

CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
PRACTICE: Drainage Water Management 554		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
RESOURCES, CONSIDERATIONS AND CONCERNS	PHYSICAL EFFECTS	RATIONALE			
SOIL - EROSION					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Slight to Moderate Improvement	Control of water surface elevations keeps the soil surface moist and prevents soil detachment by wind.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Not Applicable	Not applicable.			
Streambank	Not Applicable	Not applicable.			
Shoreline	Not Applicable	Not applicable.			
Irrigation Induced	Not Applicable	Not applicable.			
Mass Movement	Not Applicable	Not applicable.			
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.			
SOIL – CONDITION					
Organic Matter Depletion	Slight to Moderate Improvement	Maintaining water table in the root zone decreases oxidation of organic matter. Lowering water table can increase oxidation in certain situations.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Slight Worsening	Moist soil surface is susceptible to equipment compaction.			
Subsidence	Slight to Moderate Improvement	Reducing oxidation of organic matter will reduce the opportunity for subsidence.			
Contaminants:					
• Salts and other Chemicals	Neutral	If the water table is kept high, salt build up may occur.			
• Animal Waste and other Organics - N	Moderate to Substantial Improvement	Elevated water tables promote denitrification.			
• Animal Waste and other Organics - P	Neutral	Not applicable.			
• Animal Waste and other Organics - K	Neutral	Not applicable.			
• Commercial Fertilizer - N	Moderate to Substantial Improvement	Elevated water tables promote denitrification.			
• Commercial Fertilizer – P	Neutral	Not applicable.			
• Commercial Fertilizer – K	Neutral	Not applicable.			
• Residual Pesticides	Neutral	Managing the water table may or may not have an effect on pesticide activity or degradation.			
Damage from Sediment Deposition	Not Applicable	Not applicable.			
WATER – QUANTITY					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Slight Improvement	Water table is managed to			

		prevent excessive seepage.
Excessive Runoff, Flooding, or Ponding	Slight to Moderate Worsening	Runoff is controlled to create ponding or flooding conditions.
Excessive Subsurface Water	Slight to Moderate Improvement	Subsurface water is managed to limit periods of saturation compatible with the present or intended land use.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Slight Improvement	Water is released in a controlled fashion thereby relieving pressure on outlets
Inefficient Water use on Irrigated Land	Not Applicable	Not applicable.
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.
Reduced Capacity of Conveyances by Sediment Deposition	Not Applicable	Not applicable.
Reduced Storage of Water Bodies by Sediment Accumulation	Not Applicable	Not applicable.
Aquifer Overdraft	Slight Improvement	Water tables managed to recharge aquifer.
Insufficient Flows in Water Courses	Slight Improvement	Water is held longer on the fields resulting in sustained flows in water courses.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	Drainage increases aerobic pesticide degradation in the root zone during the periods when crops are growing.
• Excessive Nutrients and Organics	Slight Worsening	The action increases groundwater elevation which moves it closer in proximity to nutrients. This increases the potential to contaminate groundwater.
• Excessive Salinity	Not Applicable	Not applicable.
• Harmful Levels of Heavy Metals	Neutral	Changing the soil water level can affect soil chemistry, which can increase the solubility of some metals. This may make them more or less susceptible to leaching.
• Harmful Levels of Pathogens	Slight Improvement	The action will alter the timing and possibly amount of drainage. Holding water in root zone may contribute to pathogen die-off.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Moderate Improvement	Drainage reduces runoff and erosion.
• Excessive Nutrients and Organics	Slight Improvement	The rate of water release is slower than under natural conditions, allowing more time for some nutrients in solution to volatilize and for sediment-

		attached nutrient to settle out.
• Excessive Suspended Sediment and Turbidity	Not Applicable	Not applicable.
• Excessive Salinity	Neutral	The action can reduce the rate at which salt-contaminated water is released, but has no effect on the amount of salt.
• Harmful Levels of Heavy Metals	Slight to Moderate Improvement	Water releases are controlled giving less opportunity for heavy metal-laden sediment to enter surface water.
• Harmful Temperatures	Slight Worsening	The action increases retention time of storm water.
• Harmful Levels of Pathogens	Slight Improvement	Water releases are controlled giving less opportunity to enter surface water
• Harmful Levels of Petroleum	Slight Improvement	Water releases are controlled giving less opportunity to enter surface water
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	The action keeps the soil surface moist reducing the potential for wind erosion.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	The action keeps the soil surface moist reducing the potential for wind erosion.
Excessive Ozone	Not Applicable	Not applicable.
Excessive Greenhouse Gas:		
• CO ₂ (Carbon Dioxide)	Slight Improvement	Provides for conditions to promote plant growth.
• N ₂ O (Nitrous Oxide)	Not Applicable	Not applicable.
• CH ₄ (Methane)	Not Applicable	Not applicable.
Ammonia (NH ₃)	Slight Improvement	Provides for conditions to promote soil aeration
Chemical Drift	Not Applicable	Not applicable.
Objectionable Odors	Not Applicable	Not applicable.
Reduced Visibility	Slight Improvement	Maintains soil moisture to reduce the potential for wind erosion.
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.
PLANTS – SUITABILITY		
Plants not Adapted or Suited	Not Applicable	Not applicable.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Slight to Moderate Improvement	Drainage provides conditions for optimum plant growth.
Threatened or Endangered Plant Species:		
• Plant Species Listed or Proposed for Listing Under the Endangered Species Act	Not Applicable	Not applicable.
• Declining Species, Species of Concern	Not Applicable	Not applicable.
Noxious and Invasive Plants	Not Applicable	Not applicable.

Forage Quality and Palatability	Not Applicable	Not applicable.
Wildfire Hazard	Not Applicable	Not applicable.
ANIMALS - FISH AND WILDLIFE		
Inadequate Food	Not Applicable	Not applicable.
Inadequate Cover/Shelter	Not Applicable	Not applicable.
Inadequate Water	Slight to Moderate Improvement	Seasonal flooding provides water for some species.
Inadequate Space	Slight to Moderate Improvement	Seasonal flooding provides habitat for some species.
Habitat Fragmentation	Not Applicable	Not applicable.
Imbalance Among and Within Populations	Not Applicable	Not applicable.
Threatened and Endangered Fish and Wildlife Species:		
<ul style="list-style-type: none"> Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act 	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
<ul style="list-style-type: none"> Declining Species, Species of Concern 	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
ANIMALS - DOMESTIC		
Inadequate Quantities and Quality of Feed and Forage	Moderate to Substantial Improvement	Optimum moisture is maintained for forage production.
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Not Applicable	Not applicable.
HUMAN - ECONOMICS		
Land - Change in Land Use	Slight to moderate.	Change in crop or livestock production with different water levels..
Land - Land in Production	Slight decrease	Change in crop or livestock production with different water levels.
Capital - Change in Equipment	Substantial increase.	Equipment required to install and maintain the practice
Capital - Total Investment Cost	Substantial.	Materials, equipment and labor to install practice.
Capital - Annual Cost	Slight to moderate increase.	Operation and maintenance costs to control water levels.
Capital - Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Slight to moderate increase.	Labor required to operate and maintain water control structures.
Labor - Change in Management Level	Moderate increase.	Management required to operate and maintain water control structures.
Risk - Yield	Slight Decrease	Slight decrease due to improved drainage or holding capacity.
Risk - Flexibility	Slight Decrease	Slight decrease due to more conductive growing conditions.
Risk - Timing	Substantial Increase	Substantial increase - applied to

		conserve surface or subsurface water by controlling outflow.
Risk – Cash Flow	Slight to Moderate Increase	Slight to moderate increase due to implementation costs.
Profitability – Change in Profitability	Situational	Slight decrease to moderate increase.
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Situational	Situational May avoid or increase effects (due to effects on soil movement)
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight Increase	Energy is required to construct this practice. Some energy inputs are also required to maintain this practice but can reduced if gravity flow is utilized.
Underutilization of Non-Fossil Energy Resources	Not Applicable	Not applicable.

Human Considerations Explanation

Considerations	Physical effects indicate:
Land - Change in Land Use	The degree to which implementing the conservation practice is expected to cause a change from one land use to another.
Land - Land in Production	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of land in production.
Capital - Change in Equipment	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of capital equipment required for farm or ranch operations.
Capital - Total Investment Cost	A qualitative measure of the increase in total investment dollars required in order to implement the conservation practice.
Capital - Annual Cost	A qualitative measure of the expected change in annual capital costs required in order to operate and maintain the conservation practice.
Capital - Credit & Farm Program Eligibility	Included to make conservation planners aware of the potential availability of funding for implementing conservation practices.
Labor – Labor	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of overall farm or ranch labor required for operations.
Labor - Change in Management Level	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of required active management on a farm or ranch.
Risk – Yield	The degree to which risk, as related to crop or livestock yields, is expected to increase or decrease as a result of implementing the conservation practice.
Risk – Flexibility	The degree to which risk, as related to the flexibility of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice. For example, converting from flood irrigation to a sprinkler system gives a farmer an increase in flexibility of irrigation, which results in a decrease in the level of risk associated with inflexibility of operations.
Risk – Timing	The degree to which risk, as related to the timing of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
Risk - Cash Flow	The degree to which risk, as related to cash flow in farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
Profitability - Change in Profitability	The degree to which farm or ranch profitability is expected to increase or decrease as a result of implementing the conservation practice.
Cultural Resources and/or Historic Properties Present or Suspected to be Present	The degree to which implementation of the conservation practice is expected to increase or decrease the risk of cultural resource disturbance, degradation, or loss.
Depletion of Fossil Fuel Resources	Inefficient use of fossil-originated energy sources (diesel, gasoline, propane, natural gas, coal), lubricants, and other materials.
Underutilization of Non-Fossil Energy Sources	Available and cost-effective alternative energy sources (solar, wind, biofuel, hydroelectric, geothermal) are not being used or are being used inefficiently.