

Practice: 351 - Water Well Decommissioning

Scenario: #1 - Shallow, > 15-inch diameter

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations. Install fill material (gravel, earth, concrete, and/or bentonite) consisting of 80% Gravel, 10% Cement or Bentonite, and 10% Earthfill.

Before Situation:

Shallow well or hand dug well that is greater than 15" diameter and less than 20 feet deep. Assume 30" diameter casing. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations. Resource Concern - Water Quality Degradation

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Foot

Scenario Typical Size: 20

Scenario Cost: \$676.29

Scenario Cost/Unit: \$33.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.03	3	\$15.09
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.19	3	\$168.57
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	\$18.99	2	\$37.98
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.95	3	\$74.85
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	\$11.99	3	\$35.97
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	\$3.56	3	\$10.68
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry.	Cubic Yard	\$24.69	2.9	\$71.60
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.72	1	\$258.72

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Scenario: #2 - Shallow, ≤ 15-inch diameter

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations. Install fill material (gravel, earth, concrete, and/or bentonite) consisting of 60% Gravel, 20% Concrete or Bentonite, and 20% Earthfill.

Before Situation:

Shallow well or hand dug well that is less than 15" diameter and less than 80 feet deep. Assume 12" diameter casing. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations. Resource Concern - Water Quality Degradation

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding.

Scenario Feature Measure: Length of well casing

Scenario Unit: Foot

Scenario Typical Size: 80

Scenario Cost: \$569.96

Scenario Cost/Unit: \$7.12

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.03	0.6	\$3.02
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.19	2	\$112.38
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	\$18.99	2	\$37.98
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.95	2	\$49.90
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$22.10	1.4	\$30.94
Bentonite	41	Bentonite, includes materials (50# bag)	Each	\$11.99	5	\$59.95
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	\$3.56	4	\$14.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.72	1	\$258.72

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Scenario: #3 - Drilled, ≤ 300 feet

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:

Drilled well with surface casing that is approximately 250 feet deep. Typically will be a well of less than 6" in diameter, or an artesian well which will require grout pumped and well filled from bottom up. Resource Concern - Water Quality Degradation

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Foot

Scenario Typical Size: 250

Scenario Cost: \$3,907.05

Scenario Cost/Unit: \$15.63

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
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	\$56.19	2	\$112.38
Rotary Drill Rig with Operator	1595	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$173.60	10	\$1,736.00
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	4	\$57.08
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.03	5	\$25.15
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$28.44	4	\$113.76
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	\$18.99	2	\$37.98
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.95	2	\$49.90
Materials						
Grout, cement	1333	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	\$696.96	1.8	\$1,254.53
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.72	2	\$517.44

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Scenario: #4 - Drilled, > 300 feet

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:

Drilled well that is greater than 300 feet deep. Assume 6" diameter casing. Resource Concern - Water Quality Degradation

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Scenario Feature Measure: Length of well casing

Scenario Unit: Linear Feet

Scenario Typical Size: 500

Scenario Cost: \$6,879.39

Scenario Cost/Unit: \$13.76

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Rotary Drill Rig with Operator	1595	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$173.60	20	\$3,472.00
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hour	\$14.27	8	\$114.16
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$56.19	2	\$112.38
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$5.03	5	\$25.15
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$28.44	8	\$227.52
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	\$18.99	2	\$37.98
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$24.95	2	\$49.90
Materials						
Grout, cement	1333	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	\$696.96	3.7	\$2,578.75
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.72	1	\$258.72