

**Practice:** 574 - Spring Development

**Scenario:** #1 - Spring Development laterals

**Scenario Description:** Develop a water source from a low yielding, diffuse flow natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing two 75 ft long, 4 inch diameter HDPE perforated pipe laterals enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (150 ft long) and behind compacted soil and plastic to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (3' diameter well casing x 8 ft long) equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:** Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:** Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Scenario Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$5,100.35

**Scenario Cost/Unit:** \$5,100.35

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.09	16	\$993.46
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.43	33	\$80.15

**Materials**

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$32.13	20	\$642.56
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.70	10	\$316.98
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.46	150	\$68.69
Pipe, PVC, 1 1/2", SCH 40	975	Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.06	20	\$21.15
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	\$4.08	50	\$204.06
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Foot	\$0.08	1500	\$118.54
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$179.96	1	\$179.96
Well Casing, Concrete	2173	Concrete tile 3' diameter x 8' long. Materials only.	Foot	\$56.25	8	\$449.98

**Labor**

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$24.55	16	\$392.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$22.19	48	\$1,065.32

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$283.39	2	\$566.78
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**Practice:** 574 - Spring Development

**Scenario:** #2 - Spring Development no lateral

**Scenario Description:** Develop a water source from a high yielding point source natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) at a point source natural spring or adjacent to a pond. Water seeps through back filled gravel to a perforated spring box (3' diameter well casing, 8 ft long) equipped with a watertight lid and two outlets. Compacted soil and plastic is placed below the spring box to cut off water flow. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: Livestock Pipeline (516), Watering Facility (614), Fence (382), Critical Area Planting (342); Pumping Plant (533).

**Before Situation:** Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:** Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Scenario Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$2,967.36

**Scenario Cost/Unit:** \$2,967.36

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.09	8	\$496.73
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.43	7	\$17.00

**Materials**

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$32.13	10	\$321.28
Pipe, PVC, 1 1/2", SCH 40	975	Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.06	20	\$21.15
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Foot	\$0.08	100	\$7.90
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$179.96	1	\$179.96
Well Casing, Concrete	2173	Concrete tile 3' diameter x 8' long. Materials only.	Foot	\$56.25	8	\$449.98

**Labor**

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$24.55	8	\$196.36
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$22.19	32	\$710.21

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$283.39	2	\$566.78
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**Practice:** 574 - Spring Development

**Scenario:** #3 - Spring Box with laterals

**Scenario Description:** Develop a water source from a low yielding, diffuse flow natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing two 100 ft long, 4 inch diameter HDPE perforated pipe laterals enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (200 ft long) and behind compacted soil and plastic to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a concrete CIP or precast spring box with watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to a watering facility (not included) for use. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:** Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:** Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Scenario Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$7,215.06

**Scenario Cost/Unit:** \$7,215.06

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.09	20	\$1,241.83
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yard	\$429.82	4	\$1,719.30
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.43	44	\$106.87

**Materials**

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$32.13	25	\$803.20
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.70	13	\$412.07
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.46	200	\$91.59
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	\$4.08	50	\$204.06
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Foot	\$0.08	2000	\$158.06

**Labor**

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$24.55	20	\$490.90
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$22.19	64	\$1,420.42

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$283.39	2	\$566.78
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**Practice:** 574 - Spring Development

**Scenario:** #4 - Plastic Tank With Laterals

**Scenario Description:** Develop a water source from a low yielding, diffuse flow natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing two 100 ft long, 4 inch diameter HDPE perforated pipe laterals enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (200 ft long) and behind compacted soil and plastic to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a plastic 1000 gal tank with watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to a watering facility (not included) for use. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:** Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:** Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Scenario Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Total Scenario Cost:** \$5,719.11

**Scenario Cost/Unit:** \$5,719.11

**Cost Details**

Component Name	Id	Description	Unit	Cost	Qty	Total
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**Equipment Installation**

Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.09	16	\$993.46
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.43	44	\$106.87

**Materials**

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yard	\$32.13	25	\$803.20
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yard	\$31.70	13	\$412.07
Pipe, HDPE, 4", PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only.	Foot	\$0.46	200	\$91.59
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	\$4.08	50	\$204.06
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Foot	\$0.08	2000	\$158.06
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	\$0.93	1000	\$925.00

**Labor**

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$24.55	16	\$392.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$22.19	48	\$1,065.32

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$283.39	2	\$566.78
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