

**Scenario Worksheet**

**Practice and Scenario Description:**

<b>Information Type</b>	<b>Data</b>
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	4
Scenario Name	Deep Well
Scenario Description	Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 800 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 30 feet.
Before Practice Situation	Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.
After Practice Situation	Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

**Cost Summary:**

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$3,149.39	\$3,149.39
Equipment/Installation	\$7,590.00	\$7,590.00
Labor	\$0.00	\$0.00
Mobilization	\$291.22	\$291.22
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
<b>Total</b>	<b>\$11,030.61</b>	<b>\$11,030.61</b>

**Cost Details:**

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1810	Well Casing, Metal, 6"	Steel well casing, 6". Materials only.	Foot	\$80.39	30	\$2,411.70
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	1	\$2.32
Materials	1786	Well Cap, 6"	Well cap, 6". Materials only.	Each	\$32.35	1	\$32.35
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	2	\$199.58
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Materials	1995	Well Screen, stainless steel, 6"	6" Stainless steel well screen. Materials only.	Foot	\$225.62	2	\$451.24
Equipment/Installation	1595	Rotary Drill Rig with Operator	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$316.25	24	\$7,590.00
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	\$33.78	0.5	\$16.89
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33

## Scenario Worksheet

## Practice and Scenario Description:

<b>Information Type</b>	<b>Data</b>
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	1
Scenario Name	Dug Well
Scenario Description	Typical construction is for the excavation of a shallow dug well. The purpose of the practice is to provide water for livestock. A typical dug well is 4 foot in diameter and 12 feet in depth. The well is excavated using a backhoe. Excavate to a depth where the water recharge is greater than the equipment can remove. Washed gravel is placed in the base of the dug opening. Concrete manhole risers are installed to hold the water. Pea gravel is placed above the washed gravel to transition to the earth backfill. The hole is backfilled and sloped to direct surface water away from entering the manhole cover.
Before Practice Situation	Livestock have insufficient water or are fenced from their water source.
After Practice Situation	Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

## Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,912.02	\$5,912.02
Equipment/Installation	\$182.84	\$182.84
Labor	\$342.08	\$342.08
Mobilization	\$304.33	\$304.33
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$6,741.27	\$6,741.27

## Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	5	\$11.60
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	5	\$498.95
Materials	1053	Manhole, 4' x 4'	Precast Manhole with base and top delivered	Each	\$1,755.33	3	\$5,265.99
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Materials	46	Aggregate, Gravel, Graded	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$27.76	3	\$83.28
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	\$45.71	4	\$182.84
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	\$25.71	8	\$205.68
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	\$34.10	4	\$136.40
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	\$33.78	0.5	\$16.89
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
Mobilization	1142	Mobilization, General labor	Mobilization of general labor: Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$26.21	0.5	\$13.11

**Scenario Worksheet**

**Practice and Scenario Description:**

<b>Information Type</b>	<b>Data</b>
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	7
Scenario Name	High Volume Deep Well
Scenario Description	Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are ≥ 8" in diameter. Steel casing is installed to a depth of 30 feet.
Before Practice Situation	There is insufficient water for use in irrigation.
After Practice Situation	Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

**Cost Summary:**

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,192.89	\$5,192.89
Equipment/Installation	\$12,650.00	\$12,650.00
Labor	\$0.00	\$0.00
Mobilization	\$291.22	\$291.22
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
<b>Total</b>	<b>\$18,134.11</b>	<b>\$18,134.11</b>

**Cost Details:**

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1811	Well Casing, Metal, 8"	Steel well casing, 8". Materials only.	Foot	\$142.92	30	\$4,287.60
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	1	\$2.32
Materials	1787	Well Cap, 8"	Well cap, 8". Materials only.	Each	\$48.23	1	\$48.23
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	2	\$199.58
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Materials	1819	Well Screen, stainless steel, 8"	8" Stainless steel well screen. Materials only.	Foot	\$301.48	2	\$602.96
Equipment/Installation	1595	Rotary Drill Rig with Operator	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$316.25	40	\$12,650.00
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	\$33.78	0.5	\$16.89
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33

## Scenario Worksheet

## Practice and Scenario Description:

<b>Information Type</b>	<b>Data</b>
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	5
Scenario Name	High Volume Shallow Well
Scenario Description	Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for overhead irrigation. An average well depth is 75 feet. Well casings are ≥ 8" in diameter. Steel casing is installed to a depth of 30 feet.
Before Practice Situation	There is insufficient water for use in irrigation.
After Practice Situation	Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

## Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$6,097.33	\$6,097.33
Equipment/Installation	\$1,897.50	\$1,897.50
Labor	\$0.00	\$0.00
Mobilization	\$291.22	\$291.22
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$8,286.05	\$8,286.05

## Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1811	Well Casing, Metal, 8"	Steel well casing, 8". Materials only.	Foot	\$142.92	30	\$4,287.60
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	1	\$2.32
Materials	1787	Well Cap, 8"	Well cap, 8". Materials only.	Each	\$48.23	1	\$48.23
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	2	\$199.58
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Materials	1819	Well Screen, stainless steel, 8"	8" Stainless steel well screen. Materials only.	Foot	\$301.48	5	\$1,507.40
Equipment/Installation	1595	Rotary Drill Rig with Operator	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$316.25	6	\$1,897.50
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	\$33.78	0.5	\$16.89
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33

## Scenario Worksheet

## Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	6
Scenario Name	High Volume Typical Well
Scenario Description	Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are ≥ 8" in diameter. Steel casing is installed to a depth of 30 feet.
Before Practice Situation	There is insufficient water for use in irrigation.
After Practice Situation	Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

## Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$5,192.89	\$5,192.89
Equipment/Installation	\$5,060.00	\$5,060.00
Labor	\$0.00	\$0.00
Mobilization	\$291.22	\$291.22
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$10,544.11	\$10,544.11

## Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1811	Well Casing, Metal, 8"	Steel well casing, 8". Materials only.	Foot	\$142.92	30	\$4,287.60
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	1	\$2.32
Materials	1787	Well Cap, 8"	Well cap, 8". Materials only.	Each	\$48.23	1	\$48.23
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	2	\$199.58
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Materials	1819	Well Screen, stainless steel, 8"	8" Stainless steel well screen. Materials only.	Foot	\$301.48	2	\$602.96
Equipment/Installation	1595	Rotary Drill Rig with Operator	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$316.25	16	\$5,060.00
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	\$33.78	0.5	\$16.89
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33

## Scenario Worksheet

## Practice and Scenario Description:

<b>Information Type</b>	<b>Data</b>
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	2
Scenario Name	Shallow Well
Scenario Description	Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 50 feet. Well casings is 4" in diameter. Steel casing is installed to a depth of 10 feet.
Before Practice Situation	Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.
After Practice Situation	Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

## Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$642.24	\$642.24
Equipment/Installation	\$1,265.00	\$1,265.00
Labor	\$0.00	\$0.00
Mobilization	\$274.33	\$274.33
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$2,181.57	\$2,181.57

## Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	1	\$2.32
Materials	1809	Well Casing, Metal, 4"	Steel well casing, 4". Materials only.	Foot	\$35.73	10	\$357.30
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	2	\$199.58
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Materials	1785	Well Cap, 4"	Well cap, 4". Materials only.	Each	\$23.64	1	\$23.64
Materials	1998	Well Screen, plastic, 4"	4" PVC well screen. Materials only.	Foot	\$7.20	1	\$7.20
Equipment/Installation	1595	Rotary Drill Rig with Operator	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$316.25	4	\$1,265.00
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33

## Scenario Worksheet

## Practice and Scenario Description:

Information Type	Data
Region	New England
State	Connecticut
Discipline Group	Engineering General
Practice Code/Name	642 - Water Well
Scenario ID	3
Scenario Name	Typical Well
Scenario Description	Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 30 feet.
Before Practice Situation	Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.
After Practice Situation	Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

## Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	\$2,923.77	\$2,923.77
Equipment/Installation	\$2,530.00	\$2,530.00
Labor	\$0.00	\$0.00
Mobilization	\$291.22	\$291.22
Acquisition of Technical Knowledge	\$0.00	\$0.00
Foregone Income	\$0.00	\$0.00
Total	\$5,744.99	\$5,744.99

## Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Materials	1810	Well Casing, Metal, 6"	Steel well casing, 6". Materials only.	Foot	\$80.39	30	\$2,411.70
Materials	1786	Well Cap, 6"	Well cap, 6". Materials only.	Each	\$32.35	1	\$32.35
Materials	1995	Well Screen, stainless steel, 6"	6" Stainless steel well screen. Materials only.	Foot	\$225.62	1	\$225.62
Materials	1333	Grout, cement	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$99.79	2	\$199.58
Materials	1335	Chlorine	Liquid chlorine bleach. Materials only.	Gallon	\$2.32	1	\$2.32
Equipment/Installation	1595	Rotary Drill Rig with Operator	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$316.25	8	\$2,530.00
Materials	309	Test, Standard Water Test, Well Water	Domestic Well Water Suitability	Each	\$52.20	1	\$52.20
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$274.33	1	\$274.33
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	\$33.78	0.5	\$16.89