

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	6
Scenario Name	Access Ramp
Scenario Description	Installation of a gravel access ramp to provide a stable, non-eroding surface for areas frequently used by livestock for limited access to drinking water from a pond or stream.
Before Practice Situation	A 30 head cow/calf operation with an unstable and eroding area at a pond or stream due to cattle accessing the water for drinking. The area lacks vegetation and has severe compaction concerns as well as deep mud. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion.
After Practice Situation	A 14 ft wide ramp for livestock access to surface water is constructed by excavating a 6:1 approach on the bank of the stream or pond. Average bank height is 4.6 feet. Thirty-nine cubic yards of earth will be excavated to create a reasonable slope to the surface water. Twenty-five cubic yards of gravel are placed over 68 square yards of geotextile fabric installed to create the travel surface on the ramp and a level section of 10 feet at the base. Earthwork includes construction of a low (2') berm 30 ft long above the approach to divert runoff water from the ramp area. An additional 8 hours of labor is added to construct the berm. The access ramp stabilizes stream banks used for livestock water, reduces soil erosion, and improves water quality and livestock health. Scenario includes earthwork, aggregate and geotextile fabric. Cost data is applicable to organic and conventional agricultural production systems.
Scenario Feature Measure	Area of access ramp
Scenario Unit	Square Foot
Scenario Typical Size	560

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$667.50	\$1.19
Equipment/Installation	\$242.48	\$0.43
Labor	\$0.00	\$0.00
Mobilization	\$445.90	\$0.80
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,355.88	\$2.42

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	25	\$667.50
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.12	39	\$82.68
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.35	68	\$159.80
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

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Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	4
Scenario Name	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.
Before Practice 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 Practice Situation	The stabilized area is surfaced with approximately 630 square feet of bituminous concrete pavement on 8 cubic yards of 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. 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	630

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,448.40	\$2.30
Equipment/Installation	\$8.48	\$0.01
Labor	\$0.00	\$0.00
Mobilization	\$216.32	\$0.34
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,673.20	\$2.66

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1867	Asphalt, pavement	Bituminous Concrete, includes materials, equipment and labor for 4" layer, base not included.	Square Foot	\$1.96	630	\$1,234.80
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	8	\$213.60
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.12	4	\$8.48
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.54	0.5	\$13.27

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Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	5
Scenario Name	Concrete HUA with Curbing
Scenario Description	Installation of a concrete (slab on grade over gravel) pad with reinforced concrete curbing, surrounded by gravel on three sides, to provide a stable, non-eroding surface, and allow for collection of manure, for areas frequently used by livestock.
Before Practice Situation	A 50 head cow/calf operation with an intensively used area in a pasture for winter feeding. This area is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion.
After Practice Situation	The stabilization of areas frequently and intensively used by pastured livestock during winter feeding. A concrete (slab on grade over gravel) pad with reinforced concrete curbing, surrounded by gravel on three sides, to provide a stable, non-eroding surface, and allow for collection of manure, will be installed to reduce soil erosion, improve water quality, air quality, and livestock health. Typical total size is 4,324 square feet. There is a 2,624 square feet of unreinforced slab on grade concrete, which is 5" thick. This concrete is placed over a 3" base of gravel. Curbing consists of 36 cubic yards of reinforced, formed concrete added to allow for capturing of animal waste. Approximately 1,700 square feet of gravel 8" thick placed over light geotextile fabric surrounds three sides of the concrete pad. Payment incorporates site preparation through grading and shaping, concrete pad and curbing and gravel. Cost data is applicable to organic and conventional agricultural production systems.
Scenario Feature Measure	Area of Concrete with curbing
Scenario Unit	Square Foot
Scenario Typical Size	4324

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,216.10	\$0.51
Equipment/Installation	\$22,635.88	\$5.23
Labor	\$0.00	\$0.00
Mobilization	\$445.90	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$25,297.88	\$5.85

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	\$406.16	36	\$14,621.76
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	83	\$2,216.10
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	\$255.77	29	\$7,417.33
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.12	72	\$152.64
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.35	189	\$444.15
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

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Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	7
Scenario Name	Gravel with Geotextile, 8" Thickness
Scenario Description	Installation of a gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.
Before Practice Situation	A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.
After Practice Situation	The stabilization of areas frequently and intensively used by livestock by installing a gravel surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. Gravel, 8" deep, is placed over light geotextile fabric and surfaced with a 3" layer of fines. Payment incorporates site preparation through grading and shaping, gravel and layer of fines and light geotextile fabric. Cost data is applicable to organic and conventional agricultural production systems.
Scenario Feature Measure	Area of gravel with Geotext 8" Thickness
Scenario Unit	Square Foot
Scenario Typical Size	3900

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,551.10	\$0.91
Equipment/Installation	\$1,610.47	\$0.41
Labor	\$160.74	\$0.04
Mobilization	\$445.90	\$0.11
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$5,768.21	\$1.48

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	133	\$3,551.10
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$98.82	6	\$592.92
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.35	433	\$1,017.55
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	6	\$160.74
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

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Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	8
Scenario Name	Gravel without Geotextile, 8" Thickness
Scenario Description	Installation of a gravel heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.
Before Practice Situation	A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.
After Practice Situation	The stabilization of areas frequently and intensively used by livestock by installing a gravel surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. Gravel, 8" deep, is surfaced with a 3" layer of fines. Payment incorporates site preparation through grading and shaping, gravel and layer of fines. Cost data is applicable to organic and conventional agricultural production systems.
Scenario Feature Measure	Area of gravel with out Geotext 8" thickness
Scenario Unit	Square Foot
Scenario Typical Size	3900

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,551.10	\$0.91
Equipment/Installation	\$592.92	\$0.15
Labor	\$160.74	\$0.04
Mobilization	\$445.90	\$0.11
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,750.66	\$1.22

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	133	\$3,551.10
Equipment/Installation	927	Dozer, 140 HP	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$98.82	6	\$592.92
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	6	\$160.74
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	561 - Heavy Use Area Protection
Scenario ID	1
Scenario Name	Concrete HUA
Scenario Description	Installation of a concrete heavy use pad to provide a stable, non-eroding surface for areas frequently used by livestock, people or vehicles.
Before Practice Situation	A 30 head cow/calf operation with a frequently used area that is unstable with an eroding surface. The area lacks vegetation and has severe compaction concerns as well as deep mud. Concentration of nutrients cannot be spread on adjacent fields due to the unstable surface. Livestock health is compromised as additional energy is being used to travel through mud. A need exists to improve water quality, air quality, livestock health, as well as reduce soil erosion and compaction.
After Practice Situation	The stabilization of areas frequently and intensively used by livestock by installing a concrete surface to reduce soil erosion, improve water quality, air quality, and livestock health. Typical size is 3,900 square feet. The base consists of 4" of gravel. The concrete is a reinforced slab on grade with a thickness of 5". Payment incorporates site preparation through grading and shaping, concrete pad and gravel. Cost data is applicable to organic and conventional agricultural production systems.
Scenario Feature Measure	Area of reinforced concrete
Scenario Unit	Square Foot
Scenario Typical Size	3900

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,281.60	\$0.33
Equipment/Installation	\$15,754.61	\$4.04
Labor	\$0.00	\$0.00
Mobilization	\$445.90	\$0.11
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$17,482.11	\$4.48

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	48	\$1,281.60
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	Steel reinforced concrete formed and cast-in-place as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$255.77	61	\$15,601.97
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.12	72	\$152.64
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	574 - Spring Development
Scenario ID	1
Scenario Name	Collection Structure
Scenario Description	Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a water collection structure. Payment includes excavation and labor to expose the spring, concrete for collection box, lid and gravel backfill. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant
Before Practice Situation	Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.
After Practice Situation	Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Site is excavated with a backhoe to expose the seep, a concrete collection box (3'x3'x4') is installed and gravel is backfilled between the spring source and collection box.
Scenario Feature Measure	Number of Developments
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$194.64	\$194.64
Equipment/Installation	\$473.80	\$473.80
Labor	\$250.04	\$250.04
Mobilization	\$406.10	\$406.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,324.58	\$1,324.58

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1281	Spring Collection Box Cover, steel, 4' diameter	"4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication."	Each	\$167.94	1	\$167.94
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	1	\$26.70
Equipment/Installation	38	Concrete, CIP, formed reinforced	Steel reinforced concrete formed and cast-in-place in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$397.17	0.75	\$297.88
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	4	\$175.92
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	574 - Spring Development
Scenario ID	3
Scenario Name	Horizontal Pipe with Collection Box
Scenario Description	Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system and a water storage structure. The collection system is commonly composed of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope into the collection box. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant
Before Practice Situation	Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.
After Practice Situation	Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a spring box (48 inch diameter x 6 ft long CMP). Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long).
Scenario Feature Measure	Number of Developments
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$577.46	\$577.46
Equipment/Installation	\$1,523.87	\$1,523.87
Labor	\$1,000.16	\$1,000.16
Mobilization	\$406.10	\$406.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,507.59	\$3,507.59

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$25.70	2	\$51.40
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	2	\$53.40
Materials	978	"Pipe, PVC, 4", SCH 40"	"Materials: - 4" - PVC - SCH 40 - ASTM D1785"	Foot	\$2.97	20	\$59.40
Materials	1270	"Pipe, HDPE, 4", PCPT, Single Wall"	"Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only."	Foot	\$0.47	50	\$23.50
Materials	1280	"Pipe, CMP, 48", 14 Gauge"	"48" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only."	Foot	\$36.97	6	\$221.82
Materials	1281	Spring Collection Box Cover, steel, 4' diameter	"4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication."	Each	\$167.94	1	\$167.94
Equipment/Installation	38	Concrete, CIP, formed reinforced	Steel reinforced concrete formed and cast-in-place in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$397.17	2	\$794.34
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.35	11	\$25.85
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	16	\$703.68
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	16	\$362.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	32	\$637.44
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	574 - Spring Development
Scenario ID	2
Scenario Name	Horizontal Collection Pipe
Scenario Description	Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system. The collection system is commonly composed of perforated drainage pipe placed in an excavated collection trench that runs across the slope, and is piped directly to watering facilities (implemented through associated practice 614). Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility
Before Practice Situation	Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.
After Practice Situation	Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long).
Scenario Feature Measure	Length of Development
Scenario Unit	Foot
Scenario Typical Size	50

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$180.70	\$3.61
Equipment/Installation	\$201.77	\$4.04
Labor	\$250.04	\$5.00
Mobilization	\$406.10	\$8.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,038.61	\$20.77

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1270	"Pipe, HDPE, 4", PCPT, Single Wall"	"Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only."	Foot	\$0.47	50	\$23.50
Materials	45	Aggregate, Sand, Graded, Washed	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$25.70	3	\$77.10
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	3	\$80.10
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.35	11	\$25.85
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	4	\$175.92
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	575 - Animal Trail or Walkway
Scenario ID	2
Scenario Name	Linear Ft of Trail or Walkway
Scenario Description	Layout and construction of a lane or travel way to facilitate animal movement, to provide or improve access to forage, water, working/handling facilities, and/or shelter. Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites and address soil erosion and water quality resource concerns. Costs include excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practice.
Before Practice Situation	On a farmstead, pastureland, or rangeland areas where the control of animal movement is needed to address soil erosion, water quality, and livestock production limitation resource concerns.
After Practice Situation	The typical trail or walkway is an 8 foot wide by 300 foot long lane. Includes all excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock. No surface materials or vegetative establishment is included in the Animal Trails and Walkways practice. Associated practices include Critical Area Planting (342), Heavy Use Area Protection (561), Stream Crossing (578), Diversion (362), and Fencing (382). Access Road (560) should be used by vehicles or equipment for purposes other than management and maintenance of the animal trails or walkways.
Scenario Feature Measure	Length of trail or walkway
Scenario Unit	Foot
Scenario Typical Size	600

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$157.98	\$0.26
Labor	\$210.02	\$0.35
Mobilization	\$424.31	\$0.71
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$792.31	\$1.32

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$53.48	2	\$106.96
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	1	\$22.67
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	3	\$93.93
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.46	0.25	\$5.62
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1141	Mobilization, Skilled labor	Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.48	0.25	\$7.62

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	575 - Animal Trail or Walkway
Scenario ID	1
Scenario Name	Sq Ft of Trail or Walkway
Scenario Description	Layout and construction of a lane or travel way to facilitate animal movement, to provide or improve access to forage, water, working/handling facilities, and/or shelter. Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites and address soil erosion and water quality resource concerns. Costs include excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practice.
Before Practice Situation	On a farmstead, pastureland, or rangeland areas where the control of animal movement is needed to address soil erosion, water quality, and livestock production limitation resource concerns.
After Practice Situation	The typical trail or walkway is an 8 foot wide by 300 foot long (2400 square foot) lane. Includes all excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock. No surface materials or vegetative establishment is included in the Animal Trails and Walkways practice. Associated practices include Critical Area Planting (342), Heavy Use Area Protection (561), Stream Crossing (578), Diversion (362), and Fencing (382). Access Road (560) should be used by vehicles or equipment for purposes other than management and maintenance of the animal trails or walkways.
Scenario Feature Measure	Area of trail or walkway
Scenario Unit	Square Foot
Scenario Typical Size	4800

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$157.98	\$0.03
Labor	\$210.02	\$0.04
Mobilization	\$424.31	\$0.09
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$792.31	\$0.17

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$53.48	2	\$106.96
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	1	\$22.67
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	3	\$93.93
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.46	0.25	\$5.62
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1141	Mobilization, Skilled labor	Mobilization of skilled labor: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$30.48	0.25	\$7.62

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	578 - Stream Crossing
Scenario ID	5
Scenario Name	Concrete Crossing
Scenario Description	A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles. This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford crossing is desired for livestock, people, and /or equipment. Stream bed in the channel reach containing the crossing must be vertically stable. Scenario is for stabilizing the bottom and slope of a stream channel using concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel and concrete channel bottom and approaches. Scenario is based on a 20' wide x 50' long crossing. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.
Before Practice Situation	Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.
After Practice Situation	Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.
Scenario Feature Measure	Crossing dimensions
Scenario Unit	Square Foot
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$507.30	\$0.51
Equipment/Installation	\$6,151.01	\$6.15
Labor	\$0.00	\$0.00
Mobilization	\$406.10	\$0.41
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$7,064.41	\$7.06

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	19	\$507.30
Equipment/Installation	38	Concrete, CIP, formed reinforced	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	\$406.16	3	\$1,218.48
Equipment/Installation	37	Concrete, CIP, slab on grade, reinforced	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	\$255.77	19	\$4,859.63
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.62	45	\$72.90
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	578 - Stream Crossing
Scenario ID	6
Scenario Name	Culvert installation
Scenario Description	Install a new culvert. Work includes dewatering, site preparation and removing any old crossing, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 36 inch Culvert installation with <75 cy of fill needed and < 2 yds rock riprap for headwalls. Pipe is 40 feet long. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.
Before Practice Situation	Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.
After Practice Situation	Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.
Scenario Feature Measure	Culvert
Scenario Unit	Inch-Foot
Scenario Typical Size	720

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,609.72	\$3.62
Equipment/Installation	\$920.69	\$1.28
Labor	\$267.90	\$0.37
Mobilization	\$222.95	\$0.31
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,021.26	\$5.59

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	44	Rock Riprap, Placed with geotextile	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$63.36	2	\$126.72
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	50	\$1,335.00
Materials	1247	Pipe, HDPE, 30", CPT, Double Wall	Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	\$28.70	40	\$1,148.00
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$90.50	10	\$905.00
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.23	3	\$15.69
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	10	\$267.90
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	1	\$19.90

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	578 - Stream Crossing
Scenario ID	4
Scenario Name	Rip Rap Crossing
Scenario Description	A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles. This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford crossing is desired for livestock, people, and /or equipment. Stream bed in the channel reach containing the crossing must be vertically stable. Scenario is for stabilizing the bottom and slope of a stream channel using Rip Rap, gravel and geotextile. This scenario includes site preparation, dewatering, acquiring and installing rip rap and gravel on channel bottom and approaches. Scenario is based on a 20' wide x 50' long crossing. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.
Before Practice Situation	Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.
After Practice Situation	Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.
Scenario Feature Measure	Crossing dimensions
Scenario Unit	Square Foot
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,851.62	\$2.85
Equipment/Installation	\$59.94	\$0.06
Labor	\$53.58	\$0.05
Mobilization	\$203.05	\$0.20
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,168.19	\$3.17

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	44	Rock Riprap, Placed with geotextile	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$63.36	37	\$2,344.32
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	19	\$507.30
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$1.62	37	\$59.94
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	2
Scenario Name	Bioengineered
Scenario Description	<p>measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes.</p> <p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation, the stream has moderately degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
Before Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Linear Feet of Streambank/Shoreline Protected
Scenario Unit	Linear Foot
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$4,269.12	\$4.27
Equipment/Installation	\$6,134.96	\$6.13
Labor	\$11,667.97	\$11.67
Mobilization	\$2,064.73	\$2.06
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$24,136.78	\$24.14

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	100	\$125.00
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	2222	\$3,244.12
Materials	87	Fescue, Tall (Festuca arundinacea)	Introduced Perennial Grasses and shipping.	Pound	\$1.80	100	\$180.00
Materials	1426	Tree, willow	"Willow tree for planting, 18" to 36" seedling. Materials only."	Each	\$0.72	1000	\$720.00
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Equipment and labor cost included.	Acre	\$9.30	0.46	\$4.28
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$53.48	16	\$855.68
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.11	2500	\$5,275.00
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	16	\$362.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	320	\$6,374.40

Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	80	\$2,921.60
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	75	\$2,009.25
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	10	\$361.80
Mobilization	1138	Mobilization, small equipment	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	\$138.58	1	\$138.58
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	48	\$955.20
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	3	\$609.15

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	9
Scenario Name	Weir/Riffle Large
Scenario Description	<p>Protection of streambanks using a rock riffle to stabilize and protect banks of streams or excavated channels against scour and erosion by controlling down cutting. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; and gabions.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of a 1.5' high riffle on a stream with a 30' bottom width and 7' banks.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p> <p>Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation, the stream has severely degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Per structure installed
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,348.35	\$5,348.35
Equipment/Installation	\$1,778.12	\$1,778.12
Labor	\$647.76	\$647.76
Mobilization	\$379.78	\$379.78
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$8,154.01	\$8,154.01

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1200	Rock Riprap, graded, angular	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$28.91	185	\$5,348.35
Equipment/Installation	1228	Excavation, common earth, wet, side cast, large equipment	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$3.93	84	\$330.12
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$90.50	16	\$1,448.00
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	6	\$219.12
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	16	\$428.64
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	1	\$379.78

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	8
Scenario Name	Weir/Riffle Medium
Scenario Description	<p>Protection of streambanks using a rock riffle to stabilize and protect banks of streams or excavated channels against scour and erosion by controlling down cutting. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; and gabions.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of a 1.5' high riffle on a stream with a 20' bottom width and 6' banks.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p> <p>Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation, the stream has severely degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Per structure installed
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,931.76	\$3,931.76
Equipment/Installation	\$1,329.66	\$1,329.66
Labor	\$540.60	\$540.60
Mobilization	\$379.78	\$379.78
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$6,181.80	\$6,181.80

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1200	Rock Riprap, graded, angular	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$28.91	136	\$3,931.76
Equipment/Installation	1228	Excavation, common earth, wet, side cast, large equipment	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$3.93	62	\$243.66
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$90.50	12	\$1,086.00
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	6	\$219.12
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	12	\$321.48
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	1	\$379.78

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	7
Scenario Name	Weir/Riffle Small
Scenario Description	<p>Protection of streambanks using a rock riffle to stabilize and protect banks of streams or excavated channels against scour and erosion by controlling down cutting. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; and gabions.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of a 1' high riffle on a stream with a 8' bottom width and 5' banks.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p> <p>Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation, the stream has severely degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Per structure installed
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,618.96	\$1,618.96
Equipment/Installation	\$637.32	\$637.32
Labor	\$379.86	\$379.86
Mobilization	\$379.78	\$379.78
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,015.92	\$3,015.92

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1200	Rock Riprap, graded, angular	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$28.91	56	\$1,618.96
Equipment/Installation	1228	Excavation, common earth, wet, side cast, large equipment	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$3.93	24	\$94.32
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$90.50	6	\$543.00
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	6	\$219.12
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	6	\$160.74
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	1	\$379.78

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	3
Scenario Name	Structural
Scenario Description	<p>Protection of streambanks using rock riprap to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 10-foot high bank at 2(H):1(V) slope for 500 linear feet is used for estimation purposes. The rock will be 2' thick and 10' high. The bank above the riprap will be graded to a stable slope and revegetated.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all or the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Cubic Yard of Riprap
Scenario Unit	Cubic Yard
Scenario Typical Size	833

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$36,137.50	\$43.38
Equipment/Installation	\$7,717.46	\$9.26
Labor	\$871.52	\$1.05
Mobilization	\$452.14	\$0.54
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$45,178.62	\$54.24

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1200	Rock Riprap, graded, angular	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$28.91	1250	\$36,137.50
Equipment/Installation	932	Hydraulic Excavator, 2 CY	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$151.43	32	\$4,845.76
Equipment/Installation	42	Geotextile, woven	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.35	1222	\$2,871.70
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	32	\$725.44
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	1	\$379.78

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	5
Scenario Name	Stone Toe protection with vegetation
Scenario Description	Protection of streambanks using riprap toe protection with grass vegetation on the upper portion of the bank to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost includes rock rip rap, bank shaping, erosion control blanket and seeding. Typical installation consists of 4 vertical feet of riprap toe protection on a 2:1 slope, 2' thick. 4 vertical feet of bank above the rock will be shaped to a 4:1 slope, seeded to cool season vegetation and covered with erosion control blanket. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.
Before Practice Situation	A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.
After Practice Situation	The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.
Scenario Feature Measure	Linear Feet of Bank Protected
Scenario Unit	Foot
Scenario Typical Size	250

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$7,968.18	\$31.87
Equipment/Installation	\$2,926.66	\$11.71
Labor	\$519.76	\$2.08
Mobilization	\$419.58	\$1.68
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$11,834.18	\$47.34

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	45	\$56.25
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	458	\$668.68
Materials	1200	Rock Riprap, graded, angular	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	\$28.91	250	\$7,227.50
Materials	95	Smooth Bromegrass (Bromus inermis)	Introduced Perennial Grasses and shipping.	Pound	\$3.15	5	\$15.75
Equipment/Installation	1228	Excavation, common earth, wet, side cast, large equipment	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	\$3.93	560	\$2,200.80
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$90.50	8	\$724.00
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Equipment and labor cost included.	Acre	\$9.30	0.2	\$1.86
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36

Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	8	\$214.32
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	1	\$379.78
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	580 - Streambank and Shoreline Protection
Scenario ID	1
Scenario Name	Vegetative
Scenario Description	<p>Protection of streambanks consisting of conventional plantings of vegetation to stabilize and protect against scour and erosion.</p> <p>The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and erosion control fabric; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes.</p> <p>Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.</p> <p>Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility</p>
Before Practice Situation	<p>A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion.</p> <p>Soil Erosion: The streambank is unstable.</p> <p>Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.</p> <p>Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.</p> <p>Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.</p>
After Practice Situation	<p>The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.</p> <p>For Soil Erosion: The streambank is stable.</p> <p>For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.</p> <p>For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.</p> <p>For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.</p>
Scenario Feature Measure	Linear Feet of Streambank/Shoreline Protected
Scenario Unit	Linear Foot
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,549.12	\$3.55
Equipment/Installation	\$6,134.96	\$6.13
Labor	\$4,001.44	\$4.00
Mobilization	\$1,195.94	\$1.20
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$14,881.46	\$14.88

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	176	Ryegrass, Annual (Lolium multiflorum)	Annual Grasses, Cover Crops and shipping.	Pound	\$1.25	100	\$125.00
Materials	1213	Erosion Control Blanket, biodegradable	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials only.	Square Yard	\$1.46	2222	\$3,244.12
Materials	87	Fescue, Tall (Festuca arundinacea)	Introduced Perennial Grasses and shipping.	Pound	\$1.80	100	\$180.00
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.11	2500	\$5,275.00
Equipment/Installation	929	Dozer, 80 HP	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$53.48	16	\$855.68
Equipment/Installation	959	Seeding Operation, Broadcast, Ground	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Equipment and labor cost included.	Acre	\$9.30	0.46	\$4.28
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	56	\$2,045.12
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	80	\$1,593.60
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	16	\$362.72

Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	7	\$253.26
Mobilization	1138	Mobilization, small equipment	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	\$138.58	1	\$138.58
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	20	\$398.00

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	585 - Stripcropping
Scenario ID	1
Scenario Name	Stripcropping - water erosion
Scenario Description	This scenario describes the implementation of a stripcropping system that is designed specifically for the control of water erosion or minimizing the transport of sediments or other water borne contaminants originating from runoff on cropland. The planned stripcropping system will meet the current 585 standard. Implementation will result in alternating strips of erosion susceptible crops with erosion resistant crops that are oriented as close to perpendicular to water flows as possible. The designed system will reduce erosion/sediment/contaminants to desired objectives. Payment for implementation is to defray the costs of designing the system, installing the strips on the landscape appropriately, and integrating a crop rotation that includes water erosion resistant species.
Before Practice Situation	In this geographic area, excessive water erosion is caused by raising crops in a manner that allows water flows to travel unimpeded down the slope due to lack of residue or other conservation measures causing sheet and rill erosion or concentrated flow conditions, degradation of soil health through loss of topsoil and organic matter, along with offsite negative impacts to water quality and aquatic wildlife habitat.
After Practice Situation	A stripcropping system that includes at least two or more strips within the planning slope will be designed to include parallel strips of approximately equal widths of water erosion resistant crop species with non-water erosion resistant crop species. Widths will be determined using current water erosion prediction technology to meet objectives. The design and implementation of a stripcropping system will minimize sheet and rill erosion, protect soil quality, reduce offsite sedimentation, and benefit offsite aquatic wildlife habitat. Erosion prediction before and after practice application will be recorded showing the design and benefits of the practice. Erosion -resistant strips in rotation must be managed to maintain the planned vegetative cover and surface roughness.
Scenario Feature Measure	area of strips
Scenario Unit	Acre
Scenario Typical Size	80

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$76.53	\$0.96
Labor	\$209.88	\$2.62
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$286.41	\$3.58

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	3	\$76.53
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	2	\$150.12
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	3	\$59.76

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	9
Scenario Name	Drainage Water Management, <=10" pipe
Scenario Description	A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management
Before Practice Situation	The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.
After Practice Situation	The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres. A single structure with stoplogs may have its influence extended by use of buried float-activated control structures, which may be paid for as separate structures also.
Scenario Feature Measure	Number of Structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,113.00	\$1,113.00
Equipment/Installation	\$131.94	\$131.94
Labor	\$112.88	\$112.88
Mobilization	\$180.94	\$180.94
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,538.76	\$1,538.76

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	2145	Water Control Structure, Stoplog, Inline, fixed costs portion	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	\$303.88	1	\$303.88
Materials	2146	Water Control Structure, Stoplog, Inline, variable cost portion	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	\$11.74	48	\$563.52
Materials	994	Pipe, PVC, 8", SDR 35	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	\$6.14	40	\$245.60
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	3	\$131.94
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	2	\$73.04
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	1	\$19.90
Mobilization	1138	Mobilization, small equipment	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	\$138.58	1	\$138.58
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.46	1	\$22.46

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	10
Scenario Name	Drainage Water Management, >=12" pipe
Scenario Description	A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management
Before Practice Situation	The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.
After Practice Situation	The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres. A single structure with stoplogs may have its influence extended by use of buried float-activated control structures, which may be paid for as separate structures also.
Scenario Feature Measure	Number of Structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,677.36	\$1,677.36
Equipment/Installation	\$131.94	\$131.94
Labor	\$132.80	\$132.80
Mobilization	\$180.94	\$180.94
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,123.04	\$2,123.04

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1323	Pipe, PVC, dia. < 18", weight priced	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.39	380	\$528.20
Materials	2145	Water Control Structure, Stoplog, Inline, fixed costs portion	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	\$303.88	1	\$303.88
Materials	2146	Water Control Structure, Stoplog, Inline, variable cost portion	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	\$11.74	72	\$845.28
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	3	\$131.94
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	2	\$73.04
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	3	\$59.76
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	1	\$19.90
Mobilization	1138	Mobilization, small equipment	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	\$138.58	1	\$138.58
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.46	1	\$22.46

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	7
Scenario Name	Flap Gate, <=15"
Scenario Description	A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A Flap/Slide Gate with a pipe of 15" diameter or less is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, and flap gate.
Before Practice Situation	A wetland or other area is in need of a flap gate to control the flow of water through a pipe to provide habitat for fish and wildlife. The landowner wishes to provide a way for water to flow into a managed wetland pool yet automatically prevent flow from leaving the pool when the water source inflow head becomes less than the pool head.
After Practice Situation	A WCS pipe with flap gate 15" or less in diameter is installed. The pipe is installed through a water management embankment allowing shallow water impoundments to take on water from a higher elevation such as floodwater. When the surface of the inflow water source drops to an elevation that is lower than the wetland pool water surface, the flap gate automatically closes, preventing the loss of water from the wetland area. A wetland area is enhanced by having the ability to automatically fill with water when the hydrologic opportunity presents itself to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Number of structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,297.42	\$1,297.42
Equipment/Installation	\$263.88	\$263.88
Labor	\$525.02	\$525.02
Mobilization	\$203.05	\$203.05
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,289.37	\$2,289.37

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1375	Steel, Plate, 3/8"	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$13.55	4	\$54.20
Materials	1047	Steel, Plate, 1/4"	Flat Steel Plate, 1/4" thick, materials only.	Square Foot	\$4.15	49	\$203.35
Materials	1722	Pipe, PVC, 15", SDR 35	Materials: 15" - PVC - SDR35 - ASTM D3034	Foot	\$13.21	65	\$858.65
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	82	\$181.22
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	6	\$263.88
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	12	\$239.04
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	4	\$125.24
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	6	\$160.74
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	8
Scenario Name	Flapgate, >15"
Scenario Description	A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A Flap/Slide Gate with a pipe of greater than 15" diameter is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, and flap gate.
Before Practice Situation	A wetland or other area is in need of a flap gate to control the flow of water through a pipe to provide habitat for fish and wildlife. The landowner wishes to provide a way for water to flow into a managed wetland pool yet automatically prevent flow from leaving the pool when the water source inflow head becomes less than the pool head.
After Practice Situation	A WCS pipe with flap gate greater than 15" in diameter is installed. The pipe is installed through a water management embankment allowing shallow water impoundments to take on water from a higher elevation such as floodwater. When the surface of the inflow water source drops to an elevation that is lower than the wetland pool water surface, the flap gate automatically closes, preventing the loss of water from the wetland area. A wetland area is enhanced by having the ability to automatically fill with water when the hydrologic opportunity presents itself to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Number of structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,762.90	\$2,762.90
Equipment/Installation	\$263.88	\$263.88
Labor	\$556.33	\$556.33
Mobilization	\$203.05	\$203.05
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,786.16	\$3,786.16

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1375	Steel, Plate, 3/8"	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$13.55	8	\$108.40
Materials	1254	Pipe, PVC, 24", PS 46	Pipe, PVC, PS 46, 24" Diameter - ASTM F679. Material cost only.	Each	\$32.44	65	\$2,108.60
Materials	1047	Steel, Plate, 1/4"	Flat Steel Plate, 1/4" thick, materials only.	Square Foot	\$4.15	49	\$203.35
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	155	\$342.55
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	6	\$263.88
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	12	\$239.04
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	5	\$156.55
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	6	\$160.74
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	2
Scenario Name	Commercial Inline WCS, 12"-18" Pipe
Scenario Description	An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 65' of 15" SDR35 PVC (inlet and outlet combined).
Before Practice Situation	The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.
After Practice Situation	A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Feet of Pipe
Scenario Unit	Foot
Scenario Typical Size	65

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,605.31	\$40.08
Equipment/Installation	\$377.45	\$5.81
Labor	\$338.18	\$5.20
Mobilization	\$203.05	\$3.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,523.99	\$54.22

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1375	Steel, Plate, 3/8"	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$13.55	4	\$54.20
Materials	1425	Water Control Structure, Stoplog, Inline, 20"x24"x6', 15" diameter	Water Level Control Structure, Inline stoplog type, 20" wide x 24" deep x 6' high suitable for a 15" diameter pipe. Typically made of PVC or fiberglass materials. Materials only.	Each	\$1,366.26	1	\$1,366.26
Materials	1047	Steel, Plate, 1/4"	Flat Steel Plate, 1/4" thick, materials only.	Square Foot	\$4.15	36	\$149.40
Materials	1722	Pipe, PVC, 15", SDR 35	Materials: 15" - PVC - SDR35 - ASTM D3034	Foot	\$13.21	65	\$858.65
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	80	\$176.80
Equipment/Installation	930	Hydraulic Excavator, .5 CY	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	\$44.90	2	\$89.80
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.23	55	\$287.65
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	4	\$125.24
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	3
Scenario Name	Commercial Inline WCS, >18" Pipe
Scenario Description	An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 31", height of six feet, The pipe is 65' of 24" used steel (inlet and outlet combined).
Before Practice Situation	The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.
After Practice Situation	A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Feet of Pipe
Scenario Unit	Foot
Scenario Typical Size	65

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$6,176.29	\$95.02
Equipment/Installation	\$377.45	\$5.81
Labor	\$526.04	\$8.09
Mobilization	\$203.05	\$3.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$7,282.83	\$112.04

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1375	Steel, Plate, 3/8"	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$13.55	8	\$108.40
Materials	1360	Pipe, Steel, 24", Std Wt, USED	Materials: - USED - 24" - Steel Std Wt	Foot	\$54.27	65	\$3,527.55
Materials	2146	Water Control Structure, Stoplog, Inline, variable cost portion	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	\$11.74	144	\$1,690.56
Materials	2145	Water Control Structure, Stoplog, Inline, fixed costs portion	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	\$303.88	1	\$303.88
Materials	1047	Steel, Plate, 1/4"	Flat Steel Plate, 1/4" thick, materials only.	Square Foot	\$4.15	49	\$203.35
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	155	\$342.55
Equipment/Installation	930	Hydraulic Excavator, .5 CY	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	\$44.90	2	\$89.80
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.23	55	\$287.65
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	10	\$313.10
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58

Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05
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Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	1
Scenario Name	Commercial Inline WCS, 6"-10" Pipe
Scenario Description	An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 12", height of six feet, The pipe is 65' of 8" SCH 40 PVC (inlet and outlet combined).
Before Practice Situation	The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.
After Practice Situation	A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Feet of pipe
Scenario Unit	Foot
Scenario Typical Size	65

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,618.70	\$24.90
Equipment/Installation	\$377.45	\$5.81
Labor	\$212.94	\$3.28
Mobilization	\$203.05	\$3.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,412.14	\$37.11

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	2146	Water Control Structure, Stoplog, Inline, variable cost portion	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	\$11.74	48	\$563.52
Materials	2145	Water Control Structure, Stoplog, Inline, fixed costs portion	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	\$303.88	1	\$303.88
Materials	1047	Steel, Plate, 1/4"	Flat Steel Plate, 1/4" thick, materials only.	Square Foot	\$4.15	36	\$149.40
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	40	\$88.40
Materials	981	Pipe, PVC, 8", SCH 40	Materials: - 8" - PVC - SCH 40 - ASTM D1785	Foot	\$7.90	65	\$513.50
Equipment/Installation	930	Hydraulic Excavator, .5 CY	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	\$44.90	2	\$89.80
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.23	55	\$287.65
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	11
Scenario Name	Straight Pipe, <=10"
Scenario Description	Used as an outlet for Wetland; no drop box; straight through 10" diameter PVC pipe; pipe is backfilled with #57 stone to 1' over the top of the pipe; 12" thick layer of Type D riprap is placed at the outlet end with 6" thick of #57 stone under it.
Before Practice Situation	The landowner wishes to establish a wetland area to provide habitat for fish and wildlife.
After Practice Situation	A straight pipe (principal spillway) is installed through an earth embankment to create a wetland. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Feet of pipe installed
Scenario Unit	Foot
Scenario Typical Size	30

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$448.16	\$14.94
Equipment/Installation	\$219.90	\$7.33
Labor	\$233.55	\$7.79
Mobilization	\$203.05	\$6.77
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,104.66	\$36.82

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1251	Pipe, PVC, 10", SDR 35	Pipe, PVC, SDR 35, 10" Diameter - ASTM D3034. Material cost only.	Foot	\$9.63	30	\$288.90
Materials	2131	Rock Riprap, graded, angular, material only	Graded Rock Riprap for 12" to 24" size ranges. Includes material costs only. Shipping not included.	Ton	\$12.88	2	\$25.76
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	5	\$133.50
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	5	\$219.90
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	5	\$133.95
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	5	\$99.60
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	12
Scenario Name	Straight Pipe, >=12"
Scenario Description	Used as an outlet for Wetland; no drop box; straight through 12" diameter PVC pipe; pipe is backfilled with #57 stone to 1' over the top of the pipe; 12" thick layer of Type D riprap is placed at the outlet end with 6" thick of #57 stone under it.
Before Practice Situation	The landowner wishes to establish a wetland area to provide habitat for fish and wildlife.
After Practice Situation	A straight pipe (principal spillway) is installed through an earth embankment to create a wetland. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Feet of pipe installed
Scenario Unit	Foot
Scenario Typical Size	30

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$678.02	\$22.60
Equipment/Installation	\$219.90	\$7.33
Labor	\$233.55	\$7.79
Mobilization	\$203.05	\$6.77
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,334.52	\$44.48

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1323	Pipe, PVC, dia. < 18", weight priced	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.39	354	\$492.06
Materials	2131	Rock Riprap, graded, angular, material only	Graded Rock Riprap for 12" to 24" size ranges. Includes material costs only. Shipping not included.	Ton	\$12.88	2	\$25.76
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	6	\$160.20
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	5	\$219.90
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	5	\$133.95
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	5	\$99.60
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	4
Scenario Name	Weir box with <=16" pipe
Scenario Description	A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure with a pipe of 16" diameter or less is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, flap gate and weir box structure.
Before Practice Situation	The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.
After Practice Situation	A weir box structure is placed in a levee to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Number of structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,831.66	\$2,831.66
Equipment/Installation	\$377.45	\$377.45
Labor	\$463.42	\$463.42
Mobilization	\$203.05	\$203.05
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,875.58	\$3,875.58

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1372	Steel, Angle, 3" x 3" x 1/4"	Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36	Foot	\$3.21	30	\$96.30
Materials	1375	Steel, Plate, 3/8"	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$13.55	4	\$54.20
Materials	1357	Pipe, Steel, 16", Std Wt, USED	Materials: - USED - 16" - Steel Std Wt	Foot	\$32.27	65	\$2,097.55
Materials	1047	Steel, Plate, 1/2"	Flat Steel Plate, 1/2" thick, materials only.	Square Foot	\$4.15	49	\$203.35
Materials	1048	Steel, Plate, 3/16"	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	\$6.22	32	\$199.04
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	82	\$181.22
Equipment/Installation	930	Hydraulic Excavator, .5 CY	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	\$44.90	2	\$89.80
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.23	55	\$287.65
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	8	\$250.48
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	5
Scenario Name	Weir Box with >16" pipe
Scenario Description	A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure with a pipe of greater than 16" diameter is placed in a levee to manage water level elevation. Payment incorporates pipe, anti seep collar, trash guard, animal guard, flap gate and weir box structure.
Before Practice Situation	The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.
After Practice Situation	A weir box structure is placed in a levee to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Number of structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$4,423.24	\$4,423.24
Equipment/Installation	\$377.45	\$377.45
Labor	\$494.73	\$494.73
Mobilization	\$203.05	\$203.05
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$5,498.47	\$5,498.47

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1372	Steel, Angle, 3" x 3" x 1/4"	Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36	Foot	\$3.21	30	\$96.30
Materials	1375	Steel, Plate, 3/8"	Flat steel plate, 3/8" thickness. Materials only.	Square Foot	\$13.55	8	\$108.40
Materials	1360	Pipe, Steel, 24", Std Wt, USED	Materials: - USED - 24" - Steel Std Wt	Foot	\$54.27	65	\$3,527.55
Materials	1047	Steel, Plate, 1/2"	Flat Steel Plate, 1/2" thick, materials only.	Square Foot	\$4.15	36	\$149.40
Materials	1048	Steel, Plate, 3/16"	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	\$6.22	32	\$199.04
Materials	1608	Trash Guard, metal	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	\$2.21	155	\$342.55
Equipment/Installation	930	Hydraulic Excavator, .5 CY	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	\$44.90	2	\$89.80
Equipment/Installation	50	Earthfill, Manually Compacted	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.23	55	\$287.65
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	9	\$281.79
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	2	\$53.58
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Engineering General
Practice Code/Name	587 - Structure for Water Control
Scenario ID	6
Scenario Name	Weir Box Only for existing subsurface system
Scenario Description	A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. This practice applies wherever a permanent structure is needed as an integral part of a water-control system. A fabricated weir box structure is installed on existing piping.
Before Practice Situation	The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.
After Practice Situation	A weir box structure is placed in a levee over an existing subsurface system to manage water level elevation. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.
Scenario Feature Measure	Number of structures
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$295.34	\$295.34
Equipment/Installation	\$51.02	\$51.02
Labor	\$165.08	\$165.08
Mobilization	\$39.80	\$39.80
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$551.24	\$551.24

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1372	Steel, Angle, 3" x 3" x 1/4"	Materials: Angle, 3" x 3" x 1/4", Meets ASTM A36	Foot	\$3.21	30	\$96.30
Materials	1048	Steel, Plate, 3/16"	Flat Steel Plate, 3/16" thick, materials only.	Square Foot	\$6.22	32	\$199.04
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	4	\$125.24
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	7
Scenario Name	Adaptive NM
Scenario Description	The practice scenario is for the implementation of nutrient management on a small plot where Nitrogen use efficiency is evaluated. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement various nutrient use efficiency improvement methods for timing, rate, method of application, or source of nutrients.
Before Practice Situation	The practice will be installed on cropland (small grain rotation or typical corn-soybean rotation) to address water quality degradation, air quality degradation and energy concerns. The scenario applies to non-organic and organic operations.
After Practice Situation	Installation of this scenario will result in adopting the four R's of nutrient management (right source, right rate, right timing and right placement) by following the procedures outlined in Agronomy Technical Note 6 - Adaptive Nutrient Management. Implementation involves establishing the replicated plots to evaluate one or more of the 4 R's. The plot consists of 7 replicated plots designed, laid out, managed and evaluated with the assistance of technical service provider certified in nutrient management planning and implementation. Results are used to make nutrient application decisions to address water quality degradation issues and nutrient use efficiencies. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 6 - Adaptive Nutrient Management. The yields for each plot will be adjusted to the appropriate moisture content.
Scenario Feature Measure	
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$848.10	\$848.10
Equipment/Installation	\$2.40	\$2.40
Labor	\$1,069.32	\$1,069.32
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$150.27	\$150.27
Foregone Income	\$0.00	\$0.00
Total	\$2,070.09	\$2,070.09

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	301	Test, Plant Tissue Test	Tissue analysis for crops	Each	\$24.61	21	\$516.81
Materials	300	Test, Soil Test, Precision, Grid or Zone	Includes materials, labor, and equipment costs.	Each	\$12.45	2	\$24.90
Materials	311	Test, Soil Nitrogen Testing	Pre-Side Dress/Deep Soil Testing	Each	\$14.59	21	\$306.39
Equipment/Installation	966	Satellite imagery, aerial photography, infrared	Infrared imagery	Acre	\$0.12	20	\$2.40
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	10	\$750.60
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	16	\$318.72
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$116.67	1	\$116.67
Acquisition of Technical Knowledge	297	Transportation	Mileage to attend a training conference, workshop, or TSP travel associated with developing Conservation Activity Plan.	Mile	\$0.56	60	\$33.60

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	2
Scenario Name	Basic NM
Scenario Description	This scenario describes the implementation of a basic nutrient management system on cropland or hayland (non-organic and organic) where there is no manure application. The planned NM system will meet the current 590 standard. Implementation will result in the proper rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Records demonstrating implementation of the 4 R's of the NM criteria will be required.
Before Practice Situation	In this geographic area, a fertility program is either non-existent or does not meet the 590 nutrient management standard. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients.
After Practice Situation	<p>Plan Development</p> <ul style="list-style-type: none"> A nutrient management system will be developed to meet the NRCS 590 standard. The development and implementation of a nutrient management plan (NMP) will benefit plant productivity and reduce off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. <p>Testing/Nutrient Data Collection</p> <ul style="list-style-type: none"> On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. The use post-harvest of soil tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. <p>Producer Activities/Equipment Needed</p> <ul style="list-style-type: none"> Records are maintained annually documenting current soil test, analysis, amount of application, forms and rates of nutrients for each field, including post harvest analysis. Applications will be completed in a manner that minimizes nutrient runoff and leaching or build up of excess nutrient concentrations.
Scenario Feature Measure	
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$19.06	\$0.48
Equipment/Installation	\$25.51	\$0.64
Labor	\$490.20	\$12.26
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$534.77	\$13.37

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	299	Test, Soil Test, Standard	Includes materials, labor, and equipment costs.	Each	\$9.53	2	\$19.06
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	1	\$25.51
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	6	\$450.36
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	3
Scenario Name	Basic NM with Manure

Scenario Description	This scenario describes the implementation of a basic nutrient management system on cropland or hayland (non-organic and organic) where there is manure or compost application in addition to commercial fertilizer applications. The planned NM system will meet the current 590 standard. Implementation will result in the proper rate, source, method of placement, and timing of nutrients while minimizing off-site degradation or the excessive built up of N and P. Payment for implementation is to defray the costs of soil testing, manure testing, analysis, proper implementation, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Risk assessments including PI (phosphorus index) and NI (nitrogen index) will be completed with applications of manure completed based on risk results. Records demonstrating implementation of the 4 R's of the NM plan will be required along with copies of risk assessments.
Before Practice Situation	In this geographic area, a fertility program is either non-existent or does not meet the 590 nutrient management standard. Soil testing and manure testing is not completed on a regular basis and applications of nutrients are not based on land grant university recommendations or a nutrient budget. Nutrients and manure solids are transported to surface waters through runoff or erosion or to groundwater through leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection often times resulting in wind, sheet, rill, and ephemeral erosion.
After Practice Situation	<p>Plan Development</p> <ul style="list-style-type: none"> A nutrient management system that includes manure as a source will be developed to meet the NRCS 590 standard. The development and implementation of a nutrient management plan (NMP) will benefit plant productivity and reduce off-site degradation. A nutrient management budget will be developed for each field(s) based on soil tests and manure test analysis along with land grant university recommendations or crop removal rates. <p>Testing/Nutrient Data Collection</p> <ul style="list-style-type: none"> Soil testing is completed according to LGU recommendations. The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. Applications of manure are based on risk assessments (PI - phosphorus index). The use of post-harvest soil tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N. The use of Pre side-dress soil nitrogen test (PSNT) or a Pre Top Dress Tissue test (PTDTT) prior to the rapid biomass growth of the plant will assist the producer in evaluating the mineralization of Nitrogen from manures / cover crops in providing adequate nitrogen to meet the crop requirements, thus reducing the potential for off-site impacts. <p>Producer Activities/Equipment Needed</p> <ul style="list-style-type: none"> Records are maintained annually documenting current soil tests, manure tests, analyses, amount of application, forms and rates of nutrients for each field, including
Scenario Feature Measure	
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$62.12	\$1.55
Equipment/Installation	\$25.51	\$0.64
Labor	\$735.30	\$18.38
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$822.93	\$20.57

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	1	\$43.06
Materials	299	Test, Soil Test, Standard	Includes materials, labor, and equipment costs.	Each	\$9.53	2	\$19.06
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	1	\$25.51
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	9	\$675.54
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	3	\$59.76

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	4
Scenario Name	Enhanced NM
Scenario Description	This scenario describes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced. An enhanced nutrient management system includes activities such as split applications, multiple nutrient concentration tests (other than only soil tests) and methods that more concisely enable scheduling of appropriate fertilizer applications. Nutrients are transported to surface waters through runoff or wind erosion in quantities that degrade water quality and limit use of intended purposes. Inefficient energy utilization occurs due to traditional methods and forms of fertilizer applications.
Before Practice Situation	In this geographic area, conventional fertility programs involve very little or no soil testing. Application of fertilizers and amendments, are completed annually based upon tradition that does not specifically consider the detrimental affects of improper timing or rates of nutrients, or excess nutrient build-up in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Runoff flows into adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters or leaching of nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil quality may also be detrimentally affected. The current system is also typically inefficient energy user due to traditional methods, forms, and amounts of nutrient applications.
After Practice Situation	<p>Plan Development:</p> <ul style="list-style-type: none"> The development and implementation of a Nutrient Management Plan (NMP) will benefit plant productivity and reduce off-site movement of nutrients. The NMP will stress the use of the four R's (Right Source of Nutrients, Right Time of Application, Right Rate, and Right Method of Application). These include practices such as use of split applications, slow release nutrients, proper timing of application, more appropriate formulations, banding, etc. A nutrient budget is developed for each field or section of field annually. Further minimization of risk is accomplished by identifying the variability across the field(s) by using soil survey maps or other simple techniques to establish zones, along with zonal soil testing. <p>Testing/Nutrient data collection:</p> <ul style="list-style-type: none"> The use of pre-plant soil tests will assist with the development of the annual nutrient budget in accordance with Land Grant University fertilizer guides. Soil testing is completed according to LGU recommendations. Use of a post-harvest soil test (interpreted by a crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Analysis are completed at least once every three years for N-P-K (soil tests). <p>Producer Activities/Equipment Needed:</p> <ul style="list-style-type: none"> Applications of nutrients are completed using a GPS guided variable rate fertilizer applicator. Application of nutrients via fertilizers, and/or manures applied in a manner that minimizes nutrient runoff and leaching. Application rates of all sources of nutrients are based upon soil tests and either LGU recommendations, crop removal rates, or industry standard. Record keeping will document application of nutrients based on the 4 R's. Nutrients are applied at rates based on soil test zone analyses. The producer will attend training of "crop school or nutrient management workshop" or similar activity annually to stay current on crop-specific nutrient management.
Scenario Feature Measure	
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$186.75	\$4.67
Equipment/Installation	\$472.40	\$11.81
Labor	\$640.32	\$16.01
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$326.52	\$8.16
Foregone Income	\$0.00	\$0.00
Total	\$1,625.99	\$40.65

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	300	Test, Soil Test, Precision, Grid or Zone	Includes materials, labor, and equipment costs.	Each	\$12.45	15	\$186.75
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Equipment/Installation	965	All terrain vehicles, ATV	Includes equipment and labor costs.	Hour	\$27.89	2	\$55.78
Equipment/Installation	952	Fertilizer, precision application	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	\$9.14	40	\$365.60
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	8	\$600.48
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Acquisition of Technical Knowledge	297	Transportation	Mileage to attend a training conference, workshop, or TSP travel associated with developing Conservation Activity Plan.	Mile	\$0.56	60	\$33.60
Acquisition of Technical Knowledge	296	Training, Registration Costs	Conference Registration Fees	Each	\$176.25	1	\$176.25
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$116.67	1	\$116.67

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	5
Scenario Name	Enhanced NM with Manure
Scenario Description	This scenario describes a conventional cropping system where either no nutrient management or only a basic nutrient management is being practiced. Manure is applied in addition to commercial fertilizer. An enhanced nutrient management system includes split applications and multiple nutrient concentration tests (other than only soil tests) and methods that more concisely enable scheduling of appropriate fertilizer applications. Nutrients are transported to surface waters through runoff or wind erosion in quantities that degrade water quality and limit use of intended purposes. Inefficient energy utilization occurs due to traditional methods and forms of fertilizer applications.
Before Practice Situation	In this geographic area, conventional fertility programs involve very little or no soil or manure testing. Application of fertilizers, including manures and amendments, are completed annually based upon tradition that does not specifically consider the detrimental affects of improper timing or rates of nutrients, or excess nutrient build-up in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Runoff flows into adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters or leaching of nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil quality may also be detrimentally affected. The current system is also typically inefficient energy user due to traditional methods, forms, and amounts of nutrient applications.
After Practice Situation	<p>Plan Development</p> <ul style="list-style-type: none"> The development and implementation of a Nutrient Management Plan (NMP) will benefit plant productivity and reduce off-site movement of nutrients. The NMP will stress the use of the four R's (Right Source of Nutrients, Right Time of Application, Right Rate, and Right Method of Application). These include practices such as use of split applications, slow release nutrients, proper timing of application, more appropriate formulations, banding, etc. A nutrient budget is developed for each field or section of field annually. <p>Testing/Nutrient data collection</p> <ul style="list-style-type: none"> Soil testing is completed according to LGU recommendations. Analysis are completed at least once every three years for N-P-K (soil tests). The use of pre-plant soil tests will assist with the development of the annual nutrient budget in accordance with Land Grant University fertilizer guides. Use of a post-harvest soil test and manure tests (interpreted by a crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Further minimization of risk is accomplished by identifying the variability across the field(s) by using soil survey maps or other simple techniques to establish zones, along with zonal soil testing. <p>Producer Activities/Equipment Needed</p> <ul style="list-style-type: none"> Applications of nutrients are completed using a GPS guided variable rate fertilizer applicator. Record keeping will document application of nutrients based on the 4 R's. Nutrients and manure are applied at rates based on soil test zone analyses. The producer attends training of "crop school or nutrient management workshop" or similar activity annually to stay current on crop-specific nutrient management. Typical treatment area is 40 acres. Application of nutrients via fertilizers, and/or manures applied in a manner that minimizes nutrient runoff and leaching.
Scenario Feature Measure	
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$229.81	\$5.75
Equipment/Installation	\$472.40	\$11.81
Labor	\$980.40	\$24.51
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$326.52	\$8.16
Foregone Income	\$0.00	\$0.00
Total	\$2,009.13	\$50.23

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	1	\$43.06
Materials	300	Test, Soil Test, Precision, Grid or Zone	Includes materials, labor, and equipment costs.	Each	\$12.45	15	\$186.75
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Equipment/Installation	952	Fertilizer, precision application	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	\$9.14	40	\$365.60
Equipment/Installation	965	All terrain vehicles, ATV	Includes equipment and labor costs.	Hour	\$27.89	2	\$55.78
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	12	\$900.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Acquisition of Technical Knowledge	296	Training, Registration Costs	Conference Registration Fees	Each	\$176.25	1	\$176.25
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$116.67	1	\$116.67
Acquisition of Technical Knowledge	297	Transportation	Mileage to attend a training conference, workshop, or TSP travel associated with developing Conservation Activity Plan.	Mile	\$0.56	60	\$33.60

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	6
Scenario Name	Enhanced NM with Tissue Testing
Scenario Description	This scenario describes the implementation of an advanced precision nutrient management system on cropland. The planned NM system will meet the current 590 standard. Payment for implementation is to defray the costs of soil testing, analysis, consultant services, skilled labor and specialized nutrient application that provide nutrient proper recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, recordkeeping, and monitoring on a precision level that includes split applications, NDVI sensing, and aerial imaging. Records are kept demonstrating implementation of the 4 R's of the NM plan. This scenario goes beyond the enhanced system by using technologies that improve efficiency and effectiveness of nutrient management by utilizing specialized precision techniques and tools (variable rate applicators, NDVI, aerial photography, yield monitoring, plant tissue testing). Precision nutrient mgmt techniques ensure that the right rate, proper timing, and proper placement of nutrients minimize non-point source pollution and provide proper amounts of nutrients to the crop where it is needed and not applying where it is not needed.
Before Practice Situation	In this geographic area, a fertility program is already in place, however, application of nutrients across large acreages is based on a lack of representative soil samples or analyses. The current NM system may or may not meet 590 standards, however, could be improved by reducing energy inputs and utilizing precise mapping and diagnostic equipment. Because whole fields are often fertilized with the same rate, excess nutrients may be applied in some areas while inadequate amounts of nutrients are applied in other areas. Excess nutrients are transported to surface waters through runoff or erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fertilizer applications are made in their entirety more than 30 days prior to planting. Applications do not consider the detrimental affects of improper timing or improper rates. Whole fields with like crops and rotation are fertilized the same.
After Practice Situation	<p>Plan Development</p> <ul style="list-style-type: none"> An application rate (prescription) is developed for each zone based on representative soil analysis and a zone nutrient budget. A nutrient budget is developed for each field annually. Yield monitoring maps will be collected and utilized (where technology allows) to develop the following year nutrient applications. <p>Testing/Nutrient Data Collection</p> <ul style="list-style-type: none"> Soil testing is completed in a fashion that provides a representative assessment of nutrient concentrations in each field or planning unit including zone directed sampling, real time NDVI (normalized differenced vegetative index) sensing, EC Index type sampling, or via high definition aerial photography that allows for the identification of numerous variations (zones) in a planning unit. Zone maps are created and a nutrient budget developed for each zone. Soil testing is completed annually for N and at least once every three years for P-K. Plant tissue samples collected and evaluated. <p>Producer Activities/Equipment Needed</p> <ul style="list-style-type: none"> Application of nutrients is completed so that non-point source pollution is minimized. Nutrients are applied based on realistic yield expectations. The average field size is >=40acres. Applications of nutrients are completed using a GPS guided variable rate fertilizer applicator. Applications of nutrients will be completed in split applications where a majority of the N needs are applied based on the needs of the crop based on growing season requirements. Advanced training may be needed to effectively implement the practice. Producer attends training courses and use specialized labor where needed in the annual maintenance of the NM plan.
Scenario Feature Measure	
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$225.95	\$5.65
Equipment/Installation	\$1,013.60	\$25.34
Labor	\$1,082.86	\$27.07
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$326.52	\$8.16
Foregone Income	\$0.00	\$0.00
Total	\$2,648.93	\$66.22

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	301	Test, Plant Tissue Test	Tissue analysis for crops	Each	\$24.61	1	\$24.61
Materials	300	Test, Soil Test, Precision, Grid or Zone	Includes materials, labor, and equipment costs.	Each	\$12.45	15	\$186.75
Materials	311	Test, Soil Nitrogen Testing	Pre-Side Dress/Deep Soil Testing	Each	\$14.59	1	\$14.59
Equipment/Installation	1125	Chlorophyll Reader	Applicator and chlorophyll sensor includes labor. No materials	Acre	\$10.74	40	\$429.60
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Equipment/Installation	952	Fertilizer, precision application	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acre	\$9.14	40	\$365.60
Equipment/Installation	965	All terrain vehicles, ATV	Includes equipment and labor costs.	Hour	\$27.89	4	\$111.56
Equipment/Installation	966	Satellite imagery, aerial photography, infrared	Infrared imagery	Acre	\$0.12	40	\$4.80
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	12	\$900.72
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	6	\$119.52

Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	2	\$62.62
Acquisition of Technical Knowledge	296	Training, Registration Costs	Conference Registration Fees	Each	\$176.25	1	\$176.25
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$116.67	1	\$116.67
Acquisition of Technical Knowledge	297	Transportation	Mileage to attend a training conference, workshop, or TSP travel associated with developing Conservation Activity Plan.	Mile	\$0.56	60	\$33.60

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	590 - Nutrient Management
Scenario ID	1
Scenario Name	Specialty Crop NM
Scenario Description	Small farm/diversified systems include CSA's (community supported agriculture), truck crop farms, market gardens, orchards, etc., where numerous variable crops are grown on small acreages. This scenario attempts to capture the higher cost/acre of nutrient management planning and implementation on smaller production areas (usually between 0.25-10 acres) with multiple crops, often times with multiple harvests per year, that require intense and diversified nutrient management. The planned NM system for this organic or conventional production system will meet current 590 Nutrient Management criteria. Payment for implementation of this scenario is to defray the costs of soil testing, manure and/or compost analysis, training attendance, and consultant services that provide nutrient management recommendations, associated nutrient budgets, and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required.
Before Practice Situation	In this geographic area, a fertility program does not meet the 590 nutrient management standard. Soil testing is not completed on a regular basis and applications of fertilizers, amendments, manure, and/or compost are not based on land grant university recommendations or a nutrient budget. Nutrients are transported to surface waters through runoff or erosion or to groundwater by leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods.
After Practice Situation	<p>Plan Development</p> <ul style="list-style-type: none"> A nutrient management system will be developed to meet the 590 nutrient management standard and national organic program regulations where applicable. A nutrient management budget will be developed annually for each "crop block" or each crop rotation pertaining to a block of ground based on soil test analysis and land grant university recommendations or crop removal rates. <p>Testing/Nutrient Data Collection</p> <ul style="list-style-type: none"> Application rates of all nutrients are based upon soil test analyses either LGU recommendations, crop removal rates, or industry standard. <p>Producer Activities/Equipment Needed</p> <ul style="list-style-type: none"> Application of nutrients will be completed at the proper rate, timing, and methods, and sources. Applications will be completed in a manner that minimizes nutrient runoff and leaching or build up of excess nutrient concentrations. Specialized training is acquired by attending annual workshops and/or conferences. Records will be maintained annually of the current soil test, analyses, amount of application, forms and rates of nutrients for each crop block.
Scenario Feature Measure	
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$62.12	\$62.12
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,280.64	\$1,280.64
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$326.52	\$326.52
Foregone Income	\$0.00	\$0.00
Total	\$1,669.28	\$1,669.28

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	1	\$43.06
Materials	299	Test, Soil Test, Standard	Includes materials, labor, and equipment costs.	Each	\$9.53	2	\$19.06
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hour	\$75.06	16	\$1,200.96
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Acquisition of Technical Knowledge	297	Transportation	Mileage to attend a training conference, workshop, or TSP travel associated with developing Conservation Activity Plan.	Mile	\$0.56	60	\$33.60
Acquisition of Technical Knowledge	296	Training, Registration Costs	Conference Registration Fees	Each	\$176.25	1	\$176.25
Acquisition of Technical Knowledge	294	Training, Workshops	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$116.67	1	\$116.67

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	591 - Amend. for Treat. of Ag. Waste
Scenario ID	1
Scenario Name	Litter Amendments for Air Quality With Partially Treated Brood Chamber
Scenario Description	This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. An entire poultry house is treated year round for air quality impacts. In the winter, the producer or integrator treats the brood chamber between flocks with litter amendments solely for bird health and production. The amount being applied by the producer or integrator in winter months does not meet the air quality resource concerns. Additional litter amendments are added in winter for Air Quality benefits not being applied by the integrator. Litter amendments are applied spring through fall for entire flocks. NRCS is not responsible for the litter amendments already being applied by the integrator for the purposes of production and bird health. The purpose of the practice is to address resource concerns related to air quality impacts due to particulate matter and precursors, and objectionable odors. Associated practices: Nutrient Management (590).
Before Practice Situation	No litter amendments are being applied during the spring through fall months. An amendment is being applied at a lower application rate during the winter months, typically half the house and only two flocks. Partial winter application is solely for production purposes and the lower application rate is not enough to address the air quality resource concerns. The operation raises 4 flocks per year and the integrator partially treats 2 flocks in the winter months. Approximately 18.7% of the needed litter amendments are being applied and only during the winter months.
After Practice Situation	An NRCS approved amendment is applied between each flock. All flocks are optimally treated with litter amendments year-round. A typical broiler operation with 4 flocks in a 42' x 500' house (21,000 square feet) is treated to reduce the impacts on air quality. Typically 100 pounds of litter amendments per 1000 square feet are applied 4 times annually. The total amendment applied is adjusted by 81.3% to account for the portion of the brood chamber that is receiving partial application during the winter months. The amendment is proven to control the odor, to reduce ammonia emissions from the litter. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts from objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns. Formula to calculate the number of 1000 SF units: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of applications/year) = Number of 1000SF/year. 21,000 SF / 1000 SF X 1 house X 4 app/yr = 84 units of 1000SF
Scenario Feature Measure	Number of 1000SF applications per year
Scenario Unit	1000 Square Feet
Scenario Typical Size	84

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,419.44	\$28.80
Equipment/Installation	\$174.01	\$2.07
Labor	\$0.00	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,593.45	\$30.87

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1686	Ag Waste Amendment, sodium bisulfate	Sodium bisulfate poultry litter amendment. NRCS approved for air quality concerns to reduce ammonia emissions from the litter. Materials only.	Ton	\$711.60	3.4	\$2,419.44
Equipment/Installation	2020	Application of ag waste amendment for poultry litter	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	\$51.18	3.4	\$174.01

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	591 - Amend. for Treat. of Ag. Waste
Scenario ID	5
Scenario Name	Liquid Animal Waste Amendment
Scenario Description	This practice scenario includes the treatment of liquid animal waste for odor control. The purpose of the practice is to address resource concerns related to air quality impacts from objectionable odors caused by manure storage in a facility close to a small town. Associated practices: Nutrient Management (590), Waste Storage Facility (313).
Before Practice Situation	Before application of the waste amendment, the liquid manure in the storage facility is creating significant odor problems. The producer is receiving complaints from neighbors.
After Practice Situation	This practice scenario is applicable for all types of liquid animal waste. A swine operation has been chosen for this scenario example. Typical implementation scenario is a pit under a swine production building for 1180 head of lactating sows, 400 lb each. The pit is 100' x 140' x 8' deep; 1' freeboard and 1' un-pumpable sludge reduces working depth to 6'. This scenario is based on the working volume of manure stored and treated per year. The working volume in the manure storage facility is 84,000 cubic feet, and the facility is emptied every 6 months. The resulting total annual working volume of manure to be treated with the amendment is 168,000 cubic feet. An NRCS approved amendment is applied periodically according to manufacturer's instructions, typically on a monthly basis. The manufacturer's recommended dosage is based on the volume of manure added to the waste storage facility between amendment doses. The resulting waste contains higher levels of nutrients, which is accounted for in the nutrient management plan. Nutrient level testing of the liquid manure and nutrient planning is done in conformance with CPS Nutrient Management, Code 590. The amendment is proven to reduce odor by up to 83%, and successfully reduces the objectionable odors on the site.
Scenario Feature Measure	Cubic Feet of required manure storage per year
Scenario Unit	Cubic Foot
Scenario Typical Size	168000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,731.50	\$0.02
Equipment/Installation	\$0.00	\$0.00
Labor	\$119.52	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$3,851.02	\$0.02

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1688	Ag Waste Amendment, digestive enzymes, 10 liter container	10 liter container of an organic manure amendment. Liquefied lignite coal. Materials only.	Each	\$109.75	34	\$3,731.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	6	\$119.52

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	591 - Amend. for Treat. of Ag. Waste
Scenario ID	3
Scenario Name	Litter Amendments applied for Air Quality resource concerns
Scenario Description	This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. The amendment used is proven to reduce ammonia levels in the house by transforming nitrogen into a form of ammonium. The purpose of the practice is to address resource concerns from existing nutrient levels that may contribute to air quality impacts such as objectionable odors and ammonia emissions and impacts on bird health due to excess nutrients and pathogens. Associated practices: Nutrient Management (590).
Before Practice Situation	Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions.
After Practice Situation	This scenario is based on a typical poultry operation with a 2-house facility and each house size is 40' x 400', 16,000 SF. An NRCS approved amendment is applied between flocks, 5 flocks annually, at rate required to meet air quality resource concern, typically 100 pounds per 1000 SF. Formula to calculate the amount of amendment per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of Applications per Year)= Number of 1000SF. 16,000 SF / 1000 SF X 2 houses X 5 applications/year= 160 units of 1000SF An NRCS approved amendment is applied between each flock, 5 applications, at rate required for treatment to address air quality resource concerns. For most products, this is 100 pounds per 1000 SF. The amendment is proven to control the odor, and to reduce ammonia emissions. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts of objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns.
Scenario Feature Measure	Number of 1000SF applications per year
Scenario Unit	1000 Square Feet
Scenario Typical Size	160

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,692.80	\$35.58
Equipment/Installation	\$409.44	\$2.56
Labor	\$0.00	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$6,102.24	\$38.14

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1686	Ag Waste Amendment, sodium bisulfate	Sodium bisulfate poultry litter amendment. NRCS approved for air quality concerns to reduce ammonia emissions from the litter. Materials only.	Ton	\$711.60	8	\$5,692.80
Equipment/Installation	2020	Application of ag waste amendment for poultry litter	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	\$51.18	8	\$409.44

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	591 - Amend. for Treat. of Ag. Waste
Scenario ID	4
Scenario Name	Litter Amendments applied on a %w/w basis for Water Quality Impacts
Scenario Description	This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce water-soluble phosphorous in the poultry litter by a specified percentage. The amendment used is proven to and transform nitrogen into a form of ammonium and reduce the concentration of water-soluble phosphorous in the litter and reduces ammonia levels in the house. Resource concerns from existing nutrient levels may contribute to water quality degradation from nutrient runoff and leaching from fields fertilized with poultry litter and air quality impacts such as objectionable odors and ammonia emissions. Associated practices: Nutrient Management (590).
Before Practice Situation	Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions and soluble phosphorus. This scenario is based on a typical poultry operation with a desired application rate of 10% by weight of the litter (10%w/w) of a phosphorus binding amendment. Typical operation consists of 2 houses, 40' x 400' house (16,000 SF), 20,000 birds (4 pound finished bird weight), 0.5 lb litter/bird (assume 54 pounds P205/Ton of litter). The operation raises 5 flocks per year. Formula to calculate required amendment at the prescribed rate in tons per year is: (Number of birds) X (Finish weight of birds (lbs)) X (Pounds of litter)/bird) X (Number of houses) X (application rate) X (Number of applications per year) / 2000 pounds/ton 20,000 birds X 4 lb bird X 0.50 lb litter/bird X 2 houses X 0.10 lb amendment/lb litter X 5 app/year / 2000 lb/ton = 20 tons/year. An NRCS approved amendment is applied between each flock at the prescribed rate. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The amendment is proven to reduce soluble phosphorus in the litter, to control the odor, and to reduce ammonia emissions. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and
After Practice Situation	
Scenario Feature Measure	Tons of amendment per year.
Scenario Unit	Ton
Scenario Typical Size	20

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$13,000.00	\$650.00
Equipment/Installation	\$1,023.60	\$51.18
Labor	\$0.00	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$14,023.60	\$701.18

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1684	Ag Waste Amendment, aluminum sulfate, alum	Aluminum sulfate, alum, poultry Litter amendment. NRCS approved for air and water quality concerns to reduce ammonia emissions and soluble phosphorus in the litter. Materials only.	Ton	\$650.00	20	\$13,000.00
Equipment/Installation	2020	Application of ag waste amendment for poultry litter	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	\$51.18	20	\$1,023.60

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	591 - Amend. for Treat. of Ag. Waste
Scenario ID	2
Scenario Name	Litter Amendments for Water Quality With Partially Treated Brood Chamber
Scenario Description	This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions and water-soluble phosphorous in the poultry litter. An entire poultry house is treated year round for air and water quality impacts. In the winter, the producer or integrator treats the brood chamber between flocks with litter amendments solely for bird health and production. The amount being applied by the producer or integrator in winter months does not meet the air and water quality resource concerns. Additional litter amendments are added in winter for Air Quality benefits not being applied by the integrator. Litter amendments are applied spring through fall for entire flocks. NRCS is not responsible for the litter amendments already being applied by the integrator for the purposes of production and bird health. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrients and pathogens and air quality impacts due to particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590).
Before Practice Situation	No litter amendments are being applied during the spring through fall months. An amendment is being applied at a lower application rate during the winter months, typically half the house and only two flocks. Partial winter application is solely for production purposes and the lower application rate is not enough to address resource concerns from existing nutrient levels which may contribute to water quality degradation from nutrient runoff and leaching from fields fertilized with poultry litter and cause adverse air quality impacts such as objectionable odors and ammonia emissions. The operation raises 4 flocks per year and the integrator partially treats 2 flocks in the winter months. Approximately 18.7% of the needed litter amendments are being applied and only during the winter months.
After Practice Situation	An NRCS approved amendment is applied between each flock. All flocks are optimally treated with litter amendments year-round. A typical broiler operation with 4 flocks in a 42' x 500' house (21,000 square feet) is treated to reduce the impacts on air and water quality. Typically 100 pounds of litter amendments per 1000 square feet are applied 4 times annually. The total amendment applied is adjusted by 81.3% to account for the portion of the brood chamber that is receiving partial application during the winter months. The amendment is proven to reduce ammonia emissions and soluble phosphorus in the litter. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses water quality degradation from nutrients in surface and ground water and air quality impacts due to objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns. Formula to calculate the number of 1000 SF units: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of applications/year) = Number of 1000SF/year. 21,000 SF / 1000 SF X 1 house X 4 app/yr = 84 units of 1000SF
Scenario Feature Measure	Number of 1000SF applications per year
Scenario Unit	1000 Square Feet
Scenario Typical Size	84

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,210.00	\$26.31
Equipment/Installation	\$174.01	\$2.07
Labor	\$0.00	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,384.01	\$28.38

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1684	Ag Waste Amendment, aluminum sulfate, alum	Aluminum sulfate, alum, poultry Litter amendment. NRCS approved for air and water quality concerns to reduce ammonia emissions and soluble phosphorus in the litter. Materials only.	Ton	\$650.00	3.4	\$2,210.00
Equipment/Installation	2020	Application of ag waste amendment for poultry litter	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	\$51.18	3.4	\$174.01

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	592 - Feed Management
Scenario ID	1
Scenario Name	Cow Dairy - Large
Scenario Description	Feed ration management on a dairy operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients particularly phosphorus and nitrogen. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for "landlocked" farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient management (590), Prescribed Grazing (528), Forage and Biomass Planting (512), Forage Harvest Management (511)
Before Practice Situation	Producer is feeding a higher level of protein (17%) and phosphorus (0.45%) than is needed to meet National Research Council (NRC) recommendations for a herd of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.
After Practice Situation	The scenario assumes the operation milks 500 holstein cows at average weight of 1,400 pounds, or 700 animal units. A baseline analysis of manure, feed, and milk will be completed to determine the current nutrient inputs and outputs. The Producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (12% protein and 0.35% phosphorus). Producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include things like grouping animals per similar age or stage of production, or feeding based on individual rolling average production.
Scenario Feature Measure	Number of 1000 pound animal units
Scenario Unit	Animal Unit
Scenario Typical Size	700

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$834.28	\$1.19
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,612.22	\$2.30
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,446.50	\$3.50

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	4	\$172.24
Materials	1989	Test, Feed Analysis	Representative sample of feed	Each	\$41.20	16	\$659.20
Materials	1990	Test, MUN Testing	Testing nitrogen level in milk as a measure of nitrogen that will be exhibited in manure	Each	\$0.71	4	\$2.84
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	\$31.31	10	\$313.10
Labor	231	General Labor	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.	Hours	\$19.92	20	\$398.40
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hours	\$75.06	12	\$900.72

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	592 - Feed Management
Scenario ID	2
Scenario Name	Dairy-Small
Scenario Description	Feed ration management on a small dairy operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients particularly phosphorus and nitrogen. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for "landlocked" farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient management (590), Prescribed Grazing (528), Forage and Biomass Planting (512), Forage Harvest Management (511)
Before Practice Situation	Producer is feeding a higher level of protein (17%) and phosphorus (0.45%) than is needed to meet National Research Council (NRC) recommendations for a herd of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.
After Practice Situation	The scenario assumes the operation milks 50 Jersey and Guernsey cows at average weight of 1,000 pounds, or 50 animal units. A baseline analysis of manure, feed, and milk will be completed to determine the current nutrient inputs and outputs. The Producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (12% protein and 0.35% phosphorus). The producer will also implement pasturing of his herd part to the time where the animals will obtain some of their diet by grazing pastures as well as explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and phosphorus levels down without hurting production of the animals or profitability of the operation.
Scenario Feature Measure	Number of 1000 pound animal units
Scenario Unit	Animal Unit
Scenario Typical Size	50

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$504.68	\$10.09
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,002.50	\$20.05
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,507.18	\$30.14

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	4	\$172.24
Materials	1989	Test, Feed Analysis	Representative sample of feed	Each	\$41.20	8	\$329.60
Materials	1990	Test, MUN Testing	Testing nitrogen level in milk as a measure of nitrogen that will be exhibited in manure	Each	\$0.71	4	\$2.84
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	\$31.31	10	\$313.10
Labor	231	General Labor	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.	Hours	\$19.92	12	\$239.04
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hours	\$75.06	6	\$450.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	592 - Feed Management
Scenario ID	3
Scenario Name	Livestock
Scenario Description	This example is feed ration management on a swine finishing operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concerns are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degradation concerns. Associated Practices: Nutrient management (590)
Before Practice Situation	The producer is feeding a single diet with a higher level of protein (16%) and phosphorus (0.65%) than is needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.
After Practice Situation	This scenario's operation currently houses 2800 finishing hogs with an average weight of 154 pounds, or 430 animal units ((2800 hogs * 154 lbs/hog/1000 lbs/AU154) = 430 AU). The farm typically grows out 2.5 turns per year. A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manure management prevents surface and groundwater degradation from excess nitrogen and phosphorus.
Scenario Feature Measure	Number of 1000 pound animal units
Scenario Unit	Animal Unit
Scenario Typical Size	1075

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$337.04	\$0.31
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,768.77	\$1.65
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,105.81	\$1.96

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	4	\$172.24
Materials	1989	Test, Feed Analysis	Representative sample of feed	Each	\$41.20	4	\$164.80
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	\$31.31	15	\$469.65
Labor	231	General Labor	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.	Hours	\$19.92	20	\$398.40
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hours	\$75.06	12	\$900.72

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Environmental Engineering
Practice Code/Name	592 - Feed Management
Scenario ID	4
Scenario Name	Poultry/Layer Operation
Scenario Description	This example is feed ration management on a poultry or layer operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concerns are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degradation concerns. Associated Practices: Nutrient management (590)
Before Practice Situation	The producer is feeding animals a single diet with a higher nutrient levels than are needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.
After Practice Situation	This scenario's operation currently houses 15,000 broilers with an average weight of 5 pounds, or 75 animal units ((15,000 broilers * 5lbs/chicken/1000 lbs/) = 75 AU). A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manure management prevents surface and groundwater degradation from excess nitrogen and phosphorus.
Scenario Feature Measure	Number of 1000 pound animal units
Scenario Unit	Animal Unit
Scenario Typical Size	75

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$337.04	\$4.49
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,229.49	\$16.39
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,566.53	\$20.89

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	306	Test, Manure Analysis	Moisture, Total N, P, K	Each	\$43.06	4	\$172.24
Materials	1989	Test, Feed Analysis	Representative sample of feed	Each	\$41.20	4	\$164.80
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	\$31.31	15	\$469.65
Labor	231	General Labor	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.	Hours	\$19.92	8	\$159.36
Labor	235	Consultant Services	Consultant services to assist in resource inventory, plan development, site surveys, site monitoring, installation of practices, etc.	Hours	\$75.06	8	\$600.48

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	3
Scenario Name	Advanced IPM Field All RCs
Scenario Description	A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).
After Practice Situation	After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,025.96	\$25.65
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,025.96	\$25.65

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	4	\$125.24
Labor	235	Specialist Labor	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	\$75.06	12	\$900.72

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	6
Scenario Name	Advanced IPM Fruit/Veg All RCs
Scenario Description	A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).
After Practice Situation	After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,952.40	\$195.24
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,952.40	\$195.24

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	24	\$751.44
Labor	235	Specialist Labor	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	\$75.06	16	\$1,200.96

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	9
Scenario Name	Advanced IPM Orchard All RCs
Scenario Description	A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).
After Practice Situation	After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$2,202.88	\$220.29
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,202.88	\$220.29

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	32	\$1,001.92
Labor	235	Specialist Labor	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	\$75.06	16	\$1,200.96

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	12
Scenario Name	Advanced IPM S-Farm All RCs
Scenario Description	A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, Organic, etc.) to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings. This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems. This scenario describes implementation of 595 on an operation generally less than 100 acres and accounts for the economy of scale on a smaller operation with the unit of "each."
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).
After Practice Situation	After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Total Farm
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$2,202.88	\$2,202.88
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,202.88	\$2,202.88

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	32	\$1,001.92
Labor	235	Specialist Labor	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	\$75.06	16	\$1,200.96

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	2
Scenario Name	Basic IPM Field >1RC
Scenario Description	A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address multiple identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).
After Practice Situation	After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	40

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$544.29	\$13.61
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$544.29	\$13.61

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	3	\$93.93
Labor	235	Specialist Labor	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	\$75.06	6	\$450.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	5
Scenario Name	Basic IPM Fruit/Veg >1RC
Scenario Description	A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).
After Practice Situation	After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,401.68	\$140.17
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,401.68	\$140.17

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	16	\$500.96
Labor	235	Specialist Labor	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	\$75.06	12	\$900.72

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	8
Scenario Name	Basic IPM Orchard >1RC
Scenario Description	A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).
After Practice Situation	After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,827.16	\$182.72
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,827.16	\$182.72

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	20	\$626.20
Labor	235	Specialist Labor	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	\$75.06	16	\$1,200.96

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	11
Scenario Name	IPM S-Farm >1RC
Scenario Description	A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/ Diversified Systems (e.g. CSA, organic, etc.) to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems. This scenario describes implementation of 595 on an operation generally less than 100 acres and accounts for the economy of scale on a smaller operation with the unit of "each."
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).
After Practice Situation	After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).
Scenario Feature Measure	Total Farm
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$951.32	\$951.32
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$951.32	\$951.32

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	16	\$500.96
Labor	235	Specialist Labor	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	\$75.06	6	\$450.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	595 - Integrated Pest Management
Scenario ID	13
Scenario Name	Risk Prevention IPM All RCs
Scenario Description	A comprehensive IPM plan based primarily on LGU-approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. LGU-approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns. This type of system is very difficult to achieve, but may be most commonly achieved in Organic Systems that already rely heavily on prevention and avoidance techniques.
Before Practice Situation	Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).
After Practice Situation	After implementing the 595 practice, a comprehensive IPM plan based primarily on Land Grant University approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. Land Grant University approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns.
Scenario Feature Measure	Acres of Implementation
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$0.00	\$0.00
Labor	\$1,220.25	\$122.03
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,220.25	\$122.03

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$31.31	15	\$469.65
Labor	235	Specialist Labor	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	\$75.06	10	\$750.60

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	601 - Vegetative Barriers
Scenario ID	1
Scenario Name	Vegetative Barrier: 3-5 ft wide
Scenario Description	Permanent strips of stiff, dense vegetation established along the general contour of slopes or across concentrated flow areas.
Before Practice Situation	Significant erosion is occurring resulting in substantial transport of sediment across the slope or concentrated flow areas. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.
After Practice Situation	A strip or strips of stiff, dense vegetation three to five feet wide is/are established along the general contour of the slope or across concentrated flow areas that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.
Scenario Feature Measure	3-5ft wide
Scenario Unit	Linear Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$42.51	\$0.04
Equipment/Installation	\$3.16	\$0.00
Labor	\$0.00	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$45.67	\$0.05

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	76	Big Blue Stem (Andropogon gerardii)	Native Grasses and shipping.	Pound	\$11.81	1.65	\$19.49
Materials	78	Indian Grass, Tomahawk (Sorghastrum nutans)	Native Grasses and shipping.	Pound	\$12.63	1.32	\$16.67
Materials	82	Switchgrass, Blackwell (Panicum virgatum)	Native Grasses and shipping.	Pound	\$9.62	0.66	\$6.35
Equipment/Installation	960	Seeding Operation, No Till/Grass Drill	No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor.	Acre	\$19.08	0.11	\$2.10
Equipment/Installation	945	Tillage, Light	Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included.	Acre	\$9.63	0.11	\$1.06

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	601 - Vegetative Barriers
Scenario ID	2
Scenario Name	Vegetative Barrier: >5 ft wide
Scenario Description	Permanent strips of stiff, dense vegetation established along the general contour of slopes or across concentrated flow areas.
Before Practice Situation	Significant erosion is occurring resulting in substantial transport of sediment across the slope or concentrated flow areas. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.
After Practice Situation	A strip or strips of stiff, dense vegetation greater than five feet wide is/are established along the general contour of the slope or across concentrated flow areas that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife. A strip of land 5-10 feet wide is taken out of crop production.
Scenario Feature Measure	Linear feet of practice installed
Scenario Unit	Linear Feet
Scenario Typical Size	1000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$88.88	\$0.09
Equipment/Installation	\$6.60	\$0.01
Labor	\$0.00	\$0.00
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$95.48	\$0.10

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	76	Big Blue Stem (Andropogon gerardii)	Native Grasses and shipping.	Pound	\$11.81	3.45	\$40.74
Materials	78	Indian Grass, Tomahawk (Sorghastrum nutans)	Native Grasses and shipping.	Pound	\$12.63	2.76	\$34.86
Materials	82	Switchgrass, Blackwell (Panicum virgatum)	Native Grasses and shipping.	Pound	\$9.62	1.38	\$13.28
Equipment/Installation	960	Seeding Operation, No Till/Grass Drill	No Till drill or grass drill for seeding. Includes all costs for equipment, power unit, and labor.	Acre	\$19.08	0.23	\$4.39
Equipment/Installation	945	Tillage, Light	Includes light disking (tandem) or field cultivator. Equipment and power unit costs. Labor is included.	Acre	\$9.63	0.23	\$2.21

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agronomy
Practice Code/Name	603 - Herbaceous Wind Barriers
Scenario ID	1
Scenario Name	Perennial species
Scenario Description	Perennial warm season grass herbaceous barriers are installed to reduce wind velocities and wind-borne particulate matter. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology. Associated practices include, but not limited to (590) Nutrient Management, and (645) Upland Wildlife Habitat Management.
Before Practice Situation	Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affects soil and air resources. Seeding development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite. The wind-borne sediment is also negatively affecting air quality through the generation of particulate matter.
After Practice Situation	Typical installation is on a 40 acre field, with 6 foot wide strips seeded every 60 feet resulting in 27,720 linear feet of seeded strips, or 3.8 acres seeded. Implementation of perennial herbaceous wind barriers will modify the flow and velocity of air dependant upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, improve air quality by reducing particulate matter, and provide food and cover for wildlife. Payment is for the design and implementation of perennial barriers.
Scenario Feature Measure	linear feet of barrier planted
Scenario Unit	Linear Foot
Scenario Typical Size	27720

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$124.01	\$0.00
Equipment/Installation	\$247.73	\$0.01
Labor	\$159.36	\$0.01
Mobilization	\$0.00	\$0.00
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$1,478.43	\$0.05
Total	\$2,009.53	\$0.07

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	76	Big Blue Stem (Andropogon gerardii)	Native Grasses and shipping.	Pound	\$11.81	10.5	\$124.01
Equipment/Installation	945	Tillage, Light	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$9.63	7.6	\$73.19
Equipment/Installation	960	Seeding Operation, No Till/Grass Drill	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$19.08	3.8	\$72.50
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	8	\$159.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	1.9	\$732.51
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	1.9	\$745.92

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	1
Scenario Name	≤ 5" CPP
Scenario Description	Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control; 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 Waste Storage Facility
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,460.00	\$0.73
Equipment/Installation	\$2,500.00	\$1.25
Labor	\$0.00	\$0.00
Mobilization	\$203.05	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,163.05	\$2.08

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1271	Pipe, HDPE, 5", PCPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5" diameter - ASTM F405. Material cost only.	Foot	\$0.73	2000	\$1,460.00
Equipment/Installation	53	Trenching, Earth, 12" x 48"	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.25	2000	\$2,500.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	4
Scenario Name	10" CPP
Scenario Description	Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 10-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$7,480.00	\$3.74
Equipment/Installation	\$2,500.00	\$1.25
Labor	\$0.00	\$0.00
Mobilization	\$203.05	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$10,183.05	\$5.09

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1273	Pipe, HDPE, 10", PCPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10" diameter - ASTM F667. Material cost only.	Foot	\$3.74	2000	\$7,480.00
Equipment/Installation	53	Trenching, Earth, 12" x 48"	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.25	2000	\$2,500.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	5
Scenario Name	12" CPP
Scenario Description	<p>Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 12-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices.</p> <p>Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients).</p> <p>Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility</p>
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$9,500.00	\$4.75
Equipment/Installation	\$2,500.00	\$1.25
Labor	\$0.00	\$0.00
Mobilization	\$203.05	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$12,203.05	\$6.10

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1274	Pipe, HDPE, 12", PCPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12" diameter - ASTM F667. Material cost only.	Foot	\$4.75	2000	\$9,500.00
Equipment/Installation	53	Trenching, Earth, 12" x 48"	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.25	2000	\$2,500.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	2
Scenario Name	6" CPP
Scenario Description	<p>Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes construction of 2,000 feet of 6-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices.</p> <p>Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients).</p> <p>Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility</p>
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,160.00	\$1.08
Equipment/Installation	\$2,500.00	\$1.25
Labor	\$0.00	\$0.00
Mobilization	\$203.05	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,863.05	\$2.43

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1242	Pipe, HDPE, 6", CPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	\$1.08	2000	\$2,160.00
Equipment/Installation	53	Trenching, Earth, 12" x 48"	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.25	2000	\$2,500.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	3
Scenario Name	8" CPP
Scenario Description	<p>Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 8-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices.</p> <p>Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients).</p> <p>Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility</p>
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$4,020.00	\$2.01
Equipment/Installation	\$2,500.00	\$1.25
Labor	\$0.00	\$0.00
Mobilization	\$203.05	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$6,723.05	\$3.36

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1272	Pipe, HDPE, 8", PCPT, Single Wall	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8" diameter - ASTM F667. Material cost only.	Foot	\$2.01	2000	\$4,020.00
Equipment/Installation	53	Trenching, Earth, 12" x 48"	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.25	2000	\$2,500.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	8
Scenario Name	Corrugated Plastic Pipe (CPP), Twin-Wall, ≥ 8"
Scenario Description	Description: below ground installation of HDPE (Corrugated Plastic Pipe) pipe/line, using a drainage plow. HDPE (CPP) twin-wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 8-inch to 15-inch; and typical scenario size is 12-inch. Construct 1,000 feet of 12-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 1,000 feet of 12-inch, Twin-Wall, HDPE CPP weighs 2.10 lb/ft, or a total of 2,100 pounds. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation such as grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to system retrofit enabling drainage water management.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	1,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$8,556.00	\$8.56
Equipment/Installation	\$3,350.00	\$3.35
Labor	\$1,274.88	\$1.27
Mobilization	\$406.10	\$0.41
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$13,586.98	\$13.59

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1588	Pipe, HDPE, corrugated double wall, ≥ 15", soil tight, weight priced	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe ≥ 15" diameter. Materials only.	Pound	\$1.86	4600	\$8,556.00
Equipment/Installation	1460	Trenching, Earth, 24" x 60"	Trenching, earth, 24" wide x 60" depth, includes equipment and labor for trenching and backfilling.	Foot	\$3.35	1000	\$3,350.00
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	64	\$1,274.88
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	7
Scenario Name	Enveloped Corrugated Plastic Pipe (CPP), Single-Wall, ≤ 6"
Scenario Description	<p>Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline with sand-gravel envelope, using a drainage trencher. Scenario includes the construction of 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet, and surrounded with a sand-gravel envelope. The unit is in weight of pipe material in pounds. 2,000 feet of 5-inch, Single-Wall, perforated HDPE CPP weighs 0.50 lb/ft, or a total of 1,000 pounds. The typical volume sand-gravel for 2,000 feet of 12"wide x 12" high envelope is 64 cubic yards. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices including (but not limited to) perimeter drainage around a waste storage facility. Resource Concerns: Excess Water (seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility</p>
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) waste storage facilities have a high failure rate due to uplift pressures damaging the integrity of the facility, particularly in high water table areas.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, preventing uplift pressures from damaging the integrity of installed structures. Excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due decreased erosion.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,424.73	\$1.71
Equipment/Installation	\$3,998.56	\$2.00
Labor	\$214.32	\$0.11
Mobilization	\$1,165.66	\$0.58
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$8,803.27	\$4.40

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$26.70	64	\$1,708.80
Materials	1380	Pipe, HDPE, corrugated single wall, ≤ 12" weight priced Compound	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	\$1.64	1000	\$1,640.00
Materials	1458	Drainage Lateral Connection	Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	\$25.31	3	\$75.93
Equipment/Installation	935	Track Loader, 95HP	Equipment and power unit costs. Labor not included.	Hour	\$72.32	8	\$578.56
Equipment/Installation	1459	Trenching, Earth, 12" x 60"	Trenching, earth, 12" wide x 60" depth, includes equipment and labor for trenching, laying 3"-6" CPP drain line with envelope, and backfilling.	Foot	\$1.71	2000	\$3,420.00
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators ≥50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers ≥12", Dump Trucks, Ag Equipment ≥150 HP, Scrapers, Water Wagons.	Hour	\$26.79	8	\$214.32
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	2	\$759.56

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Water Management Engineering
Practice Code/Name	606 - Subsurface Drain
Scenario ID	6
Scenario Name	>= 15" CPP
Scenario Description	Description: below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a trencher. Scenario describes the construction 2,000 feet of 15-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. Subsurface drainage is installed as a supporting practice for a number of associated conservation practices. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management; 620 - Underground Outlet; 412 - Grassed Waterway; 638 - Water and Sediment Control Basin; 342 - Critical Area Planting; 484 - Mulching; 410 - Grade Stabilization Structure; 468 - Lined Waterway or Outlet; 313 - Waste Storage Facility
Before Practice Situation	Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.). Conservation practice implementation including (but not limited to) grassed waterways have a high failure rate due to the prolonged wetness that prohibits plant germination and/or drowns new growth.
After Practice Situation	The drainage modifications result in reduced water in the upper horizons of the soil profile, allowing for sufficient aeration to allow vegetation to establish. Gully erosion and sediment transport are minimized by established vegetation, a direct result of removing excess water from the soil profile. Plant stress due to excessive wetness caused by a seasonal high water table is minimized, and drainage water quality is improved due to increased erosion control.
Scenario Feature Measure	length of pipe
Scenario Unit	Foot
Scenario Typical Size	2,000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$17,112.00	\$8.56
Equipment/Installation	\$2,500.00	\$1.25
Labor	\$0.00	\$0.00
Mobilization	\$203.05	\$0.10
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$19,815.05	\$9.91

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1588	Pipe, HDPE, corrugated double wall, ≥ 15", soil tight, weight priced	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe ≥ 15" diameter. Materials only.	Pound	\$1.86	9200	\$17,112.00
Equipment/Installation	53	Trenching, Earth, 12" x 48"	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.25	2000	\$2,500.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	1	\$203.05

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	12
Scenario Name	Container Tress and Shrubs (3 gallon), Each
Scenario Description	Containerized trees and/or shrubs (potted) to be planted or interplanted to establish woody plants in any area where they can be grown for wildlife, erosion control, water quality improvement, carbon sequestration, forest products, and aesthetics. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife. Payment includes 3 gallon containerized plants and equipment and labor to plant. Foregone income is not included with this scenario since, if applicable, it most likely would be covered by an associated practice (such as 311 Alley Cropping, 380 Windbreak/Shelterbest Establishment, 391 Riparian Forest Buffer, or 422 Hedgerow Planting). Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.
Before Practice Situation	The land has little/no tree cover, is understocked, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Each
Scenario Typical Size	100

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,342.00	\$13.42
Equipment/Installation	\$56.64	\$0.57
Labor	\$338.64	\$3.39
Mobilization	\$112.16	\$1.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,849.44	\$18.49

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1532	Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal.	Potted or balled and burlapped hardwood tree, 2-3 gal. Materials only.	Each	\$13.42	100	\$1,342.00
Equipment/Installation	1590	Hand tools, tree planting	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only.	Hour	\$9.44	6	\$56.64
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	6	\$219.12
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	6	\$119.52
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	13
Scenario Name	Container Tress and Shrubs (3 gallon) with tree shelters, Each
Scenario Description	Containerized trees and/or shrubs (potted) to be planted or interplanted to establish woody plants in any area where they can be grown for wildlife, erosion control, water quality improvement, carbon sequestration, forest products, and aesthetics. Seedlings are protected from deer browsing by installing tree tube shelters. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife. Payment includes 3 gallon containerized plants, tree shelters, and equipment and labor to plant and install tree shelters. Foregone income is not included with this scenario since, if applicable, it most likely would be covered by an associated practice (such as 311 Alley Cropping, 380 Windbreak/Shelterbest Establishment, 391 Riparian Forest Buffer, or 422 Hedgerow Planting). Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.
Before Practice Situation	The land has little/no tree cover, is understocked, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Each
Scenario Typical Size	100

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,693.00	\$16.93
Equipment/Installation	\$56.64	\$0.57
Labor	\$458.16	\$4.58
Mobilization	\$112.16	\$1.12
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,319.96	\$23.20

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1532	Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal.	Potted or balled and burlapped hardwood tree, 2-3 gal. Materials only.	Each	\$13.42	100	\$1,342.00
Materials	1583	Stakes, wood, 3/4" x 3/4" x 60"	3/4" x 3/4" x 60" wood stakes to fasten items in place. Materials only.	Each	\$1.44	100	\$144.00
Materials	1571	Tree shelter, solid tube type, 5" x 48"	5" x 48" tree tube for protection from animal damage. Materials only.	Each	\$1.93	100	\$193.00
Materials	1575	Cable ties, plastic	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.07	200	\$14.00
Equipment/Installation	1590	Hand tools, tree planting	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only.	Hour	\$9.44	6	\$56.64
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	6	\$219.12
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	12	\$239.04
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	5
Scenario Name	Conifer Establishment, Bareroot
Scenario Description	This practice involves planting of bare-root conifer tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 436 trees per acre (10' x 10' spacing). Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of crop production. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching
Before Practice Situation	The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,008.40	\$300.84
Equipment/Installation	\$196.68	\$19.67
Labor	\$316.44	\$31.64
Mobilization	\$389.32	\$38.93
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$3,890.60	\$389.06
Total	\$7,801.44	\$780.14

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1514	Tree, conifer, seedling, bare root, 2-1	Bare root conifer trees, 2-1 (3 years old). Materials only.	Each	\$0.69	4360	\$3,008.40
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	4	\$77.12
Equipment/Installation	1600	Mechanical tree planter	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$4.38	4	\$17.52
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1138	Mobilization, small equipment	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	\$138.58	2	\$277.16
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	5	\$1,927.65
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	5	\$1,962.95

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	3
Scenario Name	Hardwood Establishment, Bareroot
Scenario Description	This practice involves planting of bare-root hardwood tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 436 trees per acre (10' x 10' spacing). Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of crop production. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching
Before Practice Situation	The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,488.00	\$348.80
Equipment/Installation	\$196.68	\$19.67
Labor	\$316.44	\$31.64
Mobilization	\$389.32	\$38.93
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$3,890.60	\$389.06
Total	\$8,281.04	\$828.10

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1510	Tree, hardwood, seedling or transplant, bare root, 16-36"	Bare root hardwood trees 18-36" tall. Materials only.	Each	\$0.80	4360	\$3,488.00
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	4	\$77.12
Equipment/Installation	1600	Mechanical tree planter	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$4.38	4	\$17.52
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1138	Mobilization, small equipment	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	\$138.58	2	\$277.16
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	5	\$1,927.65
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	5	\$1,962.95

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	14
Scenario Name	Hardwood Establishment, Free Bareroot Seedlings
Scenario Description	This practice involves planting of bare-root hardwood tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 436 trees per acre (10' x 10' spacing). Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes equipment and labor to plant and foregone income for the land taken out of crop production. Seedlings are acquired for no charge to the landowner. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching
Before Practice Situation	The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	10

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$0.00	\$0.00
Equipment/Installation	\$196.68	\$19.67
Labor	\$316.44	\$31.64
Mobilization	\$389.32	\$38.93
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$3,890.60	\$389.06
Total	\$4,793.04	\$479.30

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	4	\$77.12
Equipment/Installation	1600	Mechanical tree planter	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$4.38	4	\$17.52
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1138	Mobilization, small equipment	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	\$138.58	2	\$277.16
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	5	\$1,927.65
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	5	\$1,962.95

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	6
Scenario Name	Bareroot Tress and Shrubs, Each
Scenario Description	Bare-root trees and/or shrubs to be planted or interplanted to establish woody plants in any area where they can be grown for wildlife, erosion control, water quality improvement, carbon sequestration, forest products, and aesthetics. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant. Foregone income is not included with this scenario since, if applicable, it most likely would be covered by an associated practice (such as 311 Alley Cropping, 380 Windbreak/Shelterbest Establishment, 391 Riparian Forest Buffer, or 422 Hedgerow Planting). Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.
Before Practice Situation	The land has little/no tree cover, is understocked, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Each
Scenario Typical Size	4360

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,488.00	\$0.80
Equipment/Installation	\$210.16	\$0.05
Labor	\$316.44	\$0.07
Mobilization	\$389.32	\$0.09
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,403.92	\$1.01

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1510	Tree, hardwood, seedling or transplant, bare root, 16-36"	Bare root hardwood trees 18-36" tall. Materials only.	Each	\$0.80	4360	\$3,488.00
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	4	\$77.12
Equipment/Installation	1600	Mechanical tree planter	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$4.38	4	\$17.52
Equipment/Installation	1503	Trailer, enclosed, small	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$3.37	4	\$13.48
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1138	Mobilization, small equipment	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	\$138.58	2	\$277.16
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	0	\$0.00
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	0	\$0.00

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	4
Scenario Name	Shrub Establishment, Bareroot
Scenario Description	This practice involves planting of bare-root shrub seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will support a planting rate of 1210 shrubs per acre (6' x 6' spacing). Plantings are in either uplands or bottomlands. The site lacks ground level habitat structure and diversity for wildlife. Resource concern is inadequate habitat for fish and wildlife - habitat fragmentation. Payment includes bare-root seedlings, equipment and labor to plant, and foregone income for the land taken out of crop production. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching
Before Practice Situation	No shrubby vegetation, or very little, is present under the forest overstory. Wildlife species that need shrub cover are not present. An adequate stand of overstory trees is present, but it is a single level, not multi-level.
After Practice Situation	Multiple small blocks of shrubs are planted that total 1 acre. The blocks are based on a habitat appraisal that determines the specific size and location to maximize habitat structure and diversity.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,028.50	\$1,028.50
Equipment/Installation	\$139.80	\$139.80
Labor	\$225.76	\$225.76
Mobilization	\$112.16	\$112.16
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$389.06	\$389.06
Total	\$1,895.28	\$1,895.28

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1507	Shrub, seedling or transplant, bare root, 18"-36"	Bare root hardwood trees 18-36" tall. Materials only.	Each	\$0.85	1210	\$1,028.50
Equipment/Installation	1590	Hand tools, tree planting	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only.	Hour	\$9.44	4	\$37.76
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	0.5	\$192.77
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	0.5	\$196.30

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	7
Scenario Name	Bare-root Tress and Shrubs, Each with trees shelter
Scenario Description	Bare-root trees and/or shrubs to be planted or interplanted to establish woody plants in any area where they can be grown for wildlife, erosion control, water quality improvement, carbon sequestration, forest products, and aesthetics. Seedlings are protected from deer browsing by installing tree tube shelters. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings, tree shelters, and equipment and labor to plant and install shelters. Foregone income is not included with this scenario since, if applicable, it most likely would be covered by an associated practice (such as 311 Alley Cropping, 380 Windbreak/Shelterbest Establishment, 391 Riparian Forest Buffer, or 422 Hedgerow Planting). Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.
Before Practice Situation	The land has little/no tree cover, is understocked, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition
After Practice Situation	The land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Each
Scenario Typical Size	4360

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$14,562.40	\$3.34
Equipment/Installation	\$210.16	\$0.05
Labor	\$475.80	\$0.11
Mobilization	\$389.32	\$0.09
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$15,637.68	\$3.59

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1560	Tree shelter, solid tube type, 3-1/4" x 30"	3-1/4" x 30" tree tube for protection from animal damage. Materials only.	Each	\$1.74	4360	\$7,586.40
Materials	1581	Stakes, wood, 3/4" x 3/4" x 36"	3/4" x 3/4" x 36" wood stakes to fasten items in place. Materials only.	Each	\$0.66	4360	\$2,877.60
Materials	1510	Tree, hardwood, seedling or transplant, bare root, 16-36"	Bare root hardwood trees 18-36" tall. Materials only.	Each	\$0.80	4360	\$3,488.00
Materials	1575	Cable ties, plastic	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.07	8720	\$610.40
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	4	\$77.12
Equipment/Installation	1600	Mechanical tree planter	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$4.38	4	\$17.52
Equipment/Installation	1503	Trailer, enclosed, small	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$3.37	4	\$13.48
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	4	\$146.08
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	4	\$90.68
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	12	\$239.04
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1138	Mobilization, small equipment	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	\$138.58	2	\$277.16

Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53		\$0.00
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59		\$0.00

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	1
Scenario Name	Hardwood Establishment, Direct Seeding
Scenario Description	This practice involves planting of tree and shrubs through direct seeding after the site has been prepared for seedling growth and establishment. Planting rate will be approximately 3000 seed per acre. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes tree seed, equipment and labor to seed, and foregone income for the land taken out of crop production. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching
Before Practice Situation	The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition
After Practice Situation	Seed from native species are collected or purchased and planted at prescribed rates. 5 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	5

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$466.50	\$93.30
Equipment/Installation	\$437.12	\$87.42
Labor	\$473.52	\$94.70
Mobilization	\$523.38	\$104.68
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$1,945.30	\$389.06
Total	\$3,845.82	\$769.16

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1871	Trees and shrubs, seed	Tree or shrub seed, e.g., acorns, to establish trees. Materials only.	Pound	\$3.11	150	\$466.50
Equipment/Installation	1601	Mechanical nut planter	Mechanical nut planter for direct seeding of trees and shrubs. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$9.85	8	\$78.80
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	8	\$204.08
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	8	\$154.24
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	8	\$292.16
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	8	\$181.36
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.46	2	\$44.92
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36
Foregone Income	1959	FI, Corn Dryland	Dryland Corn is Primary Crop	Acre	\$392.59	2.5	\$981.48
Foregone Income	1961	FI, Soybeans Dryland	Dryland Soybeans is Primary Crop	Acre	\$385.53	2.5	\$963.83

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	2
Scenario Name	Hardwood Establishment, Direct Seeding, no Foregone Income
Scenario Description	This practice involves planting of tree and shrubs through direct seeding after the site has been prepared for seedling growth and establishment. Planting rate will be approximately 3000 seed per acre. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes tree seed and equipment and labor to seed. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching
Before Practice Situation	The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition
After Practice Situation	Seed from native species are collected or purchased and planted at prescribed rates. 5 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	5

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$466.50	\$93.30
Equipment/Installation	\$437.12	\$87.42
Labor	\$473.52	\$94.70
Mobilization	\$523.38	\$104.68
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,900.52	\$380.10

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1871	Trees and shrubs, seed	Tree or shrub seed, e.g., acorns, to establish trees. Materials only.	Pound	\$3.11	150	\$466.50
Equipment/Installation	1601	Mechanical nut planter	Mechanical nut planter for direct seeding of trees and shrubs. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$9.85	8	\$78.80
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	8	\$204.08
Equipment/Installation	963	Tractor, agricultural, 60 HP	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$19.28	8	\$154.24
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	8	\$292.16
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	8	\$181.36
Mobilization	1143	Mobilization, Light Equipment Operator	Mobilization of light equipment operators: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.46	2	\$44.92
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	8
Scenario Name	Hardwood Planting, 1 gallon pots
Scenario Description	Improving the hardwood forest setting by hand planting containerized hardwood tree seedlings. The number of trees to plant (100 per acre) is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.
Before Practice Situation	In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.
After Practice Situation	The area of treatment is 5 acres. Containerized hardwood seedlings are planted by hand in the best locations for seedling survival. Post planting vegetation control is planned to ensure seedling survival.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	5

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,380.00	\$676.00
Equipment/Installation	\$283.20	\$56.64
Labor	\$1,693.20	\$338.64
Mobilization	\$112.16	\$22.43
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$5,468.56	\$1,093.71

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1531	Tree, hardwood, seedling or transplant, potted, 1 gal.	Potted hardwood tree, 1 gal. Materials only.	Each	\$6.68	500	\$3,340.00
Materials	1586	Wire flags	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.08	500	\$40.00
Equipment/Installation	1590	Hand tools, tree planting	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only.	Hour	\$9.44	30	\$283.20
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	30	\$1,095.60
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	30	\$597.60
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Forestry
Practice Code/Name	612 - Tree & Shrub Establishment
Scenario ID	9
Scenario Name	Hardwood Planting, 1 gallon pots with tree shelters
Scenario Description	Improving the hardwood forest setting by hand planting containerized hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant (100 per acre) is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.
Before Practice Situation	In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.
After Practice Situation	The area of treatment is 5 acres. Containerized hardwood seedlings are planted by hand in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from animal browsing damage. Post planting vegetation control is planned to ensure seedling survival.
Scenario Feature Measure	Area of Treatment
Scenario Unit	Acre
Scenario Typical Size	5

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,500.00	\$1,100.00
Equipment/Installation	\$283.20	\$56.64
Labor	\$2,290.80	\$458.16
Mobilization	\$112.16	\$22.43
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$8,186.16	\$1,637.23

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1531	Tree, hardwood, seedling or transplant, potted, 1 gal.	Potted hardwood tree, 1 gal. Materials only.	Each	\$6.68	500	\$3,340.00
Materials	1565	Tree shelter, solid tube type, 4" x 36"	4" x 36" tree tube for protection from animal damage. Materials only.	Each	\$3.02	500	\$1,510.00
Materials	1582	Stakes, wood, 3/4" x 3/4" x 48"	3/4" x 3/4" x 48" wood stakes to fasten items in place. Materials only.	Each	\$1.08	500	\$540.00
Materials	1586	Wire flags	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.08	500	\$40.00
Materials	1575	Cable ties, plastic	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.07	1000	\$70.00
Equipment/Installation	1590	Hand tools, tree planting	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only.	Hour	\$9.44	30	\$283.20
Labor	234	Supervisor or Manager	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$36.52	30	\$1,095.60
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	60	\$1,195.20
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	2	\$39.80
Mobilization	1145	Mobilization, Supervisor or Manager	Mobilization of supervisors or management. Includes crew supervisors, foremen and farm/ranch managers, etc.	Hour	\$36.18	2	\$72.36

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	614 - Watering Facility
Scenario ID	6
Scenario Name	Above Ground Storage, Large
Scenario Description	Establishment of a large permanent watering facility for livestock having 3,001 to 5,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. Overflow pipe and stabilized area under and around the watering facility is not included and must be addressed through associated practices pipeline (516) and Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.
Before Practice Situation	This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.
After Practice Situation	A permanent watering facility with water storage capacity of 3,001 to 5,000 gallons is typically installed for 50 animal units to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.
Scenario Feature Measure	Number
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,420.00	\$3,420.00
Equipment/Installation	\$208.47	\$208.47
Labor	\$127.77	\$127.77
Mobilization	\$523.52	\$523.52
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,279.76	\$4,279.76

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1075	Tank, Poly Enclosed Storage, >1,000	Includes materials	Gallon	\$0.76	4500	\$3,420.00
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	3	\$76.53
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	3	\$131.94
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	3	\$59.76
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	3	\$68.01
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1137	Mobilization, very small equipment	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	\$56.22	2	\$112.44

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	614 - Watering Facility
Scenario ID	5
Scenario Name	Above Ground Storage, Standard
Scenario Description	A permanent watering facility for livestock constructed of approved materials having 1,000 to 3,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. Overflow pipe and stabilized area under and around the watering facility is not included and must be addressed through associated practices pipeline (516) and Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.
Before Practice Situation	This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.
After Practice Situation	A permanent watering facility with water storage capacity of 1,000 to 3,000 gallons is typically installed for 30 animal units to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.
Scenario Feature Measure	Number
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,900.00	\$1,900.00
Equipment/Installation	\$138.98	\$138.98
Labor	\$85.18	\$85.18
Mobilization	\$523.52	\$523.52
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,647.68	\$2,647.68

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1075	Tank, Poly Enclosed Storage, >1,000	Includes materials	Gallon	\$0.76	2500	\$1,900.00
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Equipment/Installation	926	Backhoe, 80 HP	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$43.98	2	\$87.96
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Labor	232	Equipment Operators, Light	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$22.67	2	\$45.34
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$203.05	2	\$406.10
Mobilization	1137	Mobilization, very small equipment	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	\$56.22	2	\$112.44

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	614 - Watering Facility
Scenario ID	4
Scenario Name	Fountain or Large Permanent Tank
Scenario Description	Establishment of a large permanent watering facility for livestock using materials such as a large concrete trough or fountain type waterers. Payment includes materials and labor costs for installing the watering tank, float valve, wildlife escape ramp, and freeze proof hydrant. Overflow pipe and stabilized area under and around the watering facility is not included and must be addressed through associated practices pipeline (516) and Heavy Use Area Protection (561).
Before Practice Situation	This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.
After Practice Situation	This practice is typically installed for 50 animal units. It consists of a necessarily large permanent concrete trough, or fountain type waterer that provides adequate water and access for the livestock. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: Pipeline (516), Critical Area Planting (342), Water Harvesting Catchment (636), Water Well (642), Pumping Plant (533), Spring Development (574), and Heavy Use Area Protection (561).
Scenario Feature Measure	Number
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$1,413.99	\$1,413.99
Equipment/Installation	\$102.04	\$102.04
Labor	\$79.68	\$79.68
Mobilization	\$117.42	\$117.42
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,713.13	\$1,713.13

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	240	Freeze Proof Hydrant	Freeze Proof Hydrant, 3 ft bury	Each	\$57.20	1	\$57.20
Materials	242	Wildlife Escape Ramp	Pool size 15' x 30', for small mammals less than one pound	Each	\$36.74	1	\$36.74
Materials	1050	"Post, Wood, CCA Treated, 4-5" X 7"	"Wood Post, Line 4-5" X 7", CCA Treated"	Each	\$11.30	2	\$22.60
Materials	1049	Tank, Concrete, 500 gallon	Materials and delivery	Each	\$1,207.50	1	\$1,207.50
Materials	1044	Dimension Lumber, Treated	"Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners"	Board Foot	\$0.71	8	\$5.68
Materials	1077	Tank, Float Valve Assembly	Float Valve, Stem, Swivel, Float Ball	Each	\$84.27	1	\$84.27
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	4	\$102.04
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	4	\$79.68
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1137	Mobilization, very small equipment	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	\$56.22	2	\$112.44

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	614 - Watering Facility
Scenario ID	2
Scenario Name	Portable Tank
Scenario Description	Establishment of a watering facility for livestock as part of an intensively managed grazing system where the livestock are frequently moved. Payment includes materials and labor costs for installing the watering tank, float valve, and freeze proof hydrant. If needed, an overflow pipe and stabilized area under and around the watering facility is not included and must be addressed through associated practices pipeline (516) and Heavy Use Area Protection (561).
Before Practice Situation	This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.
After Practice Situation	This practice is typically installed for 30 animal units. It consists of a portable trough of either durable plastic, steel, or rubber that provides adequate water and access for the livestock. The trough materials include floats, and appurtenances for inflow and outflow of water. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Associated practices: Pipeline (516), Critical Area Planting (342), Water Harvesting Catchment (636), Water Well (642), Pumping Plant (533), Spring Development (574), and Heavy Use Area Protection (561).
Scenario Feature Measure	Number
Scenario Unit	Each
Scenario Typical Size	4

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$675.22	\$168.81
Equipment/Installation	\$153.06	\$38.27
Labor	\$119.52	\$29.88
Mobilization	\$117.42	\$29.35
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$1,065.22	\$266.30

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	240	Freeze Proof Hydrant	Freeze Proof Hydrant, 3 ft bury	Each	\$57.20	4	\$228.80
Materials	1050	"Post, Wood, CCA Treated, 4-5" X 7"	"Wood Post, Line 4-5" X 7", CCA Treated"	Each	\$11.30	8	\$90.40
Materials	1044	Dimension Lumber, Treated	"Treated dimension lumber with nominal thickness equal or less than 2"". Includes lumber and fasteners"	Board Foot	\$0.71	32	\$22.72
Materials	290	Tank, Polyethylene, 100 gallon	Portable heavy duty rubber stock tank	Each	\$82.38	2	\$164.76
Materials	1077	Tank, Float Valve Assembly	Float Valve, Stem, Swivel, Float Ball	Each	\$84.27	2	\$168.54
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	6	\$153.06
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	6	\$119.52
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1137	Mobilization, very small equipment	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	\$56.22	2	\$112.44

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	614 - Watering Facility
Scenario ID	1
Scenario Name	Permanent Tank, Standard
Scenario Description	A permanent watering facility for livestock constructed of approved materials with less than 500 gallons of capacity that provides adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the watering tank, float valve, wildlife escape ramp, and freeze proof hydrant. Overflow pipe and stabilized area under and around the watering facility is not included and must be addressed through associated practices pipeline (516) and Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.
Before Practice Situation	This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.
After Practice Situation	A permanent watering facility with a capacity of less than 500 gallons is typically installed for 30 animal units with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.
Scenario Feature Measure	Number
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$420.22	\$420.22
Equipment/Installation	\$51.02	\$51.02
Labor	\$39.84	\$39.84
Mobilization	\$117.42	\$117.42
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$628.50	\$628.50

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	240	Freeze Proof Hydrant	Freeze Proof Hydrant, 3 ft bury	Each	\$57.20	1	\$57.20
Materials	242	Wildlife Escape Ramp	Pool size 15' x 30', for small mammals less than one pound	Each	\$36.74	1	\$36.74
Materials	279	Tank, Galvanized, 400 gallon	Tank Galvanized - 400 gallon capacity	Each	\$213.73	1	\$213.73
Materials	1050	"Post, Wood, CCA Treated, 4-5" X 7"	"Wood Post, Line 4-5" X 7", CCA Treated"	Each	\$11.30	2	\$22.60
Materials	1044	Dimension Lumber, Treated	"Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners"	Board Foot	\$0.71	8	\$5.68
Materials	1077	Tank, Float Valve Assembly	Float Valve, Stem, Swivel, Float Ball	Each	\$84.27	1	\$84.27
Equipment/Installation	939	Truck, Pickup	Equipment and power unit costs. Labor not included.	Hour	\$25.51	2	\$51.02
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	2	\$39.84
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.90	0.25	\$4.98
Mobilization	1137	Mobilization, very small equipment	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	\$56.22	2	\$112.44

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Corn Belt
State	Ohio
Discipline Group	Agricultural Engineering
Practice Code/Name	614 - Watering Facility
Scenario ID	7
Scenario Name	Underground Storage Tank
Scenario Description	A precast concrete tank used for storing water for livestock watering system. The storage tank will consist of 1 storage tank (2500 gal.) adequate base material and backfill around the tank, access riser with lid, and 20 ft of 4 inch for overflow pipe.
Before Practice Situation	This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.
After Practice Situation	A permanent watering facility for livestock constructed of approved materials with a 2,500 gallons of additional storage capacity for adequate quantity and quality of water for storage when backup capacity is needed peak water demand periods. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate.
Scenario Feature Measure	Number
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,814.42	\$2,814.42
Equipment/Installation	\$452.50	\$452.50
Labor	\$233.55	\$233.55
Mobilization	\$878.64	\$878.64
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$4,379.11	\$4,379.11

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1055	Tank, Concrete, 2500 gallon	Concrete tank for water storage, with riser and lid	Each	\$2,721.00	1	\$2,721.00
Materials	1323	"Pipe, PVC, dia. < 18", weight priced"	"Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only."	Pound	\$1.39	40	\$55.60
Materials	1099	Aggregate, Gravel, Ungraded, Quarry Run	Includes materials, equipment and labor	Cubic yard	\$18.91	2	\$37.82
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$90.50	5	\$452.50
Labor	231	General Labor	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.92	5	\$99.60
Labor	233	Equipment Operators, Heavy	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.79	5	\$133.95
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$379.78	2	\$759.56
Mobilization	1137	Mobilization, very small equipment	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	\$56.22	2	\$112.44
Mobilization	1144	Mobilization, Heavy Equipment Operator	Mobilization of heavy equipment operators: Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$26.54	0.25	\$6.64