrients Generated after Losses (lbs)	Nutrients Removed by Crop and Exported after Losses (lbs)	Net Nutrient Balance after Losses (lbs)
Nitrogen (N) -	1127646 lbs	1140745 lbs	-13099 lbs
Phosphate (P_2O_5) -	1554323 lbs	1326668 lbs	227655 lbs
Potassium (K_2O) -	3017215 lbs	2606878 lbs	410337 lbs

System Losses:	Nutrients Generated (lbs)	Nutrients Remaining after Losses (lbs)	Nutrients Lost in System (lbs)
Nitrogen (N) -	1379700 lbs	1127646 lbs	252054 lbs
Phosphate (P_2O_5) -	386331 lbs	1554323 lbs	-1167991 lbs
Potassium (K_2O) -	507998 lbs	3017215 lbs	-2509217 lbs

Note: Total nutrients utilized and generated are computed from reference data taken from Extension Publications or the USDA Natural Resources Conservation Service National Agricultural Waste Management Field Handbook. Nutrients generated after losses are computed from analytical data by taking the total volume of material times the nutrient analysis of the material except for grazing where reference data is used.

GENERAL INFORMATION

Background And Site Information

Oregon Trail Cattle Feeders is located at 2423 12th Avenue E, near Vale, Oregon and is owned and operated by John Hepton. The operation is a beef cattle feedlot and is set on 1,060.9 acres available for manure application in Malheur County which is permitted for 14,000 mature beef livestock. Oregon Trail Cattle Feeders is planning to increase the capacity of the feedlot to 25,000 beef livestock. An Oregon Department of Agriculture application to increase permitted animal numbers is located in Section 5. The cattle are of mixed breeds and the average weight of the animals during the confinement period is 750 pounds.

Manure Collection Methods

All cattle are confined in earthen pens. The manure is collected in the pens where it is dehydrated and used as bedding for the cattle. When the cattle are removed from the facility, the pens are cleaned and the dry manure is used as a soil amendment. Some manure is left in the pens, re-mounded and packed for bedding. Three small evaporation ponds (total 4.25 acre-inches) are maintained to catch contaminated runoff that may occur during a large winter storm event. Additionally, there are ditches that run along portions of the feedlot that are 4' wide and 1' deep for emergency situations. The ditches are not hydrologically connected to any surface water. Earthen berms and grass filter strips are maintained around the pens to reduce potential for runoff during a storm event.

Manure Storage Facilities and Transfer

The manure generated at the facility is handled in a dry solid form. Dry manure is scraped and stacked within feedlots during the confinement period, and then land applied during the growing season. All manure will be contained
within the facilities. Clean water is diverted around the system, except in extreme conditions, when some rainfall enters the feedlots. Three evaporation ponds are available to catch contaminated rainwater that falls on the pens. All runoff collected in the ponds evaporates due to the dry climate (9.97" average annual rainfall, 40.23" average annual evaporation). Solids that collect in the ponds are cleaned out every five years, or as needed. The solids are applied to crop ground. All leachate from silage bunkers is contained and evaporated. The solid manure is stored within the dry lots. Manure is transported and applied to crop fields via a 500 cubic foot manure spreader.

Manure Utilization

The land available for manure application is owned and/or leased by John Hepton. There are 309.1 acres of crop land and 33.8 acres of range land adjacent to the operation and another 571.3 acres of crop land which are located a few miles to the south of the feedlot that are available for manure application. Practices include intensive farming of alfalfa hay, corn for silage and grain, and winter wheat. The alfalfa yields 7 tons, corn silage 30 tons (as-fed), corn grain yields 190 bushels, and the wheat yields 11 0 bushels per acre. The crops are used as feed in a high roughage ration for the cattle. Dry manure will be spread in a wheat-corn silage-corn grain rotation. No manure is currently applied to the alfalfa. No manure is exported off farm at this time.

GENERAL INFORMATION

Manure is not only used for nutrient benefits, but also to improve soil tilth via the inputs of organic material. This plan is balanced for nitrogen production and use.

Land Application Areas

A field map showing numbered field locations for all manure application acreage and surface water features, a topography map and a schematic of the feedlot headquarters are included in this NMP.

Nutrient Management

Solid manure is applied and incorporated into the soil in the spring and summer of each year. Manure applied to the corn ground is incorporated when applied in the spring then seed is planted. Manure applied to corn ground in the fall is incorporated, and then the soil is bedded for the corn, which is planted the following spring. Manure applied to the wheat ground is incorporated then seed is planted. Siphon irrigation is used from April through September to apply fresh water to growing crops. To reduce potential for runoff and leaching, irrigation water is applied at approximately 1 inch per application. No tile lines or other form of artificial drainage are used on the property.

A 35 foot vegetated buffer along Willow Creek and the irrigation ditch system does not receive manure application. These buffer areas are either in crop production or are naturally vegetated with grasses.

Soil samples are taken in each field that receives manure, once every 5 years. An annual manure sample will be taken just prior to field application. Protocol for sampling and testing soil, manure and crops are included in this NMP.

Emergency Response Plan

In Case of an Emergency Storage Facility Spill, Leak or Failure-

Implement the following first containment steps:

Stop all other activities to address the spill.
Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
Call for help and excavator if needed.
Complete the clean-up and repair the necessary components.
Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application-

Implement the following first containment steps:

Stop all other activities to address the spill and stop the flow.
Call for help if needed.
If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
If flow is coming from a tile, plug the tile with a tile plug immediately.
Assess the extent of the emergency and request additional help if needed.

Contacts to be made by the owner or operator within 24 hours-

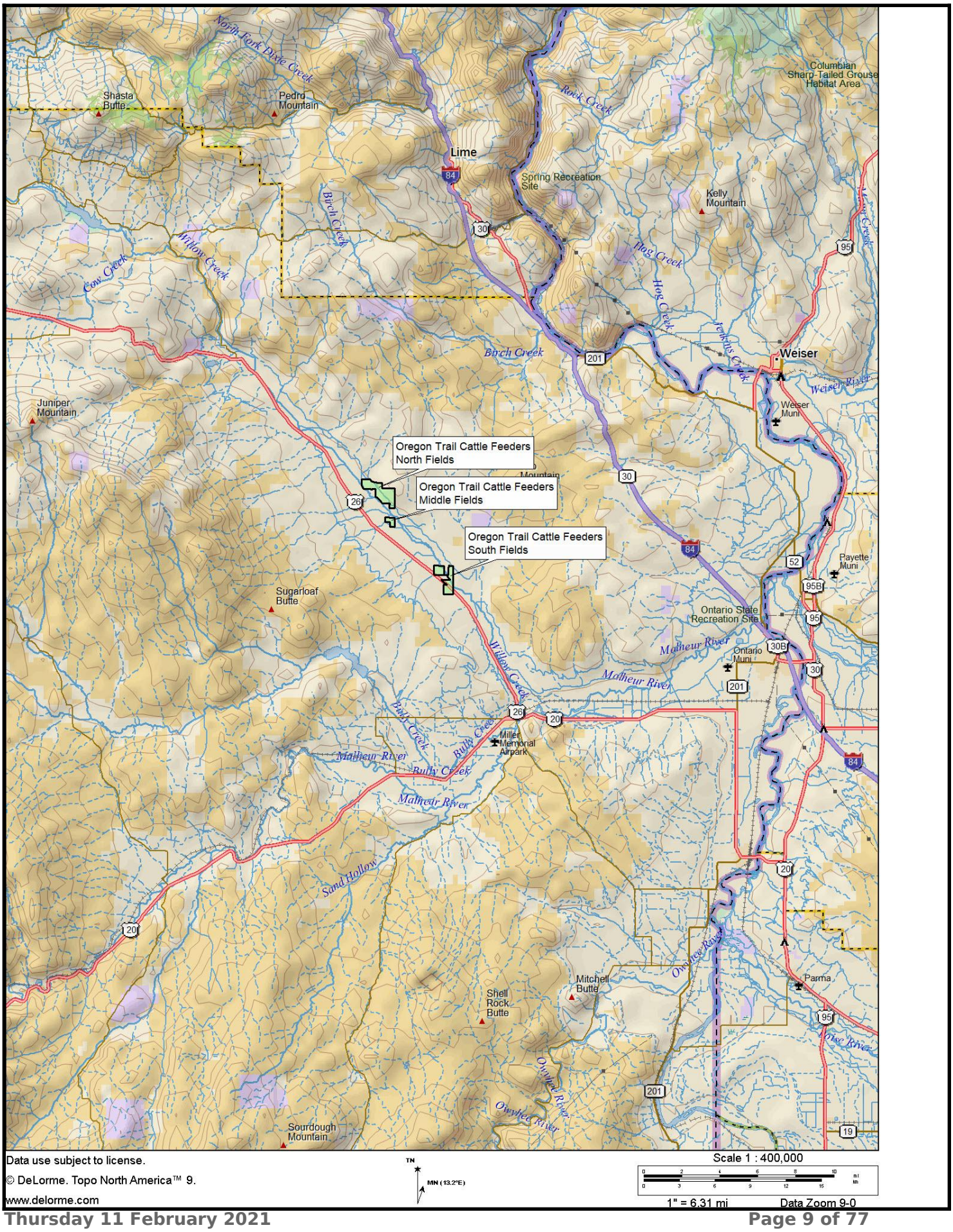
Organization	**Phone Number**
Oregon Department of Agriculture Natural Resources Division TTD 635 Capitol St., N.E. Salem, OR 97301-2532	(503) 986-4699 (503) 986-4762
Oregon Emergency Response (System OERS)	(800) 452-0311

Be prepared to provide the following information:

Your name and contact information.
Farm location (driving directions) and other pertinent information.
Description of emergency.
Estimate of the amounts, area covered, and distance traveled.
Whether manure has reached surface waters or major field drains. Include the name of the surface water source that manure reached. Contact the Oregon Emergency Response System if manure entered a drinking water source.
Whether there is any obvious damage: employee injury, fish kill, or property damage.
If a grab sample of the discharge was taken.
Current status of containment efforts.

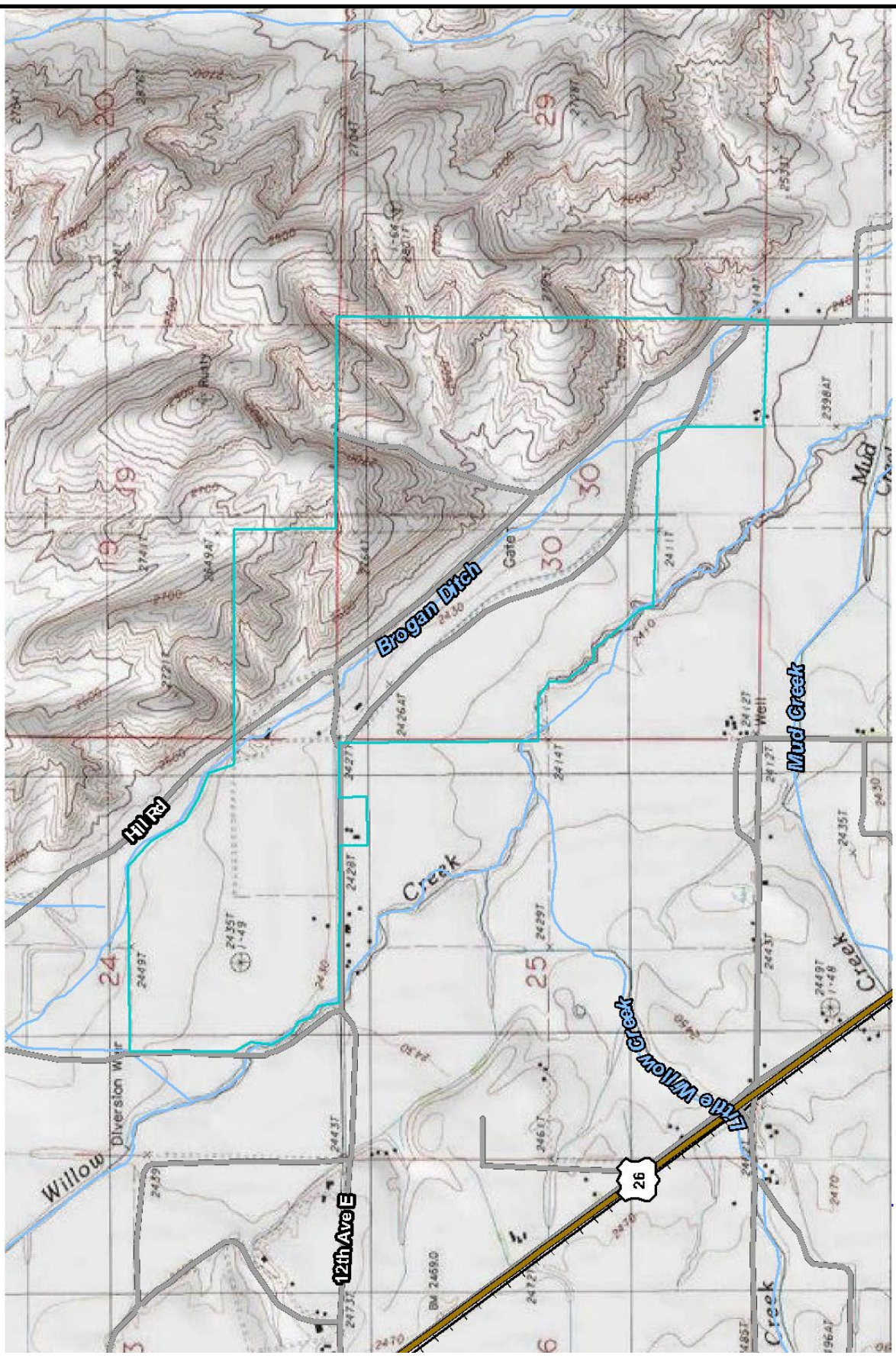
GENERAL INFORMATION

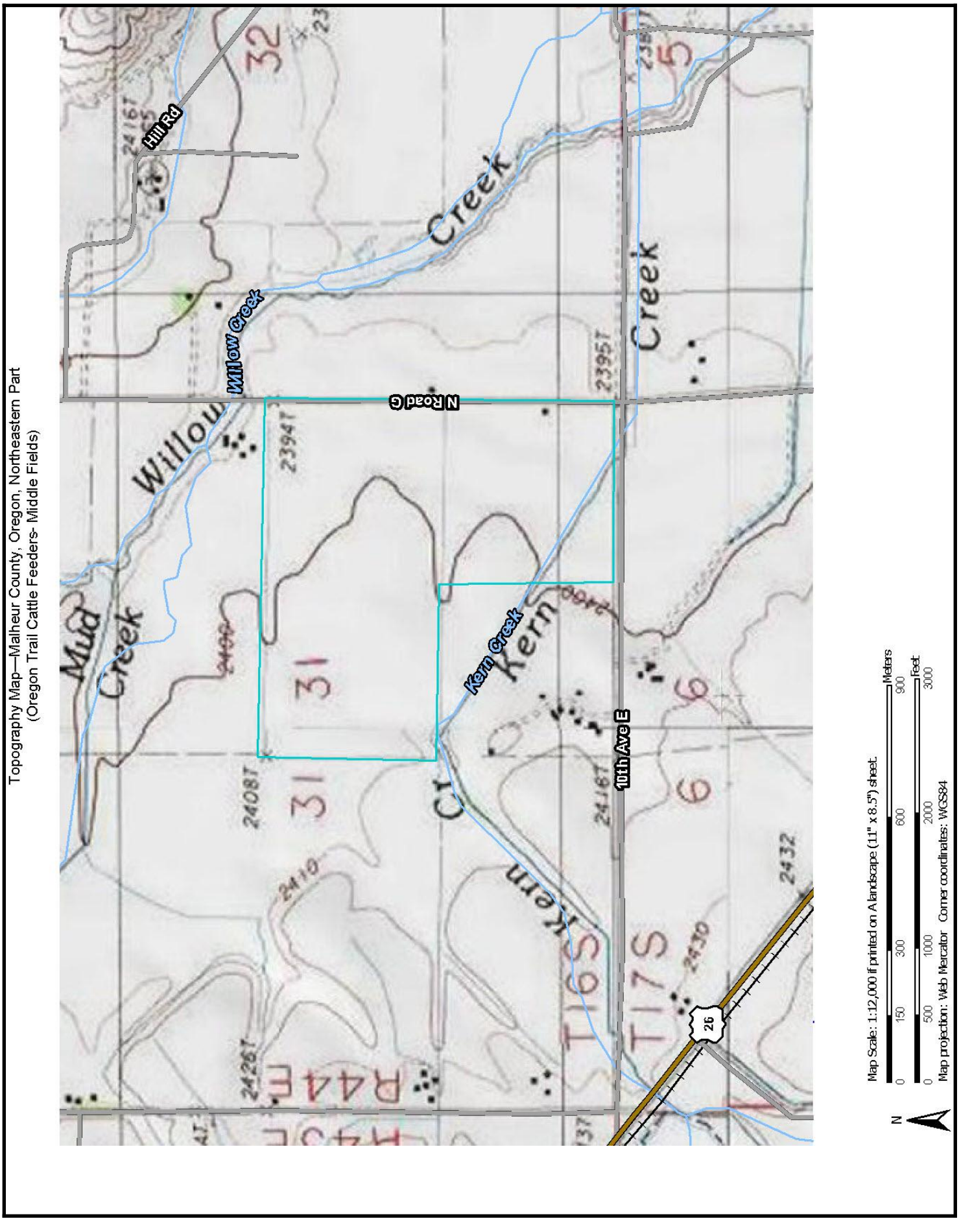
Location Maps for Oregon Trail Cattle Feeders



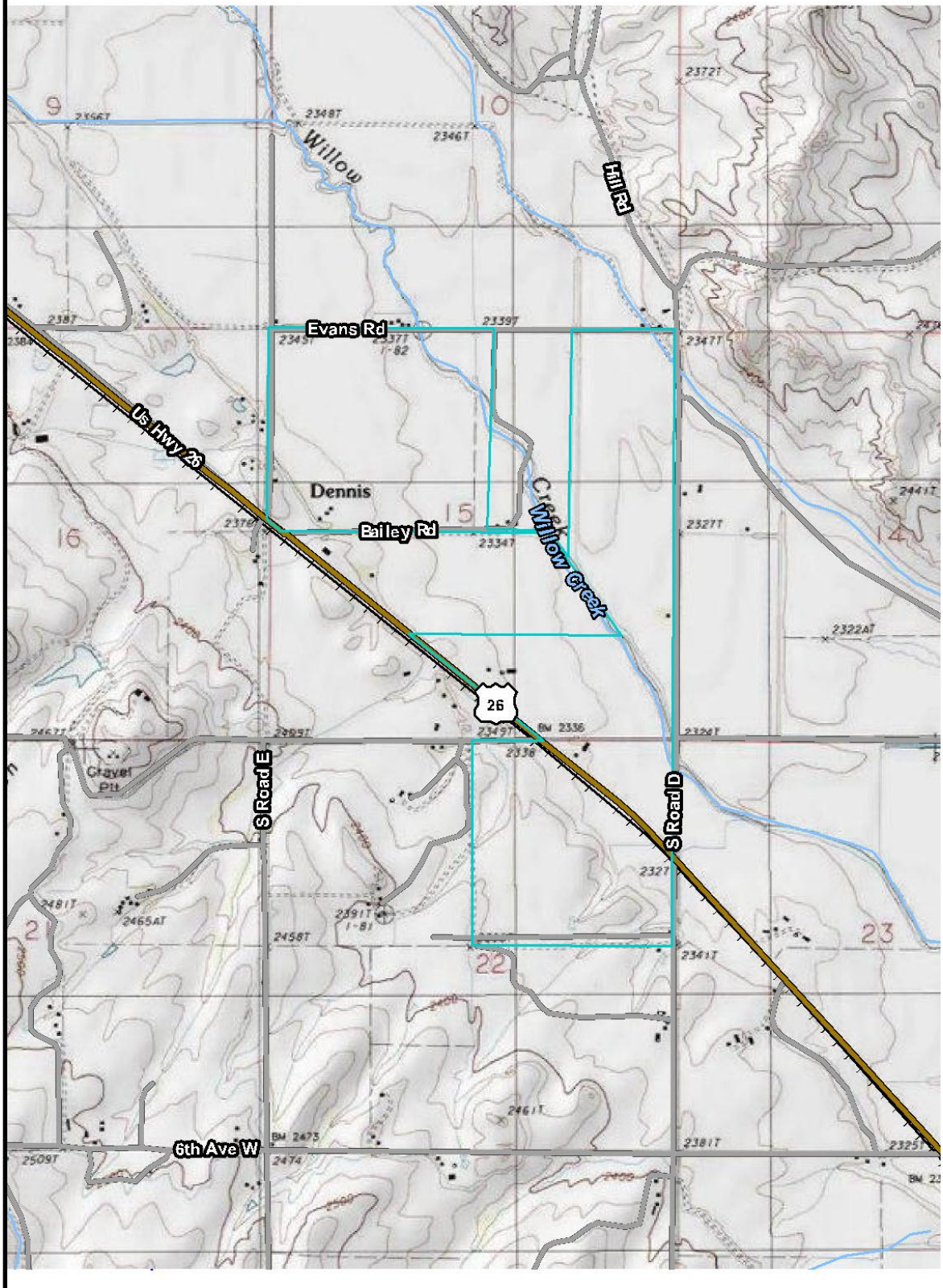
Topographical Maps for Oregon Trail Cattle Feeders

Topography Map—Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part
(Oregon Trail Cattle Feeders- North Fields)




Topography Map—Malheur County, Oregon, Northeastern Part
(Oregon Trail Cattle Feeders- Middle Fields)
Hill Rd
Willow Creek
N Road G
Mud Creek
Kern Creek
10th Ave E
T16S
T17S
R44E
R45E
26
Map Scale: 1:12,000 if printed on A landscape (11" x 8.5") sheet.
Meters
Feet
Map projection: Web Mercator Corner coordinates: WGS84
N

Topography Map—Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part
(Oregon Trail Cattle Feeders- South Fields)



Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 350 700 1400 2100

Feet
0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84

Animal Mortality

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, approved handling and utilization methods shall be implemented in the handling of normal mortality losses.
Animal mortalities must be handled in accordance to ORS 601.140 to prevent the discharge of pollutants to state waters. Animal mortalities will be managed to ensure that they are not disposed of in a liquid manure, storm water, process waste water storage or treatment system, or that is not specifically designed to treat animal mortalities.
Under no circumstances are animal mortalities to be disposed of in any type of liquid manure storage facility.

Guidance for Proper Management of Dead Animals
Refer to Plan for Catastrophic Animal Mortality Handling for guidance on what steps to take for a catastrophic animal mortality event. Having dead animals sent to an acceptable disposal site is the best method to deal with animal mortalities. A list of landfills and phone numbers can be found on the internet at http://www.deq.state.or.us/lq/sw/disposal/permittedfacilities.html. If a local landfill is not permitted to accept animal carcasses, the Oregon Department of Environmental Quality (DEQ) may grant an exception. Phone numbers to local DEQ offices can be found in most phone books or on the internet at http://www.deq.state.or.us/about/locations.html.

Under no circumstances are animal mortalities to be disposed of in any type of liquid manure storage facility.

Acceptable methods and guidance for animal mortality disposal are:
Composting- Composting animal mortalities requires a composting plan be prepared and submitted to the Oregon Department of Agriculture, Natural Resources Division. A composting plan consists of a site plan drawing of the composting facility, a description of how any runoff from the facility will be contained, a description of the composting process to be used and how the compost will be used. The composting facility for animal mortalities must have a concrete floor or similar impervious surface to prevent nutrient leaching. A roof covering the animal mortality composting facility is recommended to control moisture added by rainfall and rainfall runoff. Assistance to develop a composting plan is available from the Natural Resources Division of the Oregon Department of Agriculture, (503) 986-4700. A permit is also needed from the Department of Environmental Quality (DEQ) if animal mortalities will be imported from other farms for composting.
Rapid composting of dead animals occurs when the carbon to nitrogen (C:N) ratio of the compost mix ranges between 10 and 20 to 1. To achieve the recommended C:N ratio, build the initial compost pile by placing 18 inches of sawdust or other bulking agent on the floor of the composting area. The bulking agent should extend beyond the perimeter of the animal to be composted by at least 2 feet. If using a compost bin the bulking material should extend at least 1 foot beyond the perimeter of the animal being composted. Using a bulking agent such as sawdust will absorb any liquids as the animal decomposes during the composting process.
Once the bulking agent has been placed on the floor of the composting area, place the animal carcass on top. To decrease composting time and prevent bloating the body cavity should be cut open. Cover the carcass with 1 to 3 feet of separated manure solids or other material that has a moisture content between 30 to 60 percent and a C:N ratio of not more than 30 to 1. Use 1 foot of material for small carcasses and 3 feet for large carcasses such as cattle. Be careful not to add material that is to wet as it will hinder the composting

process and cause odors. Small animals can be layered in a compost pile by placing 12 inches of the bulking agent between layers as shown in the figure below. Be sure the total height of the compost pile does not exceed 7 feet in height as it may spontaneously combust causing a fire.
The first heating or primary composting cycle will take approximately 15 to 90 days depending on the size of the animal being composted. Refer to the table below for estimated primary composting times. Check pile temperature using thermometer probe on a daily basis. The pile temperature should be checked at multiple points around the compost pile and at a point approximately 3 feet into the pile. The temperature of the compost pile should reach 130 degrees Fahrenheit (F) within a few days. Temperatures should peak between 130 and 150 degrees F in 3 to 4 days. When the temperature of the compost pile falls below 130 degrees F, the compost needs to be aerated by turning or other means. Be sure carcasses remain covered with the bulking agent after being aerated. It is important to maintain a temperature above 130 degrees F for at least 7 days during the primary composting cycle as failure to do so may result in the incomplete destruction of pathogens and can cause fly and odor problems. After aerating the compost pile, the secondary composting times will be similar to the first.
CAUTION: It is unclear whether prions that are the proteins that cause Bovine Spongiform Encephalitis (BSE or Mad Cow Disease) are destroyed in the composting process. Animals showing signs of Mad Cow Disease and those with anthrax should not be composted and must be reported to the Oregon Department of Agriculture, Animal Health and Identification Division at (503) 986-4680 for guidance on disposal.
After aerating the compost pile by turning or other means, be sure to check the moisture content and add water if necessary being careful not to add to much water. The compost pile should feel moist to the touch but you should not be able to squeeze any water out of it.
Odors given off by the composting operation is a good indicator of how the compost operation is proceeding. Foul odors may mean that the process has turned from aerobic to anaerobic. Anaerobic conditions are the result of insufficient oxygen in the compost. This may be caused by excessive moisture in the compost or the need for turning or aerating of the compost pile.
After the composting process is finished, it may be used as a bulking agent for a new compost pile. A rule of thumb is to use 50 percent of the composted material for a bulking agent but you may want to use more or less depending on how degraded the bulking agent is in the finished compost. Using finished compost in a new compost pile reduces the amount of bulking agent needed for the new pile and provides microbial inoculants to get the composting process started.
Finished compost can also be applied to crop and pasture land fields for utilization of the nutrients and organics in the composted material. Compost from animal mortalities should not be applied to crops that will be consumed directly by humans. The nutrient content of the composted material should be determined and application equipment calibrated to ensure nutrients contained in the composted material are not over applied.

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

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

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

Burial- Dead animals may be buried in accordance with ORS 601.090(7) as a method of disposal. Large animals such as an adult cow will require a hole approximately 2 feet by 7 feet by 8 feet deep. Be sure to select a site that doesn't have a water table to insure the bottom of the hole will be dry. The animal carcass should be covered with hydrated lime and covered with at least 4 feet of soil mounded 2 feet above the natural ground line to allow for settling as the carcass decomposes. Burial sites should be located at least 500 feet down slope from surface waters or wells.
Burial is not an acceptable method of disposal for animal byproducts generated from butchering. Burial of large numbers of animal mortalities is not acceptable unless performed in accordance with a Catastrophic Animal Mortality Management Plan. Burial of imported animal mortalities is subject to disposal regulations and the Oregon Department of Environmental Quality (DEQ), the Oregon Department of Agriculture (ODA) and the local land use planning authority should be contacted.

Plan for Catastrophic Animal Mortality Handling

The following information describes how you plan to manage catastrophic loss of animals in a manner that protects surface and ground water quality. You must follow all national, state and local laws, regulations and guidelines that protect soil, water, air, plants, animals and human health.

Guidance in the event of a catastrophic animal mortality event:
Remove animal mortalities from the livestock production area and place in an area designated for mortality storage to be determined at the time of the catastrophic event.

Contact the state veterinarian if animal death is suspicious or animal displayed unusual symptoms before death.
If it is determined that a disease outbreak may be eminent, implement procedures as directed by the State Veterinarian. This may include killing exposed animals, burning carcasses and burial of ashes in a predetermined catastrophic mortality burial areas.
Refer to state guidance regarding appropriate catastrophic animal mortality handling methods.

Contact Information-

Organization	**Phone Number**
Oregon Department of Agriculture Natural Resources Division 635 Capitol St. NE Salem, OR 97301-2532	(503) 986-4699 TTD- (503) 986-4762
Oregon Emergency Response System (OERS)	(800) 452-0311
Oregon State Veterinarian USDA APHIS 530 Center Street NE, Suite 335 Salem, OR 97301	(503) 378-4710 (503) 399-5871 Fax- (503) 399-5607

Operation and Maintenance Considerations

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

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

Dry Stack Storage Facility
Solid manure storage facility will be inspected annually. Broken slabs and curbs will be repaired. Repair or replace rusted or damaged areas on roof structure. Broken gutters and/or downspouts will be repaired or replaced . Check for adequacy and function of drain away from downspouts. Check floor, side and back walls for soundness. Manure solid s and leachate will not escape through cracks in the facility.

Feed lot Pens
Maintaining a firm, dry feedlot surface is an important factor in good animal health and the environment. Diversion ditches or berms should direct clean water flow away from feedlot pens and holding areas. Storm water runoff from pens will be collected and st o red appropriately. Dry manure will be contained within the pen until removed for storage or field application. Manure accumulations created by manure packs or mounding will be managed such that a pollution hazard is not created . Short- term mounding may be used in conjunction with quick clean-ups used to reduce manure pack from around aprons and under fences. Manure will be removed annually from pens. When remov ing manure from pens, care is taken to maintain the integrity of the compacted protective seal or "hard pan".

Fencing
Fences will be inspected periodically. Broken or decayed posts will be replaced. Sagging wire will be tightened. Broken wire will be spliced or replaced. Broken or missing insulators for electric fen ci ng w ill be re p la c e d . Vegetation will be controlled under the fences. Electric fencing will be sufficiently charged to detour animals.

Irrigation Water Management
Irrigation water application will be at rates that minimize transport of sediment, nutrients, and chemicals to surface water and ground water. Equipment modifications and/or soil amendments such as polyacrylamides and mulches should be considered to reduce erosion if needed.

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

Manure Application Equipment

PRODUCTION AREA

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

Manure Effluent and Irrigation Transfer Lines

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

Trough or Tank

Watering facility will be inspected periodically. Damaged tank/trough will be repaired or replaced. Float valves will be maintained in good working order. Area immediately surrounding the trough/tank will be maintained in a stable condition. Watering facilities will not be allowed to overflow if additional liquid will affect waste storage capacities.

Evaporation Waste Storage Pond

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

Immediately repair any vandalism, vehicular, or livestock damage to any earthfill. Settlement or cracks in earthen sections should be investigated to determine cause and immediately repaired. Maintain vigorous growth of vegetative coverings on the dikes to eliminate soil erosion. Eradicate or otherwise remove all rodents or burrowing animals and repair any damage caused by their activity. Fences and/or warning signs should be maintained as necessary to unauthorized human or livestock entry. Operate systems in a manner that minimizes odor and drift.

Chemical Handling Checklist-

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

1. Make sure all chemicals are stored in proper containers. Expired chemicals and empty containers are to be properly disposed of in accordance with state and federal regulations. Pesticides and associate refuse are to be disposed of in accordance with the FIFRA label.
2. Chemical storage areas are to be self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.

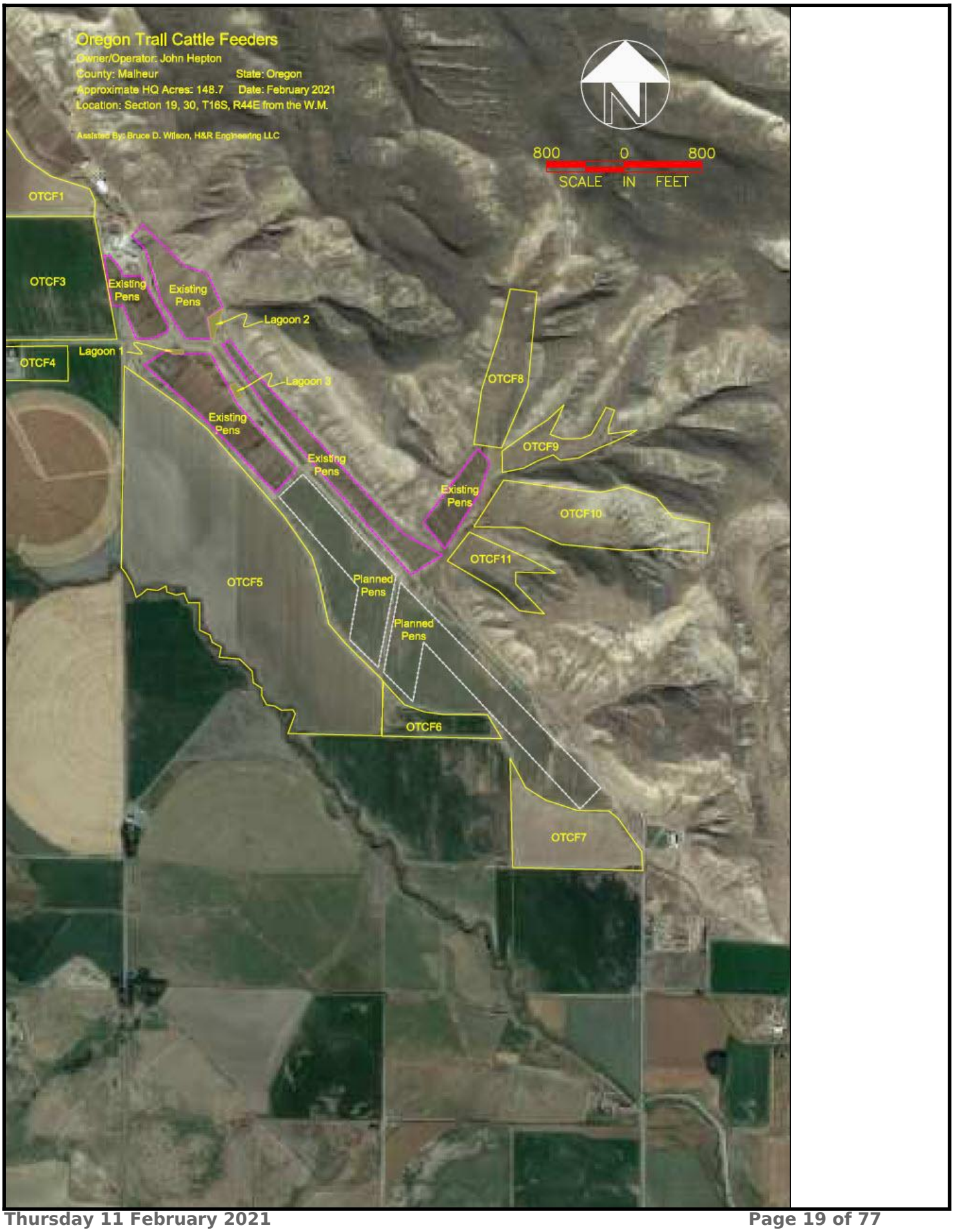
3. Chemical storage areas are to be covered to prevent chemical contact with rain or snow.

4. Emergency procedures and equipment are to be in place to contain and clean up chemical spills.

5. Chemical handling and equipment wash areas are to be designed and constructed to prevent contamination of surface waters, waste water, and storm water storage and treatment systems.

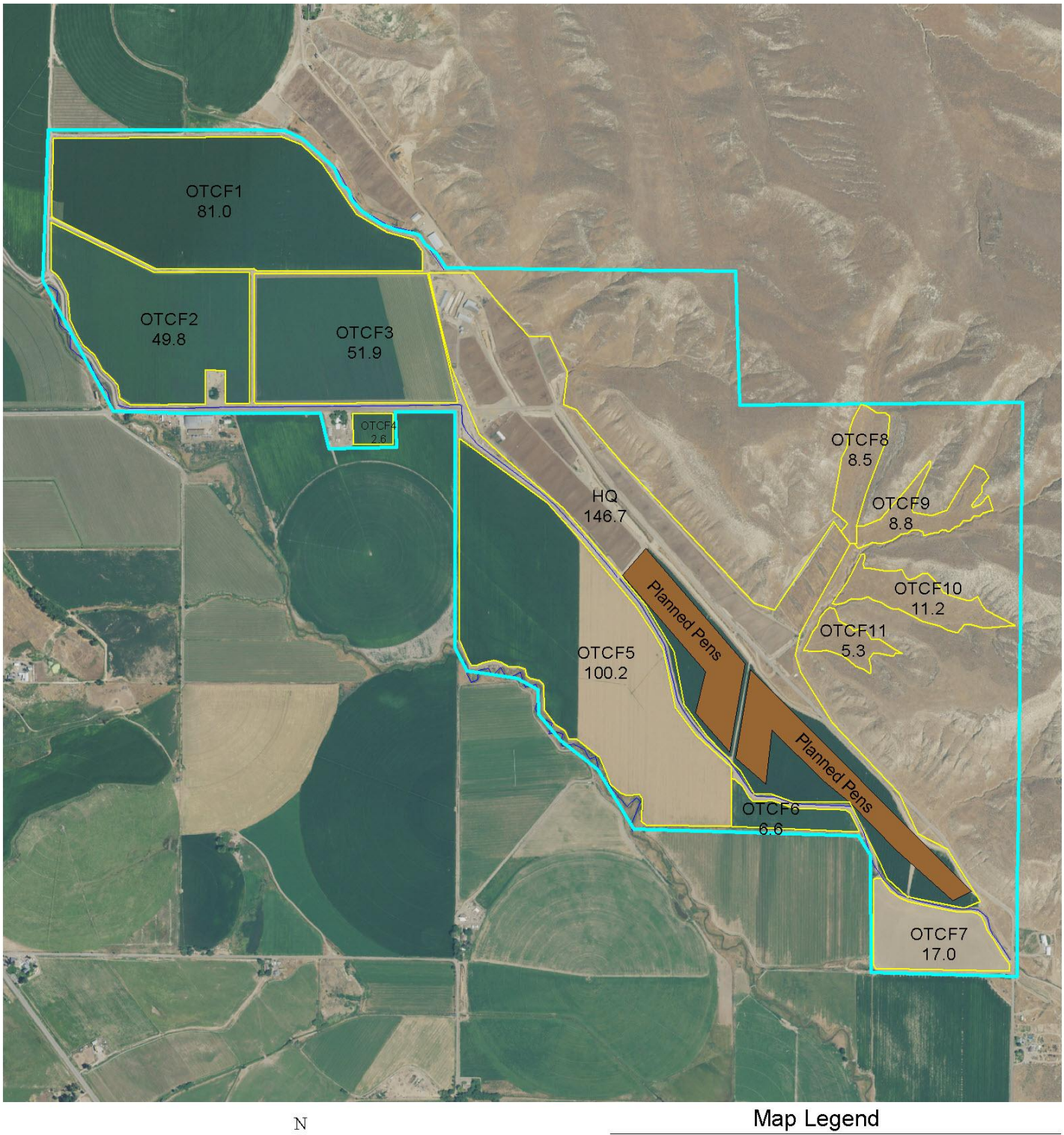
PRODUCTION AREA

Production Area Maps for Oregon Trail Cattle Feeders



Field Maps for Oregon Trail Cattle Feeders

Oregon Trail Cattle Feeders
North Fields



N
W E
S

Scale 0 1500 3000 4500 Feet

Map Legend

Field Name
Acres
- Field Boundary, Field Name, Acres

Oregon Trail Cattle Feeders
Middle Fields

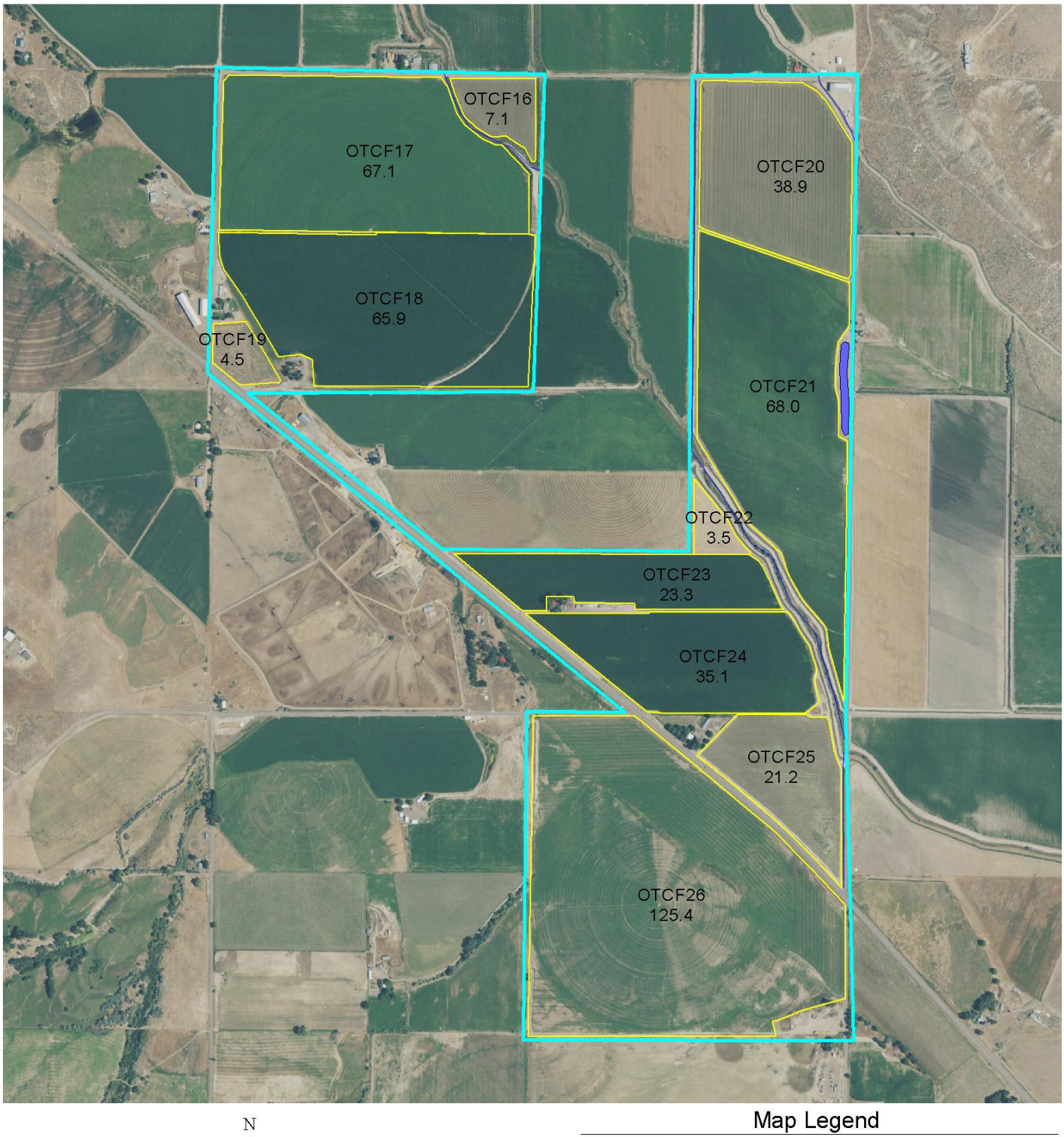
N
W E
S

Scale 0 500 1000 1500 Feet

Map Legend

Field Name
Acres
- Field Boundary, Field Name, Acres

Oregon Trail Cattle Feeders
South Fields



N
W E
S

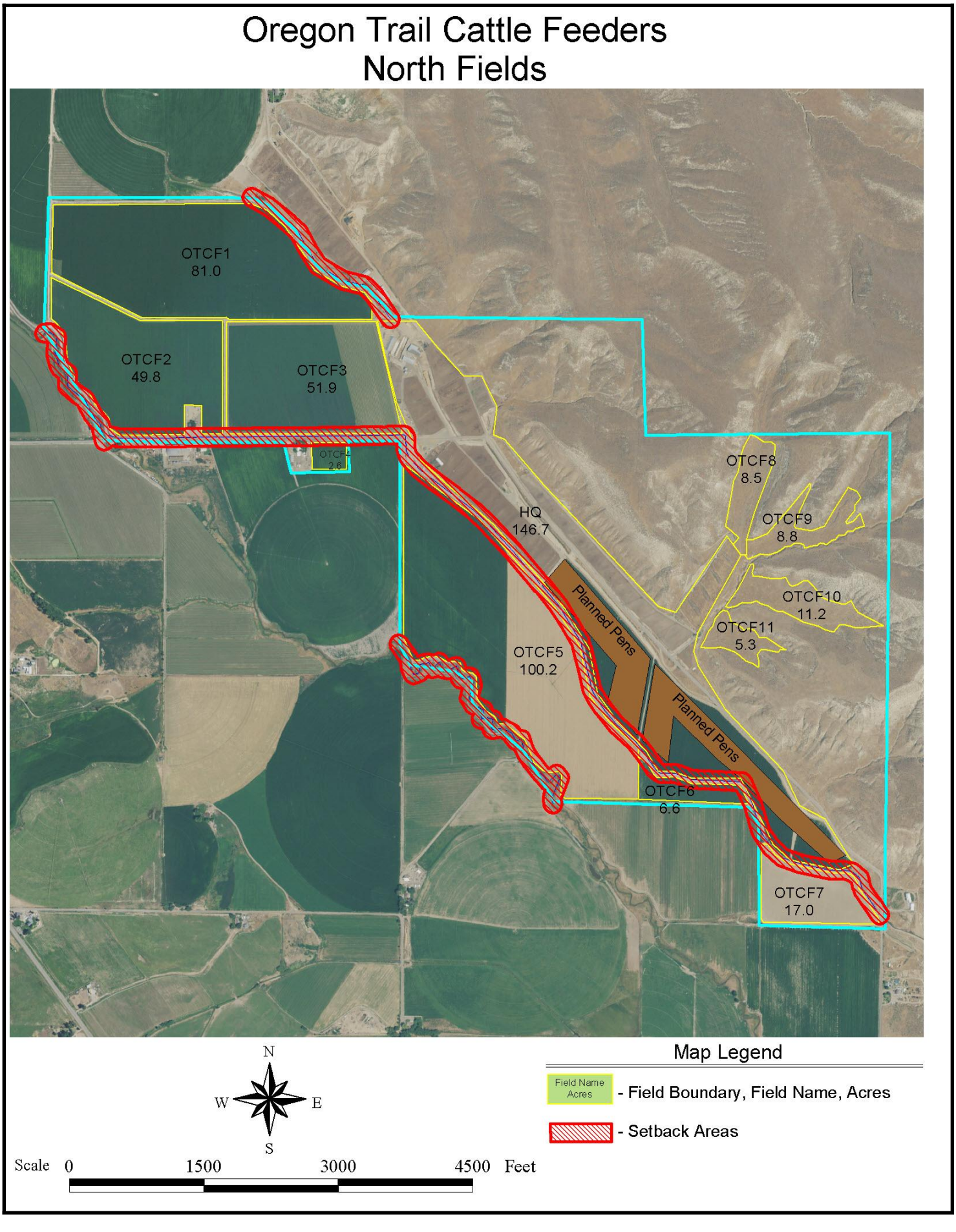
Scale 0 1000 2000 3000 Feet

Map Legend

Field Name
Acres
- Field Boundary, Field Name, Acres

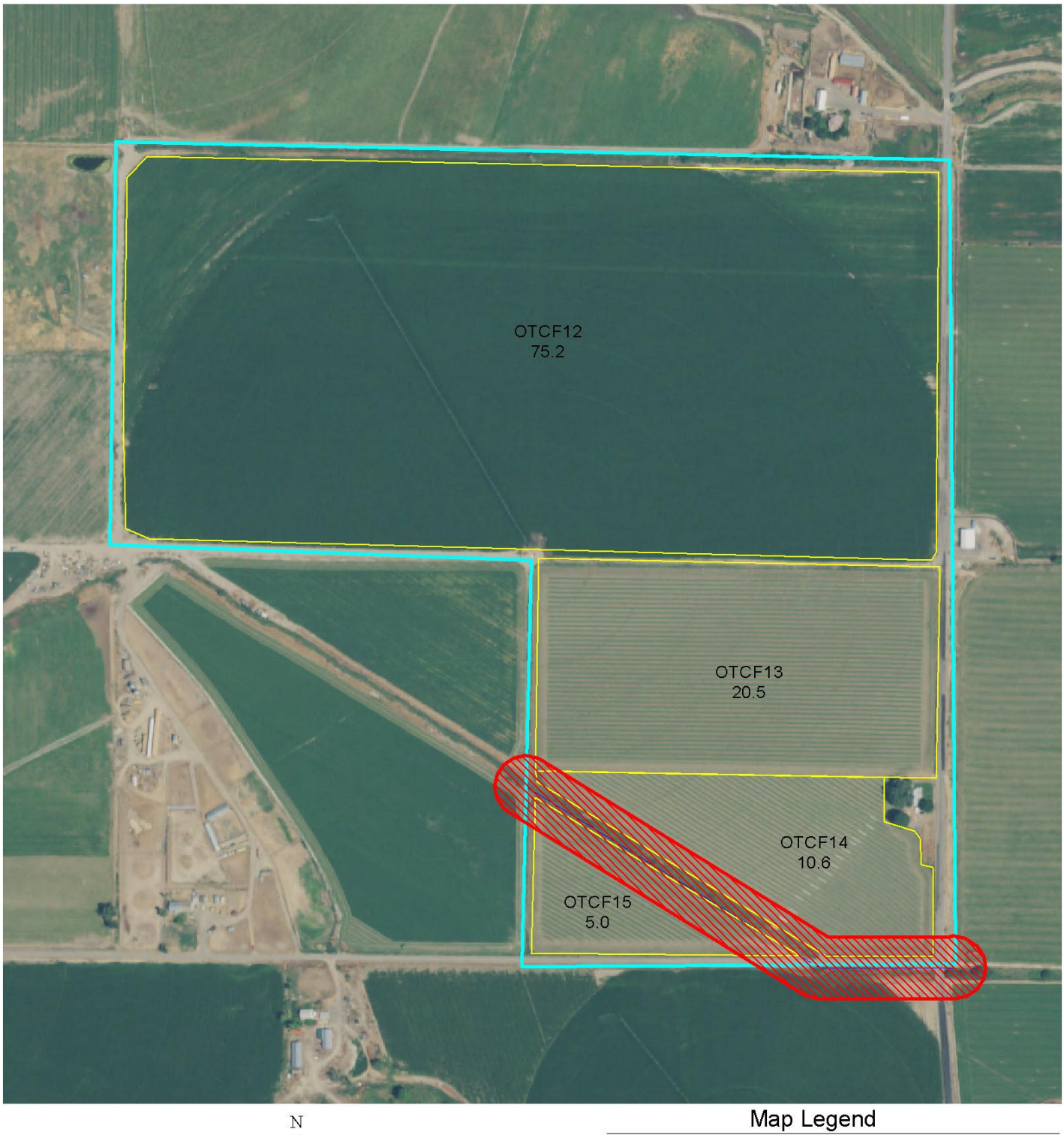
UTILIZATION AREA

Setback Maps for Oregon Trail Cattle Feeders



UTILIZATION AREA

Oregon Trail Cattle Feeders
Middle Fields



N
W E
S

Scale 0 500 1000 1500 Feet

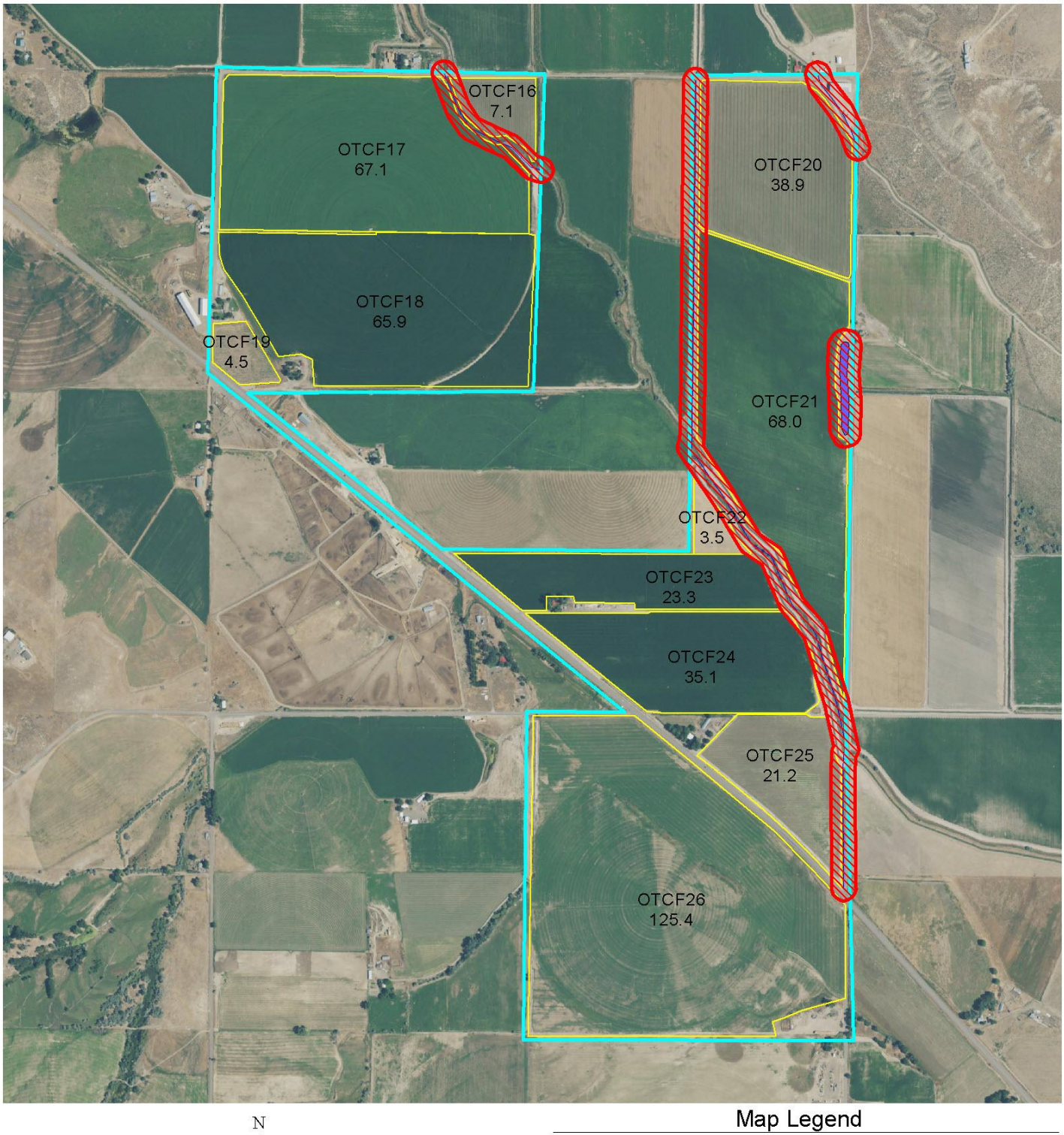
Map Legend

Field Name
Acres - Field Boundary, Field Name, Acres

- Setback Areas

UTILIZATION AREA

Oregon Trail Cattle Feeders
South Fields



N
W E
S

Scale 0 1000 2000 3000 Feet

Map Legend

Field Name
Acres - Field Boundary, Field Name, Acres

- Setback Areas

Application Considerations

The manure and irrigation application systems will be calibrated in accordance with guidance in this section to insure the applications of manure, bedding and runoff from the waste storage facilities are in accordance with agronomic rates.

No application of wastewater or solids containing manure is to be made to the field buffer areas shown on the Setback Map in Section 3-2. Applications of wastewater and solids containing manure should be made in accordance with guidance in this section to reduce the risk of contaminated runoff to surface water sources and leaching of contaminants to ground water sources.

The phosphorus runoff rating for each of the farm fields is based on the Oregon Natural Resources Conservation Service Phosphorus Index and is shown in the table in Section 4-3. Wastewater, solids and commercial fertilizer for any field with a LOW runoff rating can be applied on a nitrogen basis. Wastewater, solids and commercial fertilizer for any field with a MEDIUM or HIGH runoff rating must be applied on a phosphorus basis. No applications of manure or commercial fertilizer containing phosphorus are to be made on a field with a ZERO OUT phosphorus runoff rating.

Manure applications may be made at any time of the year provided certain factors have been considered. However, the overriding factor one should use in considering whether or not to apply nutrients to a crop, irrespective of the nutrient source, is the agronomic need of the crop at the time of application. The following guidelines are to be considered once the decision has been made to make a manure application.

Consider using T-Sum 200 to determine when manure applications are to begin as long as you can comply with all other permit and AWMP requirements. Calculations for T-Sum 200 are outlined in OSU Extension Fertilizer Guide for Pastures (OSU FG63, 2000). T-Sum 200 is based on accumulated heat units and is an accurate guide to estimate plant activity. Research has shown that T-Sum 200 is the earliest date when plant roots begin to grow in the spring and thus are receptive to applied nutrients.

T-Sum 200 is determined by monitoring surface air temperature and summing the daily minimum and maximum air temperatures and dividing the sum by two to get the average daily air temperature then converting that to centigrade (F degrees minus 32 times 0.556). Manure applications may begin once 200 heat units have been accumulated. However, one must still apply manure at agronomic rates based on the estimated growth potential of the crop and anticipated climatic events.

Based on crop nutrient uptake patterns, manure applications should stop when the crop is done growing for the year and before the first significant rainfall event that is expected to result in saturated soils or surface runoff.

Fields that are subsurface (TILE) drained require additional precautions when manure is applied. Any pre-application tillage should leave as much residue as possible on the soil surface. Water control structures installed in subsurface drainage systems should be managed to prevent discharge of manure and wastewater during periods of application.

Be aware of the location of sensitive areas, concerns of neighbors or concerns of the public, which require special application procedures. To reduce odor problems, apply

wastewater and solids containing manure 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.

Calibrate application equipment to insure uniform distribution and accurate application rates in accordance with guidance given in the Considerations for Manure Applications and with guidance on the calibration of application equipment.

Maintain setbacks for manure application from any surface waters. The management goal is not to allow manure to enter surface waters at any time. The following table shows **minimum setback requirements** for manure applications:

Manure Type	Application Equipment	Month and Setback Distance in Feet [a, b, d]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Liquid	Big gun	100	100	100	35	35	35	35	35	35	100	100	100
Liquid	Spreader Bar	100	100	35	35	35/15[c]	15	15	15	35	100	100	100
Liquid	Tank Wagon	100	100	35	35	35/15[c]	15	15	15	35	100	100	100
Liquid	Tanker Truck	100	100	35	35	35/15[c]	15	15	15	35	100	100	100
Solid	Spreader	100	100	35	35	35/15[c]	15	15	15	35	100	100	100

Note:

a. Setbacks are the distance between open waterways and manure application area.
b. Setback requirements will generally increase for manures which are applied aerially (such as a traveling big gun) versus manures applied lower to the ground (such as a splash bar) due to potential for drift from wind or splashing.
c. This is a floating date and should be evaluated based on current weather conditions and forecast information.
d. Fifteen (15) feet is the suggested setback distance during summer months, however larger and/or smaller distances may be set depending on conversations with the ODA.

Record applications, transfers or exports of nutrients (manure and fertilizer) and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or other acceptable record keeping systems can be used to record this information.

CONSIDERATIONS FOR DRY SEASON MANURE APPLICATIONS:

Apply wastewater and solids containing manure at agronomic rates using the following guidelines:
-Consider using T-Sum 200 as a guideline to begin making manure applications.
-Do not apply to soils immediately before or during rainfall events that are expected to result in saturated soils or surface runoff.
-Apply to land being prepared for crops. Till manure into soil within 3 days of application if possible or apply to actively growing crops such as grass, clover or alfalfa after cutting.
-Maintain the setback buffer distances described in this section and shown on the Setback Map when making applications of liquids or solids containing manure.
-Record applications, transfers or exports of nutrients (manure and fertilizer) and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or other acceptable record keeping systems can be used to record this information.

CONSIDERATIONS FOR WET SEASON MANURE APPLICATIONS:

Only apply manure during this time period if the following guidelines CAN be met. Call the ODA CAFO Program at (503) 986-4700 for guidance if a manure application is needed and the following guidelines CANNOT be met:

- Apply manure only to actively growing crops such as grass, clover or alfalfa.
- Minimize application rates by using the maximum travel rates for the application equipment.
- Maintain the setback buffer distances described in this section and shown on the Setback Map when making applications of liquids or solids containing manure.
- Do not apply to soils immediately before or during rainfall events that are expected to result in saturated soils or surface runoff.
- Do not apply to saturated or flooded soils. It is recommended that application(s) be limited to soils (areas) where the flooding frequency class rating is None, Very Rare or Rare.
- Do not apply to slopes greater than 5%. See the Soil Map in Section 4-1 for the location of soil map units with slopes greater than 5%.

Applications of wastewater or solids containing manure to frozen soils should be avoided. Do the following if an application of wastewater or solids containing manure is to be made to frozen soils:
- Apply only enough wastewater or solids containing manure to address storage limitations until suitable soil conditions for application are available.
- Minimize applications to 5 wet tons per acre or less of solids containing manure and 6,788 gallons (0.25 inches) per acre or less of wastewater.
- Apply to alternating strips to reduce the risk of contaminated runoff reaching surface water sources.
- Apply to fields of established hay, pasture or fields containing at least 90% cover and are the furthest from open water sources.
- Do not apply wastewater or solids containing manure within 200 feet of surface water sources, drainageways, wells, or inlets to subsurface drainage systems.
- Runoff control systems such as earthen dikes must be in place where applications will be made to fields with slopes greater than 5%.

Record applications, transfers or exports of nutrients (manure and fertilizer) and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or other acceptable record keeping systems can be used to record this information.

Do not apply manure or commercial fertilizer to fields receiving applications unless the nutrients applied in the manure are less than the annual application of nutrients planned in the nutrient budget for the fields.

HOW TO CALIBRATE APPLICATION EQUIPMENT

Calibration of application equipment is a critical part of nutrient management. Calibration should be completed at least annually to insure manure and fertilizer will be uniformly applied. There are two basic approaches for calibrating a manure spreader – the load area and the weight area methods. The load area method is more accurate and can be used for both liquid and solid manure. The weight area method works only with solid or semi-solid manure.

UTILIZATION AREA

Irrigation System Calibration
Place 3-5 buckets throughout the irrigation spray pattern and collect samples while operating the pump at a given rpm and pressure (for a traveling gun record the travel speed also). At the end of the planned sample period measure the amount of liquid collected in inches (average the samples). The following chart shows how many gallons per acre applied per inch of liquid applied:

Inches Liquid Manure Applied	Gallons per Acre
0.20	5,431
0.30	8,146
0.40	10,862
0.50	13,577
0.75	20,366
1.00	27,152
1.25	33,943
1.50	40,731

Soft Hose Injection System with Irrigation Hose:
Alternative 1. Use a flow meter mounted on the injector system and calculate the distance and width to determine amount applied over a measured area. Example the flow meter measures 1,000 gallons over a distance of 600 feet and 10 feet wide.
Formula: Application Rate (7,260 gallons/acre) = (Gallons Applied (1,000 gal) X 43,560 sq. ft/acre) divided by (Distance traveled (600 ft) X Application width (10 ft))

Alternative 2. (Requires a 10-20 gallon graduated measuring container)
Step 1) In the field, measure the flow out of one injector for 5 seconds into the graduated measuring container and record gallons, repeat three (3) times and average the results.
Step 2) Multiply the average amount collected from one injector by the number of injectors (equals amount applied for the whole system for 5 seconds).
Step 3) Multiply the results of Step 2 times 12 to get gallons per minute.
Step 4) Place the injector in the soil at the planned depth and operating speed and record the distance traveled in 1 minute (average 3 different measurements).
Step 5) Determine the effective application width (number of injectors X injector spacing in feet).
Step 6) Multiply the effective width times the distance traveled in 1 minute (this gives the square feet covered in 1 minute).
Step 7) Divide the result of Step 6 by 43,560 (this gives the acres covered in 1 minute).
Step 8) Divide the results of Step 3 (gallons per minute) by the results of Step 7 (acres covered in 1 minute) - (this gives the gallons applied per acre.

For example:
Step 1) Collect an average of 6 gallons from one injector for 5 seconds.
Step 2) Applicator has 8 injectors (8 injectors X 6 gallons per injector = 48 gallons for 5 seconds)
Step 3) 48 gallons in 5 seconds X 12 = 576 gallons/minute applied
Step 4) Average distance covered in 1 minute was 250 feet
Step 5) Average width of the applicator is 12 feet.
Step 6) 12 feet wide X 250 feet long = 3000 square feet
Step 7) 3000 square feet divided by 43,560 square feet/acre = .0688 acres covered in 1 minute
Step 8) 576 gallons/minute divided by .0688 acres/minute = 8,372 gallons/acre.

Manure Spreader/Tanker Calibration

There are several methods that can be used to calibrate the application rate of a manure spreader. The two best methods are the load-area method and the weight-area method. It is desirable to repeat the calibration procedure 2 to 3 times and average the results to establish a more accurate calibration. Before calibrating a manure spreader, the spreader settings such as splash plates should be adjusted so that the spread is uniform. Most spreaders tend to deposit more manure near the middle than at the edge of the spread pattern. Overlapping can make the overall application more uniform. Calibrating application rates when overlapping is involved requires measuring the width of two spreads and dividing by two to get the effective spread width.

Calibration should take place annually or whenever manure is being applied from a different source or consistency.

Load-Area Method:

The load-area method is the most accurate and can be used for both liquid and solid manure. The load area method is a 3-step process:

Step 1) Determine the amount of manure in the spreader. The most accurate way to determine the amount of manure in a spreader is weighting the spreader when it is empty and again when it is full. For a reliable estimate of spreader capacity, weigh several representative loads (at least five) to determine the average gross weight. Subtract the empty spreader weight. Then, calculate the average net loaded weight.

Step 2) Determine the area of spread using the method at the right. Width measurements near the beginning and end of the spread pattern should be avoided because the spreader may not be operating at full capacity.

Step 3) Calculate the application rate. The application rate is calculated using the formula for either liquid or solid manure.

Formula for Solid Manure Equals Tons/Acre

(Average Loaded Weight (lbs) x 21.81) divided by (Distance Traveled (ft) x Width of Spread (ft))

Formula for Liquid Manure Equals Gal/Acre

(Tank Volume (gal) x 43,560) divided by (Distance Traveled (ft) x Width of Spread (ft))

Weight-Area Method:

The weight-area method can only be used with solid or semi-solid manure. When a scale is not available, the application rate of a box spreader can be determined by collecting manure on a tarp or piece of heavy material. The weight area method is less accurate than the load area method.

This method consists of eight steps:

Step 1) Prepare/cut three 56-inch square tarps or pieces of heavy material (this size equals 1/2,000 of an acre). The pounds of manure collected on 56 inches square equals tons applied per acre.

Step 2) Weigh one of the clean tarps and a large bucket on a platform scale. Record the weight.

Step 3) Anchor the three tarps in the field ahead of the spreader near the beginning, middle, and end of the area that will be spread with one load.

Step 4) Drive over the three tarps at a normal speed to collect a representative manure sample.

Step 5) Fold and place the first tarp into the empty bucket without spilling the manure.

Weigh the bucket, tarp, and manure. Subtract the weight of the clean tarp and bucket recorded in step 2.

Step 6) Repeat the process for each of the two remaining tarps.

Calculate the average weight (pounds) of the manure collected. This value equals tons of manure applied per acre.
Factor for converting pounds to tons and square feet to acres (21.8 = 43,560 sq ft per acre divided by 2,000 lbs/ton).
The factor for converting square feet to acres = 43,560 sq ft per acre.
Step 7) Determining Area of Spread.
The “area of spread” is the length and width of the ground covered with one load of manure. The area of spread is affected by speed and equipment settings. Spreaders discharge manure at varying rates depending on travel and PTO speed, gear box settings, and discharge openings. It is important to adjust the spreader so the pattern is as uniform as possible. Accurately measuring the length and width of this area is essential. To determine width, measure two adjacent spreads and divide by two to find the “effective” spread width. This accounts for overlap, which is often needed for a more uniform application. The length of spread is determined using the following three values:
Desired manure application rate based on soil and manure tests,
Width of the manure spread, and
Manure spreader holding capacity (weight and/or volume).
From these values, calculate the distance or lengths of spread using these formulas:
Formula: Solid Manure Equals Feet/Load
(Average Load Weight (lbs) x 21.81) divided by (Spread Width (ft) x App. Rate (tons/ac))
Formula: Liquid Manure Equals Feet/Load
(Tank Volume (gal) x 43,560) divided by (Spread Width (ft) x Desired App. Rate (gal/ac))
Step 8) Spread a load. If the distance traveled does not equal the calculated distance, adjust the speed or equipment settings.

AMOUNT OF MANURE TO APPLY FOR CROPS GROWN

The formulas for determining the total nutrient application rate per unit yield for each crop shown in the table below are as follows:

Total N to apply in pounds = N in pounds per yield unit from the table for the crop grown X Yield Units per Acre X actual percent (%) dry matter (DM) of harvested crop/percent (%) dry matter (DM) from table

Total P_2O_5 to apply in pounds = P in pounds per yield unit from the table for the crop grown X Yield Units per Acre X 2.291 P_2O_5/P X actual percent (%) dry matter (DM) of harvested crop/percent (%) dry matter (DM) from table

Total K_2O to apply in pounds = K in pounds per yield unit from the table for the crop grown X Yield Units per Acre X 1.205 K_2O/K X actual percent (%) dry matter (DM) of harvested crop/percent (%) dry matter (DM) from table

Example- for a field with 5 tons per acre of grass/legume hay harvested at 90% dry matter:

Total N to apply in pounds per acre = (33.92 lb N / ton) X (5 tons / acre) X (90%DM / 100% DM) = 153 lbs N / acre

UTILIZATION AREA

The following tables show the crops that may be grown on this farm:

FRUIT OR VEGETABLES				**Nutrient Removal (lb/yield unit)**		
	Yield Unit	**lb/Unit**	**% DM**	**N**	**P**	**K**
Beans, dry edible	cwt	100	100	3.13	0.45	0.85
Blueberries	ton	2000	100	13.93	1.30	11.57
Caneberries	ton	2000	100	11.43	7.42	11.43
Corn, Sweet	ton	2000	100	20.67	5.60	13.66
Grapes	ton	2000	100	11.39	1.07	20.43
Mixed Vegetables & Fruit	ton	2000	100	8.33	2.08	10.20
Onions	cwt	100	100	0.18	0.04	0.13
Orchard, Fruit	ton	2000	100	13.00	2.00	16.00
Pea, edible	ton	2000	100	73.60	8.00	18.00
Potatoes	ton	2000	100	30.0	5.45	47.27
Squash	ton	2000	100	21.33	6.80	11.40

GRAIN, SEED OR OIL CROPS				**Nutrient Removal (lb/yield unit)**		
	Yield Unit	**lb/Unit**	**% DM**	**N**	**P**	**K**
Barley	bushels	48	100	0.87	0.16	0.21
Beets, sugar	ton	2000	100	4.00	0.60	2.78
Bluegrass, Seed	cwt	100	100	2.88	0.43	1.98
Canola	ton	2000	100	70.00	12.00	18.00
Corn, grain shelled	bushels	56	100	0.90	0.16	0.22
Crimson Clover seed	lb	1	100	0.05	0.01	0.02
Fescue Seed, Straw Removed	cwt	100	100	1.97	0.20	2.00
Fescue, seed (Fine or Tall)	lb	1	100	1.47	0.31	1.67
Oats, grain	bushels	32	100	0.62	0.11	0.16
Orchardgrass seed	lb	1	100	0.016	0.002	0.004
Peppermint for Oil	ton	2000	100	4.20	1.80	2.80
Peppermint for Oil, Leaves & Stems Removed	ton	2000	100	87.23	36.80	57.80
Pumpkins	ton	2000	100	4.00	1.40	6.60
Rapeseed	bushels	50	100	1.38	0.30	0.30
Red Clover seed	cwt	100	100	4.55	1.00	2.00
Ryegrass seed	cwt	100	100	1.67	0.27	1.42
Ryegrass Seed, Straw Removed	ton	2000	100	30.00	18.80	37.60
Ryegrass, Perennial seed	lb	1	100	0.02	0.002	0.004
Wheat, Soft White for grain	bushels	60	100	1.00	0.24	0.21
Wheat, Soft White, Straw Removed	ton	2000	100	43.40	8.90	20.90
Wheat, Hard Red for grain	bushels	60	100	1.60	0.37	0.31
Wheat, Hard Red, Straw Removed	ton	2000	100	53.36	10.96	23.76

UTILIZATION AREA

HAY AND PASTURE CROPS				Nutrient Removal (lb/yield unit)		
	Yield Unit	lb/Unit	% DM	N	P	K
Alfalfa, Hay	ton	2000	100	54.40	6.83	35.70
Alfalfa, Seed	cwt	100	100	6.12	0.70	2.34
Alta Fescue Hay/Pasture	ton	2000	100	32.98	6.88	37.60
Grass Legume Hay/Pasture	ton	2000	100	33.92	5.30	7.56
Meadow Fescue Hay/Pasture	ton	2000	100	41.56	8.70	47.43
Oats Hay/Pasture	ton	2000	100	26.01	10.20	14.79
Orchardgrass Hay/Pasture	ton	2000	100	53.21	8.58	18.62
Perennial Grass Hay/Pasture	ton	2000	100	58.00	8.00	40.00
Reed Canary Grass	ton	2000	100	27.00	3.57	41.57
Ryegrass Hay	ton	2000	100	33.41	5.44	28.39
Ryegrass, Perennial Pasture	ton	2000	100	58.00	8.00	48.00
Sorghum-Sudan Haylage	ton	2000	100	54.40	6.40	58.00
Tall Fescue Hay/Pasture	ton	2000	100	39.40	4.00	40.00
Vetch Hay	ton	2000	100	51.93	7.20	44.76

SILAGE AND HAYLAGE CROPS				Nutrient Removal (lb/yield unit)		
	Yield Unit	lb/Unit	% DM	N	P	K
Alfalfa/Grass Haylage	ton	2000	100	15.60	1.02	6.84
Corn for Silage	ton	2000	100	25.00	4.00	20.00
Crimson Clover forage	ton	2000	100	40.00	4.48	33.28
Field Pea, Forage	ton	2000	100	73.60	8.00	18.00
Mustard, White	ton	2000	100	38.55	0.0	0.0
Oat haylage	ton	2000	100	26.0	10.2	14.8
Oats & Peas/ Green Beans	ton	2000	100	32.03	5.58	18.65
Perennial Grass Haylage	ton	2000	100	15.00	2.40	12.78
Red Clover forage	ton	2000	100	40.00	4.41	32.98
Ryegrass Haylage	ton	2000	100	15.00	2.40	12.78
Sorghum-Sudan Haylage	ton	2000	100	16.32	1.92	17.40
Triticale Haylage	ton	2000	100	49.00	6.80	11.40
Vetch Haylage	ton	2000	100	59.67	6.57	50.00
Wheat Haylage	ton	2000	100	41.30	5.00	57.30
Wheatgrass Hay/Pasture	ton	2000	100	49.59	6.21	68.76

OTHER CROPS				Nutrient Removal (lb/yield unit)		
	Yield Unit	lb/Unit	% DM	N	P	K
Filberts	ton	2000	100	41.70	7.30	39.29
Hops, Cones	bale	200	100	9.00	0.96	5.00
Natural Area (Trees & Grass)	ton	2000	100	10.52	1.56	9.20
Nursery Stock	ton	2000	100	8.33	2.08	10.20
Poplars, Pulpwood	ton	2000	100	0.30	0.09	0.12
Hemp/Cannabis	ton	2000	100	31.09	3.37	36.23

Note: Nutrient uptake values are taken from the NRCS National Agricultural Waste Management Field Handbook and updated with more current information from the Extension Service when available. When nutrient uptake values are not available from NRCS or Extension references, then nutrient uptake data from the NRCS Plant Database or other approved data sources is used.

Nutrient Applications

Nutrient Applications Report

Oregon Trail Cattle Feeders

Vale

OTCF1

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
03/03/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
11/10/2021	Pens	Solids Spreader	100	24 Ton/Ac	178	245	475
				OTCF1 Totals:	377	520	1,010

OTCF12

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/16/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
				OTCF12 Totals:	200	275	535

OTCF13

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/17/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF13 Totals:	155	214	416

OTCF14

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/18/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF14 Totals:	155	214	416

OTCF15

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/19/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF15 Totals:	155	214	416

OTCF16

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/20/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF16 Totals:	155	214	416

OTCF17

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/21/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
				OTCF17 Totals:	200	275	535

OTCF18

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
03/24/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
10/20/2021	Pens	Solids Spreader	100	24 Ton/Ac	178	245	475
				OTCF18 Totals:	377	520	1,010

OTCF19

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/23/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF19 Totals:	155	214	416

OTCF2

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/16/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
				OTCF2 Totals:	200	275	535

OTCF20

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/24/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF20 Totals:	155	214	416

OTCF21

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/25/2021	Pens	Solids Spreader	100	21 Ton/Ac	155	214	416
				OTCF21 Totals:	155	214	416

OTCF22

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
09/27/2021	Pens	Solids Spreader	100	20 Ton/Ac	148	204	396
				OTCF22 Totals:	148	204	396

OTCF23

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
03/17/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
10/13/2021	Pens	Solids Spreader	100	24 Ton/Ac	178	245	475
				OTCF23 Totals:	377	520	1,010

OTCF24

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
03/10/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
10/06/2021	Pens	Solids Spreader	100	24 Ton/Ac	178	245	475
				OTCF24 Totals:	377	520	1,010

OTCF25

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
09/28/2021	Pens	Solids Spreader	100	20 Ton/Ac	148	204	396
				OTCF25 Totals:	148	204	396

OTCF26

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/26/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
				OTCF26 Totals:	200	275	535

OTCF3

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/20/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
				OTCF3 Totals:	200	275	535

OTCF4

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
04/11/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
				OTCF4 Totals:	200	275	535

OTCF5

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
02/24/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
11/03/2021	Pens	Solids Spreader	100	24 Ton/Ac	178	245	475
				OTCF5 Totals:	377	520	1,010

OTCF6

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
02/17/2021	Pens	Solids Spreader	100	27 Ton/Ac	200	275	535
10/27/2021	Pens	Solids Spreader	100	24 Ton/Ac	178	245	475
				OTCF6 Totals:	377	520	1,010

OTCF7

Date	Source	Equipment Used	% of Field	Amount Applied	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac
09/25/2021	Pens	Solids Spreader	100	20 Ton/Ac	148	204	396
				OTCF7 Totals:	148	204	396

Sampling Guidance

Manure and Soil Sampling Frequency

For large concentrated animal feeding operations, sample liquids and solids containing manure during applications in early spring annually and have each sample analyzed for Total Nitrogen (TKN), Ammonium Nitrogen (NH_4-N), Phosphorus (P_2O_5) and Potassium (K_2O) plus percent moisture. Ask the lab to report results in pounds per ton for the solids containing manure and in pounds per thousand gallons for liquids containing manure. Analyses of solids and liquids containing manure should be performed by a laboratory that meets the requirements and performance standards of the Manure Testing Laboratory Certification Program (MTLCP), https://www.mda.state.mn.us/licensing/licensetypes/mapprogram.aspx.

For small and medium animal feeding operations, if no samples of liquids and solids containing manure have been taken, take a sample of liquids and solids during applications in early spring once a year for three consecutive years to develop a cumulative manure analysis history as a basis for nutrient allocation to the fields. If there is a sampling history of liquids and solids containing manure, take a sample of liquids and solids during applications in early spring once every 5 years or whenever a significant change in animal numbers or in the manure handling system occurs. Have each sample analyzed for Total Nitrogen (TKN), Ammonium Nitrogen (NH_4-N), Phosphorus (P_2O_5) and Potassium (K_2O) plus percent moisture. Ask the lab to report results in pounds per ton for the solids containing manure and in pounds per thousand gallons for liquids containing manure. Analyses of solids and liquids containing manure should be performed by a laboratory that meets the requirements and performance standards of the Manure Testing Laboratory Certification Program (MTLCP), https://www.mda.state.mn.us/licensing/licensetypes/mapprogram.aspx.

Large CAFO's are required to test a minimum of 20 percent of their fields annually which would result in all of the fields being tested once every 5 years. Small and Medium CAFO's are only required to test all of their fields once every 5 years. However, from a management standpoint, more frequent soil testing offers good information on the nutrient status of your soils.

Collect soil samples from 20 percent of the fields receiving solids or liquids containing manure **annually** in the fall after harvest or before rains begin(typically September 15-October 15) in accordance with **Pacific Northwest (PNW) Extension publication 570-E, "Monitoring Soil Nutrients Using a Management Unit Approach",** https://catalog.extension.oregonstate.edu/pnw570. Have the soil samples analyzed for Total Nitrogen (TKN) and Phosphorus (P) and ask the lab to report results in parts per million (ppm). Soil test analyses should be performed by laboratories that meet the requirements and performance standards of the North American Proficiency Testing Program (NAPT) Proficiency Assessment Program (PAP); http://www.naptprogram.org/pap/.

How to Sample Liquid Manure

Obtain a composite following one of the procedures listed below and thoroughly mix. Using a plunger, an up-and-down action works well for mixing liquid manure in a five-gallon bucket. Fill a one-quart plastic bottle not more than three-quarters full with the composite sample. Store sample in freezer if not delivered to the lab immediately.

Procedure 1. Sampling from storage- Agitate storage facility thoroughly before sampling. Collect at least five samples from the storage facility or during loading using a five-gallon bucket. Place a sub sample of the composite sample in a one-quart plastic container. Sampling a liquid manure storage facility without proper agitation (2-4 hrs. minimum) is not recommended due to nutrient stratification, which occurs in liquid systems. If manure is sampled from a lagoon that was not properly agitated, typically the nitrogen and potassium will be more concentrated in the top liquid, while the phosphorus will be more concentrated in the bottom solids.

Procedure 2. Sampling during application- Place buckets around field to catch manure from spreader or irrigation equipment. Combine and mix samples into one composite sub sample in a one-quart plastic container.

How to Sample Solid Manure

Collect a composite sample by following one of the procedures listed below. A method for mixing a composite sample is to pile the manure and then shovel from the outside to the inside of the pile until well mixed. Fill a one-gallon plastic heavy-duty zip lock bag approximately one-half full with the composite sample, squeeze out excess air, close and seal. Store sample in freezer if not delivered to the laboratory immediately.

Procedure 1. Sampling while loading - Recommended method for sampling from a stack or bedded pack. Take at least ten samples while loading several spreader loads and combine to form one composite sample. Thoroughly mix the composite sample and take an approximately one pound sub sample using a one-gallon plastic bag. Sampling directly from a stack or bedded pack is not recommended.

Procedure 2. Sampling during spreading - Spread a tarp in field and catch the manure from one pass. Sample from several locations and create a composite sample. Thoroughly mix the composite sample together and take a one-pound sub sample using a one-gallon plastic bag.

Procedure 3. Sampling daily haul - Place a five-gallon bucket under the barn cleaner 4-5 times while loading a spreader. Thoroughly mix the composite sample together and take a one-pound sub sample using a one-gallon plastic bag. Repeat sampling 2-3 times over a period of time and test separately to determine variability.

Procedure 4. Sampling poultry in-house - Collect 8-10 samples from throughout the house to the depth the litter will be removed. Samples near feeders and waterers may not be indicative of the entire house and sub samples taken near here should be proportionate to their space occupied in the whole house. Mix the samples well in a five-gallon pail and take a one-pound sub sample, place it in a one-gallon zip lock bag.

Procedure 5. Sampling stockpiled litter - Take ten sub samples from different locations around the pile at least 18 inches below the surface. Mix in a five-gallon pail and place a one-pound composite sample in a gallon zip lock bag.

Sample Identification and Delivery

Identify the sample container with information regarding the farm, animal species and date. This information should also be included on the sample information sheet along with application method, which is important in determining first year availability of nitrogen.

Keep all manure samples frozen until shipped or delivered to a laboratory. Ship early in the week (Mon.-Wed.) and avoid holidays and weekends.

How to Sample Soils

Current soil tests must be used in the development and editing of nutrient management plans. A current soil test is one that is no older than 5 years that is used to represent the nutrient status of the entire field. Soil analysis must be performed by laboratories successfully meeting the requirements and performance standards of the North American Proficiency Testing Program-Performance Assessment Program (NAPT-PAP). Results of these analysis will be used to determine application rates for manure, litter, and process wastewater. Guidance for soil sampling can be found in the **Pacific Northwest (PNW) Extension publication 570-E, "Monitoring Soil Nutrients Using a Management Unit Approach"**, https://catalog.extension.oregonstate.edu/pnw570. **Oregon State University Extension publication EC1478, "Soil Test Interpretation Guide",** https://catalog.extension.oregonstate.edu/ec1478 provides guidance on how to determine soil nutrient concentrations and how to adjust soil pH to improve nutrient availability.

Field Area. A composite soil sample should represent a uniform field area. Each area should have similar crop and fertility history. Soil characteristics (color, slope, texture, drainage) should be similar. Exclude small areas within a field that are obviously different. The field area represented by a single composite sample should represent no more than 40 irrigated acres or 100 dry land acres.

Sampling Depth. Laboratory tests are calibrated to specific depths. It is vital to collect samples from appropriate depths. Sampling depth for most soils is the rooting depth in 6-inch intervals. In Oregon, as a minimum, soil samples should be collected from the 0-12" depth. The 0-6" surface soil samples are normally used for conventional tests of organic matter, nitrogen, phosphorus, potassium, pH and salt levels. Additionally, subsurface samples from the 6-24" depth are needed to estimate nitrogen availability for crops grown in dry land areas.

Post Harvest Soil Testing for Evaluating Nutrient Applications. Refer to **Pacific Northwest (PNW) Extension publication 570-E, "Monitoring Soil Nutrients Using a Management Unit Approach"**, https://catalog.extension.oregonstate.edu/pnw570, for guidance on how to evaluate nutrient applications and crop uptake of nutrients.

Manure Tests

Nutrient Analysis Report

Oregon Trail Cattle Feeders

Vale

Sample Date	Storage Name	Units	Total N	P_2O_5	K_2O	NH_4-N	NO_3-N	Org N	Density Lbs/CF
09/25/2018	Pens	lbs/Ton	7.4	10.2	19.8	3.5	0.0	3.9	36.0

Soil Tests

Soils Testing Report

Oregon Trail Cattle Feeders

2423 12th Avenue E, Vale

OTCF1

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF10

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF11

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF12

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF13

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF14

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF15

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF16

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF17

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF18

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF19

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF2

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF20

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.6	12.0		

OTCF21

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF22

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF23

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF24

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	0.2	0.8	12.0		

OTCF25

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	42.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF26

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9222	1T	12.0	7.4		0.32	3.86			44.0	432.0	628.0 ppm	5311.0	62.0 ppm	31.0	6.0	23.0	0.6	4.9	2.0	0.8	12.0		

OTCF3

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF4

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF5

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF6

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF7

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11				72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF8

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

OTCF9

Test Date	Lab #	Sample ID	Depth	pH	BpH	SS (ppm)	OM %	Ex Carb	Bray P	Olsen P	K (ppm)	Mg	Ca	Na	NO3-N	NH4-N	S (ppm)	B (ppm)	Zn (ppm)	Mn (ppm)	Cu (ppm)	Fe (ppm)	Al (ppm)	Cl (ppm)
9/24/2018	9221	1T	12.0	7.5		0.11	2.72			72.0	200.0	397.0 ppm	2982.0	24.0 ppm	50.0	5.0	14.0	0.5	4.6	2.0	0.8	14.0		

Soil test analyses should be performed by laboratories that meet the requirements and performance standards of the North American Proficiency Testing Program (NAPT) Proficiency Assessment Program (PAP);
http://www.naptprogram.org/pap/

Nutrient Balances

Nutrient Balances Report

Oregon Trail Cattle Feeders

Vale

Field	Acres	Crop	Yield	Nutrient Uptake (lbs/ac)			Nutrient Applied (lbs/ac)			Nutrient Balance (lbs/ac)		
				N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
OTCF1	81.0	Alfalfa Hay	7 Ton	381	109	301	377	520	1,010	(-3)	411	709
OTCF10	11.2	Grass Hay/Pasture	0.4 Ton	23	7	19	0	0	0	(-23)	(-7)	(-19)
OTCF11	5.3	Grass Hay/Pasture	0.4 Ton	23	7	19	0	0	0	(-23)	(-7)	(-19)
OTCF12	75.2	Corn, Silage	9 Ton	225	82	217	200	275	535	(-25)	193	318
OTCF13	20.5	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF14	10.6	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF15	5.0	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF16	7.1	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF17	67.1	Corn, Silage	9 Ton	225	82	217	200	275	535	(-25)	193	318
OTCF18	65.9	Alfalfa Hay	7 Ton	381	109	301	377	520	1,010	(-3)	411	709
OTCF19	4.5	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF2	49.8	Corn, Silage	9 Ton	225	82	217	200	275	535	(-25)	193	318
OTCF20	38.9	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF21	68.0	Corn, Grain	5 Ton	160	64	48	155	214	416	(-5)	150	368
OTCF22	3.5	Wheat, Winter	110 Bu	176	93	41	148	204	396	(-28)	111	355
OTCF23	23.3	Alfalfa Hay	7 Ton	381	109	301	377	520	1,010	(-3)	411	709
OTCF24	35.1	Alfalfa Hay	7 Ton	381	109	301	377	520	1,010	(-3)	411	709
OTCF25	21.2	Wheat, Winter	110 Bu	176	93	41	148	204	396	(-28)	111	355
OTCF26	125.4	Corn, Silage	9 Ton	225	82	217	200	275	535	(-25)	193	318
OTCF3	51.9	Corn, Silage	9 Ton	225	82	217	200	275	535	(-25)	193	318
OTCF4	2.6	Corn, Silage	9 Ton	225	82	217	200	275	535	(-25)	193	318
OTCF5	100.2	Alfalfa Hay	7 Ton	381	109	301	377	520	1,010	(-3)	411	709
OTCF6	6.6	Alfalfa Hay	7 Ton	381	109	301	377	520	1,010	(-3)	411	709
OTCF7	17.0	Wheat, Winter	110 Bu	176	93	41	148	204	396	(-28)	111	355
OTCF8	8.5	Grass Hay/Pasture	0.4 Ton	23	7	19	0	0	0	(-23)	(-7)	(-19)
OTCF9	8.8	Grass Hay/Pasture	0.4 Ton	23	7	19	0	0	0	(-23)	(-7)	(-19)

Transferred Nutrients

Transfers Report

Oregon Trail Cattle Feeders

Vale

Exported from	Date Transferre	Quantity	Analysis Available	Total N lbs	P_2O_5 lbs	K_2O lbs	Exported to
Pens	04/14/2021	61,172 Ton	No	452,672.81	272,350.25	1,005,149.88	Bedding Mounds
Pens	10/07/2021	61,171 Ton	No	452,665.41	272,345.78	1,005,133.44	Bedding Mounds
	Sub Totals:	6,796,833 CF		905,338.22	544,696.03	2,010,283.31	

Imported from	Date Transferre	Quantity	Analysis Available	Total N lbs	P_2O_5 lbs	K_2O lbs	Imported to
No Imports.				0	0	0	
	Sub Totals:	CF		0	0	0	
	Totals:	6,796,833 CF		905,338	544,696	2,010,283	

Cropping History

Cropping Report

Oregon Trail Cattle Feeders

Vale

Planted	Field	Acres	Crop	Yield	Nutrient Uptake (lbs/ac) N	P_2O_5	K_2O
01/01/2021	OTCF1	81.0	Alfalfa Hay	7 Ton	54	16	43
	OTCF1 Totals:				54	16	43
01/01/2021	OTCF10	11.2	Grass Hay/Pasture	0.4 Ton	58	18	48
	OTCF10 Totals:				58	18	48
01/01/2021	OTCF11	5.3	Grass Hay/Pasture	0.4 Ton	58	18	48
	OTCF11 Totals:				58	18	48
05/23/2021	OTCF12	75.2	Corn, Silage	30 Ton	25	9	24
	OTCF12 Totals:				25	9	24
05/02/2021	OTCF13	20.5	Corn, Grain	5 Ton	32	13	10
	OTCF13 Totals:				32	13	10
05/07/2021	OTCF14	10.6	Corn, Grain	5 Ton	32	13	10
	OTCF14 Totals:				32	13	10
05/14/2021	OTCF15	5.0	Corn, Grain	5 Ton	32	13	10
	OTCF15 Totals:				32	13	10
05/17/2021	OTCF16	7.1	Corn, Grain	5 Ton	32	13	10
	OTCF16 Totals:				32	13	10
05/24/2021	OTCF17	67.1	Corn, Silage	30 Ton	25	9	24
	OTCF17 Totals:				25	9	24
01/01/2021	OTCF18	65.9	Alfalfa Hay	7 Ton	54	16	43
	OTCF18 Totals:				54	16	43
05/03/2021	OTCF19	4.5	Corn, Grain	5 Ton	32	13	10
	OTCF19 Totals:				32	13	10
05/16/2021	OTCF2	49.8	Corn, Silage	30 Ton	25	9	24
	OTCF2 Totals:				25	9	24
04/23/2021	OTCF20	38.9	Corn, Grain	5 Ton	32	13	10
	OTCF20 Totals:				32	13	10
04/26/2021	OTCF21	68.0	Corn, Grain	5 Ton	32	13	10
	OTCF21 Totals:				32	13	10
01/01/2021	OTCF22	3.5	Wheat, Winter	110 Bu	2	1	0
	OTCF22 Totals:				2	1	0
01/01/2021	OTCF23	23.3	Alfalfa Hay	7 Ton	54	16	43
	OTCF23 Totals:				54	16	43

Cropping Report - Oregon Trail Cattle Feeders

Planted	Field	Acres	Crop	Yield	Nutrient Uptake (lbs/ac) N	P_2O_5	K_2O
01/01/2021	OTCF24	35.1	Alfalfa Hay	7 Ton	54	16	43
	OTCF24 Totals:				54	16	43
01/01/2021	OTCF25	21.2	Wheat, Winter	110 Bu	2	1	0
	OTCF25 Totals:				2	1	0
05/07/2021	OTCF26	125.4	Corn, Silage	30 Ton	25	9	24
	OTCF26 Totals:				25	9	24
05/09/2021	OTCF3	51.9	Corn, Silage	30 Ton	25	9	24
	OTCF3 Totals:				25	9	24
05/16/2021	OTCF4	2.6	Corn, Silage	30 Ton	25	9	24
	OTCF4 Totals:				25	9	24
01/01/2021	OTCF5	100.2	Alfalfa Hay	7 Ton	54	16	43
	OTCF5 Totals:				54	16	43
01/01/2021	OTCF6	6.6	Alfalfa Hay	7 Ton	54	16	43
	OTCF6 Totals:				54	16	43
01/01/2021	OTCF7	17.0	Wheat, Winter	110 Bu	2	1	0
	OTCF7 Totals:				2	1	0
01/01/2021	OTCF8	8.5	Grass Hay/Pasture	0.4 Ton	58	18	48
	OTCF8 Totals:				58	18	48
01/01/2021	OTCF9	8.8	Grass Hay/Pasture	0.4 Ton	58	18	48
	OTCF9 Totals:				58	18	48

Irrigation Water Management

The application of Irrigation Water Management to the irrigated fields as shown on the Field Map will manage soil moisture to promote the desired crop response, optimize the available water supplies, minimize irrigation induced erosion, decrease non-point source pollution of surface and groundwater sources, manage salts in the crop root zone and manage the crop micro climate.

Permits: Under Oregon law all water is publicly owned, and anyone planning to store or divert surface or groundwater for the purpose of irrigation must obtain a permit or water right from the Oregon Water Resources Department. These permits or water rights must be obtained prior to the use of the water. It is the responsibility of the Farmer to file for the necessary permits or water rights. More information about Oregon water rights can be found at http://www.oregon.gov/owrd/Pages/wr/index.aspx.

The irrigation system used to irrigate crops should be adapted for site conditions (soil, slope, crop grown, climate, water quantity and quality, etc.) and capable of applying water and wastewater to meet the consumptive use of the crop. The following table shows the estimated Available Water Holding Capacity (AWHC) and sprinkler intake rates by soil texture that should be considered in the design of the irrigation system.1/

Symbol	Soil Texture	AWHC Range (in/in)	Sprinkler Intake Rate Range (in/hour)
COS	Coarse Sand	0.01-0.03	1.0+
S	Sand	0.01-0.03	0.5+
FS	Fine Sand	0.05-0.07	0.5+
VFS	Very Fine Sand	0.05-0.07	0.5+
LCOS	Loamy Coarse Sand	0.06-0.08	1.0+
LS	Loamy Sand	0.06-0.08	0.4-1.5
LFS	Loamy Fine Sand	0.09-0.11	0.4-1.5
LVFS	Loamy Very Fine Sand	0.10-0.12	0.3-1.25
COSL	Coarse Sandy Loam	0.10-0.12	0.3-1.25
SL	Sandy Loam	0.11-0.13	0.3-1.25
FSL	Fine Sandy Loam	0.13-0.15	0.3-1.0
VFSL	Very Fine Sandy Loam	0.15-0.17	0.3-1.0
L	Loam	0.16-0.18	0.6-0.7
SIL	Silt Loam	0.19-0.21	0.5-0.7
SI	Silt Loam	0.16-0.18	0.5-0.7
SCL	Sandy Clay Loam	0.14-0.16	0.1-0.5
CL	Clay Loam	0.19-0.21	0.1-0.5
SICL	Silty Clay Loam	0.19-0.21	0.1-0.4
SC	Sandy Clay	0.15-0.17	0.1-0.4
SIC	Silty Clay	0.15-0.17	0.1-0.2
C	Clay	0.14-0.16	0.1-0.2

1/ Values in this table are taken from the Natural Resources Conservation Service National Engineering Handbook, Part 652, Irrigation Guide and are estimates based on soil texture and should only be used where local data is unavailable.

Irrigation water management requires knowledge, skills, and desire to determine when irrigation water should be applied. The main factors influencing IWM are irrigation interval (time between irrigations), irrigation set time (time water is applied), and application rate (rate at which water is applied). These parameters define the timing and duration of irrigation and the amount of water applied. System design and maintenance are also important factors influencing irrigation water management.

UTILIZATION AREA

Guidance given in the irrigation water requirements worksheets was developed based on Oregon State University Extension Miscellaneous 8530, Oregon Crop Water Use and Irrigation Requirements publication. For additional information on irrigation water management contact a professional with the required knowledge and skill. The following average monthly evapotranspiration and precipitation graphs can be used to estimate when to irrigate and how much to apply:

UTILIZATION AREA

Irrigation Water Flows, Volumes, and Relationships

Equation 1 -

$$Q \times T = D \times A$$

wher

Q = flow rate (acre-in/hr or cfs)
T = time (hr)
D = gross depth applied (in)
A = area (acres)

Equation 2 -

$$Q = \frac{453 \times A \times}{F \times H}$$

wher

Q = flow rate (acre-in/hr or cfs)
A = area (acres)
D = gross depth applied (in)
F = irrigation period (days)
H = Hours of operation per

Water Flow

1 cubic foot per second (cfs)
= 448.8 gallons per minute
1 cfs for 1 hour = 0.99 acre-inch
1 cfs for 24 hr = 1.98 acre-ft
1,000 gpm = 2.23 cfs
1,000 gpm for 24 hr = 4.42 ac-ft
1 gpm/acre =0.053 ac-in/ac/day
1 cfs = 40 miner's inches in OR, No CA
1 cfs = 50 miner's inches in ID, WA

1 miner's inch = 11.22 gpm in OR
1 miner's inch = 9 gpm in ID, WA
1 cfs = 28.32 liters/sec
1 cubic meter/sec = 35.3 cfs
1 liter/sec = 15.85 gpm

Q x T = D x where:

Q = cfs, T = hr, D = inches depth; A =

Gpm for 5 ft/s velocity in PVC pipe:

6"	8"	10"	12"	14"
480	800	125	175	215

Water Volumes & Weights:

1 cubic foot = 7.48 gallons
= 62.4 lbs = 28.3 liters
1 acre-foot = 43,560 cubic feet
(1 acre covered 1 ft deep)
12 acre-in = 1 acre-ft = 325,829 gal
1 million gallons = 3.07 acre-ft
1 acre-ft = 1,234 cubic meters
1 cu meter = 1,000 liters = 35.3 cu ft

Pressure and Pressure Head:

1 psi = 2.31 ft of pressure head
1 atmosphere (sea level)
= 14.7 psi = 33.9 ft of head

Lengths and Areas:

1 mile = 5,280 ft = 1.61 km
1 meter = 3.28 ft = 39.37 inches
1 acre = 43,560 square ft
1 hectare = 2.47 acres

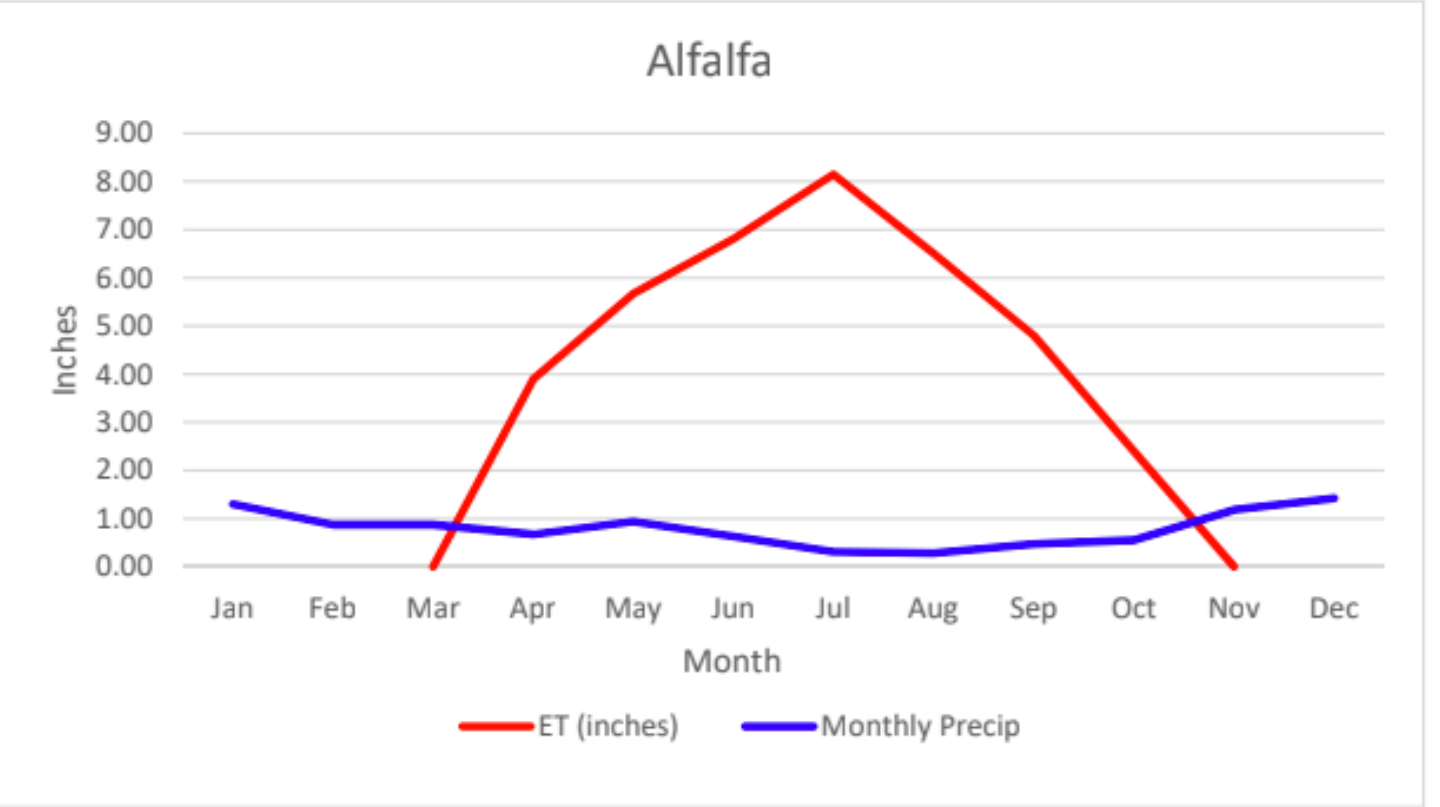
Pump Power Requirement

$$Horsepower = \frac{Pump\ \ Head\ \ in\ \ ft\ \ x\ \ gpm}{39.6 \times \%\ Pump\ \ Efficiency}$$

UTILIZATION AREA

Crop- Alfalfa
Region- Southeast

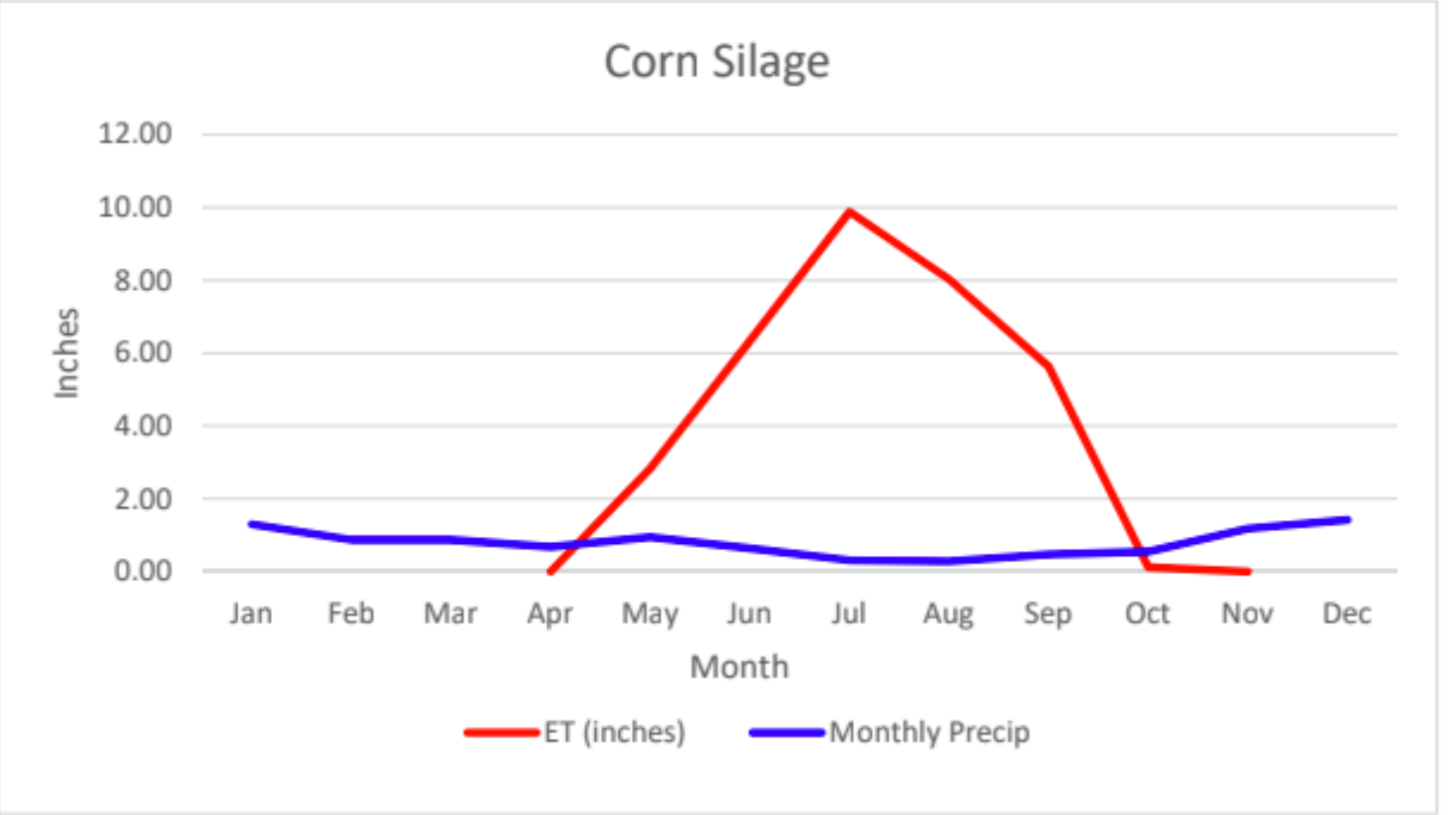
Total Seasonal Evapotranspiration-	38.23	Inches
Peak Evapotranspiration Rate-	0.27	Inches/Day
Maximum Allowed Depletion-	50	%
Critical Moisture Deficit Period-	Jul	



UTILIZATION AREA

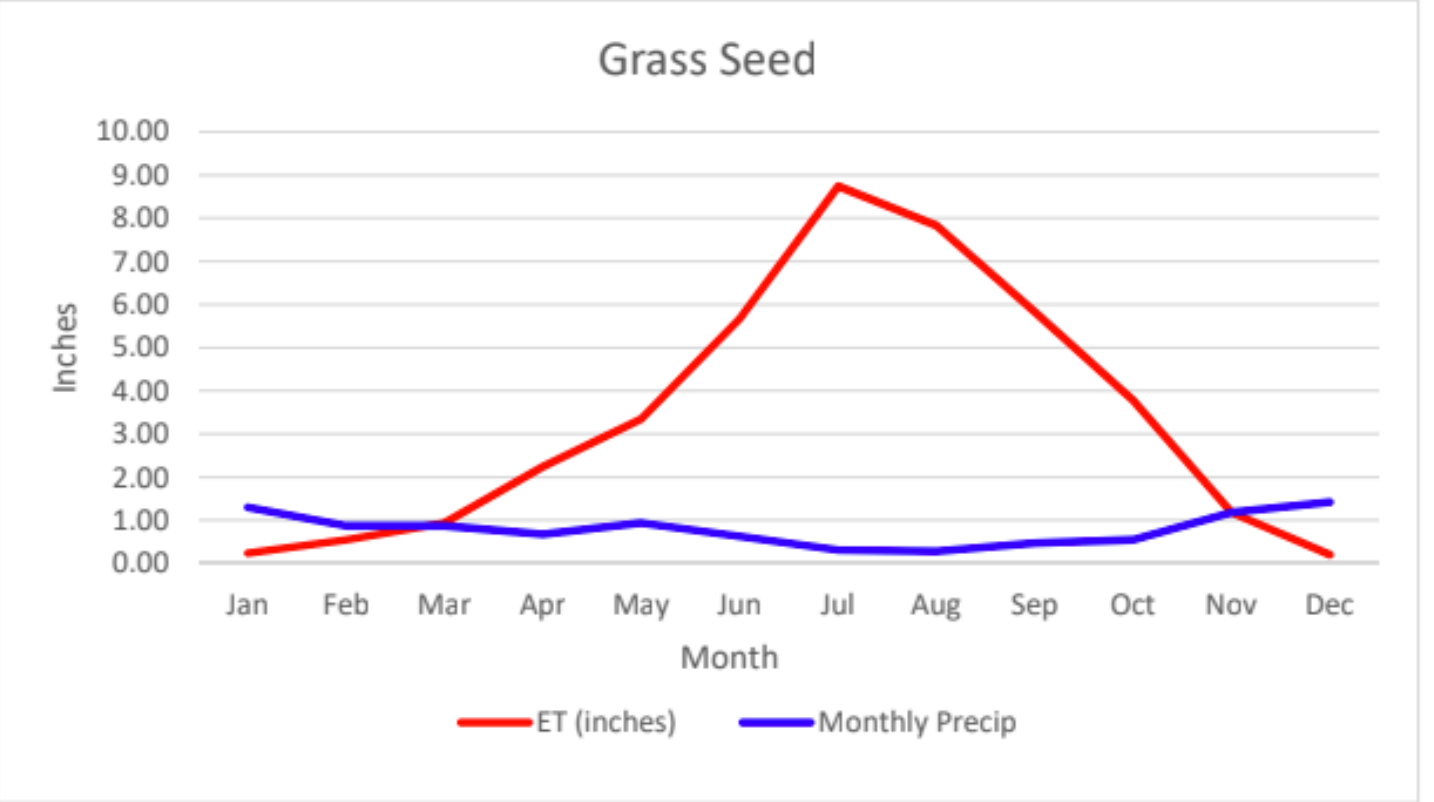
Crop- Corn Silage
Region- Southeast

Total Seasonal Evapotranspiration-	32.83	Inches
Peak Evapotranspiration Rate-	0.33	Inches/Day
Maximum Allowed Depletion-	50	%
Critical Moisture Deficit Period-	Jul	



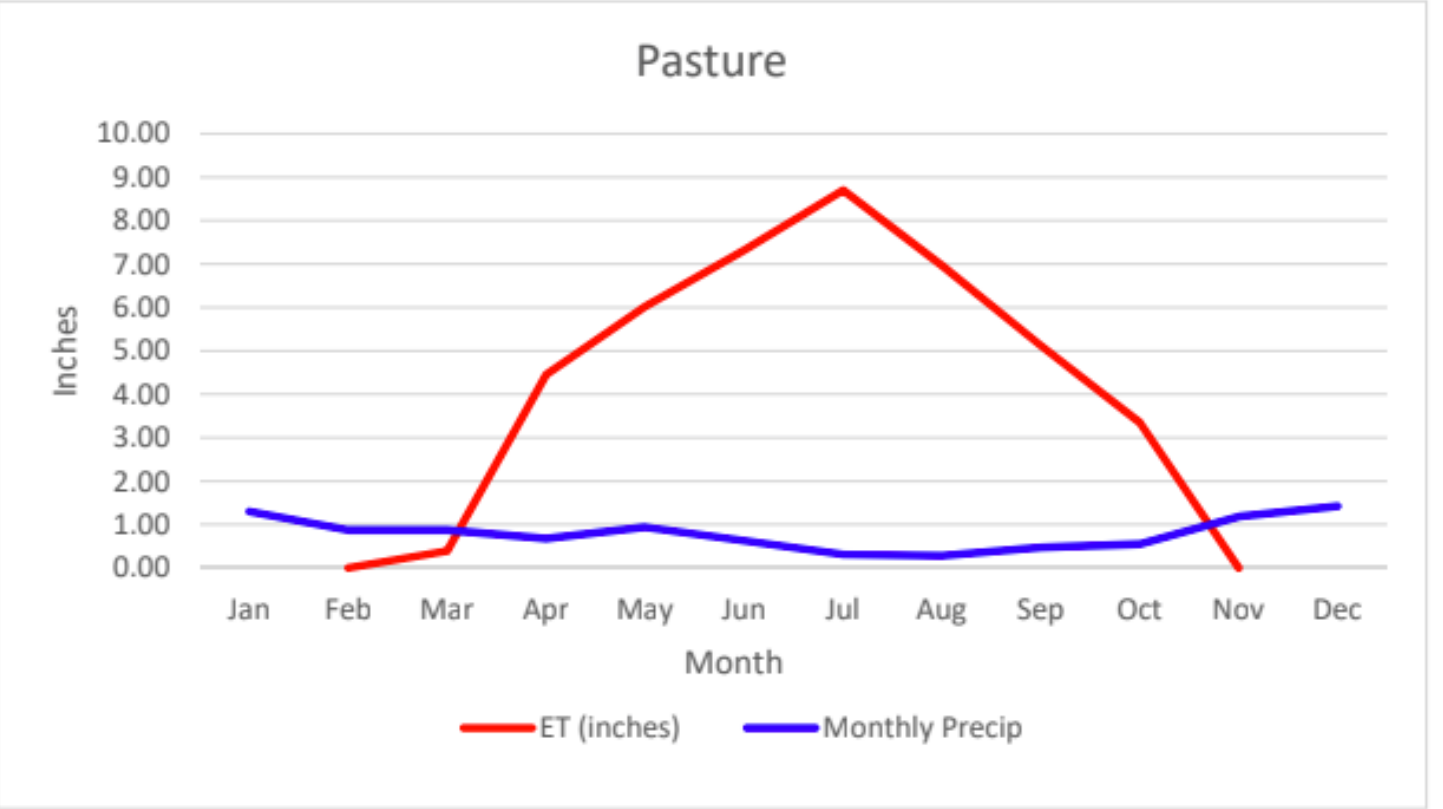
UTILIZATION AREA

Crop-	Grass Seed	
Region-	Southeast	
Total Seasonal Evapotranspiration-	40.55	Inches
Peak Evapotranspiration Rate-	0.29	Inches/Day
Maximum Allowed Depletion-	50	%
Critical Moisture Deficit Period-	Jul	



UTILIZATION AREA

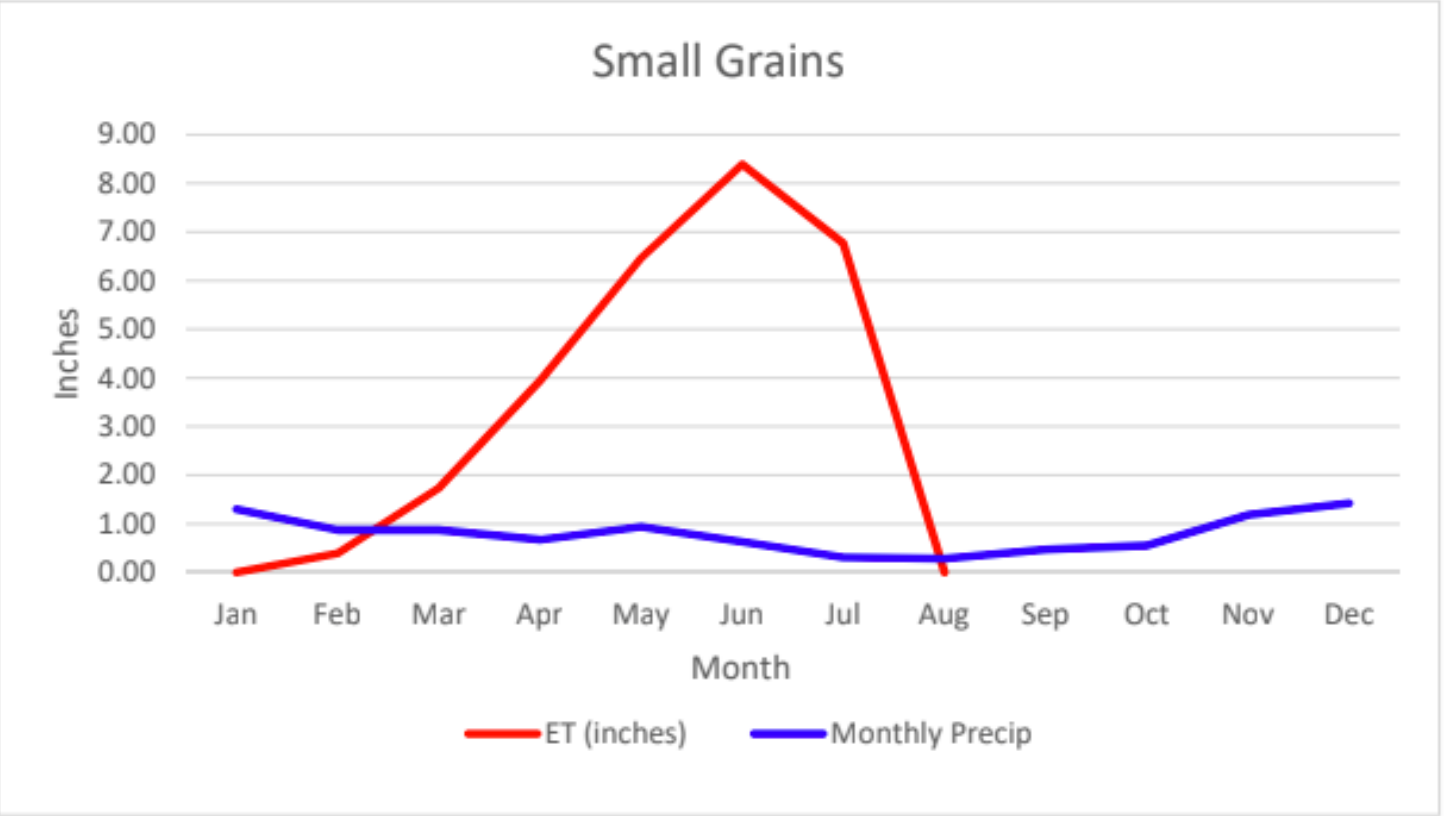
Crop-	Pasture	
Region-	Southeast	
Total Seasonal Evapotranspiration-	42.32	Inches
Peak Evapotranspiration Rate-	0.29	Inches/Day
Maximum Allowed Depletion-	50	%
Critical Moisture Deficit Period-	Jul	

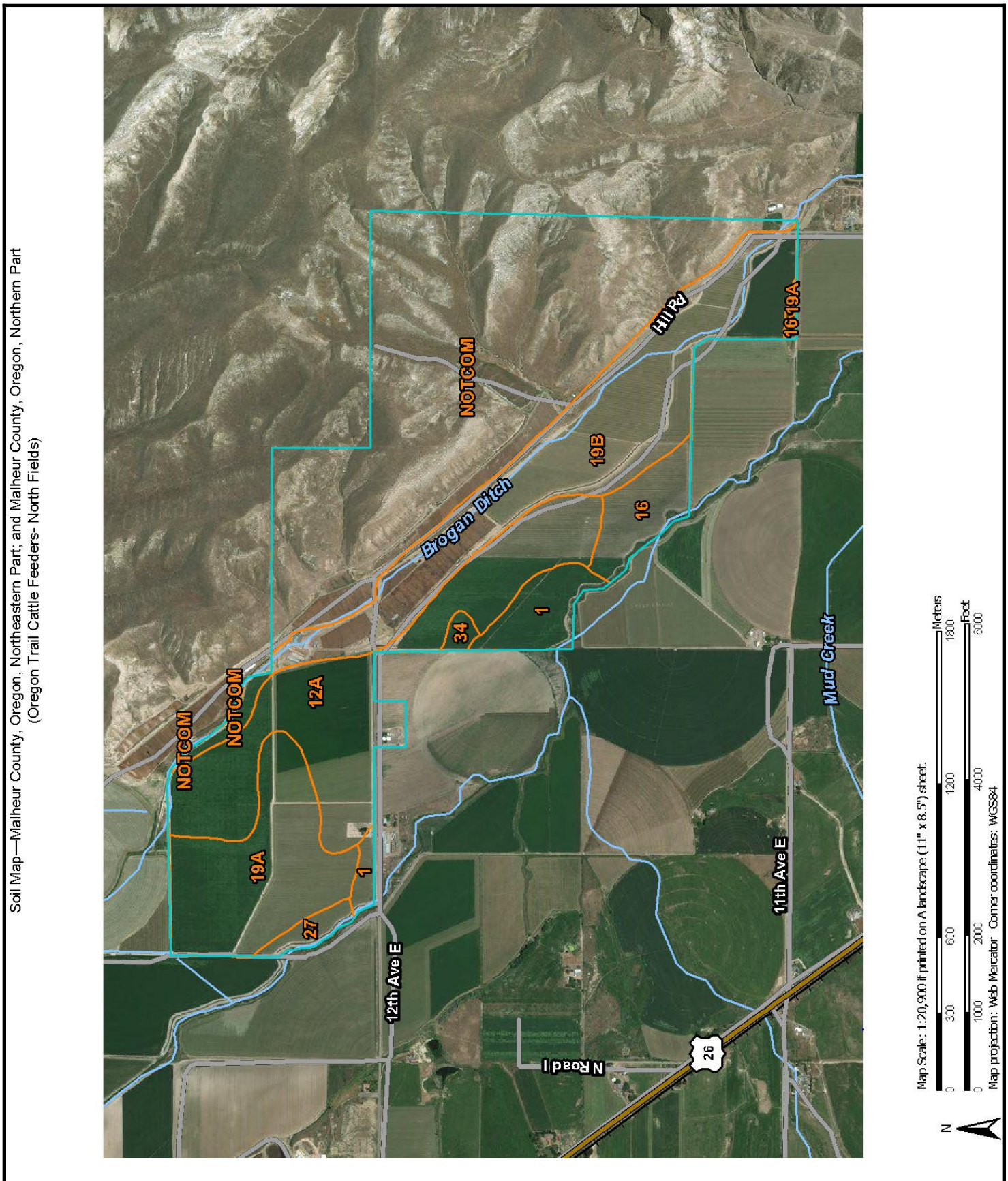


UTILIZATION AREA

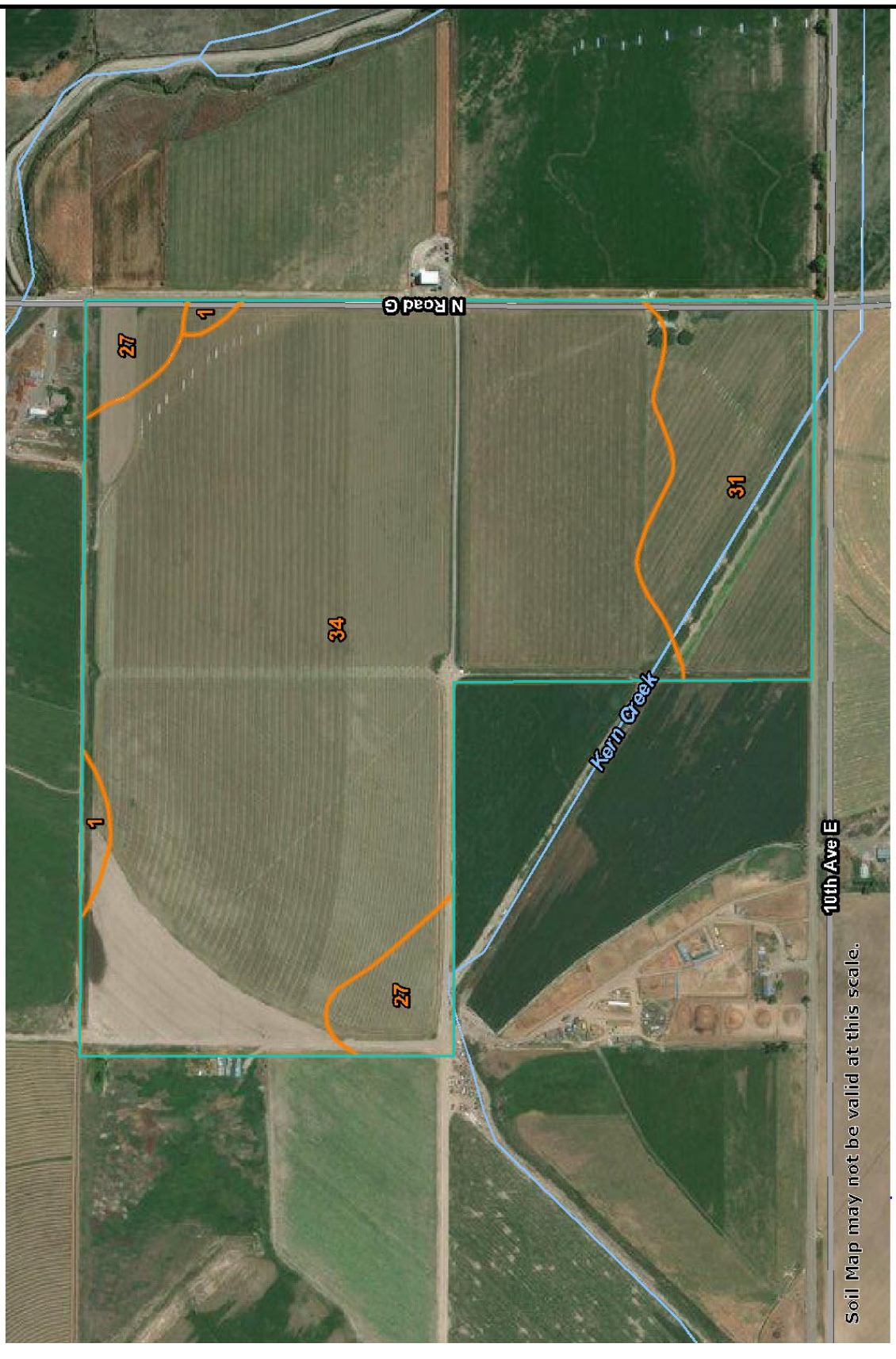
Crop- Small Grains
Region- Southeast

Total Seasonal Evapotranspiration-	27.68	Inches
Peak Evapotranspiration Rate-	0.28	Inches/Day
Maximum Allowed Depletion-	50	%
Critical Moisture Deficit Period-	Jun	



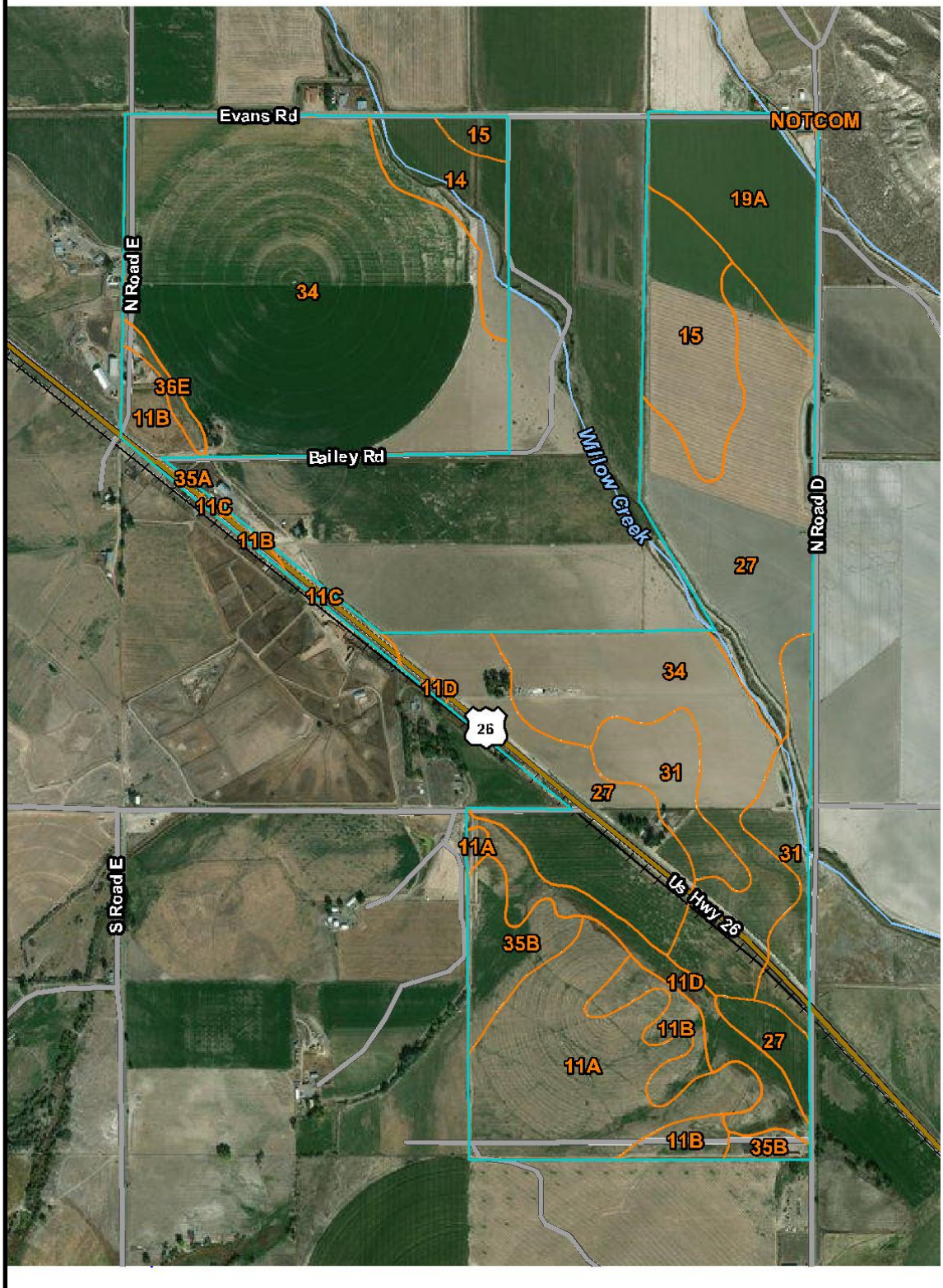

Soil Map—Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part
(Oregon Trail Cattle Feeders- North Fields)
NOTCOM
NOTCOM
NOTCOM
12A
19A
27
1
1
34
16
19B
16
19A
Hill Rd
Brogan Ditch
Mud Creek
12th Ave E
11th Ave E
N Road I
26
Map Scale: 1:20,900 if printed on A landscape (11" x 8.5") sheet.
Meters
0
300
600
1200
1800
Feet
0
1000
2000
4000
6000
N
Map projection: Web Mercator Corner coordinates: WGS84

Soil Map—Malheur County, Oregon, Northeastern Part
(Oregon Trail Cattle Feeders- Middle Fields)



Map Scale: 1:6,810 if printed on A landscape (11" x 8.5") sheet.
Meters 0 100 200 400 600
Feet 0 300 600 1200 1800
N
Map projection: Web Mercator Corner coordinates: WGS84

Soil Map—Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part
(Oregon Trail Cattle Feeders- South Fields)



Map Scale: 1:14,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 200 400 800 1200

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84

Soil Reports

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils. Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas. An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a soil series. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series. Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups. A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all

areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example. An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example. An undifferentiated group is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example. Some surveys include miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Malheur County, Oregon, Northeastern Part
Maag Farm Inc.- North Fields

1—Ahtanum silt loam

Map Unit Setting National map unit symbol: 23bb Elevation: 700 to 3,200 feet
Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 48 to 52 degrees F Frost-free period: 110 to 165 days Farmland classification: Farmland of statewide importance
Map Unit Composition Ahtanum and similar soils: 80 percent Minor components: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Ahtanum Setting Landform: Flood plains, fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 10 inches: silt loam H2 - 10 to 30 inches: silt loam H3 - 30 to 36 inches: cemented material H4 - 36 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Somewhat poorly drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: About 0 to 18 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 15 percent Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 10.0 Available water storage in profile: Very low (about 3.0 inches) Interpretive groups Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6w Hydrologic Soil Group: C/D Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: Yes
Minor Components Harana Percent of map unit: 10 percent Hydric soil rating: No
Ahtanum, shallow to pan Percent of map unit: 10 percent Landform: Flood plains Hydric soil rating: Yes

12A—Garbutt silt loam, 0 to 2 percent slopes

Map Unit Setting National map unit symbol: 23bk Elevation: 250 to 4,500 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 46 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Prime farmland if irrigated
Map Unit Composition Garbutt and similar soils: 77 percent Minor components: 23 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Garbutt Setting Landform: Fans, terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium and loess Typical profile H1 - 0 to 10 inches: silt loam H2 - 10 to 62 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 15 percent Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 5.0 Available water storage in profile: High (about 11.0 inches) Interpretive groups Land capability classification (irrigated): 1 Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B Ecological site: SWALE 8-11 PZ (R011XY005OR) Hydric soil rating: No Minor Components Umapine Percent of map unit: 10 percent Hydric soil rating: No Turbyfill Percent of map unit: 10 percent Hydric soil rating: No Stanfield Percent of map unit: 3 percent Hydric soil rating: No

16—Harana silty clay loam, alkali

Map Unit Setting National map unit symbol: 23br Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 48 to 52 degrees F Frost-free period: 120 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Harana, alkali, and similar soils: 75 percent Minor components: 25 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Harana, Alkali Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 21 inches: silty clay loam H2 - 21 to 64 inches: silty clay loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr) Depth to water table: About 48 to 60 inches
Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 20 percent Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 25.0 Available water storage in profile: High (about 11.2 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No Minor Components Harana sicl Percent of map unit: 10 percent Hydric soil rating: No Umapine Percent of map unit: 10 percent Hydric soil rating: No Harana sil Percent of map unit: 5 percent Hydric soil rating: No

19A—McLoughlin silt loam, 0 to 2 percent slopes

Map Unit Setting National map unit symbol: 23bv Elevation: 250 to 5,400 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 100 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Mcloughlin and similar soils: 80 percent Minor components: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Mcloughlin Setting Landform: Fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium
Typical profile H1 - 0 to 20 inches: silt loam H2 - 20 to 60 inches: silty clay loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 35 percent Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 5.0 Available water storage in profile: Moderate (about 8.4 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Garbutt Percent of map unit: 10 percent Hydric soil rating: No Stanfield Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric soil rating: No

19B—McLoughlin silt loam, 2 to 5 percent slopes

Map Unit Setting National map unit symbol: 23bw Elevation: 2,000 to 5,400 feet Mean annual precipitation: 6 to 10 inches Mean annual air temperature: 45 to 52 degrees F Frost-free period: 100 to 170 days Farmland classification: Farmland of statewide importance
Map Unit Composition Mcloughlin and similar soils: 90 percent Minor components: 10 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Mcloughlin Setting Landform: Fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 20 inches: silt loam H2 - 20 to 60 inches: silty clay loam Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 35 percent Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 5.0 Available water storage in profile: Moderate (about 8.4 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Garbutt Percent of map unit: 10 percent Hydric soil rating: No

27—Powder silt loam

Map Unit Setting National map unit symbol: 23cn Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 14 inches Mean annual air temperature: 46 to 52 degrees F Frost-free period: 100 to 195 days Farmland classification: Prime farmland if irrigated
Map Unit Composition Powder and similar soils: 85 percent Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Powder Setting Landform: Fans, terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 33 inches: silt loam H3 - 33 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: About 48 to 72 inches Frequency of flooding: Rare Frequency of ponding: None Available water storage in profile: Very high (about 13.2 inches) Interpretive groups Land capability classification (irrigated): 2c Land capability classification (nonirrigated): 4c Hydrologic Soil Group: B Ecological site: LOAMY BOTTOM (R010XY005OR) Hydric soil rating: No
Minor Components Kimberly Percent of map unit: 5 percent Hydric soil rating: No Poden Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric soil rating: No

34—Umapine silt loam
Map Unit Setting National map unit symbol: 23d5 Elevation: 300 to 3,500 feet Mean annual precipitation: 8 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Umapine and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Umapine Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 11 inches: silt loam H2 - 11 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: About 24 to 48 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 20 percent Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 20.0 Available water storage in profile: High (about 11.9 inches) Interpretive groups Land capability classification (irrigated): 3w Land capability classification (nonirrigated): 4s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Stanfield Percent of map unit: 10 percent Hydric soil rating: No Powder Percent of map unit: 5 percent Hydric soil rating: No

Report—Map Unit Description
Malheur County, Oregon, Northeastern Part
Map Unit Description---Malheur County, Oregon, Northeastern Part
Maag Farm Inc.- Middle Fields

1—Ahtanum silt loam
Map Unit Setting National map unit symbol: 23bb Elevation: 700 to 3,200 feet
Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 48 to 52 degrees F Frost-free period: 110 to 165 days Farmland classification: Farmland of statewide importance
Map Unit Composition Ahtanum and similar soils: 80 percent Minor components: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Ahtanum Setting Landform: Flood plains, fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material:

Alluvium Typical profile H1 - 0 to 10 inches: silt loam H2 - 10 to 30 inches: silt loam H3 - 30 to 36 inches: cemented material H4 - 36 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Somewhat poorly drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: About 0 to 18 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 15 percent Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 10.0 Available water storage in profile: Very low (about 3.0 inches) Interpretive groups Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6w Hydrologic Soil Group: C/D Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: Yes
Minor Components Harana Percent of map unit: 10 percent Hydric soil rating: No
Ahtanum, shallow to pan Percent of map unit: 10 percent Landform: Flood plains Hydric soil rating: Yes

27—Powder silt loam

Map Unit Setting National map unit symbol: 23cn Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 14 inches Mean annual air temperature: 46 to 52 degrees F Frost-free period: 100 to 195 days Farmland classification: Prime farmland if irrigated
Map Unit Composition Powder and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Powder Setting Landform: Fans, terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 33 inches: silt loam H3 - 33 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: About 48 to 72 inches Frequency of flooding: Rare Frequency of ponding: None Available water storage in profile: Very high (about 13.2 inches) Interpretive groups Land capability classification (irrigated): 2c Land capability classification (nonirrigated): 4c Hydrologic Soil Group: B Ecological site: LOAMY BOTTOM (R010XY005OR) Hydric soil rating: No
Minor Components Kimberly Percent of map unit: 5 percent Hydric soil rating: No Poden Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric soil rating: No

31—Stanfield silt loam

Map Unit Setting National map unit symbol: 23cy Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Stanfield and similar soils: 83 percent Minor components: 17 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Stanfield Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 12 inches: silt loam H2 - 12 to 22 inches: silt loam H3 - 22 to 32 inches: cemented material H4 - 32 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Moderately well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: About 18 to 72 inches Frequency of flooding: None
Frequency of ponding: None Salinity, maximum in profile: Nonsaline to slightly saline (0.0

to 4.0 mmhos/cm) Available water storage in profile: Low (about 3.5 inches) Interpretive groups Land capability classification (irrigated): 4s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Umapine Percent of map unit: 10 percent Hydric soil rating: No Powder Percent of map unit: 5 percent Hydric soil rating: No Aquepts, poorly drained Percent of map unit: 2 percent Landform: Flood plains Hydric soil rating: Yes

34—Umapine silt loam
Map Unit Setting National map unit symbol: 23d5 Elevation: 300 to 3,500 feet Mean annual precipitation: 8 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Umapine and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Umapine Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 11 inches: silt loam
H2 - 11 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: About 24 to 48 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 20 percent Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 20.0 Available water storage in profile: High (about 11.9 inches) Interpretive groups Land capability classification (irrigated): 3w Land capability classification (nonirrigated): 4s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Stanfield Percent of map unit: 10 percent Hydric soil rating: No Powder Percent of map unit: 5 percent Hydric soil rating: No Data Source Information

Soil Survey Area: Malheur County, Oregon,
Northeastern Part Survey Area Data: Version 13, Sep 17, 2018

Report—Map Unit Description
Malheur County, Oregon, Northeastern Part
Map Unit Description---Malheur County, Oregon, Northeastern Part; and Malheur County, Oregon, Northern Part
Maag Farm Inc.- South Fields

11A—Frohman silt loam, 0 to 2 percent slopes
Map Unit Setting National map unit symbol: 23bd Elevation: 2,100 to 4,000 feet
Mean annual precipitation: 9 to 14 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 170 days Farmland classification: Farmland of statewide importance
Map Unit Composition Frohman and similar soils: 93 percent Minor components: 7 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Frohman Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium and lacustrine deposits Typical profile H1 - 0 to 12 inches: silt loam H2 - 12 to 18 inches:

cemented material H3 - 18 to 36 inches: silt loam H4 - 36 to 42 inches: cemented material Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 10 to 20 inches to duripan; 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 5 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Very low (about 2.1 inches) Interpretive groups Land capability classification (irrigated): 4s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: D Ecological site: SHALLOW LOAM 8-11 PZ (R011XY018OR) Hydric soil rating: No
Minor Components Virtue Percent of map unit: 5 percent Hydric soil rating: No
Nyssa Percent of map unit: 2 percent Hydric soil rating: No

11B—Frohman silt loam, 2 to 5 percent slopes
Map Unit Setting National map unit symbol: 23bf Elevation: 2,100 to 4,000 feet Mean annual precipitation: 9 to 14 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 170 days Farmland classification: Farmland of statewide importance
Map Unit Composition Frohman and similar soils: 93 percent Minor components: 7 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Frohman Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium and lacustrine deposits Typical profile H1 - 0 to 12 inches: silt loam H2 - 12 to 18 inches: cemented material H3 - 18 to 36 inches: silt loam H4 - 36 to 42 inches: cemented material Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: 10 to 20 inches to duripan; 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 5 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Very low (about 2.1 inches) Interpretive groups Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D Ecological site: SHALLOW LOAM 8-11 PZ (R011XY018OR) Hydric soil rating: No
Minor Components Virtue Percent of map unit: 5 percent Hydric soil rating: No Nyssa Percent of map unit: 2 percent Hydric soil rating: No

11C—Frohman silt loam, 5 to 8 percent slopes
Map Unit Setting National map unit symbol: 23bg Elevation: 2,100 to 4,000 feet Mean annual precipitation: 9 to 14 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 170 days Farmland classification: Farmland of statewide importance
Map Unit Composition Frohman and similar soils: 93 percent Minor components: 7 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Frohman Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium and lacustrine deposits Typical profile H1 - 0 to 12 inches: silt loam H2 - 12 to 18 inches: cemented material H3 - 18 to 36 inches: silt loam H4 - 36 to 42 inches: cemented material Properties and qualities Slope: 5 to 8 percent Depth to restrictive feature: 10 to 20 inches to duripan; 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 5 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Very low (about 2.1 inches) Interpretive groups Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D Ecological site: SHALLOW LOAM 8-11 PZ (R011XY018OR) Hydric soil rating: No
Minor Components Virtue Percent of map unit: 5 percent Hydric soil rating: No Nyssa Percent of map unit: 2 percent Hydric soil rating: No

11D—Frohman silt loam, 8 to 12 percent slopes
Map Unit Setting National map unit symbol: 23bh Elevation: 2,100 to 4,000 feet Mean annual precipitation: 9 to 14 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 170 days Farmland classification: Farmland of statewide importance
Map Unit Composition Frohman and similar soils: 93 percent Minor components: 7 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Frohman Setting Landform: Terraces Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium and lacustrine deposits Typical profile H1 - 0 to 12 inches: silt loam H2 - 12 to 18 inches: cemented material H3 - 18 to 36 inches: silt loam H4 - 36 to 42 inches: cemented material Properties and qualities Slope: 8 to 12 percent Depth to restrictive feature: 10 to 20 inches to duripan; 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 5 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Very low (about 2.1 inches) Interpretive groups Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D Ecological site: SHALLOW LOAM 8-11 PZ (R011XY018OR) Hydric soil rating: No
Minor Components Virtue Percent of map unit: 5 percent Hydric soil rating: No Nyssa Percent of map unit: 2 percent Hydric soil rating: No
14—Harana silt loam
Map Unit Setting National map unit symbol: 23bp Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Prime farmland if irrigated
Map Unit Composition Harana and similar soils: 75 percent Minor components: 25 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Harana Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 24 inches: silt loam H2 - 24 to 43 inches: silty clay loam H3 - 43 to 60 inches: clay Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Moderately well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr) Depth to water table: More than 80 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 20 percent Sodium adsorption ratio, maximum in profile: 10.0 Available water storage in profile: High (about 11.1 inches) Interpretive groups Land capability classification (irrigated): 2c Land capability classification (nonirrigated): 6c Hydrologic Soil Group: B Ecological site: LOAMY BOTTOM (R010XY005OR) Hydric soil rating: No
Minor Components Harana sicl Percent of map unit: 10 percent Hydric soil rating: No Harana sicl alkali Percent of map unit: 5 percent Hydric soil rating: No Powder Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric

soil rating: No

15—Harana silty clay loam

Map Unit Setting National map unit symbol: 23bq Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Harana and similar soils: 75 percent Minor components: 25 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harana Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 24 inches: silt loam H2 - 24 to 43 inches: silty clay loam H3 - 43 to 60 inches: clay Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Moderately well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr) Depth to water table: More than 80 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate, maximum in profile: 20 percent Sodium adsorption ratio, maximum in profile: 10.0 Available water storage in profile: High (about 11.1 inches) Interpretive groups Land capability classification (irrigated): 2c Land capability classification (nonirrigated): 6c Hydrologic Soil Group: B Ecological site: LOAMY BOTTOM (R010XY005OR) Hydric soil rating: No Minor Components Harana sil Percent of map unit: 10 percent Hydric soil rating: No Harana sicl alkali Percent of map unit: 5 percent Hydric soil rating: No

Powder Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric soil rating: No

19A—McLoughlin silt loam, 0 to 2 percent slopes

Map Unit Setting National map unit symbol: 23bv Elevation: 250 to 5,400 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 100 to 195 days Farmland classification: Farmland of statewide importance

Map Unit Composition Mcloughlin and similar soils: 80 percent Minor components: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mcloughlin Setting Landform: Fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 20 inches: silt loam H2 - 20 to 60 inches: silty clay loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 35 percent Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 5.0 Available water storage in profile: Moderate (about 8.4 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No

Minor Components Garbutt Percent of map unit: 10 percent Hydric soil rating: No Stanfield Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric soil rating: No

27—Powder silt loam

Map Unit Setting National map unit symbol: 23cn Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 14 inches Mean annual air temperature: 46 to 52 degrees F Frost-free period: 100 to 195 days Farmland classification: Prime farmland if irrigated

Map Unit Composition Powder and similar soils: 85 percent Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Powder Setting Landform: Fans, terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear
Parent material: Alluvium Typical profile H1 - 0 to 13 inches: silt loam H2 - 13 to 33 inches: silt loam H3 - 33 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: About 48 to 72 inches Frequency of flooding: Rare Frequency of ponding: None Available water storage in profile: Very high (about 13.2 inches) Interpretive groups Land capability classification (irrigated): 2c Land capability classification (nonirrigated): 4c Hydrologic Soil Group: B Ecological site: LOAMY BOTTOM (R010XY005OR) Hydric soil rating: No
Minor Components Kimberly Percent of map unit: 5 percent Hydric soil rating: No Poden Percent of map unit: 5 percent Hydric soil rating: No Umapine Percent of map unit: 5 percent Hydric soil rating: No

31—Stanfield silt loam
Map Unit Setting National map unit symbol: 23cy Elevation: 250 to 3,500 feet Mean annual precipitation: 6 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Stanfield and similar soils: 83 percent Minor components: 17 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Stanfield Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 12 inches: silt loam H2 - 12 to 22 inches: silt loam H3 - 22 to 32 inches: cemented material H4 - 32 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Moderately well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: About 18 to 72 inches Frequency of flooding: None Frequency of ponding: None Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm) Available water storage in profile: Low (about 3.5 inches) Interpretive groups Land capability classification (irrigated): 4s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Umapine Percent of map unit: 10 percent Hydric soil rating: No Powder Percent of map unit: 5 percent Hydric soil rating: No Aquepts, poorly drained Percent of map unit: 2 percent Landform: Flood plains Hydric soil rating: Yes

34—Umapine silt loam
Map Unit Setting National map unit symbol: 23d5 Elevation: 300 to 3,500 feet Mean annual precipitation: 8 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 110 to 195 days Farmland classification: Farmland of statewide importance
Map Unit Composition Umapine and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Umapine Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 11 inches: silt loam H2 - 11 to 60 inches: silt loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat poorly drained Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr) Depth to water table: About 24 to 48 inches Frequency of flooding: Rare Frequency of ponding: None Calcium carbonate,

maximum in profile: 20 percent Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm) Sodium adsorption ratio, maximum in profile: 20.0 Available water storage in profile: High (about 11.9 inches) Interpretive groups Land capability classification (irrigated): 3w Land capability classification (nonirrigated): 4s Hydrologic Soil Group: C Ecological site: SODIC BOTTOM (R010XY007OR) Hydric soil rating: No
Minor Components Stanfield Percent of map unit: 10 percent Hydric soil rating: No Powder Percent of map unit: 5 percent Hydric soil rating: No

35A—Virtue silt loam, 0 to 2 percent slopes
Map Unit Setting National map unit symbol: 23d6 Elevation: 2,100 to 5,300 feet Mean annual precipitation: 8 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 90 to 170 days Farmland classification: Prime farmland if irrigated
Map Unit Composition Virtue and similar soils: 83 percent Minor components: 17 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Virtue Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium Typical profile H1 - 0 to 14 inches: silt loam H2 - 14 to 26 inches: silty clay loam H3 - 26 to 40 inches: cemented material H4 - 40 to 60 inches: very gravelly loam Properties and qualities Slope: 0 to 2 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 5.2 inches) Interpretive groups Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 4s Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No
Minor Components Nyssa Percent of map unit: 5 percent Hydric soil rating: No Frohman Percent of map unit: 5 percent Hydric soil rating: No Malheur Percent of map unit: 5 percent Hydric soil rating: No Chilcott Percent of map unit: 2 percent Hydric soil rating: No

35B—Virtue silt loam, 2 to 5 percent slopes
Map Unit Setting National map unit symbol: 23d7 Elevation: 2,100 to 5,300 feet Mean annual precipitation: 8 to 12 inches Mean annual air temperature: 45 to 54 degrees F Frost-free period: 90 to 170 days Farmland classification: Prime farmland if irrigated
Map Unit Composition Virtue and similar soils: 83 percent Minor components: 17 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Virtue Setting Landform: Terraces Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium
Typical profile H1 - 0 to 14 inches: silt loam H2 - 14 to 26 inches: silty clay loam H3 - 26 to 40 inches: cemented material H4 - 40 to 60 inches: very gravelly loam Properties and qualities Slope: 2 to 5 percent Depth to restrictive feature: 20 to 40 inches to duripan Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Calcium carbonate, maximum in profile: 15 percent Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Low (about 5.2 inches) Interpretive groups Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Ecological site: SILTY 8-11 PZ (R011XY012OR) Hydric soil rating: No
Minor Components Nyssa Percent of map unit: 5 percent Hydric soil rating: No Frohman

Percent of map unit: 5 percent Hydric soil rating: No Malheur Percent of map unit: 5 percent Hydric soil rating: No Chilcott Percent of map unit: 2 percent Hydric soil rating: No

36E—Xeric Torriorthents, moderately steep
Map Unit Composition Xeric torriorthents and similar soils: 100 percent Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Xeric Torriorthents Setting Landform: Terraces Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Lacustrine deposits Typical profile H1 - 0 to 60 inches: variable Properties and qualities Slope: 5 to 20 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Interpretive groups Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Ecological site: SHALLOW ESCARPMENT COMPLEX 8-11 PZ (R011XY022OR) Hydric soil rating: No

Malheur County, Oregon, Northern Part
NOTCOM—No Digital Data Available
Map Unit Composition Notcom: 100 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Notcom Properties and qualities Data Source Information
Soil Survey Area: Malheur County, Oregon,
Northeastern Part Survey Area Data: Version 13, Sep 17, 2018
Soil Survey Area: Malheur County, Oregon, Northern Part Survey Area Data: Version 1, Dec 6, 2013

Phosphorus Index Report

Oregon Trail Cattle Feeders - 2021

Vale

Field	Acres	Soil	Soil Test Date	Bray P (ppm)	Olsen (ppm)	K (ppm)	pH	TFS	SFS	Score	Rating
OTCF26	125.4	11A, Frohman	09/24/2018		44.0	432.0	7.4	2.75	15.90	43.75	Low
OTCF25	21.2	31, Stanfield	09/24/2018		44.0	42.0	7.4	2.75	14.47	39.82	Low
OTCF24	35.1	34, Umapine	09/24/2018		44.0	432.0	7.4	3.5	20.80	72.81	Low
OTCF23	23.3	34, Umapine	09/24/2018		44.0	432.0	7.4	3.5	20.80	72.81	Low
OTCF22	3.5	34, Umapine	09/24/2018		44.0	432.0	7.4	3.5	14.47	50.68	Low
OTCF21	68.0	27, Powder	09/24/2018		44.0	432.0	7.4	2.5	14.68	36.71	Low
OTCF20	38.9	19A,	09/24/2018		44.0	432.0	7.4	2.75	14.68	40.38	Low
OTCF19	4.5	11B, Frohman	09/24/2018		44.0	432.0	7.4	2.75	14.68	40.38	Low
OTCF18	65.9	34, Umapine	09/24/2018		44.0	432.0	7.4	3.5	20.80	72.81	Low
OTCF17	67.1	34, Umapine	09/24/2018		44.0	432.0	7.4	3.5	15.90	55.68	Low
OTCF16	7.1	14, Harana	09/24/2018		44.0	432.0	7.4	2.5	14.68	36.71	Low
OTCF15	5.0	31, Stanfield	09/24/2018		44.0	432.0	7.4	2.75	14.68	40.38	Low
OTCF14	10.6	31, Stanfield	09/24/2018		44.0	432.0	7.4	2.75	14.68	40.38	Low
OTCF13	20.5	34, Umapine	09/24/2018		72.0	200.0	7.5	3.5	17.48	61.19	Low
OTCF12	75.2	34, Umapine	09/24/2018		72.0	200.0	7.5	3.5	18.70	65.48	Low
OTCF11	5.3	36E, Xeric	09/24/2018		72.0	200.0	7.5	8.0	5.2	41.6	Low
OTCF10	11.2	36E, Xeric	09/24/2018		72.0	200.0	7.5	9.5	5.2	49.4	Low
OTCF9	8.8	36E, Xeric	09/24/2018		72.0	200.0	7.5	9.5	5.2	49.4	Low
OTCF8	8.5	36E, Xeric	09/24/2018		72.0	200.0	7.5	12.5	5.2	65.0	Low
OTCF7	17.0	19B,	09/24/2018		72.0	200.0	7.5	2.75	17.28	47.52	Low
OTCF6	6.6	19B,	09/24/2018		72.0	200.0	7.5	2.75	23.60	64.91	Low
OTCF5	100.2	12A, Garbutt	09/24/2018		72.0	200.0	7.5	1.75	23.60	41.31	Low
OTCF4	2.6	12A, Garbutt	09/24/2018		72.0	200.0	7.5	1.75	18.70	32.74	Low
OTCF3	51.9	12A, Garbutt	09/24/2018		72.0	200.0	7.5	1.75	18.70	32.74	Low
OTCF2	49.8	19A,	09/24/2018		72.0	200.0	7.5	2.75	18.70	51.45	Low
OTCF1	81.0	19A,	09/24/2018		72.0	200.0	7.5	2.75	23.60	64.91	Low

PI Interpretations

P-Index Rating	Interpretation for Oregon	Recommended Nutrient Limitation
West PI Score<=25 or East PI Score<=100	The site has a LOW potential for P movement from the site. If farming practices are maintained at current levels, the probability of an adverse impact to surface water resources from P losses from this site are low.Phosphorus can be applied at rates greater than crop requirement	Nitrogen
West PI Score 25.1 to 50 or East PI Score 100.1 to 400	The site has a MEDIUM potential for P movement from the site. The probability for an adverse impact to surface water resources is greater than that from a LOW vulnerability rated site. Some remedial action should be taken to lessen the probability of P movement. Phosphorus can be applied not to exceed the crop requirement rate for phosphorus.	Phosphorus
West PI Score 50.1 to 75 or East PI Score 400.1 to 600	The site has a HIGH potential for P movement from the site. There is a high probability for an adverse impact to surface water resources unless action is taken to reduce the risk of P movement and probable water quality degradation. Phosphorus can be applied not to exceed the crop removal rate of phosphorus if the following requirements are met: A soil phosphorus drawdown strategy has been implemented, and a site assessment for nutrients and soil loss has been conducted to determine if mitigation practices are required to protect water quality.	Phosphorus
West PI Score >75 or East PI Score >600	ZERO OUT- The environmental threshold above which the risk of P loss from a field is too great to warrant the application of phosphorus for plant production.	No Manure