

Practice: 516 - Livestock Pipeline

Scenario #1 - Plastic, 0.75 Inch to 1.25 Inch, Normal Trenching

Scenario Description:

Description: Below ground installation of HDPE or PVC 0.75-inch to 1.25-inch diameter pipeline. Typical practice sizes range from 0.75-inch to 4-inch; and typical scenario size is 1-inch. Construct one mile (5,280 feet) of 1-inch, SCH 40 PVC Pipeline with appurtenances, installed below ground with a minimum 1½ feet of ground cover into material that includes sand, silt and/or clay. Gravel and occasional cobbles or rock may also be encountered during installation. The scenario unit is Length of Pipe. 5,280 feet of 1-inch, SCH 40 PVC pipe weighs 0.320lb/ft, or a total of 1,690 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$10,667.50

Scenario Cost/Unit: \$2.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5280	\$6,230.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	32	\$619.20
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.94	1859	\$3,606.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

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Scenario #2 - Plastic, 0.75 Inch to 1.25 Inch, Rock Trenching

Scenario Description:

Description: Below ground installation of HDPE or PVC 0.75-inch to 1.25-inch diameter pipeline that requires rock excavation, to the extent that specialized installation equipment is required. Typical practice sizes range from 0.75-inch to 4-inch; and typical scenario size is 1-inch. Construct one mile (5,280 feet) of 1-inch, SCH 40 PVC Pipeline with appurtenances, installed below ground with a minimum 1½ feet of ground cover. The scenario unit is Length of Pipe. 5,280 feet of 1-inch, SCH 40 PVC pipe weighs 0.320 lb/ft, or a total of 1,690 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$16,179.10

Scenario Cost/Unit: \$3.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5016	\$5,918.88
Trenching, Rock	1097	Includes equipment and labor for cutting trench in rock 6" x 36"	Foot	\$20.67	264	\$5,456.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	40	\$774.00
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.94	1859	\$3,606.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	2	\$422.88

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Scenario #3 - Plastic, 1.5 Inch to 2 Inch, Normal Trenching

Scenario Description:

Description: Below ground installation of PVC or HDPE 1½-inch to 2-inch diameter pipeline. PVC and HDPE are manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 0.75-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1½ feet of ground cover into material that includes sand, silt and/or clay. Gravel and occasional cobbles or rock may also be encountered during installation. 5,280 feet of 1½-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$12,706.44

Scenario Cost/Unit: \$2.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5280	\$6,230.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	32	\$619.20
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.94	2910	\$5,645.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

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Scenario #4 - Plastic, 1.5 Inch to 2 Inch, Rock Trenching

Scenario Description:

Description: Below ground installation of PVC or HDPE 1 ½-inch to 2-inch diameter pipeline requiring rock excavation, to the extent that specialized installation equipment is required. PVC and HDPE are manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. 5,280 feet of 1½-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$18,218.04

Scenario Cost/Unit: \$3.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5016	\$5,918.88
Trenching, Rock	1097	Includes equipment and labor for cutting trench in rock 6" x 36"	Foot	\$20.67	264	\$5,456.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	40	\$774.00
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.94	2910	\$5,645.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	2	\$422.88

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Scenario #5 - Plastic, Greater Than 2 Inch, Normal Trenching

Scenario Description:

Description: Below ground installation of PVC or HDPE pipeline greater than 2-inches in diameter. PVC and HDPE are manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 3-inch. Construct one mile (5,280 feet) of 3-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1½ feet of ground cover into material that includes sand, silt and/or clay. Gravel and occasional cobbles or rock may also be encountered during installation. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material. Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$22,214.64

Scenario Cost/Unit: \$4.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5280	\$6,230.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	32	\$619.20
Materials						
Pipe, PVC, 3", SCH 40	977	Materials: - 3" - PVC - SCH 40 - ASTM D1785	Foot	\$2.87	5280	\$15,153.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

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Scenario #6 - Plastic, Greater Than 2 Inch, Rock Trenching

Scenario Description:

Description: Below ground installation of PVC or HDPE pipeline greater than 2-inches in diameter requiring rock excavation, to the extent that specialized installation equipment is required. PVC and HDPE are manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 3-inch. Construct one mile (5,280 feet) of 3-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is length of pipe material. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material. Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$27,726.24

Scenario Cost/Unit: \$5.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5016	\$5,918.88
Trenching, Rock	1097	Includes equipment and labor for cutting trench in rock 6" x 36"	Foot	\$20.67	264	\$5,456.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	40	\$774.00
Materials						
Pipe, PVC, 3", SCH 40	977	Materials: - 3" - PVC - SCH 40 - ASTM D1785	Foot	\$2.87	5280	\$15,153.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	2	\$422.88

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Scenario #7 - HDPE, Less Than or Equal to 2 Inch, Surface Installation

Scenario Description:

Description: On-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline less than or equal to 2-inches in diameter. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 2-inch. Construct one mile (5,280 feet) of 2-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is length of pipe material. 5,280 feet of 2-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.744 lb/ft, or a total of 3,928 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$10,949.71

Scenario Cost/Unit: \$2.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	\$23.79	8	\$190.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	16	\$309.60
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	\$2.30	4518	\$10,391.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$58.39	1	\$58.39

Practice: 516 - Livestock Pipeline

Scenario #8 - HDPE, Greater Than 2 Inch, Surface Installation

Scenario Description:

Description: On-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline greater than 2-inches in diameter. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 3-inch. Construct one mile (5,280 feet) of 3-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is length of pipe material. 5,280 feet of 3-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 1.615 lb/ft, or a total of 8,527 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$23,419.96

Scenario Cost/Unit: \$4.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	\$23.79	8	\$190.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	24	\$464.40
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	\$2.30	9806	\$22,553.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	1	\$211.44

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Scenario #9 - Steel, Less Than 2 Inch, Below Ground

Scenario Description:

Description: Below ground installation of Steel (Iron Pipe Size) pipeline less than 2-inches in diameter. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover and the installation requires rock excavation, to the extent that specialized installation equipment is required. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is length of pipe material. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$38,449.44

Scenario Cost/Unit: \$7.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5016	\$5,918.88
Trenching, Rock	1097	Includes equipment and labor for cutting trench in rock 6" x 36"	Foot	\$20.67	264	\$5,456.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	72	\$1,393.20
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	\$1.60	15786	\$25,257.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	2	\$422.88

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Scenario #10 - Steel, 2 Inch or Larger, Below Ground

Scenario Description:

Description: Below ground installation of Steel (Iron Pipe Size) pipeline 2-inches or larger in diameter. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 2-inch. Construct one mile (5,280 feet) of 2-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover and the installation requires rock excavation, to the extent that specialized installation equipment is required. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is length of pipe material. 5,280 feet of 2-inch, Schedule 40, Galvanized Steel Pipe weighs 3.653 lb/ft, or a total of 19,288 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$47,293.84

Scenario Cost/Unit: \$8.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.18	5016	\$5,918.88
Trenching, Rock	1097	Includes equipment and labor for cutting trench in rock 6" x 36"	Foot	\$20.67	264	\$5,456.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	80	\$1,548.00
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	\$1.60	21217	\$33,947.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$211.44	2	\$422.88

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Scenario #11 - Steel, Less Than 2 Inch, Surface Installation

Scenario Description:

Description: Installation of Steel (Iron Pipe Size) pipeline less than 2-inches in diameter on the ground surface. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is length of pipe material. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$27,734.40

Scenario Cost/Unit: \$5.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	128	\$2,476.80
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	\$1.60	15786	\$25,257.60

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Scenario #12 - Steel, 2 Inch or Larger, Surface Installation

Scenario Description:

Description: Installation of Steel (Iron Pipe Size) pipeline 2-inches or larger in diameter on the ground surface. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 2-inch. Construct one mile (5,280 feet) of 2-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is length of pipe material. 5,280 feet of 2-inch, Schedule 40, Galvanized Steel Pipe weighs 3.653 lb/ft, or a total of 19,288 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit:: Foot

Scenario Typical Size: 5280

Total Scenario Cost: \$36,733.60

Scenario Cost/Unit: \$6.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.35	144	\$2,786.40
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	\$1.60	21217	\$33,947.20