

Practice: 202 - Edge of Field Water Quality System Installation

Scenario # 1 System Installation-Surface

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Practice Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$21,698.24
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	80	Hour	\$33.61	\$2,688.80
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Pre-calibrated flow control structure	1	Each	\$3,500.00	\$3,500.00
Equip./Install.	Depth (stage) sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Automated sampler with bottles and tubing	1	Each	\$5,000.00	\$5,000.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Equipment shelter	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Communications device (cell phone, radio)	1	Each	\$2,000.00	\$2,000.00
Equip./Install.	connectors, cables, platform materials	1	Each	\$1,700.00	\$1,700.00

Total Cost: \$21,698.24

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$16,273.68	EQIP-HU	\$19,528.42
WHIP	\$16,273.68	WHIP-HU	\$19,528.42

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Scenario # 2 System Installation-Surface Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Practice Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$23,073.24
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	80	Hour	\$33.61	\$2,688.80
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Pre-calibrated flow control structure	1	Each	\$3,500.00	\$3,500.00
Equip./Install.	Depth (stage) sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Automated sampler with bottles and tubing	1	Each	\$5,000.00	\$5,000.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Equipment shelter	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Communications device (cell phone, radio)	1	Each	\$2,000.00	\$2,000.00
Equip./Install.	Calf hut with propane	1	Each	\$1,250.00	\$1,250.00
Equip./Install.	connectors, cables, platform materials	1	Each	\$1,825.00	\$1,825.00

Total Cost: \$23,073.24

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$17,304.93	EQIP-HU	\$20,765.92
WHIP	\$17,304.93	WHIP-HU	\$20,765.92

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Scenario # 3 System Installation-Tile

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Practice Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$22,648.24
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	80	Hour	\$33.61	\$2,688.80
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Pre-calibrated flow control structure	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Depth (stage) sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Automated sampler with bottles and tubing	1	Each	\$5,000.00	\$5,000.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Equipment shelter	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Communications device (cell phone, radio)	1	Each	\$2,000.00	\$2,000.00
Equip./Install.	Area Velocity Sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	connectors, cables, platform materials	1	Each	\$1,650.00	\$1,650.00

Total Cost: \$22,648.24

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$16,986.18	EQIP-HU	\$20,383.42
WHIP	\$16,986.18	WHIP-HU	\$20,383.42

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Scenario # 4 System Installation-Tile Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Practice Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$23,723.24
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	80	Hour	\$33.61	\$2,688.80
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Pre-calibrated flow control structure	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Depth (stage) sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Automated sampler with bottles and tubing	1	Each	\$5,000.00	\$5,000.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Equipment shelter	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Communications device (cell phone, radio)	1	Each	\$2,000.00	\$2,000.00
Equip./Install.	Area Velocity Sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Calf hut with propane	1	Each	\$1,250.00	\$1,250.00
Equip./Install.	connectors, cables, platform materials	1	Each	\$1,475.00	\$1,475.00

Total Cost: \$23,723.24

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$17,792.43	EQIP-HU	\$21,350.92
WHIP	\$17,792.43	WHIP-HU	\$21,350.92

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Scenario # 5 System Installation-Above&Below

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will differ on the subsurface flow by allowing a smaller precalibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Practice Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$41,746.48
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	160	Hour	\$33.61	\$5,377.60
Labor	Specialist Labor	8	Hour	\$77.36	\$618.88
Equip./Install.	Pre-calibrated flow control structure	2	Each	\$3,500.00	\$7,000.00
Equip./Install.	Depth (stage) sensor	2	Each	\$3,000.00	\$6,000.00
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Automated sampler with bottles and tubing	2	Each	\$5,000.00	\$10,000.00
Equip./Install.	Power source (solar panel, controller, and	2	Each	\$1,000.00	\$2,000.00
Equip./Install.	Equipment shelter	2	Each	\$1,000.00	\$2,000.00
Equip./Install.	Communications device (cell phone, radio)	2	Each	\$2,000.00	\$4,000.00
Equip./Install.	connectors, cables, platform materials	1	Each	\$3,250.00	\$3,250.00

Total Cost: \$41,746.48

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$31,309.86	EQIP-HU	\$37,571.83
WHIP	\$31,309.86	WHIP-HU	\$37,571.83

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Scenario # 6 System Installation-Above&Below cold climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will differ on the subsurface flow by allowing a smaller pre-calibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Practice Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$44,496.48
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	160	Hour	\$33.61	\$5,377.60
Labor	Specialist Labor	8	Hour	\$77.36	\$618.88
Equip./Install.	Pre-calibrated flow control structure	2	Each	\$3,500.00	\$7,000.00
Equip./Install.	Depth (stage) sensor	2	Each	\$3,000.00	\$6,000.00
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Automated sampler with bottles and tubing	2	Each	\$5,000.00	\$10,000.00
Equip./Install.	Power source (solar panel, controller, and	2	Each	\$1,000.00	\$2,000.00
Equip./Install.	Equipment shelter	2	Each	\$1,000.00	\$2,000.00
Equip./Install.	Communications device (cell phone, radio)	2	Each	\$2,000.00	\$4,000.00
Equip./Install.	Calf hut with propane	2	Each	\$1,250.00	\$2,500.00
Equip./Install.	connectors, cables, platform materials	1	Each	\$3,500.00	\$3,500.00

Total Cost: \$44,496.48

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$33,372.36	EQIP-HU	\$40,046.83
WHIP	\$33,372.36	WHIP-HU	\$40,046.83

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Scenario # 7 System Installation-Retrofit 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and back-up/solar power supply be added to existing system. It is actually to represent a cost for any system updates that has component costs of \$2,500 or less as per the component costs in various scenarios.

Before Practice Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$3,347.20
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	16	Hour	\$33.61	\$537.76
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00

Total Cost: \$3,347.20

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$2,510.40	EQIP-HU	\$3,012.48
WHIP	\$2,510.40	WHIP-HU	\$3,012.48

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Scenario # 8 System Installation-Retrofit 2

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, and depth (stage) sensor to be added to existing system. It is actually to represent a cost for any system updates that has component costs greater than \$2,500 but less than or equal to \$7,500 as per the component costs in various scenarios.

Before Practice Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$8,481.64
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	20	Hour	\$33.61	\$672.20
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Depth (stage) sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Communications device (cell phone, radio)	1	Each	\$2,000.00	\$2,000.00

Total Cost: \$8,481.64

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$6,361.23	EQIP-HU	\$7,633.48
WHIP	\$6,361.23	WHIP-HU	\$7,633.48

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Scenario # 9 System Installation-Retrofit 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, pre-calibrated flow control structure, and depth (stage) sensor to be added to existing system. It is actually to represent a cost for any system updates that has component costs greater than \$7,500 but less than or equal to \$11,000 as per the component costs in various scenarios. Anything above a \$11,000 will be evaluated as a full system replacement as per scenarios for surface or tile (subsurface) drainage.

Before Practice Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$12,384.96
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	32	Hour	\$33.61	\$1,075.52
Labor	Specialist Labor	4	Hour	\$77.36	\$309.44
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Power source (solar panel, controller, and	1	Each	\$1,000.00	\$1,000.00
Equip./Install.	Depth (stage) sensor	1	Each	\$3,000.00	\$3,000.00
Equip./Install.	Communications device (cell phone, radio)	1	Each	\$2,000.00	\$2,000.00
Equip./Install.	Pre-calibrated flow control structure	1	Each	\$3,500.00	\$3,500.00

Total Cost: \$12,384.96

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$9,288.72	EQIP-HU	\$11,146.46
WHIP	\$9,288.72	WHIP-HU	\$11,146.46

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Scenario # 10 System Installation-Retrofit Above and Below 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and two back-up/solar power supply be added to existing paired system. It is actually to represent a cost for any system updates that has component costs of \$3,500 or less as per the component costs in various scenarios.

Before Practice Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$5,194.40
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	32	Hour	\$33.61	\$1,075.52
Labor	Specialist Labor	8	Hour	\$77.36	\$618.88
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Power source (solar panel, controller, and	2	Each	\$1,000.00	\$2,000.00

Total Cost: \$5,194.40

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$3,895.80	EQIP-HU	\$4,674.96
WHIP	\$3,895.80	WHIP-HU	\$4,674.96

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Scenario # 11 System Installation-Retrofit Above 2

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, and two depth (stage) sensors to be added to existing paired system. It is actually to represent a cost for any system updates that has component costs greater than \$3,500 but less than or equal to \$13,500 as per the component costs in various scenarios.

Before Practice Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$15,463.28
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	40	Hour	\$33.61	\$1,344.40
Labor	Specialist Labor	8	Hour	\$77.36	\$618.88
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Power source (solar panel, controller, and	2	Each	\$1,000.00	\$2,000.00
Equip./Install.	Depth (stage) sensor	2	Each	\$3,000.00	\$6,000.00
Equip./Install.	Communications device (cell phone, radio)	2	Each	\$2,000.00	\$4,000.00

Total Cost: \$15,463.28

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$11,597.46	EQIP-HU	\$13,916.95
WHIP	\$11,597.46	WHIP-HU	\$13,916.95

Practice: 202 - Edge of Field Water Quality System Installation

Scenario # 12 System Installation-Retrofit Above 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, two pre-calibrated flumes, and two depth (stage) sensors to be added to existing paired system. It is actually to represent a cost for any system updates that has component costs greater than \$13,500 but less than or equal to \$20,500 as per the component costs in various scenarios. Anything above a \$20,500 will be evaluated as a full system replacement as per scenarios for surface or tile (subsurface) drainage.

Before Practice Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Practice Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Scenario Feature Measure:

System installed

Scenario Typical Size:	1	Each	Tot Unit Cost	\$23,269.92
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Cost Category	Component Name	Quantity	Unit	Unit Cost	Cost
Labor	Skilled Labor	64	Hour	\$33.61	\$2,151.04
Labor	Specialist Labor	8	Hour	\$77.36	\$618.88
Equip./Install.	Rain gauge (1 tipping bucket and 1 standard)	1	Each	\$1,500.00	\$1,500.00
Equip./Install.	Power source (solar panel, controller, and	2	Each	\$1,000.00	\$2,000.00
Equip./Install.	Depth (stage) sensor	2	Each	\$3,000.00	\$6,000.00
Equip./Install.	Communications device (cell phone, radio)	2	Each	\$2,000.00	\$4,000.00
Equip./Install.	Pre-calibrated flow control structure	2	Each	\$3,500.00	\$7,000.00

Total Cost: \$23,269.92

Payment types:

PayType	Unit Payment	PayType	Unit Payment
EQIP	\$17,452.44	EQIP-HU	\$20,942.93
WHIP	\$17,452.44	WHIP-HU	\$20,942.93