

Practice: 614 - Watering Facility

Scenario: #1 - Converted heavy equipment tire trough

Scenario Description: An 8 ft. diameter heavy equipment tire trough (HETT) is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The HETT is placed on a concrete pad that extends 1.0' beyond the trough on all sides. The concrete pad is underlain by gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,832.66

Scenario Cost/Unit: \$1,832.66

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	2	\$111.64
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	\$290.09	1.5	\$435.14
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.70	1	\$21.70

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	1.25	\$39.07
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.06	\$6.80
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.6	\$1.17
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	2	\$1.56
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	2	\$0.87
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.08	\$9.83
Tank, Tire, 8' diameter	286	Tire, includes material cost for tank and shipping. Labor and other appurtenance costs not included.	Each	\$730.29	1	\$730.29
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.04	\$1.86

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	2	\$58.65
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	\$19.74	8	\$157.88

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #2 - 2-hole freeze-proof watering trough

Scenario Description: A permanent, 2-hole freeze-proof watering trough is installed per manufacturer's requirements to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.5' beyond the trough on all sides (5'x7'x5"). The concrete pad is underlain by 4" of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water.

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,499.12

Scenario Cost/Unit: \$1,499.12

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	2	\$58.65
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	\$19.74	8	\$157.88

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	0.5	\$15.63
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	4	\$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.06	\$6.80
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.48	\$1.08
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	1.85	\$1.45
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1.85	\$0.81
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.074	\$9.09
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	\$699.42	1	\$699.42
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.037	\$1.72

Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	2	\$111.64
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-place 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	\$290.09	0.6	\$174.05

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #3 - 4-hole freeze-proof watering trough

Scenario Description: A permanent, 4-hole freeze-proof watering trough is installed per manufacturer's requirements to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.5' beyond the trough on all sides (7'x7'x5"). The concrete pad is underlain by 4" of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water.

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,937.39

Scenario Cost/Unit: \$1,937.39

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	2.5	\$73.31
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	\$19.74	8	\$157.88

Materials

Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	6	\$7.04
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.06	\$6.80
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.5	\$1.09
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	1.9	\$1.48
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1.9	\$0.83
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.07	\$8.60
Tank, Freeze Proof, 4 hole	281	Tank, Freeze Proof with 4 drinking holes. Includes materials and shipping.	Each	\$921.93	1	\$921.93
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.037	\$1.72

Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to	Hour	\$55.82	2.5	\$139.55
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		90. Equipment and power unit costs. Labor not included.				
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$451.17	0.8	\$360.93

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #4 - Tank, 100 to 500 gallons

Scenario Description: A 300-gallon polyethylene watering trough (5' diameter) is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.0' beyond the trough on all sides (7'x7'x5"). The concrete pad is underlain by 4" of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Gallon

Scenario Typical Size: 300

Total Scenario Cost: \$1,259.54

Scenario Cost/Unit: \$4.20

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	2.5	\$73.31
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	\$19.74	8	\$157.88

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	0.5	\$15.63
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	6	\$7.04
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.6	\$67.96
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.5	\$1.09
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	1.9	\$1.48
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	1.9	\$0.83
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.07	\$8.60
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	\$257.52	1	\$257.52
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.037	\$1.72

Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	2.5	\$139.55
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-place in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$451.17	0.6	\$270.70

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #5 - Tank, 500 to 1000 gallons

Scenario Description: A 500-gallon (6 ft. diameter) concrete tank watering trough is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a 5"-thick concrete pad that extends 1.0' beyond the trough on all sides. The concrete pad is underlain by gravel (4") and geotextile. The practice includes vegetation of all areas disturbed by construction. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment ((Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 500

Total Scenario Cost: \$1,953.12

Scenario Cost/Unit: \$3.91

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	2.5	\$139.55
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	\$290.09	1	\$290.09

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	1	\$31.25
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	8	\$9.38
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.06	\$6.80
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.6	\$1.17
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	2	\$1.56
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	2	\$0.87
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.08	\$9.83
Tank, Concrete, 500 gallon	1049	Concrete tank for water storage, with riser and lid. Includes materials and delivery	Each	\$956.57	1	\$956.57
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.4	\$18.63

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	2.5	\$73.31
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	\$19.74	8	\$157.88

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #6 - Tank, 1000 to 1500 gallons

Scenario Description: A 1,000-1,500 gallon steel tank (10' dia.) with bottom liner watering trough is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a 5"-thick concrete pad that extends 1.0' beyond the trough on all sides. The concrete pad is underlain by gravel (4") and geotextile. Vegetation of disturbed areas is included in practice installation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1200

Total Scenario Cost: \$1,405.13

Scenario Cost/Unit: \$1.17

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	3	\$167.46
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	\$290.09	2.2	\$638.20

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	1.8	\$56.26
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	16	\$18.77
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.06	\$6.80
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.6	\$1.17
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	2	\$1.56
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	2	\$0.87
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.08	\$9.83
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.28	1	\$0.28
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.04	\$1.86

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	3	\$87.97
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	\$19.74	8	\$157.88

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #7 - Tank, greater than 1500 gallons

Scenario Description: A >1,500 gallon steel with bottom liner watering trough constructed of approved materials, installed to provide water for livestock on a 14' x 14' x5" concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk excessive distances to access water, degrading water quality and causing soil erosion.

After Situation: The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Scenario Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$2,514.03

Scenario Cost/Unit: \$2,514.03

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	3	\$167.46
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	\$290.09	3	\$870.27

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	2.4	\$75.01
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	\$1.17	22	\$25.81
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.06	\$6.80
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	1.6	\$1.17
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.037	\$1.45
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	2	\$1.56
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	2	\$0.87
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.08	\$9.83
Tank, Galvanized Steel Bottomless w/liner Livestock, <= 6,000 gallon	1071	Includes tank materials, shipping, and float valve, no liner	Gallon	\$0.53	1600	\$851.32
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.04	\$1.86

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	3	\$87.97
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	\$19.74	8	\$157.88

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	1	\$254.77
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Practice: 614 - Watering Facility

Scenario: #8 - Portable Trough, less than 100 gallons

Scenario Description: This scenario is used for a pasture rotation, Prescribed Grazing (528), or enhanced pasture management utilization, by installing a small water trough (100 gallon) for water supply. The trough is moved from paddock to paddock as outlined in the plan. Because the system does not flow continuously a float is needed to maintain the water level within the portable trough. A typical system will have six paddocks using a single trough.

Before Situation: Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: A portable heavy duty polyethylene trough is installed as part of an intensive rotational grazing management system. The trough is connected to a water supply system via quick coupler. The trough is secured to wooden posts next to the hydrant and protected by wooden boards attached to the posts. The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561). 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 (Code 561) as appropriate.

Scenario Feature Measure: Number of Portable Troughs installed

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$120.47

Scenario Cost/Unit: \$120.47

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	\$24.16	1	\$24.16
Tank, Polyethylene, 100 gallon	290	Portable heavy duty rubber stock tank.	Each	\$96.31	1	\$96.31

Practice: 614 - Watering Facility

Scenario: #9 - Water Ramp,Rock on Geotextile

Scenario Description: A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock and/or gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation: Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: A permanent watering facility-water ramp is constructed of 640 square feet of rock and/or gravel surfacing on 84 square yards of geotextile fabric foundation. (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Scenario Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 640

Total Scenario Cost: \$1,113.34

Scenario Cost/Unit: \$1.74

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$2.00	24	\$47.90
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.88	12	\$10.61

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	\$19.74	5	\$98.68
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Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	\$21.55	12	\$258.55
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	\$348.97
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.015	\$1.70
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	0.4	\$0.29
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.01	\$0.39
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	0.5	\$0.39
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	0.5	\$0.22
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.02	\$2.46
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.01	\$0.47

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	\$171.35	2	\$342.71
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Practice: 614 - Watering Facility

Scenario: #10 - Water Ramp, Rock in GeoCell on Geotextile

Scenario Description: A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock and/or gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation: Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: A permanent watering facility-water ramp is constructed of 640 square feet of rock and/or gravel surfacing spread 6 inches deep over 72 square yards of 4 inch cellular containment grid on 84 square yards of geotextile fabric foundation (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Scenario Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 640

Total Scenario Cost: \$3,140.77

Scenario Cost/Unit: \$4.91

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$2.00	24	\$47.90
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.88	12	\$10.61

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	\$19.74	7	\$138.15
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Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	\$21.55	12	\$258.55
GeoCell, 4"	1054	4-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	\$27.61	72	\$1,987.97
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	\$348.97
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.015	\$1.70
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	0.4	\$0.29
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.01	\$0.39
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	0.5	\$0.39
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	0.5	\$0.22
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.02	\$2.46

Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.01	\$0.47
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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	\$171.35	2	\$342.71
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Practice: 614 - Watering Facility

Scenario: #11 - Water Ramp, Rock Riprap and gravel on Geotextile

Scenario Description: A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock riprap and gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation: Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk excessive distances to access water.

After Situation: A permanent watering ramp is constructed of 640 square feet of rock riprap (8 inches deep) and gravel surfacing (2 inches deep) on 84 square yards of geotextile fabric foundation. (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Scenario Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 640

Total Scenario Cost: \$4,470.95

Scenario Cost/Unit: \$6.99

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$55.82	16	\$893.13
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$123.51	8	\$988.11
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.88	20	\$17.69
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.70	1	\$21.70

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$254.77	2	\$509.54
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Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.25	4	\$125.01
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.015	\$1.70
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.73	0.4	\$0.29
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$39.29	0.01	\$0.39
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.78	0.5	\$0.39
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.44	0.5	\$0.22
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$65.51	16	\$1,048.24
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$122.89	0.02	\$2.46
Three Species Mix, Cool	2315	Cool season, introduced grass mix. Includes material and shipping	Acre	\$46.58	0.01	\$0.47

Season, Introduced Perennial Grass		only.				
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Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$29.32	24	\$703.74
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	\$19.74	8	\$157.88