Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	355 - Well Water Testing
Scenario ID	4
Scenario Name	Basic Water Test, New Well
Scenario Description	This applies when new wells are constructed, and satifies the requirements of 642 - Water Well, Plans and Specifications, requiring water chemistry before and after disinfection. Water samples are sent to an EPA or state certified laboratory for testing. The required tests and applicable standards shall be determined based on the intended use of the water. The required tests will typically evaluate the water quality for livestock health or other water quality concerns, especially in areas of known contamination.
Before Practice Situation	There are no known contaminants of the well. Water quality impairments are known to exist in the established ground water use area that are detrimental to livestock health (e.g. high mineral composition). Neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible. This practice is installed in rural landscape.
After Practice Situation	Water quality results are known.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$83.96	$83.96
Equipment/Installation	$0.00	$0.00
Labor	$120.65	$120.65
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$204.61	$204.61

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	310	Test, Standard Water Test, Irrigation Suitability	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$41.98	2	$83.96
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.13	5	$120.65

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	355 - Well Water Testing
Scenario ID	1
Scenario Name	Basic Water Test
Scenario Description	Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be unacceptable.
Before Practice Situation	There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible.
After Practice Situation	Water quality results are known.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$41.98	$41.98
Equipment/Installation	$0.00	$0.00
Labor	$60.33	$60.33
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$102.31	$102.31

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	310	Test, Standard Water Test, Irrigation Suitability	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$41.98	1	$41.98
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.13	2.5	$60.33

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	355 - Well Water Testing
Scenario ID	3
Scenario Name	Full Spectrum Test
Scenario Description	Typical scenario includes the professional comprehensive testing for all less common substances, to include: pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is known to be degraded due to a specialized substance but thorough analysis is warranted.
Before Practice Situation	There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, sewage sludge, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is likely.
After Practice Situation	Water quality results are known.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$422.88	$422.88
Equipment/Installation	$0.00	$0.00
Labor	$60.33	$60.33
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$483.21	$483.21

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	310	Test, Standard Water Test, Irrigation Suitability	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$41.98	1	$41.98
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.13	2.5	$60.33
Materials	2002	Test, comprehensive specialized water test, well water	Comprehensive testing for a broad spectrum of pesticides, inorganic chemicals or volatile organics not included in a basic well suitability test.	Each	$380.90	1	$380.90

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Engineering General
Practice Code/Name	355 - Well Water Testing
Scenario ID	2
Scenario Name	Specialty Water Test
Scenario Description	Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance.
Before Practice Situation	There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is possible.
After Practice Situation	Water quality results are known.
Scenario Feature Measure	No.
Scenario Unit	Each
Scenario Typical Size	1

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$181.88	$181.88
Equipment/Installation	$0.00	$0.00
Labor	$60.33	$60.33
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$242.21	$242.21

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	310	Test, Standard Water Test, Irrigation Suitability	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$41.98	1	$41.98
Materials	2003	Test, singular specialized water test, well water	Testing for specific pesticide, inorganic chemical or volatile organic not included in a basic well suitability test.	Each	$139.90	1	$139.90
Labor	230	Skilled Labor	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$24.13	2.5	$60.33

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	359 - Waste Treatment Lagoon
Scenario ID	1
Scenario Name	Waste Treatment Lagoon
Scenario Description	A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Solid/Liquid Waste Separation Facility (632).
Before Practice Situation	Operator presently has a dairy or animal feeding operation where animals are confined in a small area for a period of time each day ranging from a couple of hours to 24 hours per day. The operation does not have a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.
After Practice Situation	A waste treatment lagoon that is constructed by excavation and earth-fill that stores wastes such as manure, waste water, and contaminated runoff. The purpose of this facility is to biologically treat waste, such as manure and wastewater, and thereby reduce pollution potential by serving as a treatment component of an agricultural waste management system. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : Design Volume 439,440 ft3; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13'; 1' freeboard (not included in total depth). Excavated Volume 8,500 CY, Earthfill Volume 6,800 CY
Scenario Feature Measure	Design Storage Volume
Scenario Unit	Cubic Foot
Scenario Typical Size	439,440

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$48.15	$0.00
Equipment/Installation	$23,800.00	$0.05
Labor	$0.00	$0.00
Mobilization	$952.60	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$24,800.75	$0.06

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1120	Structural steel tubing, 2" diameter	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	$3.21	15	$48.15
Equipment/Installation	1223	Excavation, common earth, large equipment, 150 ft	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	$2.80	8500	$23,800.00
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$238.15	4	$952.60

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	359 - Waste Treatment Lagoon
Scenario ID	2
Scenario Name	Waste Treatment Lagoon Rehabilitation
Scenario Description	This scenario is for the rehabilitation of an existing waste treatment lagoon. A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Solid/Liquid Waste Separation Facility (632).
Before Practice Situation	Operator presently has a dairy or animal feeding operation where animals are confined in a small area for a period of time each day ranging from a couple of hours to 24 hours per day. The operation does have an existing waste management system with a waste treatment lagoon that is inadequate to handle the waste stream leaving the animal production facilities. The existing waste treatment lagoon has exceeded its original design life and no longer has the required treatment volume due to accumulation of solids. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.
After Practice Situation	A waste treatment lagoon that has been rehabilitated by removal of all waste to restore the waste treatment volume required to meet the operations current operation. In most cases the waste treatment lagoon has to be increased in size due to operations current; animal numbers and management, design criteria and/or regulations. The purpose of this facility is to biologically treat waste, such as manure and wastewater, and thereby reduce pollution potential by serving as a treatment component of an agricultural waste management system. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : Before Design Volume 340,875 ft3 is filled 1/2 solid/slurry and 1/2 liquid effluent ; 208' X 208' (top); 3:1 inside and outside side slopes; total depth = 13'; 1' freeboard (not included in total depth). After Design Volume 439,440 ft3; 260' X 208' (top); 3:1 inside and outside side slopes; Excavated Volume 4,000 CY, Earthfill Volume 3,200 CY. Requires installation of new liner or certification of the existing liner by a Professional Engineer.
Scenario Feature Measure	Design Storage Volume
Scenario Unit	Cubic Foot
Scenario Typical Size	439,440

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$65,192.25	$0.15
Labor	$0.00	$0.00
Mobilization	$735.62	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$65,927.87	$0.15

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1633	Spreading, manure sludge	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.28	170438	$47,722.64
Equipment/Installation	956	Manure, compost, injection	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	1274961	$12,749.61
Equipment/Installation	1222	Excavation, common earth, large equipment, 50 ft	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$1.18	4000	$4,720.00
Mobilization	1138	Mobilization, small equipment	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$86.90	7	$608.30
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$127.32	1	$127.32

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	360 - Waste Facility Closure
Scenario ID	1
Scenario Name	Not pumpable, not converted to freshwater storage
Scenario Description	This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 15% liquid/slurry waste and 85% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will not be converted to freshwater storage. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)
Before Practice Situation	An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. The consistancy of the sludge/solid waste is too wet to be spread with conventional spreader and too solid to be agitated and pumped to sprinkler or tanker disposal vehicles. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.
After Practice Situation	This scenario assumes an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards (volume below spillway). The volume of solid waste to be removed is approximately 85% of the storage volume (85% X 20,000 = 17,000 CY). The sludge/solid waste will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Stockpiling of the solid waste for drying may be needed to obtain a suitable moisture content prior to land application. The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the total volume. The volume of earthwork to be paid on the placement of compacted earthfilll based on 50% of the total volume, which is 10,000 CY. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use. Monitoring wells may be needed in certain situations to comply with regulatory requirements.
Scenario Feature Measure	Storage Volume
Scenario Unit	Cubic Foot
Scenario Typical Size	540000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$169,200.16	$0.31
Labor	$329.52	$0.00
Mobilization	$730.94	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$170,260.62	$0.32

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	956	Manure, compost, injection	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	605880	$6,058.80
Equipment/Installation	1633	Spreading, manure sludge	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.28	459000	$128,520.00
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.40	10000	$34,000.00
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$77.67	8	$621.36
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$238.15	2	$476.30
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$127.32	2	$254.64
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	$17.88	8	$143.04
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	$23.31	8	$186.48

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	360 - Waste Facility Closure
Scenario ID	2
Scenario Name	Pumpable, not converted to freshwater storage
Scenario Description	This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 85% liquid/slurry waste and 15% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will not be converted to freshwater storage. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)
Before Practice Situation	An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. The consistancy of the waste is such that it can be agitated and pumped to a sprinkler or tanker disposal vehicles. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.
After Practice Situation	This scenario assumes an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards (volume below spillway). The volume of liquid waste to be removed is approximately 85% of the storage volume (85% X 20,000 = 17,000 CY(3,433,320 gallons)). The sludge/solid waste remaining after pumping operations will be removed from the impoundment using heavy earthmoving equipment and will be land applied. The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the total volume. The volume of earthwork to be paid on the placement of compacted earthfilll based on 50% of the total volume, which is 10,000 CY. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use. Monitoring wells may be needed in certain situations to comply with regulatory requirements.
Scenario Feature Measure	Storage Volume
Scenario Unit	Cubic Foot
Scenario Typical Size	540000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$91,634.56	$0.17
Labor	$329.52	$0.00
Mobilization	$730.94	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$92,695.02	$0.17

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	956	Manure, compost, injection	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	3433320	$34,333.20
Equipment/Installation	1633	Spreading, manure sludge	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.28	81000	$22,680.00
Equipment/Installation	49	Earthfill, Roller Compacted	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$3.40	10000	$34,000.00
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$77.67	8	$621.36
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$238.15	2	$476.30
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$127.32	2	$254.64
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	$17.88	8	$143.04
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	$23.31	8	$186.48

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	360 - Waste Facility Closure
Scenario ID	3
Scenario Name	Not pumpable, convert to freshwater storage
Scenario Description	This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 15% liquid/slurry waste and 85% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will be converted to freshwater storage. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)
Before Practice Situation	An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. The consistancy of the sludge/solid waste is too wet to be spread with conventional spreader and too solid to be agitated and pumped to sprinkler or tanker disposal vehicles. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.
After Practice Situation	This scenario assumes an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards (volume below spillway). The volume of solid waste to be removed is approximately 85% of the storage volume (85% X 20,000 = 17,000 CY). The sludge/solid waste will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Stockpiling of the solid waste for drying may be needed to obtain a suitable moisture content prior to land application. Additional excavation below the existing bottom of the pond is necessary to remove potential contaminants, this is assumed to be 10% of the total volume or 2,000 CY. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The waste impoundment shall be breached and have compacted earthfill placed to the extent required to return the site to pre-existing conditions or provide drainage from the site. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.
Scenario Feature Measure	Storage Volume
Scenario Unit	Cubic Foot
Scenario Typical Size	540000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$138,880.16	$0.26
Labor	$329.52	$0.00
Mobilization	$492.79	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$139,702.47	$0.26

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	956	Manure, compost, injection	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	605880	$6,058.80
Equipment/Installation	1633	Spreading, manure sludge	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.28	459000	$128,520.00
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.84	2000	$3,680.00
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$77.67	8	$621.36
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$238.15	1	$238.15
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$127.32	2	$254.64
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	$17.88	8	$143.04
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	$23.31	8	$186.48

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	360 - Waste Facility Closure
Scenario ID	4
Scenario Name	Pumpable, convert to freshwater storage
Scenario Description	This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 85% liquid/slurry waste and 15% sludge/solid waste of the the total storage capacity of the structure. The waste impoundment will be converted to freshwater storage. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)
Before Practice Situation	An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. The consistancy of the waste is such that it can be agitated and pumped to a sprinkler or tanker disposal vehicles.It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.
After Practice Situation	This scenario assumes an earthen waste impoundment, with top dimensions of 395 ft x 220 ft, 12 ft total depth with 3:1 side slopes. The total volume is approximately 20,000 cubic yards (volume below spillway). The volume of liquid waste to be removed is approximately 85% of the storage volume (85% X 20,000 = 17,000 CY(3,433,320 gallons)). The sludge/solid waste remaining after pumping operations will be removed from the impoundment using heavy earthmoving equipment and will be land applied. Additional excavation below the existing bottom of the pond is necessary to remove potential contaminants, this is assumed to be 10% of the total volume or 2,000 CY. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The waste impoundment shall be excavated to the extent required to convert the structure to a freshwater pond. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.
Scenario Feature Measure	Storage Volume
Scenario Unit	Cubic Foot
Scenario Typical Size	540000

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$61,314.56	$0.11
Labor	$329.52	$0.00
Mobilization	$492.79	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$62,136.87	$0.12

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	956	Manure, compost, injection	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	$0.01	3433320	$34,333.20
Equipment/Installation	1633	Spreading, manure sludge	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	$0.28	81000	$22,680.00
Equipment/Installation	48	Excavation, Common Earth, side cast, small equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$1.84	2000	$3,680.00
Equipment/Installation	931	Hydraulic Excavator, 1 CY	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$77.67	8	$621.36
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$238.15	1	$238.15
Mobilization	1139	Mobilization, medium equipment	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$127.32	2	$254.64
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	$17.88	8	$143.04
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	$23.31	8	$186.48

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Agricultural Engineering
Practice Code/Name	362 - Diversion
Scenario ID	1
Scenario Name	Diversion
Scenario Description	An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 1300 feet long installed on a field slope of 5 percent and requires 1.5 CY excavation per LF. Channel my be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.
Before Practice Situation	Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.
After Practice Situation	Diversion is installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).
Scenario Feature Measure	Diversion Fill Volume
Scenario Unit	Cubic Yard
Scenario Typical Size	1950

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$0.00	$0.00
Equipment/Installation	$2,710.50	$1.39
Labor	$0.00	$0.00
Mobilization	$238.15	$0.12
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$2,948.65	$1.51

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation	1227	Excavation, common earth, side cast, large equipment	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.39	1950	$2,710.50
Mobilization	1140	Mobilization, large equipment	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$238.15	1	$238.15

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	367 - Roofs and Covers
Scenario ID	1
Scenario Name	Timber and Steel Sheet Roof
Scenario Description	A timber framed building with a 29 gage corrugated sheet metal roof and supporting foundation. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. To be used in conjunction with waste management facilities, and typically installed over an approved Animal Mortality Facility (316) or Composting Facility (317). Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).
Before Practice Situation	Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.
After Practice Situation	A timber framed building with a 29 gage corrugated sheet metal roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 930 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".
Scenario Feature Measure	Footprint of Building
Scenario Unit	Square Foot
Scenario Typical Size	930

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$9,309.30	$10.01
Equipment/Installation	$0.00	$0.00
Labor	$0.00	$0.00
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$9,309.30	$10.01

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1672	Roof, Post Frame Building , less than 30' wide	Post Frame Building, no sides, - less than 30' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	$10.01	930	$9,309.30

Scenario Worksheet

Practice and Scenario Description:

Information Type	Data
Region	Southern Plains
State	Oklahoma
Discipline Group	Environmental Engineering
Practice Code/Name	367 - Roofs and Covers
Scenario ID	2
Scenario Name	Steel Frame and Roof
Scenario Description	A steel framed building with a 29 gage corrugated sheet metal roof and steel trusses and truss supports. Agricultural wastes such as manure, animal mortality and poultry litter that are stored on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. To be used in conjunction with waste management facilities, and typically installed over an approved Waste Storage Facility (313). Associated practices includes Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629).
Before Practice Situation	Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.
After Practice Situation	A steel framed building with a 29 gage corrugated sheet metal roof and steel trusses and truss supports. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 2,600 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".
Scenario Feature Measure	Footprint of Building
Scenario Unit	Square Foot
Scenario Typical Size	2,600

Cost Summary:

Cost Category	Scenario Cost	Scenario Cost/Unit
Materials	$18,876.00	$7.26
Equipment/Installation	$0.00	$0.00
Labor	$0.00	$0.00
Mobilization	$0.00	$0.00
Acquisition of Technical Knowledge	$0.00	$0.00
Foregone Income	$0.00	$0.00
Total	$18,876.00	$7.26

Cost Details:

Cost Category	Component ID	Component Name	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials	1676	Roof, Post Frame Building, 30' to 60' wide	Post Frame Building, no sides, - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Foot	$7.26	2600	$18,876.00