

Practice: 614 - Watering Facility

Scenario #1 - Wildlife Watering Facility, Less Than 400 Gallons

Scenario Description:

A wildlife watering facility with less than 400 gallons of storage. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for wildlife, habitat degradation, and water quality.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for wildlife, where water is not available in sufficient quantities at specific locations, and habitat and water quality needs to be improved.

After Situation:

A typical solution would be to install a prefabricated wildlife watering facility with 200 to 1,000 gallons of storage where the amount of storage is determined adequate to meet the resource need. Designed storage will be adequate to meet the wildlife needs. Installation is all inclusive, and includes the guzzler, anchorage, catchment, and drinker. The drinker will include wildlife escape ramps. The cooperators will install fencing at own expense to exclude feral hogs and/or livestock where indicated by NRCS resource assessment. Fences shall be installed using Fence (382). All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Another associated practice is Upland Wildlife Habitat Management (645).

Feature Measure: Each Facility

Scenario Unit:: Each

Scenario Typical Size: 1

Total Scenario Cost: \$909.57

Scenario Cost/Unit: \$909.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	4	\$147.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	6	\$116.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	4	\$86.12
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Poly Enclosed Storage, <= 300 gallon	1073	Water storage tanks. Includes materials and shipping only.	Gallon	\$1.31	300	\$393.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$142.21	1	\$142.21

Practice: 614 - Watering Facility

Scenario #2 - Wildlife Watering Facility, Greater Than or Equal to 400 Gallons

Scenario Description:

A wildlife watering facility with greater than or equal to 400 gallons of storage. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for wildlife, habitat degradation, and water quality.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for wildlife, where water is not available in sufficient quantities at specific locations, and habitat and water quality needs to be improved.

After Situation:

A typical solution would be to install a prefabricated wildlife watering facility with 200 to 1,000 gallons of storage where the amount of storage is determined adequate to meet the resource need. Designed storage will be adequate to meet the wildlife needs. Installation is all inclusive, and includes the guzzler, anchorage, catchment, and drinker. The drinker will include wildlife escape ramps. The cooperators will install fencing at own expense to exclude feral hogs and/or livestock where indicated by NRCS resource assessment. Fences shall be installed using Fence (382). All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Another associated practice is Upland Wildlife Habitat Management (645).

Feature Measure: Each Facility

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,663.63

Scenario Cost/Unit: \$1,663.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	8	\$294.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	8	\$172.24
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallon	\$0.90	800	\$720.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$142.21	1	\$142.21

Practice: 614 - Watering Facility

Scenario #3 - Freeze Proof Trough or Sheep/Goat Trough

Scenario Description:

Freeze proof concrete tank installed into a pond embankment or a 12'x1'x2' goat/sheep concrete trough that have no significant storage and provide drinking space for a limited number of animals. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. These watering facilities will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A 200 gallon concrete freeze proof tank is installed into the downstream side of a pond embankment or a 12'x1'x2' concrete goat/sheep trough is installed consistent with a resource assessment to provide a livestock drinking facility to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be concrete, steel, or other approved materials. Cost includes proper foundation preparation and required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Each Trough

Scenario Unit:: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,480.21

Scenario Cost/Unit: \$1,480.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$5.02	10	\$50.20
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$46.33	8	\$370.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	4	\$77.40
Materials						
Tank, Freeze Proof, concrete, => 200 gallons	285	Concrete tank with sloping sides, cover for partial burial providing freeze protection. Includes materials and shipping.	Each	\$770.53	1	\$770.53
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #4 - Energy Free Fountains

Scenario Description:

Energy-free fountain trough that has no significant storage and provides drinking space for a limited number of animals. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A 4-ball prefabricated energy-free fountain trough with 45.5 gallons of storage is installed with a concrete apron consistent with a resource assessment to provide a livestock drinking facility to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be concrete, steel, or other approved materials. Cost includes proper foundation preparation and required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 45

Total Scenario Cost: \$1,393.00

Scenario Cost/Unit: \$30.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	0.5	\$103.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Materials						
Tank, Freeze Proof, 4 hole	281	Tank, Freeze Proof with 4 drinking holes. Includes materials and shipping.	Each	\$921.93	1	\$921.93
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$58.39	1	\$58.39

Practice: 614 - Watering Facility

Scenario #5 - Watering Facility, Less than 1000 gallons

Scenario Description:

A livestock drinking trough or water storage facility with 300-1000 gallons of nominal capacity. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health. The typical scenario is a 750 gallon livestock drinking trough.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility of approved materials with a capacity of 300 to 1000 gallons will be installed consistent with a resource assessment to provide adequate water storage and/or drinking capacity as part of a livestock watering system to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be steel, fiberglass, concrete, or other approved materials installed in accordance with drawings and specifications. Troughs made exclusively of metal are not included. Cost is all inclusive including required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 750

Total Scenario Cost: \$1,443.50

Scenario Cost/Unit: \$1.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	1	\$206.15
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	8	\$294.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	8	\$172.24
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$24.15	0.6	\$14.49
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.28	750	\$210.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #6 - Watering Facility, 1001 - 1400 gallons

Scenario Description:

A livestock drinking trough or water storage facility with 1001-1400 gallons of nominal capacity. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health. The typical scenario is a 1300 gallon livestock drinking trough.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility of approved materials with a capacity of 1001 to 1400 gallons will be installed consistent with a resource assessment to provide adequate water storage and/or drinking capacity as part of a livestock watering system to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be steel, fiberglass, concrete, or other approved materials installed in accordance with drawings and specifications. Troughs made exclusively of metal are not included. Cost is all inclusive including required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 1300

Total Scenario Cost: \$1,648.39

Scenario Cost/Unit: \$1.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	1.2	\$247.38
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	8	\$294.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	8	\$172.24
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$24.15	1	\$24.15
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.28	1300	\$364.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #7 - Watering Facility, 1401 - 2100 gallons

Scenario Description:

A livestock drinking trough or water storage facility with 1401-2100 gallons of nominal capacity. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health. Typical scenario is a 1750 gallon livestock drinking trough.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility of approved materials with a capacity of 1401 to 2100 gallons will be installed consistent with a resource assessment to provide adequate water storage and/or drinking capacity as part of a livestock watering system to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be steel, fiberglass, concrete, or other approved materials installed in accordance with drawings and specifications. Troughs made exclusively of metal are not included. Cost is all inclusive including required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 1750

Total Scenario Cost: \$1,907.74

Scenario Cost/Unit: \$1.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	1.8	\$371.07
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	8	\$294.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	8	\$172.24
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$24.15	1.4	\$33.81
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.28	1750	\$490.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #8 - Watering Facility, 2101 - 3000 gallons

Scenario Description:

A livestock drinking trough or water storage facility with 2101-3000 gallons of nominal capacity. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health. Typical scenario is a 2500 gallon livestock drinking trough.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility of approved materials with a capacity of 2101 to 3000 gallons will be installed consistent with a resource assessment to provide adequate water storage and/or drinking capacity as part of a livestock watering system to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be steel, fiberglass, concrete, or other approved materials installed in accordance with drawings and specifications. Troughs made exclusively of metal are not included. Cost is all inclusive including required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 2500

Total Scenario Cost: \$2,255.92

Scenario Cost/Unit: \$0.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	2.4	\$494.76
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	8	\$294.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	8	\$172.24
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$24.15	2	\$48.30
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.28	2500	\$700.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #9 - Watering Facility, 3001 - 5000 gallons

Scenario Description:

A livestock drinking trough or water storage facility with 3001 - 5000 gallons of nominal capacity. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health. Typical scenario is a 5000 gallon livestock drinking trough.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility of approved materials with a capacity of 3001 - 5000 gallons will be installed consistent with a resource assessment to provide adequate water storage and/or drinking capacity as part of a livestock watering system to ensure proper water quantity is available and improved plant health through proper grazing distribution. Materials may be steel, fiberglass, concrete, or other approved materials installed in accordance with drawings and specifications. Troughs made exclusively of metal are not included. Cost is all inclusive including required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 5000

Total Scenario Cost: \$3,763.27

Scenario Cost/Unit: \$0.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	6	\$1,236.90
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$36.86	8	\$294.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	8	\$172.24
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$24.15	4.7	\$113.51
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.28	5000	\$1,400.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #10 - Watering Facility, Greater than 5,000 gallons

Scenario Description:

A livestock drinking trough or water storage facility with more than 5000 gallons of nominal capacity. Materials utilized for this type of facility may not meet the practice lifespan. However, the operator shall be responsible for maintaining the facility for the practice lifespan, which may include a total replacement of all facility materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, water quality, and undesirable plant productivity and health. Typical scenario is a 10,000 gallon, above ground, water storage tank.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, where water is not available in sufficient quantities at specific locations, and water quality, plant productivity and health needs to be improved.

After Situation:

A water storage facility with a capacity of more than 5,000 gallons will be installed consistent with a resource assessment to provide adequate water storage and/or drinking capacity to ensure proper water quantity is available and improved plant health through proper grazing distribution. These storage tanks are not drinking facilities. Materials may be fiberglass, concrete, steel, or other approved materials. Cost includes proper foundation preparation and required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. Install a Fence (382) to exclude or limit access to the facility, as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit:: Gallon

Scenario Typical Size: 10000

Total Scenario Cost: \$6,353.37

Scenario Cost/Unit: \$0.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$206.15	12	\$2,473.80
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$46.33	16	\$741.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	8	\$154.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.53	16	\$344.48
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$24.15	10	\$241.50
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.70	1	\$24.70
Tank, Steel, Bottomless, 12 Gauge, 30'd x 33"h	276	Tank, 12 gauge steel - Approximately 10500 gallons, Includes necessary hardware	Each	\$2,161.37	1	\$2,161.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

Practice: 614 - Watering Facility

Scenario #15 - Watering Ramp, Rock on Geotextile

Scenario Description:

A watering ramp with rock on geotextile to facilitate animal movement, to provide or improve access to water, and/or protect ecologically sensitive, erosive and/or potentially erosive sites and address soil erosion and water quality resource concerns, by providing a stabilized access point to a pond or stream. The watering ramp will be stabilized by surfacing the designated area with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Installation costs includes all excavation, materials, equipment, labor, and mobilization necessary to install the practice.

Before Situation:

On a pastureland and/or rangeland area, the shoreline soil surface around a farm pond or stream has become highly disturbed and has little to no vegetation to stabilize the soil surface, due to the frequency and intensity of use by livestock. As a result, soil erosion, water quality, and animal health are resource concerns that need to be addressed.

After Situation:

The typical watering ramp with rock on geotextile will be for a 100 head herd of cattle, and is 16 feet wide X 40 feet long, 640 square feet. The watering ramp is stabilized with surfacing material comprised of 640 square feet of rock and or gravel on approximately 84 square yards of geotextile fabric foundation material. The watering ramp is for areas frequently and intensively used by animals and will address soil erosion and water quality degradation. Installation includes all excavation, materials, equipment, labor, and mobilization to install a watering ramp with rock on geotextile. Diversion, Code 362, may also be beneficial. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Ramp

Scenario Unit:: Square Foot

Scenario Typical Size: 640

Total Scenario Cost: \$827.65

Scenario Cost/Unit: \$1.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$2.01	24	\$48.24
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.73	12	\$8.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	4	\$77.40
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	\$16.87	12	\$202.44
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$4.15	84	\$348.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$142.21	1	\$142.21

Practice: 614 - Watering Facility

Scenario #17 - Watering Ramp, Rock in Geocell on Geotextile

Scenario Description:

A watering ramp with rock in geocell on geotextile to facilitate animal movement, to provide or improve access to water, and/or protect ecologically sensitive, erosive and/or potentially erosive sites and address soil erosion and water quality resource concerns, by providing a stabilized access point to a pond or stream. The watering ramp will be stabilized by surfacing the designated area with rock and or gravel in geocell on a geotextile fabric foundation to provide a stable, non-eroding surface. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Installation costs includes all excavation, materials, equipment, labor, and mobilization necessary to install the practice.

Before Situation:

On a pastureland and/or rangeland area, the shoreline soil surface around a farm pond or stream has become highly disturbed and has little to no vegetation to stabilize the soil surface, due to the frequency and intensity of use by livestock. As a result, soil erosion, water quality, and animal health are resource concerns that need to be addressed.

After Situation:

The typical watering ramp with rock in geocell on geotextile will be for a 100 head herd of cattle, and is 16 feet wide X 40 feet long, 640 square feet. The watering ramp is stabilized with surfacing material comprised of 640 square feet of rock and or gravel in 72 square yards of geocell on approximately 84 square yards of geotextile fabric foundation material. The watering ramp is for areas frequently and intensively used by animals and will address soil erosion and water quality degradation. Installation includes all excavation, materials, equipment, labor, and mobilization to install a watering ramp with rock in geocell on geotextile. Diversion, Code 362, may also be beneficial. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Ramp

Scenario Unit:: Square Foot

Scenario Typical Size: 640

Total Scenario Cost: \$2,520.01

Scenario Cost/Unit: \$3.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$2.01	24	\$48.24
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.73	12	\$8.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	8	\$154.80
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	\$16.87	12	\$202.44
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$4.15	84	\$348.60
Geocell, 6"	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	\$22.43	72	\$1,614.96
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$142.21	1	\$142.21