

Practice: 647 - Early Successional Habitat Development/Management

Scenario: #1 - Mowing

Scenario Description: This scenario addresses inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. The typical setting for this scenario is at the edge of crop fields, in pastures, hayfields, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control or 314 brush management should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover.

Before Situation: The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

After Situation: Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

Scenario Feature Measure: Size of treated area

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$1,351.71

Scenario Cost/Unit: \$135.17

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	10	\$232.94
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Equipment Installation

Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$61.11	10	\$611.07
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	4	\$102.58

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	\$202.55	2	\$405.11
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Practice: 647 - Early Successional Habitat Development/Management

Scenario: #2 - Disking

Scenario Description: This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and creating bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is required to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation: The site is static or trending to higher successional plant species. The disturbance regime to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species such as game bird chicks.

After Situation: The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openness of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

Scenario Feature Measure: width and length of treated area

Scenario Unit: Acre

Scenario Typical Size: 2

Total Scenario Cost: \$228.79

Scenario Cost/Unit: \$114.39

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	2	\$26.23
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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	\$202.55	1	\$202.55
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Practice: 647 - Early Successional Habitat Development/Management

Scenario: #3 - Early Successional Wildlife Openings

Scenario Description: Such heavy density cuts, having a span of no less than 2X the average stand height, are created by cutting all woody vegetation >2" DBH in forest stands with the intent to regenerate shade intolerant species. The treated forest stand must be mature enough to produce viable seed, or it must be reasonably adjacent to desirable mature trees which will provide adequate seed to regenerate the targeted vegetation. This scenario includes treatments which utilize clear-cut, seed tree, and shelterwood forest regeneration methods which have been determined to need implementation with the use of heavy equipment (i.e. feller buncher, tree shear, masticator, etc.) and/or hand tools (i.e. chainsaw, brush saw, ax, handsaw, etc.). At the professional biologist's or forester's discretion 10-20 trees per acre may be left scattered or in groups. Tree tops can be loped and left in place using CPS-384. This EQIP payment scenario will account for regeneration method cost components which are not associated with the aspects of a commercial tree harvest. Starting in 2016, this scenario can be utilized to clonally regenerate aspen (coppice).

Before Situation: Young forest dominated by pole-sized timber (4 to 10 inches DBH). Early successional shrub habitat is lacking in the forest block. Forest canopy needs to be opened to stimulate shrub growth in the under story.

After Situation: Minimum 5 acre opening is created. Large mast trees or other species valuable to wildlife may be retained at a rate of 10 to 12 trees per acre. Wildlife habitat is improved with the increase of sunlight to the forest floor. Some slash has been left in the openings to provide cover and habitat for amphibians and reptiles.

Scenario Feature Measure: Size of treated area

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$6,354.58

Scenario Cost/Unit: \$635.46

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$574.99	2	\$1,149.98
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	20	\$102.82
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$84.38	40	\$3,375.20

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	\$32.34	40	\$1,293.69
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	\$21.64	20	\$432.88

Practice: 647 - Early Successional Habitat Development/Management

Scenario: #4 - Wildlife selective tree felling

Scenario Description: Prior forest or shrubland activities (land abandonment, planned regeneration cuts, or exploitive cuts) have triggered the establishment of advanced regeneration of desirable tree and shrub species, but left behind a residual overstory which has typically lost its commercial value and is now shading the new forest stand. This scenario is intended to address scattered tree removal of ≈35 trees per acre. Greater densities should be addressed under other scenarios such as Early Successional Wildlife Openings. The residual overtopping trees are typically >4"DBH. With the exception of 15-20 trees per acre (left scattered or in groups) all overtopping stems should be manually cut or triple girdled with a chainsaw, or killed with herbicide. Soft mast producing trees and existing snags can be retained at the foresters' discretion. The resulting cut trees should be utilized for their highest potential product, or left in place to provide additional wildlife habitat value. This EQIP payment scenario will only account for the non-commercial tree cutting or killing cost components

Before Situation: Tree canopy beginning to close and shade out shrubland habitat, reducing wildlife value for early successional species. Aspen too mature to provide adequate wildlife habitat.

After Situation: Large trees removed to an acceptable level to promote shrubland habitat, improving wildlife habitat with the resulting increase of sunlight reaching the forest floor. Aspen were cut, allowing regeneration and increased habitat for wildlife.

Scenario Feature Measure: No. of Trees Cut

Scenario Unit: Each

Scenario Typical Size: 40

Total Scenario Cost: \$910.22

Scenario Cost/Unit: \$22.76

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	10	\$216.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	4	\$385.91

Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	10	\$51.41
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	10	\$256.46

Practice: 647 - Early Successional Habitat Development/Management

Scenario: #5 - Wildlife feathered edge

Scenario Description: Create a transitional zone of early successional shrub habitat between grassland and forestland by removing trees >2 inches DBH. Zone of shrubs will reduce predation of wildlife nests and provide better escape cover for wildlife moving between grassland and forestland. Shrubs will also increase food availability along the edge of the forest. Cuts will occur along the edge of forestland where the forest abruptly joins grassland or cropland. Cuts should occur from September through March to minimize disturbance to nesting birds and roosting forest bats. The area to be treated is flagged out by a professional biologist or forester. Cuts will be linear and ideally, 150 feet wide. The wider the width of the cut, the better the protection, cover and food provided to wildlife. Location of feathered edges can be adjusted to avoid steep slopes, streams, wetlands, and other environmentally sensitive areas. Tree tops can be loped and left in place to provide contiguous cover and habitat for reptiles and amphibians.

Before Situation: Young forest edge dominated by pole-sized timber (4 to 10 inches DBH). Edge between the forestland and adjoining grassland or cropland is abrupt and provides poor cover and food for wildlife. Forest canopy needs to be opened to stimulate shrub growth in the under story, creating a transitional zone of shrubs between the grassland/cropland and forest.

After Situation: Cut trees have increased sunlight penetration to the ground, encouraging growth of shrubs. Transitional zone of shrubs, 150 feet wide, between grassland/cropland and forestland now provides nesting and escape cover, as well as food for wildlife. Some slash has been left on-site to provide contiguous cover and habitat for reptiles and amphibians.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$1,803.78

Scenario Cost/Unit: \$1,803.78

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	\$32.34	5	\$161.71
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	\$21.64	1	\$21.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	1	\$43.40

Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	1	\$5.14
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$84.38	5	\$421.90

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$574.99	2	\$1,149.98
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Practice: 647 - Early Successional Habitat Development/Management

Scenario: #6 - Low Shade Removal

Scenario Description: The purpose of this treatment is to increase understory light levels to facilitate an increase of desirable seedlings and herbaceous vegetation and prevent excessive competition from undesirable species. Advanced seedling and sapling reproduction is either non-existent or is very small. All undesirable understory and midstory vegetation should be mechanically and/or chemically killed. Cut stems need not be removed. In addition to herbaceous vegetation and shrubs, suppressed, intermediate, and possibly weak co-dominant trees may be removed at the discretion of the forester to achieve adequate understory light levels. Reduce relative density to 70-80% (density reduction at the discretion of forester), focusing removal on seed source trees of undesirable species. Few, if any, gaps in the main canopy should be created to prevent the germination of undesirable species. Soft mast producing trees can also be retained at the foresters' discretion. Where possible, cuts should not occur from April through October to minimize disturbance to roosting Indiana Bats and nesting birds. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Access Control (472), Critical Area Planting (342), Brush Management (314), and Forest Stand Improvement (666).

Before Situation: Understory and midstory vegetation is comprised of undesirable species of pole-timber, saplings, shrubs, or herbaceous plants that cast dense shade on the forest floor. Understory light levels are too low for the successful establishment of desirable tree seedlings, shrubs, and herbaceous vegetation, which are therefore not abundant or are too small.

After Situation: A minimum of 10 ac. is treated. Understory light levels are enhanced so that desirable herbaceous vegetation, shrubs, and desirable seedlings have high survival and can increase in root and shoot growth.

Scenario Feature Measure: Size of treated area

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$6,892.82

Scenario Cost/Unit: \$689.28

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	30	\$649.32
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	40	\$1,489.53
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	20	\$744.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	25	\$2,411.91

Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	10	\$159.26
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Equipment Installation

Brush Chipper, 6" capacity	938	Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hour	\$25.01	30	\$750.33
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	40	\$205.65
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	3	\$76.94

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	\$202.55	2	\$405.11
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Practice: 647 - Early Successional Habitat Development/Management

Scenario: #7 - Shelterwood Cut

Scenario Description: The purpose of this treatment is to increase understory light levels so that small advanced reproduction (already present) can grow and will be large enough to compete effectively following overstory removal. This treatment will prepare the stand for an eventual overstory removal which generally occurs within 4-8 years. All undesirable understory and midstory vegetation should be cut or killed with herbicide. Reduce relative density to 40-60%, depending on the size of the advanced reproduction and desired species (density reduction at the discretion of forester). Removals should be focused on seed source trees of undesirable species, all suppressed and intermediate trees, and some co-dominant trees. Retain trees with large, healthy crowns to produce seed and to moderate the ground-level environment. Where possible, cuts should not occur from April through October to minimize disturbance to roosting Indiana Bats and nesting birds. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Access Control (472), Critical Area Planting (342), Brush Management (314), and Forest Stand Improvement (666).

Before Situation: Adequate numbers of established advanced reproduction are present, but midstory and overstory shade is limiting its development. Either desirable reproduction is too small, or the likelihood of competition is too great to allow for a final (overstory) removal cut.

After Situation: Minimum of 10 ac. is treated. Understory light levels are enhanced to promote growth of advanced reproduction to competitive sizes. After implementation of this practice (4-8 years) the stand is ready for an overstory removal.

Scenario Feature Measure: Size of treated area

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$6,630.52

Scenario Cost/Unit: \$663.05

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	20	\$432.88
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	40	\$1,489.53
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	25	\$2,411.91

Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	20	\$318.52
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Equipment Installation

Brush Chipper, 12" capacity	1869	Brush Chipper, 12" capacity, typically 130 HP. Includes chipper and power unit. Does not include labor.	Hour	\$64.50	20	\$1,289.98
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	40	\$205.65
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	3	\$76.94

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	\$202.55	2	\$405.11
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Practice: 647 - Early Successional Habitat Development/Management

Scenario: #8 - Overstory Removal

Scenario Description: The canopy overstory is selectively thinned to provide light to established seedlings. Large advanced reproduction is present and is ready to be released from overstory shade to create young forest habitat. Cutting should occur from September through March to minimize disturbance to nesting birds. Disturbance to roosting Indiana bats must also be considered. 10-12 trees per acre are retained for wildlife habitat. Around 20-30 trees are removed per acre. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Access Control (472), Critical Area Planting (342), Brush Management (314), and Forest Stand Improvement (666).

Before Situation: Tree canopy is beginning to close and cause insufficient light to allow regeneration of established seedlings. An adequate number of advanced seedlings is present and large enough to compete effectively with anticipated competition once released.

After Situation: Large canopy trees are removed to an acceptable level to ensure sufficient light is available to established seedlings to encourage growth. Stand is adequately stocked with well-distributed crop trees. Approximately 10 to 12 wildlife reserve trees are retained for wildlife habitat.

Scenario Feature Measure: Size of treated area

Scenario Unit: Acre

Scenario Typical Size: 5

Total Scenario Cost: \$2,763.63

Scenario Cost/Unit: \$552.73

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	60	\$308.47
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	15	\$384.69

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	\$21.64	60	\$1,298.65
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	8	\$771.81

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #17 - Data Collect Surface Year 1-QAPP

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$21,973.25

Scenario Cost/Unit: \$21,973.25

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	100	\$7,737.75
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$93.87	20	\$1,877.33
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	130	\$4,302.62
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$108.23	16	\$1,731.70

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	4	\$103.67
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble	Each	\$25.92	40	\$1,036.70

		Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #18 - Data Collect Surface Year 1 - NO QAPP

Scenario Description: This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface systems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$15,269.12

Scenario Cost/Unit: \$15,269.12

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	60	\$4,642.65
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	130	\$4,302.62

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	4	\$103.67
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #19 - Data Collect Surface Year 2+

Scenario Description: This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface systems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$15,269.12

Scenario Cost/Unit: \$15,269.12

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	60	\$4,642.65
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	130	\$4,302.62

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	4	\$103.67
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended	Each	\$25.92	40	\$1,036.70

		Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #20 - Data Collect Surface Last Year

Scenario Description: This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected to complete monitoring period.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$18,364.22

Scenario Cost/Unit: \$18,364.22

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	100	\$7,737.75
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	130	\$4,302.62

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	4	\$103.67
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	20	\$518.35
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble	Each	\$25.92	40	\$1,036.70

		Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	40	\$1,036.70

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #21 - Data Collect Tile Year 1-QAPP

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$42,965.95

Scenario Cost/Unit: \$42,965.95

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	130	\$10,059.07
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$93.87	20	\$1,877.33
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	312	\$10,326.28
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$108.23	16	\$1,731.70

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	12	\$311.01
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #22 - Data Collect Tile Year 1 - NO QAPP

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$36,261.81

Scenario Cost/Unit: \$36,261.81

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	90	\$6,963.97
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	312	\$10,326.28

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	12	\$311.01
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09

		Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #23 - Data Collect Tile Year 2+

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$36,261.81

Scenario Cost/Unit: \$36,261.81

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	90	\$6,963.97
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	312	\$10,326.28

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	12	\$311.01
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble	Each	\$25.92	120	\$3,110.09

		Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #24 - Data Collect Tile Last Year

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nitrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$39,356.91

Scenario Cost/Unit: \$39,356.91

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	130	\$10,059.07
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	312	\$10,326.28

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	12	\$311.01
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	120	\$3,110.09

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #25 - Data Collect Surface Year 1-QAPP with two treatment Sites

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$30,121.54

Scenario Cost/Unit: \$30,121.54

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	130	\$10,059.07
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$93.87	30	\$2,816.00
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	156	\$5,163.14
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$108.23	24	\$2,597.55

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	6	\$155.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble	Each	\$25.92	60	\$1,555.05

		Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #26 - Data Collect Surface Year 1 less QAPP (pre-install information) with two treatment sites

Scenario Description: This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$21,612.89

Scenario Cost/Unit: \$21,612.89

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	90	\$6,963.97
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	156	\$5,163.14

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	6	\$155.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #27 - Data Collect Surface Year 2+ with two treatment sites

Scenario Description: This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$21,612.89

Scenario Cost/Unit: \$21,612.89

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	90	\$6,963.97
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	156	\$5,163.14

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	6	\$155.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended	Each	\$25.92	60	\$1,555.05

		Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #28 - Data Collect Surface Last Year with two treatment sites

Scenario Description: This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$26,255.54

Scenario Cost/Unit: \$26,255.54

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	150	\$11,606.62
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	156	\$5,163.14

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	6	\$155.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	30	\$777.52
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble	Each	\$25.92	60	\$1,555.05

		Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	60	\$1,555.05

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #29 - Data Collect Tile Year 1 with two treatment sites and QAPP

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site monitoring stations, preparation of monitoring plan and a quality assurance project plan (QAPP) to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have not been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$59,459.28

Scenario Cost/Unit: \$59,459.28

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	175	\$13,541.05
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	\$93.87	30	\$2,816.00
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	364	\$12,047.33
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	\$108.23	24	\$2,597.55

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	18	\$466.51
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #30 - Data Collect Tile Year 1 less QAPP (pre-install information) with two treatment sites

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$50,950.62

Scenario Cost/Unit: \$50,950.62

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	135	\$10,445.96
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	364	\$12,047.33

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	18	\$466.51
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14

		Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #31 - Data Collect Tile Year 2+ with two treatment sites

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$50,950.62

Scenario Cost/Unit: \$50,950.62

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	135	\$10,445.96
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	364	\$12,047.33

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	18	\$466.51
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble	Each	\$25.92	180	\$4,665.14

		Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.				
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14

Practice: 201 - Edge-of-Field Water Quality Monitoring– Data Collection and Evaluation

Scenario: #32 - Data Collect Tile Last Year with two treatment sites

Scenario Description: This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station. A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year. Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation: The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation: This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Scenario Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$55,593.27

Scenario Cost/Unit: \$55,593.27

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	\$77.38	195	\$15,088.60
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$33.10	364	\$12,047.33

Materials

Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	\$25.92	18	\$466.51
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	180	\$4,665.14
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	\$25.92	90	\$2,332.57

Practice: 368 - Emergency Animal Mortality Management

Scenario: #9 - In-House Composting

Scenario Description: This scenario consists the emergency disposal of poultry mortality by composting in a static windrow. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation: Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation: Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. The typical scenario number of birds to be disposed of is 20,000, 4 pound birds which can be composted in-house. Composting requires 1.5 pounds of carbon per pound of bird. There is 0.5 pounds of litter per bird already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling birds and litter in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/litter mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining litter; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Scenario Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 80

Total Scenario Cost: \$5,803.69

Scenario Cost/Unit: \$72.55

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yard	\$24.89	91	\$2,265.12
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$52.50	28	\$1,470.08

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	28	\$652.24
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	\$21.64	28	\$606.04

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	\$202.55	4	\$810.22
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Practice: 368 - Emergency Animal Mortality Management

Scenario: #10 - Burial

Scenario Description: This scenario consists of the on-site burial of animal mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation: Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation: Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be re-compacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Scenario Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 25

Total Scenario Cost: \$2,782.85

Scenario Cost/Unit: \$111.31

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	\$4.00	94	\$375.88
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$1.88	94	\$176.44
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	\$67.93	12	\$815.12

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	12	\$279.53
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	\$21.64	12	\$259.73

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$574.99	1	\$574.99
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #1 - Ventilation - Exhaust

Scenario Description: Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts and pictures from the applicant. Typical scenario includes the replacement of a 48" fan.

Before Situation: Inefficient ventilation in an agricultural building.

After Situation: High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,414.59

Scenario Cost/Unit: \$1,414.59

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	3	\$111.71
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Materials

Fan, exhaust, 48" High Efficiency	1187	48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$1,302.88	1	\$1,302.88
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #2 - Ventilation - HAF

Scenario Description: A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

Before Situation: Inefficient air circulation system in a greenhouse.

After Situation: High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$225.36

Scenario Cost/Unit: \$225.36

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	2	\$74.48
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Materials

Fan, HAF, 1/10 to 1/15 HP	1189	High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only.	Each	\$150.89	1	\$150.89
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #3 - Refrig-Plate Cooler-Small

Scenario Description: The installation of all stainless steel dual pass plate cooler, type 316 stainless steel to pre-milk prior to entering bulk tank. Practice installation will be by a factory trained dairy technician and according manufacturer's specifications. After installation, energy is saved by a reduction in compressor usage to cool milk. Installation and certification typically by a certified dairy manufacture representative. Associated Practices: AgEMP CAP 122

Before Situation: Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation: High-efficiency milk cooling system which reduces energy use. The new milk plate cooling equipment < 499 gal.hour (typically rated at 300 gallon/hour) will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$5,026.30

Scenario Cost/Unit: \$5,026.30

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Plate Cooler, <= 499 gal/hr capacity	1176	Stainless Steel, dual pass plate cooler with < 499 gallon/hour capacity. Includes materials and shipping only.	Each	\$4,728.40	1	\$4,728.40
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #4 - Refrig-Plate Cooler-Med

Scenario Description: The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. After installation, energy is saved by a reduction in compressor usage to cool milk. Installation and certification typically by a certified dairy manufacture representative. Associated Practices: AgEMP CAP 122

Before Situation: Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation: High-efficiency milk cooling system which reduces energy use. The new milk plate cooling equipment 500-749 gal/hour(typically rated at 600 gallon/hour) will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$5,913.37

Scenario Cost/Unit: \$5,913.37

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Plate Cooler, 500 - 749 gal/hr capacity	1177	Stainless Steel, dual pass plate cooler with 500 - 749 gallon/hour capacity. Includes materials and shipping only.	Each	\$5,615.46	1	\$5,615.46
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #5 - Plate Cooler-Ig

Scenario Description: The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. After installation, energy is saved by a reduction in compressor usage to cool milk. Installation and certification typically by a certified dairy manufacture representative. Associated Practices: AgEMP CAP 122

Before Situation: Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation: High-efficiency milk cooling system which reduces energy use. The new milk plate cooling equipment rated 750-900 gal/hour (typically 800 gallons/hour) will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$6,848.76

Scenario Cost/Unit: \$6,848.76

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Plate Cooler, 750 - 999 gal/hr capacity	1178	Stainless Steel, dual pass plate cooler with 750 - 999 gallon/hour capacity. Includes materials and shipping only.	Each	\$6,550.86	1	\$6,550.86
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #6 - Scroll Compressor

Scenario Description: Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor. Associated Practices: AgEMP CAP 122

Before Situation: Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

After Situation: A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of compressors

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$4,193.54

Scenario Cost/Unit: \$4,193.54

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	4	\$148.95
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Materials

Scroll Compressor - 5 HP	1183	Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	\$4,044.58	1	\$4,044.58
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #7 - Water Heater

Scenario Description: Install an Efficient Proprane Water Heater to replace an inefficient water heater or water heating system. Replacement based on results from a Type 2 energy audit meeting the requirements of ASABE S612.

Before Situation: Inefficient Water Heater or water heating system.

After Situation: Replaced inefficient water heater with modern energy efficient water heater. Reduction in energy usage associated with heating water. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$3,259.65

Scenario Cost/Unit: \$3,259.65

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	8	\$173.15
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91

Materials

Water Heater, High Efficiency	2485	Water heater with efficiency rating as per ASABE-S612. Includes materials and shipping only.	Each	\$2,788.59	1	\$2,788.59
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #8 - Variable Speed Drive, no motor

Scenario Description: The typical scenario consists of a variable speed drive (VSD) and appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to a 3-phase electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. Non 3-phase motors must be replaced. Cost share seperately on appropriate sized motor upgrade. Associated Practices: AgEMP CAP 122

Before Situation: The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation: An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Non 3-phase motors must be replaced. Appropriate sized motor upgrade is paid seperately. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: HP of VFD

Scenario Unit: Horsepower

Scenario Typical Size: 50

Total Scenario Cost: \$11,961.29

Scenario Cost/Unit: \$239.23

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	\$233.27	50	\$11,663.39
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #9 - Automatic Controller System

Scenario Description: The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation: A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation: An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$1,516.68

Scenario Cost/Unit: \$1,516.68

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$160.35	1	\$160.35
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	\$627.96	1	\$627.96
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	\$430.47	1	\$430.47

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #10 - Motor Upgrade > 100 HP

Scenario Description: The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 100 horsepower.

Before Situation: The system is inefficient with a standard efficiency motor.

After Situation: An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$23,879.91

Scenario Cost/Unit: \$23,879.91

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	16	\$595.81
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Materials

Motor, electric, NEMA Premium, 200 HP	1175	Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$23,284.10	1	\$23,284.10
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #11 - Motor Upgrade 10 - 100 HP

Scenario Description: The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is equal to or larger than 10 and less than or equal to 100 horsepower.

Before Situation: The system is inefficient with a standard efficiency motor.

After Situation: An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$6,419.97

Scenario Cost/Unit: \$6,419.97

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Motor, electric, NEMA Premium, 50 HP	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$6,122.06	1	\$6,122.06
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #12 - Motor Upgrade > 1 and < 10 HP

Scenario Description: The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

Before Situation: The system is inefficient with a standard efficiency motor.

After Situation: An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$915.39

Scenario Cost/Unit: \$915.39

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	4	\$148.95
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Materials

Motor, electric, NEMA Premium, 5 HP	1171	Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$766.43	1	\$766.43
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #13 - Motor Upgrade = 1 HP

Scenario Description: The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

Before Situation: The system is inefficient with a standard efficiency motor.

After Situation: An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$618.48

Scenario Cost/Unit: \$618.48

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	4	\$148.95
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Materials

Motor, electric, NEMA Premium, 1 HP	1169	Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	\$469.53	1	\$469.53
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #14 - Heating - Radiant Tube

Scenario Description: Replace "pancake" Brood Heaters in a poultry house with Radiant Tube Heaters, or similar. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit. The typical scenario consists of the replacement of 28 brood heaters with 6 radiant tube heaters.

Before Situation: Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder. A large number of brooders are required to cover a significant percent of floor space. As the warmed air naturally rises it loses effectiveness for poultry on the ground.

After Situation: Energy use is reduced through installation of a more efficient heater. Radiant tube heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of heaters

Scenario Unit: Each

Scenario Typical Size: 6

Total Scenario Cost: \$9,280.29

Scenario Cost/Unit: \$1,546.71

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	16	\$595.81
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Materials

Heater, radiant tube	1163	Radiant tube heater rated at 125,000 BTU/hour. Materials only.	Each	\$1,447.41	6	\$8,684.48
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #15 - Heating (Building)

Scenario Description: Replace existing low efficiency heaters with new high efficiency heaters. High-efficiency heating systems include any heating unit with efficiency rating of 80%+ for fuel oil and 90%+ for natural gas and propane. Applications may be air heating/building environment and hydronic (boiler) heating for agricultural operations, including under bench, or root zone heating. An alternative to heater replacement might be the addition of climate control system and electronic temperature controls with +/- 1 degree F differential, to reduce the annual run time.

Before Situation: Buildings heated with low efficiency heaters or heaters without proper electronic climate controls

After Situation: Higher efficiency heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas, propane, or fuel oil. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Rated Heat Output

Scenario Unit: 1,000 BTU/Hour

Scenario Typical Size: 750

Total Scenario Cost: \$9,388.94

Scenario Cost/Unit: \$12.52

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	16	\$595.81
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Materials

Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	\$11.72	750	\$8,793.12
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #16 - Heating - Attic Heat Recovery vents

Scenario Description: Install actuated inlets or automatic latching gravity inlets that draw warmer, drier air from the attic to assist with moisture and heat control when ventilation fans are being operated in poultry houses and swine barns. Other systems to transfer heat, as detailed in ASABE S612-compliant energy audit may also be used. Based on a 40' x 500' poultry house.

Before Situation: Heated buildings with attic spaces but no means to transfer heat between the heated space, attic, and ambient (outside) air when relative conditions allow for reduced energy use.

After Situation: Attic vents or inlets allow dry warm air from the attic to circulated through out the building. By using pre-warmed air from the attic less energy is needed for heating 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Number of inlets

Scenario Unit: Each

Scenario Typical Size: 14

Total Scenario Cost: \$2,440.20

Scenario Cost/Unit: \$174.30

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	24	\$893.72
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Materials

Inlet, Attic Ceiling	2414	Poultry house attic air inlets. Includes materials only.	Each	\$110.46	14	\$1,546.48
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #17 - Grain Dryer

Scenario Description: A replacement continuous dryer rated for an appropriate rated bushel/per hour capacity for the operation that includes a microcomputer-based control system that adjusts the amount of time the crop remains in the dryer in order to achieve a consistent and accurate moisture content in the dried product. Alternate types of replacement dryers which reduce energy use are acceptable as evidenced by the energy audit. The typical operation requires a rated capacity of 860 bushels per hour.

Before Situation: Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified inefficient manual control of the dryer where the operator controls the plenum temperature and the discharge auger speed to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The plenum temperature setting depends on the moisture content of crop with a typical value of 220 F. The burner cycles on and off, automatically, as necessary to maintain the plenum temperature selected by the operator.

After Situation: Energy use is reduced through installation of a more efficient continuous dryer that uses a microcomputer-based controller to reduce overdrying and total time of operation. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Rated capacity of the dryer

Scenario Unit: Bushel per Hour

Scenario Typical Size: 860

Total Scenario Cost: \$80,931.28

Scenario Cost/Unit: \$94.11

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	16	\$595.81
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Materials

Grain dryer, Axial 28'	1162	Grain dryer, 28 foot Axial with rated capacity of 990 bushels/hr. Materials only.	Bushel per Hour	\$95.24	172	\$16,381.77
Grain dryer, Axial, 12'	1158	Grain dryer, 12 foot Axial with rated capacity of 460 bushels/hour. Materials only.	Bushel per Hour	\$98.47	172	\$16,937.09
Grain dryer, Axial, 16'	1159	Grain dryer, 16 foot Axial with rated capacity of 600 bushels/hour. Materials only.	Bushel per Hour	\$85.02	172	\$14,623.28
Grain dryer, Centrifugal, 20'	1160	Grain dryer, 20 foot Centrifugal with rated capacity of 785 bushels/hour. Materials only.	Bushel per Hour	\$90.94	172	\$15,641.35
Grain dryer, Centrifugal, 24'	1161	Grain dryer, 24 foot Centrifugal with rated capacity of 860 bushels/hr. Materials only.	Bushel per Hour	\$97.40	172	\$16,751.98

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #18 - Tunnel Door

Scenario Description: Replace the traditional tunnel inlet curtain with a solid tunnel inlet door to reduce the amount of heat leakage and reduce the amount of energy used to heat and cool the poultry house. Typical tunnel inlet door is 5 feet high and 30 feet long or 150 square feet. Typical poultry house is 40 feet by 500 feet.

Before Situation: A poultry house with a traditional tunnel inlet curtain is losing heat and is inefficient while using more energy.

After Situation: Replace the traditional tunnel inlet curtain with a solid tunnel inlet door to reduce the amount of heat leakage and reduce the amount of energy used to heat and cool the poultry house. Typical tunnel inlet door is 5 feet high and 30 feet long or 150 square feet. Typical poultry house is 40 feet by 500 feet. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Area of tunnel door

Scenario Unit: Square Foot

Scenario Typical Size: 150

Total Scenario Cost: \$1,712.02

Scenario Cost/Unit: \$11.41

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	2	\$43.29
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	2	\$74.48

Materials

Tunnel doors	2413	Tunnel doors are used to replace curtains on tunnel inlets in a poultry house. Includes materials only.	Square Foot	\$10.63	150	\$1,594.26
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #19 - RO<=200 GPH

Scenario Description: Reverse osmosis (RO) unit is installed to concentrate the sugar content of sap prior to boiling to decrease boiling time and fuel use. RO units use a combination of electric high pressure pumps and membranes to concentrate the sap. Use for units rated at 200 GPH or less. Complete unit is added to operation with an existing evaporator to process sap before it enters the maple evaporator. Boiling time for concentrated sap is greatly reduced. Typical capacity of the RO unit is 125 GPH. Completion of an Agricultural Energy Management Plan AgEMP or equivalent energy audit identifies the energy savings with planned installation of the RO unit. Units are typically manufactured for maple applications. Associated Practices: AgEMP CAP 122

Before Situation: 1000 tap maple operation with a fuel oil fired evaporator running all sap through the evaporator and no existing RO. Sap is 1-2% sugar. All concentration is through evaporator with excessive boil time, fuel use, and emissions.

After Situation: Sap is processed through RO before entering the evaporator. Sap is concentrated to 8% or more drastically reducing boil time, fuel consumption and emissions. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Capacity of RO

Scenario Unit: Gallon per Hour

Scenario Typical Size: 125

Total Scenario Cost: \$4,228.92

Scenario Cost/Unit: \$33.83

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Reverse Osmosis unit, fixed cost portion	2224	Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Each	\$1,599.06	1	\$1,599.06
Reverse Osmosis unit, variable cost portion	2225	Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Gallon per Hour	\$18.66	125	\$2,331.96

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #20 - RO>200-600 GPH

Scenario Description: Reverse osmosis (RO) unit is intalled to concentrate the sugar content of sap prior to boiling to decrease boiling time and fuel use. RO units use a combination of electric high pressure pumps and membranes to concentrate the sap. Use for units rated at greater than 200 GPH and less than or equal to 600 GPH. Complete unit is added to operation with an existing evaporator only to increase existing RO capacity to process sap before it enters the maple evaporator. Boiling time for concentrated sap is greatly reduced. Typical capacity is 600 GPH. Completion of an Agricultural Energy Managment Plan AgEMP or equivalent energy audit indentifies the energy savings with planned installation of the RO unit. Units are typicllay manufactured for maple applications. Associated Practices: AgEMP CAP 122

Before Situation: 3000 tap maple operation with a fuel oil fired evaporater running all sap through the evaporator and no existing RO. Sap is 1-2% sugar. All concentration is from combustion evaporation with excessive boil time, fuel use, and emissions.

After Situation: Sap is processed through RO before entering the evaporator. Sap is concentrated to 8% or more drastically reducing boil time, fuel consumption, and emissions. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Capacity of RO

Scenario Unit: Gallon per Hour

Scenario Typical Size: 600

Total Scenario Cost: \$13,388.26

Scenario Cost/Unit: \$22.31

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	16	\$595.81
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Materials

Reverse Osmosis unit, fixed cost portion	2224	Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Each	\$1,599.06	1	\$1,599.06
Reverse Osmosis unit, variable cost portion	2225	Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Gallon per Hour	\$18.66	600	\$11,193.40

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #21 - RO >600 GPH or add on

Scenario Description: Reverse osmosis (RO) unit is intalled to concentrate the sugar content of sap prior to boiling to decrease boiling time and fuel use. RO units use a combination of electric high pressure pumps and membranes to concentrate the sap. An add-on unit is added to an existing RO unit to increase existing RO capacity to process sap before it enters the maple evaporator or a large complete RO unit greater than 600 GPH is installed. Typical unit is 1200 GPH. Boiling time for concentrated sap is greatly reduced. Completion of an Agricultural Energy Management Plan AgEMP or equivalent energy audit identifies the energy savings with planned installation of the RO unit. Units are typically manufactured for maple applications. Associated Practices: AgEMP CAP 122

Before Situation: 5000 tap maple operation with a fuel oil fired evaporator running all sap through an existing RO that is under sized causing increased boil time, fuel consumption, and emissions.

After Situation: Sap is processed through expanded RO before entering the evaporator. Sap is concentrated to 14% or more drastically reducing boil time, fuel consumption, and emissions. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Capacity of RO

Scenario Unit: Gallon per Hour

Scenario Typical Size: 1200

Total Scenario Cost: \$22,684.70

Scenario Cost/Unit: \$18.90

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Reverse Osmosis unit, variable cost portion	2225	Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Gallon per Hour	\$18.66	1200	\$22,386.79
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #22 - Enhanced preheater, small

Scenario Description: The unit is installed over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200°F while at the same time injecting air into the sap to promote evaporation. Use for units less than 40 sq ft. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor.

Before Situation: Existing evaporator uses cold sap at inflow causing long boil times. inefficient fuel use and increased emissions.

After Situation: Use of a preheater captures waste heat from the evaporator and preheats cold sap and concentrates sap. Boil time, fuel use, and emissions are reduced. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Area of pan

Scenario Unit: Square Foot

Scenario Typical Size: 24

Total Scenario Cost: \$9,670.25

Scenario Cost/Unit: \$402.93

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	4	\$148.95
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Materials

Sap Pre-Heater, High efficiency, fixed cost	2254	High efficiency sap pre-heater device, fixed cost portion. Materials only.	Each	\$4,347.52	1	\$4,347.52
Sap Pre-Heater, High efficiency, variable cost	2255	High efficiency sap pre-heater device, variable cost portion. Materials only.	Square Foot	\$215.57	24	\$5,173.78

Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #23 - Enhanced preheater, large

Scenario Description: This unit is installed over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200°F while at the same time injecting air into the sap to promote evaporation. Use for units 40 sq ft and larger. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor.

Before Situation: Existing evaporator uses cold sap at inflow causing long boil times. inefficient fuel use and increased emissions.

After Situation: Use of a preheater captures waste heat from the evaporator and preheats cold sap and concentrates sap. Boil time, fuel use, and emissions are reduced. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Area of pan

Scenario Unit: Square Foot

Scenario Typical Size: 40

Total Scenario Cost: \$8,920.87

Scenario Cost/Unit: \$223.02

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Sap Pre-Heater, High efficiency, variable cost	2255	High efficiency sap pre-heater device, variable cost portion. Materials only.	Square Foot	\$215.57	40	\$8,622.97
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #24 - High Efficiency Pans for < 1000 taps

Scenario Description: Install high efficiency pans to an existing 2.5 ft. by 8 ft. maple syrup evaporator. High efficiency pans have increased flue surface area and improved flue arrangement to increase boiling rate given the same overall rate of energy inputs. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufactures's recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

Before Situation: Existing maple operation has an existing maple syrup evaporater with documented inefficiencies from an approved AgEMP. Identified efficiency improvement is from pan replacement on an existing arch that is deemed efficient and can be retrofitted with new evaporater pans.

After Situation: New pans are installed with increased flue surace area and or improved flue agrangements. Boiling rate is increased, boiling time and fuel use are decreased. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each High Efficiency Pan

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$4,466.11

Scenario Cost/Unit: \$4,466.11

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Maple Evaporator Pan (without Arch) < 1,000 Taps	2405	High efficiency evaporator pan for maple syrup production. Does not include the arch. Small operations, less than 1,000 taps.	Each	\$4,168.21	1	\$4,168.21
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #25 - High Efficiency Pans >=1000 taps

Scenario Description: Install high efficiency pans to an existing 4 ft. by 16 ft. maple syrup evaporator. High efficiency pans have increased flue surface area and improved flue arrangement to increase boiling rate given the same overall rate of energy inputs. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufactures's recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

Before Situation: Existing maple operation has an existing maple syrup evaporater with documented inefficiencies from an approved AgEMP. Identified efficiency improvement is from pan replacement on an existing arch that is deemed efficient and can be retrofitted with new evaporater pans.

After Situation: New pans are installed with increased flue surace area and or improved flue agrangements. Boiling rate is increased, boiling time and fuel use are decreased. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each High Efficiency Pan

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$16,427.06

Scenario Cost/Unit: \$16,427.06

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Maple Evaporator Pan (without Arch) => 1,000 Taps	2403	High efficiency evaporator pan for maple syrup production. Does not include the arch. Large operations, greater than or equal to 1,000 taps.	Each	\$16,129.15	1	\$16,129.15
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #26 - High Efficiency arch < 1000 taps

Scenario Description: Install high efficiency 2.5 ft by 8 ft. combustion arch to provide combustion for evaporating maple sap. High efficiency arches use air injection, gasification technology, and/or increased insulation properties to increase energy efficiency by increasing boil rate and edits to reduce fuel use. Existing boiling pans are used or if new pans are specified in the AgEMP are installed under the appropriate scenario if available. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufacturer's recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

Before Situation: An older inefficient maple evaporator uses excessive amounts of energy to produce a given amount of maple syrup. An approved AgEMP identifies efficiency improvements by replacing the combustion arch with a newer energy efficient combustion arch unit.

After Situation: A high efficiency arch is installed that will increase boil rate and decrease boil time and energy used. Existing boiling pans are used on the new arch or if replaced are cost shared under an appropriate scenario. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each Combustion Arch

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$2,142.15

Scenario Cost/Unit: \$2,142.15

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Maple Evaporator Combustion Arch without Pan < 1,000 Taps	2406	High efficiency evaporator combustion arch for maple syrup production. Does not include the pan. Small operations, less than 1,000 taps.	Each	\$1,844.25	1	\$1,844.25
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Practice: 374 - FARMSTEAD ENERGY IMPROVEMENT

Scenario: #27 - High Efficiency arch >= 1000 taps

Scenario Description: Install high efficiency 4 ft by 16 ft. combustion arch to provide combustion for evaporating maple sap. High efficiency arches use air injection, gasification technology, and/or increased insulation properties to increase energy efficiency by increasing boil rate and edits to reduce fuel use. Existing boiling pans are used or if new pans are specified in the AgEMP are installed under the appropriate scenario if available. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufacturer's recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

Before Situation: An older inefficient maple evaporator uses excessive amounts of energy to produce a given amount of maple syrup. An approved AgEMP identifies efficiency improvements by replacing the combustion arch with a newer energy efficient combustion arch unit.

After Situation: A high efficiency arch is installed that will increase boil rate and decrease boil time and energy used. Existing boiling pans are used on the new arch or if replaced are cost shared under an appropriate scenario. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each Combustion Arch

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$16,565.64

Scenario Cost/Unit: \$16,565.64

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
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Materials

Maple Evaporator Combustion Arch without Pan => 1,000 Taps	2404	High efficiency evaporator combustion arch for maple syrup production. Does not include the pan. Large operations, greater than or equal to 1,000 taps.	Each	\$16,267.74	1	\$16,267.74
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Practice: 382 - Fence

Scenario: #1 - Barbed or Smooth Wire

Scenario Description: A multi-strand, non-electric barbed or smooth wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. The gate is constructed using fencing materials rather than a pre-manufactured gate. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

Before Situation: Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation: A multi-strand, non-electric barbed or smooth wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Fence installation includes all posts, wire, fasteners, gates, and other necessary components. Typical installation is based on a four strand common installation. The fence is installed with consideration to wildlife.

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$3,823.94

Scenario Cost/Unit: \$1.91

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	\$0.17	2000	\$331.20
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$166.29	2	\$332.58
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	\$8.06	38	\$306.31
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$15.10	44	\$664.40
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	\$71.19	6	\$427.15

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	14	\$326.12
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	\$21.64	36	\$779.19

Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	14	\$120.47
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	14	\$408.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	5	\$128.23

Practice: 382 - Fence

Scenario: #2 - Woven Wire

Scenario Description: A woven wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A woven wire fence is typically used in applications with sheep, goats, horses, wildlife exclusion, and shelterbelt/tree protection. Entire fence is constructed using fencing material rather than pre-manufactured panels. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

Before Situation: Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation: A woven wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Woven wire fence installation includes all posts, wire, fasteners, gates, and other necessary components. A woven wire fence is typically used in applications with sheep, goats, wildlife exclusion, and shelterbelt/tree protection. The fence is installed with consideration to wildlife.

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 2640

Total Scenario Cost: \$8,663.50

Scenario Cost/Unit: \$3.28

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$166.29	2	\$332.58
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	\$8.06	168	\$1,354.22
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$15.10	44	\$664.40
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	\$71.19	2	\$142.38
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	\$257.12	8	\$2,056.98

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	35	\$815.29
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	\$21.64	76	\$1,644.95

Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	35	\$301.16
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	35	\$1,020.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	5	\$128.23

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	\$202.55	1	\$202.55
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Practice: 382 - Fence

Scenario: #3 - Electric 2 strand

Scenario Description: A two strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A two strand electric fence is typically used on dairy operations. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

Before Situation: Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation: A two strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Installation includes all posts, wire, fasteners, gates, fence energizer, and other incidental necessary components. The fence is installed with consideration to wildlife.

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$3,174.20

Scenario Cost/Unit: \$1.59

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	\$8.53	1	\$8.53
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$324.22	1	\$324.22
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	\$1.81	7	\$12.67
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	\$10.51	7	\$73.56
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	\$29.98	1	\$29.98
Electric, Lightning Diverter	22	Electric, Lightning diverter for electric fence. Includes materials and shipping only.	Each	\$10.27	1	\$10.27
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	\$9.64	1	\$9.64
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	\$41.14	1	\$41.14
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.07	2000	\$137.83
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$166.29	2	\$332.58
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	\$6.26	25	\$156.52
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$15.10	32	\$483.20
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$114.08	1	\$114.08

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP,	Hour	\$23.29	9.5	\$221.29
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		Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers				
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	\$21.64	28	\$606.04

Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	9.5	\$81.74
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	9.5	\$277.06
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29

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	\$202.55	1	\$202.55
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Practice: 382 - Fence

Scenario: #4 - Electric 3 strand

Scenario Description: A three strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A three strand electric fence is typically used on beef operations. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

Before Situation: Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation: A three strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Installation includes all posts, wire, fasteners, gates, fence energizer, and other incidental necessary components. The fence is installed with consideration to wildlife.

Scenario Feature Measure: Length of fence

Scenario Unit: Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$4,060.16

Scenario Cost/Unit: \$2.03

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	\$8.53	1	\$8.53
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$324.22	1	\$324.22
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	\$1.81	7	\$12.67
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	\$10.51	7	\$73.56
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	\$29.98	1	\$29.98
Electric, Lightning Diverter	22	Electric, Lightning diverter for electric fence. Includes materials and shipping only.	Each	\$10.27	1	\$10.27
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	\$9.64	1	\$9.64
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	\$41.14	1	\$41.14
Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.12	2000	\$247.89
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$166.29	2	\$332.58
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	\$8.06	38	\$306.31
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$15.10	44	\$664.40
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$114.08	2	\$228.16

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP,	Hour	\$23.29	13.5	\$314.47
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		Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers				
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	\$21.64	32	\$692.61

Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	13.5	\$116.16
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	13.5	\$393.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29

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	\$202.55	1	\$202.55
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Practice: 382 - Fence

Scenario: #5 - Electric - 4 or more strands

Scenario Description: A four or more strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A four strand electric fence is typically used for goats, sheep, llamas, hogs or humans. Typical installation is based on a 5 strand electric fence. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

Before Situation: Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation: A four or more strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Installation includes all posts, wire, fasteners, gates, fence energizer, and other incidental necessary components. The fence is installed with consideration to wildlife.

Scenario Feature Measure: Length of fence

Scenario Unit: Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$5,153.83

Scenario Cost/Unit: \$2.58

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	\$8.53	1	\$8.53
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	\$324.22	1	\$324.22
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	\$1.81	7	\$12.67
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	\$10.51	7	\$73.56
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	\$29.98	1	\$29.98
Electric, Lightning Diverter	22	Electric, Lightning diverter for electric fence. Includes materials and shipping only.	Each	\$10.27	1	\$10.27
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	\$9.64	1	\$9.64
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	\$41.14	1	\$41.14
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$166.29	2	\$332.58
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	\$8.06	38	\$306.31
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$15.10	76	\$1,147.60
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$114.08	3	\$342.25

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	19	\$442.59
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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	\$21.64	34	\$735.90
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Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	19	\$163.49
Fence, Wire Assembly, High Tensile Electric, 5 Strand	1087	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.18	2000	\$365.14
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	19	\$554.12
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29

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	\$202.55	1	\$202.55
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Practice: 382 - Fence

Scenario: #6 - Exclusion Fence

Scenario Description: A barrier fence is installed around an NRCS constructed practice such as a waste storage system or heavy use area according to engineering design to exclude human or livestock access. The fence is permanently installed to 1) Keep humans away from waste ponds and lagoons or 2) to protect sensitive areas (Riparian areas, wetlands, springs, etc.) from heavy livestock pressure. A heavy grade fence material and close post space is required for proper installation. Associated Practices: Pond (378), Solid/Liquid Waste Separation Facility (632), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Transfer (634)

Before Situation: An NRCS designed and constructed practice, such as a waste storage pond, is planned posing significant risk to human safety if not addressed. Livestock have access to sensitive areas that may cause detrimental effect to animal/human health and wildlife habitat. Resource concerns that need to be addressed are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment, and water quality due to turbidity.

After Situation: Humans and livestock are excluded from the constructed practice, such as a waste storage pond, for safety purposes. A barrier fence is installed around the entire holding pond or livestock are kept away from a hydrologically sensitive area on a newly constructed heavy use area. The fence is typically five strand high tensile wire with close spacing. Improved livestock control and access to water or other sensitive areas promotes safety for livestock and humans, improves health and vigor of sensitive species, and limits soil erosion.

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 450

Total Scenario Cost: \$2,168.67

Scenario Cost/Unit: \$4.82

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	\$166.29	1	\$166.29
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	\$8.06	10	\$80.61
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$15.10	41	\$619.10
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$114.08	1	\$114.08

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	9	\$209.65
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	\$21.64	14	\$303.02

Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	9	\$77.44
Fence, Wire Assembly, High Tensile Electric, 5 Strand	1087	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	\$0.18	450	\$82.16
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	9	\$262.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29

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	\$202.55	1	\$202.55
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Practice: 382 - Fence

Scenario: #7 - Chain Link

Scenario Description: A chain link fence is installed around an NRCS constructed practice where significant hazards exist such as a vertical wall, concrete storage tank. The safety concerns and risks associated with this type of tank are too great to risk accidental drowning and therefore, a guaranteed strong fence is need for this critical exclusion fence. The fence is permanently installed to keep humans (small children) away from waste ponds and lagoons. A heavy grade fence material and close post space is required for proper installation. The chain link fence is constructed securely in concrete and can withstand greater pressure. Chain link fence is only used in a limited number of circumstances where those significant hazards make it too great to risk endangering people and/or livestock. Associated Practices: Pond (378), Solid/Liquid Waste Separation Facility (632), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Transfer (634)

Before Situation: An NRCS designed and constructed practice, such as a waste storage pond, is planned posing significant risk to human safety if not addressed. Livestock need to be excluded using a strong fence to ensure exclusion from location to prevented drowning and/or other detrimental effect to animal/human health and wildlife habitat. Resource concerns that need to be addressed are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment, and water quality due to turbidity.

After Situation: Humans and livestock are excluded from the constructed practice for safety purposes and to prevent accidental drowning. A chain link fence is installed securely in concrete around the entire holding pond. The fence is typically 200 feet long with one gate and is installed by a fencing contractor. Improved livestock control and access to water or other sensitive areas promotes safety for livestock and humans, improves health and vigor of sensitive species, and limits soil erosion.

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 200

Total Scenario Cost: \$3,149.53

Scenario Cost/Unit: \$15.75

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	8	\$173.15
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	1	\$43.40

Equipment Installation

Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29
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Materials

Fence, Chain Link	1079	Fence, Chain Link, 5' High, 9 ga Wire, Posts in Concrete on 10' Centers. Includes all materials, equipment and labor.	Foot	\$15.01	182	\$2,731.26
Gate, Chain Link, 18', Slide Gate	1081	Chain Link Gate, 18' Wide X 5' Tall, Installed in Concrete	Each	\$150.43	1	\$150.43

Practice: 382 - Fence

Scenario: #8 - 8 foot netted Wildlife Exclusion Fence, Wooded

Scenario Description: Excluding animals from an area in order to address identified resource concerns. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be by woven wire or poly deer netting rated for 10 to 15 years. To the extent possible, fence will be attached to suitable trees with some posts as needed. Any need for permanent fencing will be planned and installed using the Fence practice (382). Clearing of brush and trees is not necessary. Resource concerns include Wildlife Habitat degradation, Undesirable plant productivity and health, and/or Excessive sediment in surface waters.

Before Situation: Sensitive areas are threatened by the adverse actions of wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream bank stability, and/or water quality.

After Situation: Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

Scenario Feature Measure: Length of fence

Scenario Unit: Foot

Scenario Typical Size: 3600

Total Scenario Cost: \$7,346.29

Scenario Cost/Unit: \$2.04

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	\$0.12	3600	\$436.94
Gate, Game, 8' High X 4'	1082	4' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	\$202.24	1	\$202.24
Post, Steel T, 1.33 lbs, 10'	17	Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only.	Each	\$10.93	100	\$1,092.96
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	\$26.98	6	\$161.85
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only.	Each	\$1.46	35	\$51.18
Wire, Woven, Wildlife, 96"	6	High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only.	Each	\$455.40	11	\$5,009.40

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	\$21.64	4	\$86.58
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Equipment Installation

Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	4	\$102.58
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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	\$202.55	1	\$202.55
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Practice: 382 - Fence

Scenario: #50 - 8 foot Wildlife Exclusion Fence

Scenario Description: An 8 foot, woven wire wildlife exclusion fence is installed following a harvest of an established woodlot according to a Forest management Plan where intense wildlife pressure exists. The canopy is sufficiently opened to allow understory of regeneration of desired tree species, but high wildlife density poses a browse threat to new seedlings and regrowth. An 8 foot wildlife exclusion fence is installed to restrict access to the site to allow regeneration to occur.

Before Situation: A forest with a recent harvest as per a Forest Management Plan and sufficient canopy for regeneration is threatened by browse of high wildlife density causing undesirable plant species and lack of desirable understory.

After Situation: An 8 foot high, woven wire wildlife exclusion fence is installed following a harvest of an established woodlot according to a Forest Management Plan. With a sufficient canopy opening, wildlife exclusion from the site allows for regeneration of desirable plant species and understory composition. Productivity, Health, and Vigor is enhanced.

Scenario Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 3614

Total Scenario Cost: \$15,275.97

Scenario Cost/Unit: \$4.23

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Gate, Game, 8' High X 14'	1085	14' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	\$385.10	1	\$385.10
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	\$26.98	200	\$5,395.16
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only.	Each	\$1.46	35	\$51.18
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	\$114.08	2	\$228.16
Wire, Woven, Wildlife, 96"	6	High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only.	Each	\$455.40	11	\$5,009.40

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	30	\$698.82
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	\$21.64	60	\$1,298.65

Equipment Installation

Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$8.60	30	\$258.14
Fence, Wire Assembly, Woven Wire, Game Fence	1088	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	\$0.24	3600	\$873.87
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$29.16	30	\$874.93

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	\$202.55	1	\$202.55
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Practice: 386 - Field Border

Scenario: #1 - Introduced Mix, Field Crop Operation

Scenario Description: A strip of permanent vegetation established at the edge or around the perimeter of a field. Mix includes perennial introduced grasses and legumes. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of a introduced grass and legume mix or a single species native grass. The area of the field border is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation: This practice when applied around a field will support and connect other buffer practices within and between fields. Introduced grasses and legumes OR a native grass species will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$449.80

Scenario Cost/Unit: \$449.80

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	1	\$1.30
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	40	\$24.05
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	50	\$39.21
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	50	\$21.78

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.25	\$67.57

FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.25	\$40.81
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Practice: 386 - Field Border

Scenario: #2 - Introduced or Native Seeding, Fruit/Vegetable Operation

Scenario Description: A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation: This practice when applied around a field will support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$1,321.90

Scenario Cost/Unit: \$1,321.90

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	50	\$30.06
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	50	\$39.21

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Vegetables	2033	Vegetables is Primary Crop	Acre	\$1,133.49	1	\$1,133.49
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Practice: 386 - Field Border

Scenario: #3 - Native Grasses with Forbs, Field Crop Operation

Scenario Description: A strip of permanent vegetation established at the edge or around the perimeter of a field. Vegetation typically consists of 70 to 90 percent native perennial grasses and 10 to 30 percent commonly available native forbs and legumes. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native grasses and forbs. The area of the field border is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528), Upland Wildlife Habitat Management (645), Early Successional Wildlife Habitat Development and Management (647).

Before Situation: Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation: This practice when applied around a field will support and connect other buffer practices within and between fields. The mix of native grasses and forbs provides nesting, cover, and foraging habitat for early successional species and pollinators. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$567.02

Scenario Cost/Unit: \$567.02

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	\$261.29	1	\$261.29

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.25	\$67.57
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.25	\$40.81

Practice: 386 - Field Border

Scenario: #4 - Trees

Scenario Description: A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528), Tree and Shrub Planting (612).

Before Situation: Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation: This practice when applied around a field will support and connect other buffer practices within and between fields. Herbaceous plantings will be established to meet Field Border specifications and in addition trees will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Tree species selected shall be adapted to site, not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of Acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$423.08

Scenario Cost/Unit: \$423.08

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	1	\$21.64
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Materials

Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
Tree, conifer, seedling, bare root, 1-0	1512	Bare root conifer trees, 1-0 (1 year old). Includes materials and shipping only.	Each	\$0.09	400	\$34.02

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	1	\$12.04
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.25	\$67.57
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.25	\$40.81

Practice: 386 - Field Border

Scenario: #5 - Organic Seeding, Vegetable/Fruit Operaton

Scenario Description: A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutriet Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation: This practice when applied around a field will support and connect other buffer practices while creating a buffer between organic systems and conventional cropping systems. Organic grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of Acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$1,552.87

Scenario Cost/Unit: \$1,552.87

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.25	50	\$12.53
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	50	\$12.49
Rock Phosphate	262	Approved for Organic Systems - Rock Phosphate	Pound	\$0.38	50	\$18.95

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Site Preparation, Mechanical	944	Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs.	Acre	\$83.00	1	\$83.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	1	\$19.55

Foregone Income

FI, Organic, Vegetables	2252	Vegetables is Primary Crop	Acre	\$1,303.51	1	\$1,303.51
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Practice: 386 - Field Border

Scenario: #6 - Organic Seeding, Field Crop Operation

Scenario Description: A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation: This practice when applied around a field will support and connect other buffer practices while creating a buffer between organic systems and conventional cropping systems. Organic grasses and legumes will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: Number of Acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$504.99

Scenario Cost/Unit: \$504.99

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.25	50	\$12.53
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	10	\$2.50

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Site Preparation, Mechanical	944	Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs.	Acre	\$83.00	1	\$83.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	1	\$19.55

Foregone Income

FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$338.08	0.5	\$169.04
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$280.04	0.25	\$70.01
FI, Organic, Wheat Dryland	2236	Organic Dryland Wheat is Primary Crop	Acre	\$182.07	0.25	\$45.52

Practice: 386 - Field Border

Scenario: #11 - Pollinator Seeding, Native Forbs and Legumes, Field Crop Operation

Scenario Description: Objective is to provide high quality habitat beneficial to pollinators and other wildlife along the edge of a field. The mix is predominantly native forbs and legumes, but may contain some native grasses. The mix is typically preconfigured and commercially available from native seed suppliers. The cropland is taken out of production. Associated Practices: Herbaceous Weed Control (315), Upland Wildlife Habitat Management (645), Early Successional Habitat Development and Management (647), Tree and Shrub Planting (612)

Before Situation: Field is in crop production with only woodland or other crop fields along the border.

After Situation: A field border of 30 to 60 feet is established as a native wildflower meadow to provide habitat for for pollinators and other wildlife. The field border creates a soft edge between the crop field and adjacent woodland.

Scenario Feature Measure: Treated area

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$920.69

Scenario Cost/Unit: \$920.69

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	1	\$1.30
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	\$586.90	1	\$586.90

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.5	\$135.14

Practice: 393 - Filter Strip

Scenario: #1 - Introduced or Native Seeding, Field Crop Operation

Scenario Description: A strip or area of native herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep and planting of native species. The area of the filter strip is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation: The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$445.74

Scenario Cost/Unit: \$445.74

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$70.93	1	\$70.93
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	50	\$39.21
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	50	\$21.78

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.25	\$67.57
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.25	\$40.81

Practice: 393 - Filter Strip

Scenario: #2 - Introduced or Native seeding, Vegetable or Fruit Operation

Scenario Description: A strip or area of Introduced herbaceous organic vegetation situated between vegetable crops, orchards, or other high value crops and sensitive areas. Practice includes seedbed prep and planting of introduced organic species. The area of the filter strip is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Land in vegetables or fruit allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation: The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced organic species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of Acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$1,321.90

Scenario Cost/Unit: \$1,321.90

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	1	\$49.65
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	1	\$15.93
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	50	\$30.06
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	50	\$39.21

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Foregone Income

FI, Vegetables	2033	Vegetables is Primary Crop	Acre	\$1,133.49	1	\$1,133.49
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Practice: 393 - Filter Strip

Scenario: #3 - Organic Seeding, Field Crop Operation

Scenario Description: A strip or area of Introduced herbaceous organic vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep and planting of introduced organic species. The area of the filter strip is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation: The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced organic species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$428.68

Scenario Cost/Unit: \$428.68

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.25	50	\$12.53
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	10	\$2.50

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	2	\$26.23

Foregone Income

FI, Organic, Corn Dryland	2232	Organic Dryland Corn is Primary Crop	Acre	\$338.08	0.5	\$169.04
FI, Organic, Soybeans Dryland	2234	Organic Dryland Soybeans is Primary Crop	Acre	\$280.04	0.25	\$70.01
FI, Organic, Wheat Dryland	2236	Organic Dryland Wheat is Primary Crop	Acre	\$182.07	0.25	\$45.52

Practice: 393 - Filter Strip

Scenario: #4 - Organic Seeding, Vegetable or Fruit Operation

Scenario Description: A strip or area of Introduced herbaceous organic vegetation situated between vegetable crops, orchards, or other high value crops and sensitive areas. Practice includes seedbed prep and planting of introduced organic species. The area of the filter strip is taken out of production. Associated Practices: Herbaceous Weed Control (315), Conservation Cropping Rotation (328), Critical Area Planting (342), Nutrient Management (590), Integrated Pest Management (595), Prescribed Grazing (528).

Before Situation: Land in vegetables or fruit allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation: The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced organic species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$1,457.62

Scenario Cost/Unit: \$1,457.62

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	1	\$69.62
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.25	50	\$12.53
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	50	\$12.49

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	2	\$26.23

Foregone Income

FI, Organic, Vegetables	2252	Vegetables is Primary Crop	Acre	\$1,303.51	1	\$1,303.51
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Practice: 511 - Forage Harvest Management

Scenario: #1 - Improved Forage Quality

Scenario Description: Improved cultural practices and recordkeeping result in better forage quality and better livestock performance. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), and Prescribed Grazing (528).

Before Situation: Forage cutting heights are as close to the ground as equipment will allow resulting in very low stubble height. Plant regrowth is very slow. Forage quality tests are not regularly done. Records of forage quality components, cutting heights, moisture content, and harvest schedule are not regularly kept.

After Situation: Forage cutting heights are raised to leave at least 3-4" stubble height for cool season grasses and 6-8" for warm season grasses. Increased residual forage results in much faster plant regrowth. Forage quality tests are submitted to an accredited lab for analysis. Records of forage quality components, cutting heights, moisture content, and harvest schedule are regularly kept to track increased forage quality and improved livestock performance.

Scenario Feature Measure: Improved Relative Feed Value

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$330.19

Scenario Cost/Unit: \$11.01

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	1	\$37.24
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	2	\$192.95

Acquisition of Technical Knowledge

Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$45.80	1	\$45.80
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Materials

Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	\$27.10	2	\$54.19
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Practice: 511 - Forage Harvest Management

Scenario: #2 - Organic Preemptive Harvest

Scenario Description: Preemptive harvest of forage crops to prevent damage from insects (such as leafhopper on alfalfa) or other pests results in better forage quality and better livestock performance. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), and Prescribed Grazing (528).

Before Situation: Forage pests are usually controlled with pesticides.

After Situation: In organic or transitioning to organic systems, forage pests are controlled by executing a preemptive harvest before pests can damage forage quality. Forage yields are reduced because of immature stage of forage growth. Forage tests are submitted to an accredited lab for analysis. Records of forage quality components are used to adjust feeding rations.

Scenario Feature Measure: Relative Feed Value Maintained

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$330.19

Scenario Cost/Unit: \$11.01

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	1	\$37.24
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	2	\$192.95

Acquisition of Technical Knowledge

Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$45.80	1	\$45.80
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Materials

Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	\$27.10	2	\$54.19
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Practice: 511 - Forage Harvest Management

Scenario: #3 - Perennial Crops - Delayed Mowing

Scenario Description: In perennial forage crops, the delaying the harvest of the first cutting to promote the reproduction of ground nesting birds. Delaying the harvest of the first cutting will benefit ground nesting birds; research at the University of Vermont showed that breeding success for declining grassland songbirds (e.g. Bobolink) went from 0 on a regularly harvested hay field to 2.8 fledglings per female per year when the the first harvest on a hayfield was delayed until August 1st. Bobolinks, Eastern Meadowlarks, and Savannah Sparrows require a nesting period to fledge young that lasts through the end of July in most parts of the eastern US. The delayed harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After young have fledged the field will be harvested for dry forages. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), Prescribed Grazing (528), Upland Wildlife Habitat Management (645).

Before Situation: Perennial forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation: Annual crops are harvested with a delayed mowing; forage quality is compromised, however, the survival of ground nesting birds is promoted.

Scenario Feature Measure: Increased grassland bird populations.

Scenario Unit: Acre

Scenario Typical Size: 20

Total Scenario Cost: \$953.12

Scenario Cost/Unit: \$47.66

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	1	\$37.24
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Acquisition of Technical Knowledge

Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$45.80	1	\$45.80
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Materials

Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	\$27.10	2	\$54.19
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Foregone Income

FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	\$16.00	51	\$815.89
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Practice: 511 - Forage Harvest Management

Scenario: #4 - Doublecropping Annuals - Delayed harvest and subsequent planting

Scenario Description: In doublecropped annual forages, delaying the harvest of the first crop will provide feed and shelter for ground nesting birds. Delaying the harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After the young have fledged the second crop will be planted, approximately one month later than normal. Subsequently, the harvest of the second crop will cause an approximately 20% yield decline. The selected area should be large enough to buffer adults and nestlings from silage chopping in adjacent areas or fields. After young have fledged the field will be chopped and used as grain or silage. This practice is best planned cooperatively with the farmer and appropriate wildlife agencies far enough in advance to reduce disturbance to ground nesting birds. For example, Tricolored Blackbirds need a 35-day window from the time of nest building to fledge young and the silage needs to remain uncut until then. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), Prescribed Grazing (528), Upland Wildlife Habitat Management (645).

Before Situation: Double cropped annual forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation: Double cropped annual crops are harvested with a delayed mowing and a subsequent later planting of the second crop; forage quality is compromised somewhat, however, the survival of ground nesting birds is promoted.

Scenario Feature Measure: Increased grassland bird populations.

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$1,593.04

Scenario Cost/Unit: \$53.10

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	1	\$37.24
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Acquisition of Technical Knowledge

Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$45.80	1	\$45.80
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Materials

Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	\$27.10	2	\$54.19
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Foregone Income

FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	\$16.00	91	\$1,455.81
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Practice: 512 - Forage and Biomass Planting

Scenario: #1 - Native Perennial Grasses (1 species)

Scenario Description: Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$12,848.53

Scenario Cost/Unit: \$428.28

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	30	\$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	60	\$6,796.04
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$70.93	30	\$2,127.79
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	1500	\$1,176.24
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	1500	\$653.47
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	30	\$216.65
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	30	\$242.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	30	\$754.24
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	30	\$393.52

Practice: 512 - Forage and Biomass Planting

Scenario: #2 - Introduced Cool Season Grass Mix

Scenario Description: Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Poor or nonexistent stand of grass species. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$13,088.39

Scenario Cost/Unit: \$436.28

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes)	2317	Cool season grass and legume mix. Includes material and shipping only.	Acre	\$49.65	30	\$1,489.39
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	30	\$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	60	\$6,796.04
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	1200	\$878.26
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	1500	\$1,176.24
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	1500	\$653.47
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	30	\$216.65
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	30	\$242.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	30	\$754.24
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	30	\$393.52

Practice: 512 - Forage and Biomass Planting

Scenario: #3 - Native Perennial Warm Season Grasses Mix

Scenario Description: Establish or reseed a mix of species of adapted native, perennial warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$17,349.99

Scenario Cost/Unit: \$578.33

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	30	\$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	60	\$6,796.04
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	1500	\$1,176.24
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	1500	\$653.47
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Three plus Species Mix, Warm Season, Native Perennial	2327	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$220.98	30	\$6,629.25

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	30	\$216.65
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	30	\$242.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	30	\$754.24
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	30	\$393.52

Practice: 512 - Forage and Biomass Planting

Scenario: #4 - Sprigging

Scenario Description: Sprigging new grasses with sprigging application for the purpose of providing forage, increasing plant diversity, soil quality and fertility, and plant health. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, sprigs, equipment and labor for seed bed prep, tillage, sprigging, and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Poor or nonexistent stand of grass species. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$15,360.98

Scenario Cost/Unit: \$512.03

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	30	\$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	60	\$6,796.04
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	1200	\$878.26
One Species, Warm Season, Introduced Perennial Grass (seed or sprigs)	2323	Introduced, warm season perennial grass seed or sprig. Includes material and shipping only.	Acre	\$64.09	30	\$1,922.59
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	1500	\$1,176.24
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	1500	\$653.47
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	30	\$216.65
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	30	\$242.68
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	\$86.45	30	\$2,593.63
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	30	\$393.52

Practice: 512 - Forage and Biomass Planting

Scenario: #5 - Organic Introduced Perennial Cool Season Grasses with legume

Scenario Description: This practice applies to organically managed pasture or hayland. Establish or reseed three species of adapted perennial introduced cool season grasses and legume to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading. Producer follows all National Organic Program (NOP) rules and regulations. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Poor or nonexistent stand of grass species. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation: NOP approved species, materials, and methods are utilized to establish pasture or hayland, to improve forage quality and quantity, and reduce soil erosion on cropland, hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,785.18

Scenario Cost/Unit: \$378.52

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	10	\$696.22
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.25	400	\$100.25
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	500	\$124.88
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	500	\$124.88
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	10	\$80.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	10	\$251.41
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	10	\$131.17

Practice: 512 - Forage and Biomass Planting

Scenario: #6 - Untreated Conventional Seed, WSG, 1 species

Scenario Description: This practice applies to organically managed pasture and hayland. Establish or reseed adapted perennial native grasses (1 species) to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Producer follows all National Organic Program (NOP) rules and regulations. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation: NOP approved species, materials, and methods are utilized to establish pasture or hayland, to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,566.80

Scenario Cost/Unit: \$356.68

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	500	\$124.88
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	500	\$124.88
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Untreated Conventional Seed, One Species, Warm Season, Native Perennial Grass	2341	Untreated conventional native, warm season perennial grass. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	\$70.93	10	\$709.26

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	10	\$80.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	10	\$251.41

Practice: 512 - Forage and Biomass Planting

Scenario: #7 - Untreated Conventional Seed, WSG Mix

Scenario Description: This practice applies to organically managed pasture and hayland. Establish or reseed adapted perennial native grasses (3 species) to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Producer follows all National Organic Program (NOP) rules and regulations. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

Before Situation: Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation: NOP approved species, materials, and methods are utilized to establish pasture or hayland, to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$5,686.48

Scenario Cost/Unit: \$568.65

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	500	\$124.88
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	500	\$124.88
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Untreated Conventional Seed, Three plus Species Mix, Warm Season Perennial Grass	2344	Untreated conventional wWarm season perennial grass mix. May contain seed that are not available as certified organic. Includes material and shipping only.	Acre	\$282.89	10	\$2,828.95

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	10	\$80.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	10	\$251.41

Practice: 512 - Forage and Biomass Planting

Scenario: #8 - Overseeding with Nutrient Application

Scenario Description: An existing pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantity, and reduce soil erosion. Nutrient application is needed as per the soil test to ensure a viable stand.

Before Situation: A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

After Situation: A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$10,957.38

Scenario Cost/Unit: \$365.25

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	30	\$477.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	45	\$5,097.03
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	1200	\$878.26
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	1500	\$1,176.24
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	1500	\$653.47
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	\$54.10	20	\$1,082.08

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	30	\$216.65
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	30	\$242.68
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$12.29	30	\$368.84
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	30	\$754.24

Practice: 512 - Forage and Biomass Planting

Scenario: #9 - Organic, Overseeding with nutrients

Scenario Description: An existing organic pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantity, and reduce soil erosion. No additional nutrient application is needed as per the soil test to ensure a viable stand.

Before Situation: A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

After Situation: A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$609.65

Scenario Cost/Unit: \$60.97

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	5	\$348.11
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	10	\$251.41
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Practice: 512 - Forage and Biomass Planting

Scenario: #10 - Organic, Overseeding with nutrients

Scenario Description: An existing organic pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantity, and reduce soil erosion. Nutrient application is needed as per the soil test to ensure a viable stand.

Before Situation: A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

After Situation: A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,545.11

Scenario Cost/Unit: \$354.51

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes	2340	Certified organic cool season perennial grass and legume mix. Includes material and shipping only.	Acre	\$69.62	6.67	\$464.38
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	20	\$2,265.35
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	\$0.25	400	\$100.25
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	\$0.25	500	\$124.88
Potassium, Organic	268	ORGANIC Potassium	Pound	\$0.25	500	\$124.88
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13

Equipment Installation

Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	10	\$80.89
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$12.29	10	\$122.95
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	10	\$251.41

Practice: 512 - Forage and Biomass Planting

Scenario: #51 - Overseeding, no inputs

Scenario Description: An existing conventional or organic pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantity, and reduce soil erosion. No additional nutrient application is needed as per the soil test to ensure a viable stand.

Before Situation: A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

After Situation: A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 30

Total Scenario Cost: \$2,540.87

Scenario Cost/Unit: \$84.70

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	30	\$477.79
Test, Soil Test, Standard	299	Includes materials, shipping, labor, and equipment costs.	Each	\$10.13	1	\$10.13
Two Species Mix, Cool Season Annual (1 grass and 1 legume)	2314	Cool season annual grass and legume mix. Includes material and shipping only.	Acre	\$54.10	20	\$1,082.08

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	30	\$216.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	30	\$754.24

Practice: 666 - Forest Stand Improvement

Scenario: #1 - Thinning Hand Tools

Scenario Description: An over-stocked stand has declining production and health; it also lacks structural and composition diversity. A consulting forester supervises the operation, and is carried out using hand tools such as chain saws. Managing the stand utilizing accepted stocking guidelines improves plant condition, prevents wildlife habitat degradation, and reduces wildfire hazards.

Before Situation: An overstocked, unhealthy forest stand lacks structural and species diversity. Annual growth rates and vigor are declining due to overstocking of the stand, making it susceptible to insect and disease attack, as well as unacceptable wildfire risk.

After Situation: Thinning adjusts the stand's stocking to an acceptable level to promote stand growth, condition, and improve overall quality. The resultant increased sunlight reaching the forest floor without invasive species composition improves wildlife habitat.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$2,121.85

Scenario Cost/Unit: \$212.18

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	20	\$432.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	12	\$1,157.72

Materials

Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	3.5	\$23.32
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	20	\$102.82
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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	\$202.55	2	\$405.11
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Practice: 666 - Forest Stand Improvement

Scenario: #2 - Single Stem Chemical Thinning

Scenario Description: Species composition, stand structure, and stocking density are managed by controlling selected trees and understory vegetation. The tree is debarked with an axe or hatchet and the tree is then injected with an herbicide. Due to the ability of target species to propagate via the root system the injected herbicide is critical in order to ensure control of the target species. The snag trees will remain for wildlife habitat. Up to 35% of the forest stand will be treated. Restoration and Management of Declining (643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Brush Management (314) and Integrated Pest Management (595)

Before Situation: The existing stand consists of unwanted/undesirable species and the stocking rate exceeds the recommended level. Undersirable species consist of hardwoods and shrubs that can propagate via root systems that make commercial control unfeasible.

After Situation: The forest health is managed and improved due to the selective management and chemical treatment of hardwoods and shrubs. Treatment of the hardwoods and shrubs promotes plant health and vigor of the remaining trees, and allows them greater availability to water and nutrients and promotes wildlife habitat. Habitat is created for cavity nesting birds by leaving snags on site.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,665.32

Scenario Cost/Unit: \$366.53

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	20	\$432.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	12	\$1,157.72

Materials

Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	3.5	\$148.05
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	3.5	\$23.32

Equipment Installation

Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$69.97	20	\$1,399.44
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$4.94	20	\$98.81

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	\$202.55	2	\$405.11
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Practice: 666 - Forest Stand Improvement

Scenario: #3 - Chemical, Ground

Scenario Description: Removal of target, undesirable species is achieved using ground applied chemicals to release young, desirable tree species competing with overtopping vegetation. Target removal is necessary to promote plant health and vigor and to achieve the appropriate spacing and trees per acre of the desirable species that facilitates plant growth. Removal is supervised to ensure objectives are achieved. Associated Practice(s): Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Integrated Pest Management (595) and Firebreak (394)

Before Situation: An adequately stocked stand of desirable species is not growing to its potential for the site due to severe competition from undesirable trees and brush competing for water and nutrients. Competition inhibits plant health and vigor.

After Situation: The desirable vegetation is released from the competition by ground applying herbicides to the stand as an over-the-top spray. Undesirable vegetation is managed to promote desirable plant health and vigor through reduced competition. The appropriate stocking density and spacing is achieved.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 40

Total Scenario Cost: \$8,557.12

Scenario Cost/Unit: \$213.93

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	10	\$964.76
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Materials

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$40.73	40	\$1,629.18
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	40	\$51.82

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	\$202.55	2	\$405.11
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Equipment Installation

Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	\$137.66	40	\$5,506.25
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Practice: 666 - Forest Stand Improvement

Scenario: #4 - Chemical, Aerial

Scenario Description: Aerially applied chemicals release the desirable trees from competing and/or overtopping vegetation. Releasing the desirable trees from the competition is achieved through the application of appropriate herbicides according to label directions. Application will be by helicopter as an over-the-top spray. The work will be professionally planned and supervised. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation. Associated Practices: Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Fuel Break (383), Woody Residue Treatment (384), Firebreak (394) and Integrated Pest Management (595).

Before Situation: An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush.

After Situation: The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns. Releasing the desirable trees from the competition will be achieved through the application of appropriate herbicides according to label directions. Application will be by helicopter as an over-the-top spray. The work will be professionally planned and supervised.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 40

Total Scenario Cost: \$3,751.36

Scenario Cost/Unit: \$93.78

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	8	\$347.17
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Materials

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$40.73	40	\$1,629.18
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	40	\$51.82

Equipment Installation

Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acre	\$11.14	40	\$445.41
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acre	\$31.94	40	\$1,277.78

Practice: 666 - Forest Stand Improvement

Scenario: #5 - Mechanical, Light Equipment

Scenario Description: The stocking rate of an unhealthy stand with competing vegetation is adjusted to an acceptable level using a brush hog. The competing vegetation is controlled to manage desirable trees and species. A brush hog is used by mowing or shredding strips through the stand, mowing between planted rows, etc. to achieve objectives. Stand health and wildlife habitat is improved and undesirable vegetation is managed. Associated Practice(s): Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Integrated Pest Management (595) and Firebreak (394)

Before Situation: An young stand of desirable species is not growing to its potential for the site due to severe competition from undesirable trees and brush competing for water and nutrients. Competition inhibits plant health and vigor. The vegetation to be controlled is small enough that it can be mowed or shredded. The stand may also be overstocked.

After Situation: The stocking rate is adjusted to an acceptable level and the competing vegetation is controlled. The stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the increase of sunlight to the forest floor.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$2,093.14

Scenario Cost/Unit: \$209.31

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	20	\$465.88
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Equipment Installation

Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$61.11	20	\$1,222.15
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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	\$202.55	2	\$405.11
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Practice: 666 - Forest Stand Improvement

Scenario: #6 - Mechanical, Heavy Equipment

Scenario Description: The stocking rate of an unhealthy stand with competing vegetation is adjusted to an acceptable level using mechanical treatment such as a masticator or mulcher. The competing vegetation is controlled to manage desirable trees and species. Trees are marked by a consultant. Stand health and wildlife habitat is improved and undesirable vegetation is managed. Associated Practices: Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Fuel Break (383), Woody Residue Treatment (384), Firebreak (394) and Integrated Pest Management (595)

Before Situation: An young stand of desirable species is not growing to its potential for the site due to severe competition from undesirable trees and brush competing for water and nutrients. Competition inhibits plant health and vigor. The vegetation to be controlled is too large to be mowed or shredded, requiring larger mechanical methods such as masticators or mulchers.

After Situation: The stocking rate is adjusted to an acceptable level and the competing vegetation is controlled. The stand growth, composition, condition, and overall quality is improved. In addition, wildlife habitat is improved with the increase of sunlight to the forest floor. . Therefore other mechanical methods such as using masticators or mulchers is necessary.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$5,346.30

Scenario Cost/Unit: \$534.63

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	30	\$698.82
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	15	\$1,447.15

Materials

Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	10	\$66.62
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Equipment Installation

Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$84.38	30	\$2,531.40
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Practice: 666 - Forest Stand Improvement

Scenario: #7 - Forest Openings, Low Density

Scenario Description: Two acre patches are created in over-mature or degraded stands using hand tools such as chainsaws. Small openings are created by removing all undesirable trees greater than 2" in diameter. Removal of undesirable trees fosters regeneration of shade-tolerant, desirable species. Early successional wildlife habitat is created promoting forest diversity. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation. Associated Practices: Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Fuel Break (383), Woody Residue Treatment (384), Firebreak (394) and Integrated Pest Management (595)

Before Situation: An overly mature, existing stand has been degraded in value by previous management practices. The stand is stocked with the remaining undesirable species. Wildlife habitat is degraded. The undesirable species are overshadowing the desirable species inhibiting plant health and vigor.

After Situation: A young stand of desirable species is established by removing competing, larger undesirable species. An early successional wildlife habitat is created along side the forest diversity. Small openings are created by removing all trees greater than 2" in diameter. Removal of larger trees fosters regeneration of shade-tolerant, desirable species. Trees are removed using a chainsaw.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 2

Total Scenario Cost: \$1,416.79

Scenario Cost/Unit: \$708.39

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	16	\$346.31
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	4	\$385.91

Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	16	\$82.26
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Practice: 666 - Forest Stand Improvement

Scenario: #8 - Comprehensive Forest Stand Treatment with Chipping

Scenario Description: Trees within a woodlot are managed as part of a Forest Stewardship Plan (or approved equivalent) to create the appropriate stocking density for both forest health and wildlife habitat. Overstocked species over 5 inches in diameter are removed with a feller buncher. Over stocked species under 5 inches in diameter are removed using a mechanical chopper. The material is then run through a chipper/shredder and spread within the stand. Overstocked trees that are inaccessible by the large equipment are removed manually with a chainsaw. Woody vegetation and invasive species left by the cuttings that are inhibiting regeneration are removed using an herbicide that can control the woody species. The herbicide is applied via spot treatment. Activities are supervised, trees marked, and reviewed according to the management objectives by a specialist to ensure objectives are being achieved. Resource concerns include: Inadequate structure and composition, Undesirable plant productivity and health, and Habitat degradation. Associated Practices: Restoration and Management of Declining and Rare Habitat (643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Brush Management (314), Woody Residue Treatment (384), Prescribed Burning (338), Firebreak (394), Fuel Break (383) and Integrated Pest Management (595).

Before Situation: A 10 acre mature, unhealthy forest contains over-stocked trees lacking diversity in variety and stand age. The woodlot includes undesirable, invasive species inhibiting plant health. Undesirable species do not meet adequate needs of food and cover for targeted wildlife species.

After Situation: Forest health is managed and improved by manipulating the stand density and structure to restore natural/desirable plant communities. An even-aged management system is implemented creating a forest of preferred, native trees and shrubs, and understory species. The stand may vary in tree/shrub spacing, density, and class size. Plant health and vigor is improved. Healthy forest provides suitable food and cover for a variety of small and large mammals, forest interior birds, migratory songbirds, pollinators, reptiles, and amphibians.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$7,518.57

Scenario Cost/Unit: \$751.86

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	20	\$465.88
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	\$21.64	20	\$432.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	20	\$1,929.53

Materials

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$40.73	1.3	\$52.95
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	3.5	\$23.32

Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$38.47	16	\$615.53
Brush Chipper, 12" capacity	1869	Brush Chipper, 12" capacity, typically 130 HP. Includes chipper and power unit. Does not include labor.	Hour	\$64.50	10	\$644.99
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	20	\$102.82
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost	Hour	\$69.97	20	\$1,399.44

		included.				
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$84.38	10	\$843.80

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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	\$202.55	2	\$405.11

Practice: 666 - Forest Stand Improvement

Scenario: #9 - Comprehensive Forest Stand Treatment, no chipping

Scenario Description: Trees within a woodlot are managed as part of a Forest Stewardship Plan (or approved equivalent) to create the appropriate stocking density for forest health or wildlife. Overstocked species over 5 inches in diameter are removed with a feller buncher. Over stocked species under 5 inches in diameter are removed using a chainsaw. Woody vegetation and invasive species left by the cuttings that are inhibiting regeneration are removed using an herbicide that can control the woody species. The herbicide is applied via spot treatment. Activities are supervised, trees marked, and reviewed according to the management objectives by a specialist to ensure objectives are being achieved. Resource concerns include: Inadequate structure and composition, Undesirable plant productivity and health, and Habitat degradation. Associated Practices: Restoration and Management of Declining and Rare Habitat (643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Brush Management (314), Woody Residue Treatment (384), Prescribed Burning (338), Firebreak (394), Fuel Break (383) and Integrated Pest Management (595).

Before Situation: A 10 acre mature, unhealthy forest contains over-stocked trees lacking diversity in variety and stand age. The woodlot includes undesirable, invasive species inhibiting plant health. Undesirable species do not meet adequate needs of food and cover for targeted wildlife species.

After Situation: Forest health is managed and improved by manipulating the stand density and structure to restore natural/desirable plant communities. An even-aged management system is implemented creating a forest of preferred, native trees and shrubs, and understory species. The stand may vary in tree/shrub spacing, density, and class size. Plant health and vigor is improved. Healthy forest provides suitable food and cover for a variety of small and large mammals, forest interior birds, migratory songbirds, pollinators, reptiles, and amphibians.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$5,279.40

Scenario Cost/Unit: \$527.94

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	40	\$865.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	20	\$1,929.53

Materials

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$40.73	10	\$407.30
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	10	\$66.62

Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	40	\$205.65
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$69.97	20	\$1,399.44

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	\$202.55	2	\$405.11
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Practice: 666 - Forest Stand Improvement

Scenario: #10 - Forest opening, heavy density

Scenario Description: Early successional habitat opening creation: Cuts should occur from September through March to minimize disturbance to nesting birds. A well stocked pole-timber sized northern hardwood stand has the potential to provide optimal food and habitat for numerous life stages of early successional target wildlife. A professional biologist or forester has flagged out four (4) five (5) acre wildlife openings (clear cuts). Cuts should be in wide blocks. Where possible, forest wildlife openings will be applied no closer than 300 feet from any edge of the forest area. Location of wildlife openings can be adjusted to avoid steep slopes, streams, wetlands, and other environmentally sensitive areas. Tree tops can be loped and left in place.

Before Situation: Young forest dominated by pole-sized timber (4 to 8 inches DBH). Early successional shrub habitat is lacking in the forest block. Forest canopy needs to be opened to stimulate shrub growth in the under story.

After Situation: Minimum 5 acre opening is created. Large mast trees or other species valuable to wildlife may be retained at a rate of 10 to 12 trees per acre. Wildlife habitat is improved with the increase of sunlight to the forest floor.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 5

Total Scenario Cost: \$6,915.81

Scenario Cost/Unit: \$1,383.16

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	\$32.34	30	\$970.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	15	\$650.94

Equipment Installation

Feller buncher	941	Equipment and power unit costs. Labor not included.	Hour	\$138.15	30	\$4,144.62
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Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$574.99	2	\$1,149.98
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Practice: 666 - Forest Stand Improvement

Scenario: #11 - Wildlife selective tree felling

Scenario Description: Selective tree felling calls for cutting with chainsaw large trees that are scattered throughout shrubs in order to maintain canopy opening and sunlight penetration to shrub layer . Stock is typically >4" dbh or 20' tall. Leave about 10 to 12 wildlife reserve trees per acre and all shagbark hickory. Trees can be cut and left or removed. Only cut while dormant. Can be used to regenerate aspen. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Brush Management (314), Forest Slash Treatment (384) and Integrated Pest Management (595).

Before Situation: Tree canopy beginning to close and shade out shrubland habitat, reducing wildlife value for early successional species.

After Situation: Large trees removed to an acceptable level to promote shrubland habitat, improving wildlife habitat with the resulting increase of sunlight reaching the forest floor.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 5

Total Scenario Cost: \$1,332.45

Scenario Cost/Unit: \$266.49

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	17	\$367.95
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	5	\$482.38

Materials

Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	5	\$33.31
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	8.5	\$43.70
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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	\$202.55	2	\$405.11
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Practice: 666 - Forest Stand Improvement

Scenario: #38 - Basal Stem Treatment

Scenario Description: Interfering understory vegetation, which is too large to effectively control with foliar herbicides, is treated with herbicides applied into or on the bark of targeted undesirable woody plants. This treatment is intended to be utilized in forest stands up to ten years prior to a regenerating timber harvest.

Before Situation: Interfering vegetation in the forest understory poses a threat to the stand's long-term productivity, health, and future structure and composition. Some of these undesirable species can propagate via root systems that make mechanical control ineffective.

After Situation: Due to the selective management and chemical treatment of undesirable trees and shrubs, the residual forest health and productivity is improved, the stand structure and composition is corrected, and desirable wildlife habitat is capable of establishing.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$4,186.63

Scenario Cost/Unit: \$418.66

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Triclopyr	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	\$42.30	10	\$422.99
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Equipment Installation

Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$69.97	40	\$2,798.88
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Labor

Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	10	\$964.76
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Practice: 666 - Forest Stand Improvement

Scenario: #40 - Thinning with Hand Tools without a Consultant

Scenario Description: The stocking rate of an unhealthy stand which lacks species diversity is adjusted to an acceptable stocking level. The operation is supervised by a professional state or local forester and is carried out using hand tools such as chain saws.

Before Situation: The stocking rate is too high to ensure forest health. Stand also lacks species diversity.

After Situation: Managing stand stocking has improved plant productivity and health, prevented wildlife habitat degradation, reduced wildlife hazards and provided adequate structure and composition.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$803.56

Scenario Cost/Unit: \$80.36

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	30	\$154.24
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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	\$21.64	30	\$649.32
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Practice: 666 - Forest Stand Improvement

Scenario: #43 - Wildlife Crop Tree Release

Scenario Description: This stand treatment manually cuts (chainsaw) all competing woody vegetation from at least three sides of individual "Crop Trees" (E, W, & S sides) at a minimum distance from the stump of one and a half times the stand's average height and not to exceed three times the stand's average height. Utilize Woody Residue Treatment (384) to properly reduce the resulting slash created from releasing crop trees as necessary.

Before Situation: Valuable soft or hard mast producing trees or shrubs have been found in a forest stand, but are need of treatment due to over-topping from adjacent faster growing trees. The landowner's objective is to management area for wildlife habitat. Resource Concern: INADEQUATE HABITAT FOR FISH AND WILDLIFE – Habitat degradation.

After Situation: Mast producing trees are released, improving wildlife habitat.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$310.76

Scenario Cost/Unit: \$310.76

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	8	\$41.13
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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	\$21.64	8	\$173.15
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	1	\$96.48

Practice: 410 - Grade Stabilization Structure

Scenario: #1 - Check Dams

Scenario Description: Typical setting is on a 40-acre pasture/hayland field having a slope of 5 to 10 percent where ephemeral gullies have formed. Typical installation consists of stabilizing/regrading the gully and installing six check dams with a top width of 3', average height of 2.5', 19' length, and 2:1 side slopes, ; containing an average of 21 tons of rock for a total of 126 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation: The operator presently has erosion gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed vegetation of disturbed areas use Critical Area Planting (342).

Scenario Feature Measure: Tons of rock installed

Scenario Unit: Ton

Scenario Typical Size: 126

Total Scenario Cost: \$8,060.69

Scenario Cost/Unit: \$63.97

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$83.15	84	\$6,984.89
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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	\$21.64	8	\$173.15
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Equipment Installation

Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$1.88	160	\$300.33
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Practice: 410 - Grade Stabilization Structure

Scenario: #2 - Embankment, Pipe <= 6"

Scenario Description: An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2000

Total Scenario Cost: \$12,832.64

Scenario Cost/Unit: \$6.42

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	20	\$128.60
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	2000	\$9,746.88
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	5	\$669.50

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	\$32.34	5	\$161.71
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	\$21.64	10	\$216.44
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	20	\$744.76

Materials

Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$7.03	80	\$562.43
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Practice: 410 - Grade Stabilization Structure

Scenario: #3 - Embankment, Pipe 8"-12"

Scenario Description: An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pipe, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2500

Total Scenario Cost: \$18,740.71

Scenario Cost/Unit: \$7.50

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.05	3	\$93.15
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	\$23.06	90	\$2,075.05
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.47	60	\$88.08

Equipment Installation

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	29	\$186.46
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	2500	\$12,183.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	10	\$1,339.00

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	\$32.34	10	\$323.42
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	\$21.64	30	\$649.32
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	30	\$1,117.15

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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	\$83.16	1	\$83.16

Practice: 410 - Grade Stabilization Structure

Scenario: #4 - Embankment, Pipe >12"

Scenario Description: An earthen embankment dam with a principle spillway pipe greater than 12 inches. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2500

Total Scenario Cost: \$23,063.09

Scenario Cost/Unit: \$9.23

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	2	\$898.38
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$142.33	1	\$142.33
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	129	\$829.44
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	2500	\$12,183.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	13	\$1,740.69

Materials

Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.93	30	\$27.81
Pipe, Steel, 12", Std Wt, USED	1356	Materials: - USED - 12" - Steel Std Wt	Foot	\$23.40	90	\$2,105.80
Pipe, Steel, 16", Std Wt, USED	1357	Materials: - USED - 16" - Steel Std Wt	Foot	\$30.85	7	\$215.97
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$83.15	14	\$1,164.15
Steel, Plate, 1/8"	1047	Flat Steel Plate, 1/8" thick, materials only.	Square Foot	\$3.96	82	\$324.88

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	\$32.34	13	\$420.45
General Labor	231	Labor performed using basic tools such as power tool, shovels, and	Hour	\$21.64	42	\$909.05

		other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.				
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	38	\$1,415.05

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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	\$83.16	1	\$83.16

Practice: 410 - Grade Stabilization Structure

Scenario: #5 - Embankment, Soil Treatment

Scenario Description: An earthen embankment dam with a principal spillway pipe where on site soils are not acceptable and require extra processing or hauling from off farm, distances greater than one mile. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2500

Total Scenario Cost: \$28,541.71

Scenario Cost/Unit: \$11.42

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.05	3	\$93.15
Pipe, PVC, 10", SCH 80	1351	Materials: - 10" - PVC - SCH 80 - ASTM D1785	Foot	\$23.06	90	\$2,075.05
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.47	60	\$88.08

Equipment Installation

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	29	\$186.46
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	2500	\$12,183.60
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	\$0.39	25000	\$9,801.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	10	\$1,339.00

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	\$32.34	10	\$323.42
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	\$21.64	30	\$649.32
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	30	\$1,117.15

Mobilization

Mobilization, medium	1139	Equipment with 70-150 HP or typical weights between 14,000 and	Each	\$301.16	2	\$602.32
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equipment		30,000 pounds.				
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	\$83.16	1	\$83.16

Practice: 410 - Grade Stabilization Structure

Scenario: #6 - Pipe Drop, Plastic

Scenario Description: A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon 6 ft high 18" (1.5') PVC riser with a 40 ft long barrel (1.5' x 3.14 x 40' = 188 SF). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Riser Weir Length x Barrel Length

Scenario Unit: Square Foot

Scenario Typical Size: 188

Total Scenario Cost: \$5,357.44

Scenario Cost/Unit: \$28.50

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	1	\$449.19
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	20	\$128.60
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	100	\$487.34
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	2	\$267.80

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	\$32.34	2	\$64.68
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	\$21.64	8	\$173.15

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16
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	\$83.16	1	\$83.16

Materials

Coupling, PVC, Tee, 24x18, SCH 40	1374	Materials: - Tee, 24"x18" - PVC - SCH 40 - ASTM D1785	Each	\$1,642.11	1	\$1,642.11
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Pipe, PVC, 18", SCH 40	1373	Materials: - 18" - PVC - SCH 40 - ASTM D1785	Foot	\$38.62	40	\$1,544.80
Pipe, PVC, 24", ASTM-2241, SDR 26	1945	Materials: -24" -PVC - ASTM 2241, SDR 26	Foot	\$35.91	6	\$215.44

Practice: 410 - Grade Stabilization Structure

Scenario: #7 - Pipe Drop, Steel

Scenario Description: A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel pipe drop structure with a 36", 12' tall riser and a 100' long 30" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 30ft = 940). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Riser Weir Length x Barrel Length

Scenario Unit: Square Foot

Scenario Typical Size: 940

Total Scenario Cost: \$15,328.43

Scenario Cost/Unit: \$16.31

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	100	\$642.98
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	600	\$2,924.06
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	4	\$535.60

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	\$32.34	4	\$129.37
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	\$21.64	10	\$216.44
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	11	\$409.62

Materials

Pipe, Steel, 30", Std Wt, USED	1361	Materials: - USED - 30" - Steel Std Wt	Foot	\$82.88	100	\$8,288.25
Pipe, Steel, 36", Std Wt, USED	1362	Materials: - USED - 36" - Steel Std Wt	Foot	\$105.82	12	\$1,269.88
Steel, Plate, 1/8"	1047	Flat Steel Plate, 1/8" thick, materials only.	Square Foot	\$3.96	30	\$118.86
Steel, Plate, 3/8"	1375	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$11.99	9	\$107.89

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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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	\$83.16	1	\$83.16
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Practice: 410 - Grade Stabilization Structure

Scenario: #8 - Weir Drop Structures

Scenario Description: A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Feet of Weir length times Drop Height

Scenario Unit: Square Foot

Scenario Typical Size: 90

Total Scenario Cost: \$9,029.92

Scenario Cost/Unit: \$100.33

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	9	\$4,042.71
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	75	\$365.51
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	\$2.58	40	\$103.15
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.66	9	\$23.97
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	5	\$669.50

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	3	\$94.42
Corrugated Steel, 12 Gauge, galvanized	1376	Corrugated Steel, 12 gauge, 3" by 1" corrugations, galvanized, meets ASTM A 929. Materials only.	Square Foot	\$7.32	212	\$1,552.23
Pipe, CMP, 12", 14 Gauge	1377	12" - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only.	Foot	\$10.54	2	\$21.09
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$33.78	11	\$371.62

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	\$32.34	5	\$161.71
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	\$21.64	30	\$649.32

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	10	\$372.38
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Practice: 410 - Grade Stabilization Structure

Scenario: #9 - Rock Drop Structures

Scenario Description: A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3ft and weir length of 8ft (48 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Feet of Weir length times Drop Height

Scenario Unit: Square Foot

Scenario Typical Size: 48

Total Scenario Cost: \$3,915.57

Scenario Cost/Unit: \$81.57

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	40	\$194.94
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	\$2.58	7	\$18.05
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.66	23	\$61.26
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	5	\$669.50
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	\$126.06	3	\$378.17

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	\$32.34	5	\$161.71
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	\$21.64	10	\$216.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	10	\$433.96

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Materials

Gabion basket or mat	1378	Gabion baskets or mats installed and filled on grade, includes	Cubic Yard	\$168.46	7	\$1,179.22
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		materials, transport, equipment, and labor, does not include geotextile fabric.				
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Practice: 410 - Grade Stabilization Structure

Scenario: #10 - Log Drop Structures

Scenario Description: A Straight Drop structure constructed using bioengineering principles. In this instance the drop structure is constructed of logs, rock riprap, and earthfill. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon an 8 foot weir length and 3 foot drop. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized using using an engineered structure utilizing natural materials (bioengineered). The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structue for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$6,106.47

Scenario Cost/Unit: \$6,106.47

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$5.14	4	\$20.56
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	40	\$194.94
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	\$2.58	10	\$25.79
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.66	11	\$29.30
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	12	\$1,606.80
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	\$126.06	20	\$2,521.14
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$18.72	1	\$18.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	1	\$25.65

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	\$32.34	12	\$388.11
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	1	\$23.29
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	\$21.64	20	\$432.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	5	\$216.98

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Practice: 410 - Grade Stabilization Structure

Scenario: #11 - SWC, Difficult site

Scenario Description: An earthen embankment dam with a principle spillway pipe equal to or > 12 inches. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Site located at edge of field with 10-20' drop requiring high riser, tree removal and rock riprap plungepool. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Unit cost estimate is based upon a typical amount of earthfill of 300-800 cubic yards, smooth steel drop inlet principle spillway with a 6-12' ft high riser by 12-18" diameter, with a 80- 120 ft of barrel, and 60-90 Square feet of anti-seep collars. Several trees need removed. A rock lined plunge pool protects the outlet channel, that is located down at the toe of a 10-20 high embankment. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation: The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation: Area is stabilized. Installed a 10' high riser by 15" dia steel pipe, 12" barrel extending 100' to a rocklined plungepool. Approximately 500 CY of fill. Installation required several trees to be removed. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$14,928.09

Scenario Cost/Unit: \$14,928.09

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-place without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$142.33	1	\$142.33
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	50	\$321.49
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	450	\$2,193.05
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$4.44	500	\$2,221.56
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$133.90	2	\$267.80
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hour	\$67.76	1	\$67.76

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	5	\$157.36
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.93	72	\$66.75
Pipe, Steel, 12", Std Wt, USED	1356	Materials: - USED - 12" - Steel Std Wt	Foot	\$23.40	10	\$233.98
Pipe, Steel, 20", Std Wt, USED	1359	Materials: - USED - 20" - Steel Std Wt	Foot	\$43.85	100	\$4,384.63
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yard	\$83.15	20	\$1,663.07

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	\$32.34	16	\$517.47
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	32	\$1,191.62
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	16	\$694.34

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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	\$202.55	1	\$202.55

Practice: 412 - Grassed Waterway

Scenario: #1 - Waterway, over 0.2 acres

Scenario Description: Typical practice is 1244' long by 35' wide by 1.2' deep parabolic channel. The waterway is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Establishment of vegetation is included. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

Before Situation: The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation: Installed grassed waterway is 1244' long by 35' wide by 1.2' deep parabolic earthen channel. The practice is installed using a dozer. Topsoil stripped and replaced. Included is seed bed preparation, seeding, lime, fertilizer etc. for establishment of vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Scenario Feature Measure: Acre of Waterway

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$5,329.38

Scenario Cost/Unit: \$5,329.38

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	2	\$226.53
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	30	\$18.04
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	60	\$47.05
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	60	\$26.14
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	1	\$46.58

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	\$21.64	4	\$86.58
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	2	\$86.79

Equipment Installation

Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	\$9.89	1	\$9.89
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$1.88	1739	\$3,264.17
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14

Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$1.05	806	\$842.62
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16
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	\$83.16	1	\$83.16

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.25	\$67.57
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.25	\$40.81

Practice: 412 - Grassed Waterway

Scenario: #2 - Waterway, small, 0.2 Acres or less

Scenario Description: Typical practice is 200' long by 35' wide by 1.2' deep parabolic channel. The waterway is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Establishment of vegetation is included. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

Before Situation: The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation: Installed grassed waterway is 200' long by 35' wide by 1.2' deep parabolic earthen channel. The practice is installed using a dozer. Topsoil stripped and replaced. Included is seed bed preparation, seeding, lime, fertilizer etc. for establishment of vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Scenario Feature Measure: Area of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 6970

Total Scenario Cost: \$1,216.25

Scenario Cost/Unit: \$0.17

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$113.27	0.32	\$36.25
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	5	\$3.01
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	10	\$7.84
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	10	\$4.36
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	0.16	\$7.45

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	\$21.64	1	\$21.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	1	\$43.40

Equipment Installation

Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$1.88	280	\$525.57
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	0.16	\$1.29
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.16	\$4.02
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$1.05	130	\$135.91

Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	0.16	\$2.10
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16
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	\$83.16	1	\$83.16

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.08	\$21.75
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.04	\$10.81
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.04	\$6.53

Practice: 412 - Grassed Waterway

Scenario: #3 - Grass Waterway with Stone Checks

Scenario Description: Typical practice is 1244' long by 35' wide by 1.2' deep parabolic channel. A waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Instead of using Mulching to allow vegetative establishment, stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Stone Checks are installed 18" deep. Establishment of vegetation is included in non-check dam areas. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

Before Situation: The field has a small gully which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation: Installed grassed waterway is 1244' long by 35' wide by 1.2' deep parabolic earthen channel. Stone checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Include seed bed preparation, seeding, lime, fertilizer etc. to establish vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Scenario Feature Measure: Acre of Waterway

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$7,003.93

Scenario Cost/Unit: \$7,003.93

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$31.47	36	\$1,133.00
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	181	\$212.32
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.60	30	\$18.04
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	60	\$47.05
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	50	\$21.78
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	1	\$46.58

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	\$21.64	11	\$238.09
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	1	\$43.40

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	\$65.99	7	\$461.90
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes	Cubic Yard	\$1.88	1739	\$3,264.17

		equipment and labor.				
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$8.09	1	\$8.09
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	1	\$25.14
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$1.05	806	\$842.62
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$13.12	1	\$13.12

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16
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	\$83.16	1	\$83.16

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$271.88	0.5	\$135.94
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$270.29	0.25	\$67.57
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$163.26	0.25	\$40.81

Practice: 355 - Groundwater Testing

Scenario: #1 - Basic Water Test

Scenario Description: Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be acceptable. Associated Practices: Irrigation System Microirrigation (441), Irrigation System Sprinkler (442), Irrigation Water Management (449), Prescribed Grazing (528), Watering Facility (614), Water Well (642).

Before Situation: There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible.

After Situation: Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$52.35

Scenario Cost/Unit: \$52.35

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	0.5	\$10.82
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Materials

Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	\$41.52	1	\$41.52
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Practice: 355 - Groundwater Testing

Scenario: #2 - Specialty Water Test

Scenario Description: Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance. Associated Practices: Irrigation System Microirrigation (441), Irrigation System Sprinkler (442), Irrigation Water Management (449), Prescribed Grazing (528), Watering Facility (614), Water Well (642).

Before Situation: There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is possible.

After Situation: Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$214.74

Scenario Cost/Unit: \$214.74

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	0.5	\$10.82
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Materials

Test, singular specialized water test, well water	2003	Testing for specific pesticide, inorganic chemical or volatile organic not included in a basic well suitability test.. Includes materials and shipping only.	Each	\$162.40	1	\$162.40
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	\$41.52	1	\$41.52

Practice: 355 - Groundwater Testing

Scenario: #3 - Full Spectrum Test

Scenario Description: Typical scenario includes the professional comprehensive testing for all less common substances, to include: pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is known to be degraded due to a specialized substance but thorough analysis is warranted. Associated Practices: Irrigation System Microirrigation (441), Irrigation System Sprinkler (442), Irrigation Water Management (449), Prescribed Grazing (528), Watering Facility (614), Water Well (642).

Before Situation: There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, sewage sludge, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is likely.

After Situation: Water quality results are known.

Scenario Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1

Total Scenario Cost: \$262.09

Scenario Cost/Unit: \$262.09

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	0.5	\$10.82
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Materials

Test, comprehensive specialized water test, well water	2002	Comprehensive testing for a broad spectrum of pesticides, inorganic chemicals or volatile organics not included in a basic well suitability test. Includes materials and shipping only.	Each	\$209.75	1	\$209.75
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	\$41.52	1	\$41.52

Practice: 561 - Heavy Use Area Protection

Scenario: #1 - Gravel Pad on geotextile, no site prep

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with sand or quarry dust, a binder layer and then a rock base course on a geotextile fabric foundation to provide a stable, non-eroding surface. This scenario requires that site is ready for geotextile and various stone layers without any additional site preparation. Most common use will be with Animal Trail and Walkways (575) that covers the cost of site preparation, if needed. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Animal Trail and Walkway (575), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced 2,000 square feet of rock and or gravel and or sand (8 inches final thickness with 3 layers) on a geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of rock or gravel

Scenario Unit: Square Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$3,417.01

Scenario Cost/Unit: \$1.71

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.66	222	\$591.31
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor.	Hour	\$15.27	3	\$45.80

Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	\$21.70	26	\$564.10
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.05	13	\$403.66
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$33.78	38	\$1,283.76

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	\$32.34	3	\$97.03
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	3	\$130.19

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16
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Practice: 561 - Heavy Use Area Protection

Scenario: #2 - Gravel pad on geotextile with site prep

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with sand or quarry dust, a binder layer and then a rock base course on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, including site preparation. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced 2,000 square feet of rock and or gravel and or sand (8 inches final thickness with 3 layers) on a geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$4,353.67

Scenario Cost/Unit: \$2.18

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.66	222	\$591.31
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor.	Hour	\$15.27	4	\$61.06
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hour	\$103.78	4	\$415.13

Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yard	\$21.70	26	\$564.10
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.05	13	\$403.66
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$33.78	38	\$1,283.76

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	\$32.34	8	\$258.74
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	4	\$173.58

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	2	\$602.32
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Practice: 561 - Heavy Use Area Protection

Scenario: #3 - Concrete Slab, reinforced with gravel foundation

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with approximately 5000 (50 x 100) square feet of 5" thick, welded wire mesh reinforced concrete and 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 5000

Total Scenario Cost: \$28,226.70

Scenario Cost/Unit: \$5.65

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$288.82	80	\$23,105.55
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$77.85	4	\$311.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	139	\$677.41
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	\$2.58	185	\$477.06

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	81	\$2,549.25
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	3	\$903.47
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	\$202.55	1	\$202.55

Practice: 561 - Heavy Use Area Protection

Scenario: #4 - Concrete Slab, Fiber-reinforced with No Gravel

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with fiber reinforced concrete to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with approximately 1600 (40 x 40) square feet of 6" thick non-reinforced concrete with 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area

Scenario Unit: Square Foot

Scenario Typical Size: 1600

Total Scenario Cost: \$7,110.05

Scenario Cost/Unit: \$4.44

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Concrete, CIP, Slab on Grade, fiber reinforced	2001	Fiber 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	\$217.63	30	\$6,528.98
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	\$2.58	30	\$77.36

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	1	\$301.16
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	\$202.55	1	\$202.55

Practice: 561 - Heavy Use Area Protection

Scenario: #5 - Concrete Slab, Fiber-reinforced with Gravel

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with approximately 1600 (40 x 40) square feet of 5" thick non-reinforced concrete with 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area

Scenario Unit: Square Foot

Scenario Typical Size: 1600

Total Scenario Cost: \$9,614.82

Scenario Cost/Unit: \$6.01

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$31.47	27	\$849.75
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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	\$65.99	2	\$131.97
Concrete, CIP, Slab on Grade, fiber reinforced	2001	Fiber 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	\$217.63	30	\$6,528.98
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	15	\$73.10
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	\$2.58	30	\$77.36

Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	8	\$347.17

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	3	\$903.47
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	\$202.55	2	\$405.11

Practice: 561 - Heavy Use Area Protection

Scenario: #6 - Concrete Slab with Curbs & Buckwall

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, including a walled section to facilitate loading accumulated wastes. The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with 2000 (50' x 40') square feet of 5" thick concrete, reinforced with welded wire mesh. The perimeter has 100 LF of 12" high by 8" thick curbs, a 40 LF section of rolled curb for access, and 50 LF of 4' high, 8" thick reinforced concrete buck wall and footer. The wall is for assisting in loading out solids collected on the lot. If area is used for storage, use 313-Waste Storage Facility. Entire site needs to be excavated, regraded, and compacted with an average fill of 2 ft. Base under concrete to be 4-6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of pad

Scenario Unit: Square Foot

Scenario Typical Size: 2000

Total Scenario Cost: \$26,406.46

Scenario Cost/Unit: \$13.20

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	24	\$10,780.56
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	\$288.82	32	\$9,242.22
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	\$4.00	150	\$599.81
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	150	\$731.02
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	\$2.58	150	\$386.81
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hour	\$103.78	4	\$415.13

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	32	\$1,007.11
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	24	\$893.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	24	\$1,041.51

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	3	\$903.47
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	\$202.55	2	\$405.11

Practice: 561 - Heavy Use Area Protection

Scenario: #7 - Concrete Slab with Curbs, Reinforced

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with 2500 (50 x 50) square feet of 5" thick concrete, reinforced with welded wire mesh and has 12" high by 8" thick curbs on the perimeter except for a 20' section of rolled curb for access. Entire site needs excavated, regraded and compacted with an average fill of 2'. Base under concrete to be 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of slab with curbing

Scenario Unit: Square Foot

Scenario Typical Size: 2500

Total Scenario Cost: \$25,380.72

Scenario Cost/Unit: \$10.15

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	15	\$6,737.85
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	\$288.82	37	\$10,686.32
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$77.85	4	\$311.40
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	\$4.00	241	\$963.69
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	215	\$1,047.79
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	\$2.58	334	\$861.29

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	39	\$1,227.42
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	24	\$893.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	24	\$1,041.51

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	4	\$1,204.63
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	\$202.55	2	\$405.11

Practice: 561 - Heavy Use Area Protection

Scenario: #8 - Concrete slab with curb on steep site

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with concrete slab and curbs. Existing natural site grade is too steep and fill will be brought in to establish a suitable grade for concrete area and stable slopes for areas beyond the pad. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with 2500 (50 x 50) square feet of 6" thick concrete, reinforced with welded wire mesh and has 12" high by 8" thick curbs on the perimeter except for a 20' section of rolled curb for access. Entire site needs excavated, regraded and compacted with an average fill of 5' due to steep site conditions. Base under concrete to be 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 2500

Total Scenario Cost: \$30,492.80

Scenario Cost/Unit: \$12.20

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	15	\$6,737.85
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	\$288.82	39	\$11,263.96
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	\$4.00	600	\$2,399.23
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	650	\$3,167.74
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	\$2.58	740	\$1,908.25

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	54	\$1,699.50
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	20	\$744.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	20	\$867.92

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	4	\$1,204.63
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	\$83.16	6	\$498.96

Practice: 561 - Heavy Use Area Protection

Scenario: #9 - Concrete Slab with Curb, Steep site with Retaining Wall

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with concrete slab and curbs. Existing natural site grade is too steep and /or to close to a water body. A combination of a retaining and fill will be brought in to establish a suitable grade for concrete area and stable slopes for areas beyond the pad. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with 2500 (50 x 50) square feet of 6" thick concrete, reinforced with welded wire mesh and has 12" high by 8" thick curbs on the perimeter except for a 20' section of rolled curb for access. Entire site needs excavated, regraded and compacted with an average fill of 5' due to steep site conditions. In addition, the location prevents extending the slope downhill due to steepness or nearest to water. A 8' high retaining wall is needed on 50% of the perimeter or 100 LF. Base under concrete to be 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 2500

Total Scenario Cost: \$50,977.46

Scenario Cost/Unit: \$20.39

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

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	\$449.19	62	\$27,849.78
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	\$288.82	39	\$11,263.96
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	\$4.00	600	\$2,399.23
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	125	\$803.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yard	\$4.87	400	\$1,949.38
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hour	\$149.05	6	\$894.32

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$31.47	54	\$1,699.50
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	32	\$1,191.62
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Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	32	\$1,388.67
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Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	4	\$1,204.63
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	\$83.16	4	\$332.64

Practice: 561 - Heavy Use Area Protection

Scenario: #10 - Fly Ash on Geotextile

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with Fly Ash on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with 1,000 square feet of Fly Ash placed in layers to a final depth of 18" on a 112 square yard of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. Water is added to hydrate and consolidate material. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of Fly Ash

Scenario Unit: Square Foot

Scenario Typical Size: 1000

Total Scenario Cost: \$3,067.88

Scenario Cost/Unit: \$3.07

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	\$2.58	56	\$144.41
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.66	112	\$298.32
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$52.50	8	\$420.02

Materials

Fly Ash, BAB	52	Fly Ash, Bottom Ash Blend, includes material and delivery	Cubic Yard	\$25.28	73	\$1,845.62
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	8	\$186.35
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	\$21.64	8	\$173.15

Practice: 561 - Heavy Use Area Protection

Scenario: #11 - Bituminous Concrete Pavement

Scenario Description: The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with bituminous concrete pavement on aggregate gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

Before Situation: This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation: The stabilized area is surfaced with 1,000 square feet of 8" thick bituminous concrete pavement over a 6" aggregate gravel material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. Entire site needs excavated by 1' and an average fill of 2'. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area of Bituminous Pavement

Scenario Unit: Square Foot

Scenario Typical Size: 1000

Total Scenario Cost: \$8,903.13

Scenario Cost/Unit: \$8.90

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$31.47	19	\$597.97
Asphalt, pavement	1867	Bituminous Concrete, includes materials, equipment and labor for 4" layer, base not included.	Square Foot	\$2.54	2000	\$5,084.82

Equipment Installation

Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yard	\$4.00	97	\$387.88
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yard	\$6.43	75	\$482.23
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	\$2.58	37	\$95.41

Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$37.24	8	\$297.91
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	8	\$347.17

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$301.16	4	\$1,204.63
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	\$202.55	2	\$405.11

Practice: 422 - Hedgerow Planting

Scenario: #1 - Pollinator Habitat

Scenario Description: Where pollinator habitat is an additional wildlife habitat concern this scenario addresses the resource concern of inadequate fish and wildlife habitat. It provides both physical habitat by providing areas that are not disturbed by annual tillage and provides pollen and nectar throughout the growing season by establishing a diverse mixture of flowering plants. Typically a mixture of 5 or more species is planted to improve diversity so that pollen and nectar are available as long as possible. Typical installation is in or at the edge of cropland or pasture. Typical installation involves tillage to prepare the site for planting. Flowering trees and shrubs adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). A native grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. A locally adapted mixture of at 3 pollen and nectar producing plants will be drilled into the site. The species list in the component section of this scenario are strictly for deriving a cost. Species adapted to local climatic and edaphic conditions will be listed in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Pollen and nectar sources are lacking or are only available for part of the growing season. Large cropland tracks lack undisturbed areas for ground nesting bees

After Situation: Flowering plants supply pollen and nectar throughout the growing season. Undisturbed areas provide nesting sites for bees and other native pollinators.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 800

Total Scenario Cost: \$1,952.16

Scenario Cost/Unit: \$2.44

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	2.5	\$54.11
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Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	2.5	\$30.11
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.25	\$6.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.25	\$4.89

Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Three Species Mix, Native Forb	2333	Native forb mix. Includes material and shipping only.	Acre	\$586.90	3	\$1,760.71
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	100	\$52.46
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.35	100	\$35.43

Practice: 422 - Hedgerow Planting

Scenario: #2 - Contour Native

Scenario Description: Typically installation of this scenario is within an annually cropped field. The hedge row is planted on the contour to provide a physical and visual aid to contour farming. This scenario is used to facilitate additional measures that address the resource concerns of; sheet and rill soil erosion and Water Quality Degradation, excess sediment in surface waters. Trees, shrubs, and grasses adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). Species selected should be at least three feet tall at maturity. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Contour farming practices are made difficult or less effective due to a lack of visual clues as to the location of the contours. Soil is lost to sheet and rill erosion. Sediments are deposited into surface waters.

After Situation: Hedgerow planted on the contour presents a physical and visual guide for tillage and planting operations on the contour. Soil erosion from sheet and rill sources is reduced and the resultant deposition of sediment to surface waters is in turn reduced.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 800

Total Scenario Cost: \$758.86

Scenario Cost/Unit: \$0.95

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	2.5	\$54.11
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Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	2.5	\$30.11
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.25	\$6.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.25	\$4.89

Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	100	\$52.46
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.35	100	\$35.43
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$94.57	6	\$567.41

Practice: 422 - Hedgerow Planting

Scenario: #3 - Contour Introduced

Scenario Description: Typically installation of this scenario is within an annually cropped field. The hedge row is planted on the contour to provide a physical and visual aid to contour farming. This scenario is used to facilitate additional measures that address the resource concerns of; sheet and rill soil erosion and Water Quality Degradation, excess sediment in surface waters. Trees, shrubs, and exotic grasses adapted for local climatic and edaphic conditions are selected. Typically woody species are planted at eight foot intervals (this will vary with species selection and density goals). Species selected should be at least three feet tall at maturity. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Contour farming practices are made difficult or less effective due to a lack of visual clues as to the location of the contours. Soil is lost to sheet and rill erosion. Sediments are deposited into surface waters.

After Situation: Hedgerow planted on the contour presents a physical and visual guide for tillage and planting operations on the contour. Soil erosion from sheet and rill sources is reduced and the resultant deposition of sediment to surface waters is in turn reduced.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 800

Total Scenario Cost: \$564.05

Scenario Cost/Unit: \$0.71

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	2.5	\$54.11
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Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	2.5	\$30.11
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.25	\$6.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.25	\$4.89

Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Three Species Mix, Cool Season, Introduced Perennial Grass	2315	Cool season, introduced grass mix. Includes material and shipping only.	Acre	\$46.58	8	\$372.61
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	100	\$52.46
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.35	100	\$35.43

Practice: 422 - Hedgerow Planting

Scenario: #4 - Wildlife, Handplanted Trees and Shrubs with Warm Season Grass

Scenario Description: Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native warm season grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation: Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Scenario Feature Measure: Length of Hedgerow, per row of trees/shrubs

Scenario Unit: Foot

Scenario Typical Size: 800

Total Scenario Cost: \$779.20

Scenario Cost/Unit: \$0.97

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	2.5	\$54.11
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Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	2.5	\$30.11
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.25	\$6.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.25	\$4.89

Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.58	90	\$52.22
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	100	\$52.46
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.35	10	\$3.54
Two Species Mix, Warm Season, Native Perennial Grass	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$94.57	6	\$567.41

Practice: 422 - Hedgerow Planting

Scenario: #5 - Wildlife, Machine Planted Trees and Shrubs with Warm Season Grass

Scenario Description: This scenario is for machine planting of woody species. Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation: Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Scenario Feature Measure: Length of Hedgerow, per row of trees/shrubs

Scenario Unit: Foot

Scenario Typical Size: 800

Total Scenario Cost: \$950.96

Scenario Cost/Unit: \$1.19

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	2	\$46.59
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Equipment Installation

Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$6.84	1	\$6.84
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.25	\$6.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.25	\$4.89

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	\$202.55	1	\$202.55
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Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.58	90	\$52.22
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	100	\$52.46
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.35	10	\$3.54
Two Species Mix, Warm Season, Native Perennial	2325	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$94.57	6	\$567.41

Grass						
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Practice: 422 - Hedgerow Planting

Scenario: #6 - Wildlife, Handplanted Trees and Shrubs with Cool Season Grass

Scenario Description: Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A native cool season grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation: Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Scenario Feature Measure: Length of Hedgerow, per row of trees/shrubs

Scenario Unit: Foot

Scenario Typical Size: 800

Total Scenario Cost: \$534.37

Scenario Cost/Unit: \$0.67

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	2.5	\$54.11
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Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	2.5	\$30.11
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$25.14	0.25	\$6.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.25	\$4.89

Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
One Species, Cool Season, Native Perennial Grass	2312	Native, cool season perennial grass. Includes material and shipping only.	Acre	\$161.29	2	\$322.59
Shrub, seedling or transplant, bare root, 18"-36"	1507	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.58	90	\$52.22
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	100	\$52.46
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.35	10	\$3.54

Practice: 422 - Hedgerow Planting

Scenario: #7 - Poultry Trees

Scenario Description: Two or more 660 foot rows (125% of length of poultry house) of hardwood and conifer trees for wind protection, energy conservation, air quality, or to provide a visual screen. Trees are hand planted 8 feet apart in the row with rows 10 feet apart. This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters.); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561). Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Agricultural field near poultry headquarters which has one or more poultry houses requiring protection from wind, odor mitigation, and visual screen.

After Situation: Wind velocity suitably reduced to reduce soil erosion or reduce energy losses. Odors and other materials are reduced via capture of material by hedgerow(s) from poultry houses. Two or more hedgerows are comprised of conifer or hardwood trees.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 1320

Total Scenario Cost: \$3,095.48

Scenario Cost/Unit: \$2.35

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	80	\$1,731.53
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Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	164	\$86.03
Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal.	1536	Potted conifer, 1/2 to 1 gal. Includes materials and shipping only.	Each	\$4.59	82	\$376.17
Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal.	1531	Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only.	Each	\$5.02	82	\$411.86

Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	40	\$481.72
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Practice: 422 - Hedgerow Planting

Scenario: #8 - Poultry Grasses

Scenario Description: One row, 600 feet, of potted grass seedlings are planted in the swale between two parallel poultry houses which are 600 feet in length. At the end of the house are typically 4 tunnel ventilation fans which are 5 feet in diameter. Two rows of potted grass seedlings are planted in front of the tunnel fans plus an additional 20 feet to each side. Total length of the two rows is 120 feet (each row is 60 feet times 2 rows equals 120 feet). This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561). Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Agricultural field near poultry headquarters which has one or more poultry houses requiring protection from wind, odor mitigation, and visual screen.

After Situation: Wind velocity suitably reduced to reduce soil erosion or reduce energy losses. Odors and other materials are reduced via capture of material by hedgerow(s) from poultry houses. Grasses are planted in the swales and in front of the tunnels.

Scenario Feature Measure: Length of hedgerows

Scenario Unit: Foot

Scenario Typical Size: 720

Total Scenario Cost: \$2,033.72

Scenario Cost/Unit: \$2.82

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	40	\$865.76
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Equipment Installation

Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.1	\$1.95
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Materials

Shrub, seedling or transplant, potted, 1 qt.	1524	Potted shrub, 1 quart. Includes materials and shipping only.	Each	\$3.24	360	\$1,166.00
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Practice: 422 - Hedgerow Planting

Scenario: #9 - Poultry Trees &Grasses

Scenario Description: Two or more 660 foot rows (125% of length of poultry house) of hardwood, conifer trees and native grasses for wind protection, energy conservation, air quality, or to provide a visual screen. Trees are hand planted 8 feet apart in the row with rows 10 feet apart. Grasses are planted in front of the tunnel ventilation fans on 2 foot centers. This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561). Payment is based on the length of each hedgerow times the number of rows.

Before Situation: Agricultural field near poultry headquarters which has one or more poultry houses requiring protection from wind, odor mitigation, and visual screen.

After Situation: Wind velocity suitably reduced to reduce soil erosion or reduce energy losses. Odors and other materials are reduced via capture of material by hedgerow(s) from poultry houses. Two or more hedgerows are comprised of conifer or hardwood trees, and grasses in front of the tunnels.

Scenario Feature Measure: Length of hedgerows

Scenario Unit: Foot

Scenario Typical Size: 1320

Total Scenario Cost: \$3,226.92

Scenario Cost/Unit: \$2.44

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	80	\$1,731.53
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Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	40	\$481.72
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$19.55	0.6	\$11.73

Materials

Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$32.68	0.25	\$8.17
Shrub, seedling or transplant, potted, 1 qt.	1524	Potted shrub, 1 quart. Includes materials and shipping only.	Each	\$3.24	60	\$194.33
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$0.52	150	\$78.69
Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal.	1536	Potted conifer, 1/2 to 1 gal. Includes materials and shipping only.	Each	\$4.59	75	\$344.05
Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal.	1531	Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only.	Each	\$5.02	75	\$376.70

Practice: 315 - Herbaceous Weed Control

Scenario: #1 - Hand Tools, Herbaceous vegetation

Scenario Description: Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitat Management (645), Early Successional Habitat Development/Management (647), Prescribed Grazing (528), Forage and Biomass Planting (512)

Before Situation: Area is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation: Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$1,521.68

Scenario Cost/Unit: \$152.17

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	40	\$865.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	2	\$86.79

Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$38.47	4	\$153.88
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$4.94	40	\$197.63
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29

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	\$83.16	2	\$166.32
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Practice: 315 - Herbaceous Weed Control

Scenario: #2 - Mechanical

Scenario Description: Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential. Typical unit is 10 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitat Management (645), Early Successional Habitat Development/Management (647), Prescribed Grazing (528), Forage and Biomass Planting (512).

Before Situation: Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation: Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$1,351.71

Scenario Cost/Unit: \$135.17

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.29	10	\$232.94
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Equipment Installation

Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$61.11	10	\$611.07
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	4	\$102.58

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	\$202.55	2	\$405.11
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Practice: 315 - Herbaceous Weed Control

Scenario: #3 - Chemical, Spot

Scenario Description: Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment, either initial or retreatment using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. Typical unit is 20 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitat Management (645), Early Successional Habitat Development/Management (647), Prescribed Grazing (528), Forage and Biomass Planting (512)

Before Situation: Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation: Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20

Total Scenario Cost: \$1,766.11

Scenario Cost/Unit: \$88.31

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	1	\$43.40
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	5	\$79.63
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Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$38.47	5	\$192.35
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$69.97	20	\$1,399.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	2	\$51.29

Practice: 315 - Herbaceous Weed Control

Scenario: #4 - Chemical, Ground

Scenario Description: Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using ground equipment to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. Typical unit is 20 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitat Management (645), Early Successional Habitat Development/Management (647), Prescribed Grazing (528), Forage and Biomass Planting (512)

Before Situation: Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation: Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20

Total Scenario Cost: \$713.76

Scenario Cost/Unit: \$35.69

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$6.92	20	\$138.31
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	20	\$25.91

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	20	\$144.43
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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	\$202.55	2	\$405.11
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Practice: 315 - Herbaceous Weed Control

Scenario: #5 - Chemical, Aerial

Scenario Description: Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using airplane or helicopter to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. Typical unit is 20 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitat Management (645), Early Successional Habitat Development/Management (647), Prescribed Grazing (528), Forage and Biomass Planting (512)

Before Situation: Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation: Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20

Total Scenario Cost: \$1,302.07

Scenario Cost/Unit: \$65.10

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$21.64	16	\$346.31
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$43.40	2	\$86.79

Materials

Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$6.92	20	\$138.31
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	20	\$25.91

Equipment Installation

Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acre	\$11.14	20	\$222.71
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$25.65	3	\$76.94

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	\$202.55	2	\$405.11
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Practice: 315 - Herbaceous Weed Control

Scenario: #16 - Forest Herbaceous Chemical Ground

Scenario Description: The practice entails the eradication of target, interfering herbaceous species using ground applied chemicals to allow regeneration of desirable tree species and the establishment of quality wildlife habitat. Removal is supervised to ensure objectives are achieved. Typical unit is 20 acres.

Before Situation: An adequately stocked forest stand of desirable tree species is overwhelmed by extensive stands of herbaceous weeds in its understory, degrading health and vigor and diversity of native tree regeneration, as well as herbaceous species, shrub species and degrading wildlife habitat.

After Situation: After a foliar herbicide treatment was applied to the forest stand's understory, the desirable forest understory has been released from excessive competition. Ecological site condition is progressing in an upward trend, with plant health and vigor returning to desired levels and wildlife habitat improving.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 20

Total Scenario Cost: \$4,152.09

Scenario Cost/Unit: \$207.60

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Equipment Installation

Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	\$137.66	20	\$2,753.12
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	20	\$318.52
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Labor

Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	7	\$675.34
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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	\$202.55	2	\$405.11
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Practice: 315 - Herbaceous Weed Control

Scenario: #17 - Forest Herbaceous Chemical Ground

Scenario Description: The practice entails the eradication of target, interfering herbaceous species using ground applied chemicals to allow regeneration of desirable tree species and the establishment of quality wildlife habitat. Removal is supervised to ensure objectives are achieved. Typical unit is 20 acres.

Before Situation: An adequately stocked forest stand of desirable tree species is overwhelmed by extensive stands of herbaceous weeds in its understory, degrading health and vigor and diversity of native tree regeneration, as well as herbaceous species, shrub species and degrading wildlife habitat.

After Situation: After a foliar herbicide treatment was applied to the forest stand's understory, the desirable forest understory has been released from excessive competition. Ecological site condition is progressing in an upward trend, with plant health and vigor returning to desired levels and wildlife habitat improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20

Total Scenario Cost: \$3,934.77

Scenario Cost/Unit: \$196.74

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate-ipa salt 4SL	346	Product is typically used for aquatic usage. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$5.06	20	\$101.20
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Labor

Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	\$96.48	7	\$675.34
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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	\$202.55	2	\$405.11
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Equipment Installation

Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	\$137.66	20	\$2,753.12
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Practice: 325 - High Tunnel System

Scenario: #20 - High Tunnel

Scenario Description: Used for contiguous US states in areas with low or no snowfall. A quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications. Associated Practices: Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed (329), Cover Crop (340), Residue Management , Seasonal (344), Residue amd Tillage Management, Mulch Till (345), Nutrient Management (590), Pest Management (595).

Before Situation: Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include; soil erosion, soil condition, water quality, water quantity, plant condition, and energy use.

After Situation: A seasonal high tunnel has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved and there is decreased energy use by producing food locally.

Scenario Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Foot

Scenario Typical Size: 2160

Total Scenario Cost: \$8,395.16

Scenario Cost/Unit: \$3.89

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Hoop House, quonset style, base package	1277	Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and polylock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only, does not include labor.	Square Foot	\$3.18	2160	\$6,858.43
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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	\$21.64	71	\$1,536.73
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