

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	12/27/2011
<b>PRACTICE: Vertical Drain 630</b>		Baseline Setting:			
		Appropriate Land Use(s): All Land Uses			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>	<b>PHYSICAL EFFECTS</b>	<b>RATIONALE</b>			
<b>SOIL - EROSION</b>					
Sheet and Rill	Not Applicable	Not applicable.			
Wind	Not Applicable	Not applicable.			
Ephemeral Gully	Not Applicable	Not applicable.			
Classic Gully	Slight Improvement	Runoff is captured and discharged subsurface reducing erosion potential.			
Streambank	Not Applicable	Not applicable.			
Shoreline	Not Applicable	Not applicable.			
Irrigation Induced	Not Applicable	Not applicable.			
Mass Movement	Slight Improvement	Runoff is captured and discharged subsurface reducing erosion potential.			
Road, Roadsides, and Construction Sites	Slight Improvement	Runoff is captured and discharged subsurface reducing erosion potential.			
<b>SOIL – CONDITION</b>					
Organic Matter Depletion	Not Applicable	Not applicable.			
Rangeland Site Stability	Not Applicable	Not applicable.			
Compaction	Not Applicable	Not applicable.			
Subsidence	Neutral	Surface water removal may result in increased oxidation of organic matter.			
Contaminants:					
• Salts and other Chemicals	Not Applicable	Not applicable.			
• Animal Waste and other Organics - N	Not Applicable	Not applicable.			
• Animal Waste and other Organics - P	Not Applicable	Not applicable.			
• Animal Waste and other Organics - K	Not Applicable	Not applicable.			
• Commercial Fertilizer - N	Not Applicable	Not applicable.			
• Commercial Fertilizer – P	Not Applicable	Not applicable.			
• Commercial Fertilizer – K	Not Applicable	Not applicable.			
• Residual Pesticides	Not Applicable	Not applicable.			
Damage from Sediment Deposition	Neutral	When surface drainage is diverted, erosion may decrease.			
<b>WATER – QUANTITY</b>					
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.			
Excessive Seepage	Neutral	Surface water introduced to strata below the zones conducive to seepage.			
Excessive Runoff, Flooding, or Ponding	Moderate to Substantial Improvement	Surface and subsurface drainage diverted to underground strata and not available to surface problems.			

Excessive Subsurface Water	Slight to Moderate Worsening	Diversion of surface water to subsurface will increase any existing problems.
Drifted Snow	Not Applicable	Not applicable.
Inadequate Outlets	Moderate Improvement	The action provides an outlet for areas with inadequate surface drainage.
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	Slight Improvement	Reduced erosion and sediment from flows being diverted subsurface.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight Improvement	Reduced erosion and sediment from flows being diverted subsurface
Aquifer Overdraft	Moderate to Substantial Improvement	Diverting surface flows subsurface will tend to recharge aquifer.
Insufficient Flows in Water Courses	Slight to Moderate Worsening	Water diverted underground not available for surface waters.
<b>WATER – QUALITY</b>		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Substantial Worsening	Water entering the drain may contain pesticide residues.
• Excessive Nutrients and Organics	Slight to Substantial Worsening	Water conveyed to subsurface strata may contain organics and nutrients.
• Excessive Salinity	Slight Worsening	Water containing soluble salts is outlet below the soil surface where it may reach groundwater.
• Harmful Levels of Heavy Metals	Slight Worsening	Water diverted to the subsurface may contain some heavy metals.
• Harmful Levels of Pathogens	Slight Worsening	Water diverted to the subsurface may contain some pathogens.
• Harmful Levels of Petroleum	Slight Worsening	Water diverted to the subsurface may contain some pathogens.
In Surface Water:		
• Harmful Levels of Pesticides	Not Applicable	Not applicable.
• Excessive Nutrients and Organics	Slight Improvement	Nutrients in the water diverted into a vertical drain is kept out of surface water.
• Excessive Suspended Sediment and Turbidity	Slight Improvement	Water diverted subsurface will reduce surface water flows.
• Excessive Salinity	Slight Improvement	Water containing salt could be diverted from a surface outlet to the subsurface.
• Harmful Levels of Heavy Metals	Slight Improvement	Water diverted subsurface will reduce metal transport to surface waters.
• Harmful Temperatures	Neutral	Diversion of drainage water subsurface removes water from surface flows.
• Harmful Levels of Pathogens	Slight Improvement	Water diverted subsurface reduces surface runoff.

• Harmful Levels of Petroleum	Slight Improvement	Water diverted subsurface may contain some level of contaminant.
<b>AIR – QUALITY</b>		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Not Applicable	Not applicable.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Not Applicable	Not applicable.
Excessive Ozone	Not Applicable	Not applicable.
Excessive Greenhouse Gas:		
• CO <sub>2</sub> (Carbon Dioxide)	Not Applicable	Not applicable.
• N <sub>2</sub> O (Nitrous Oxide)	Not Applicable	Not applicable.
• CH <sub>4</sub> (Methane)	Not Applicable	Not applicable.
Ammonia (NH <sub>3</sub> )	Not Applicable	Not applicable.
Chemical Drift	Not Applicable	Not applicable.
Objectionable Odors	Not Applicable	Not applicable.
Reduced Visibility	Not Applicable	Not applicable.
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.
<b>PLANTS – SUITABILITY</b>		
Plants not Adapted or Suited	Not Applicable	Not applicable.
<b>PLANTS - CONDITION</b>		
Productivity, Health, and Vigor	Not Applicable	Not applicable.
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.
<b>ANIMALS - FISH AND WILDLIFE</b>		
Inadequate Food	Not Applicable	Not applicable.
Inadequate Cover/Shelter	Not Applicable	Not applicable.
Inadequate Water	Not Applicable	Not applicable.
Inadequate Space	Not Applicable	Not applicable.
Habitat Fragmentation	Not Applicable	Not applicable.
Imbalance Among and Within Populations	Not Applicable	Not applicable.
Threatened and Endangered Fish and Wildlife Species:		
• 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.
• Declining Species, Species of Concern	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
<b>ANIMALS – DOMESTIC</b>		
Inadequate Quantities and Quality of	Not Applicable	Not applicable.

Feed and Forage		
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Not Applicable	Not applicable.
<b>HUMAN – ECONOMICS</b>		
Land - Change in Land Use	Not applicable.	Not applicable.
Land – Land in Production	Slight decrease.	
Capital – Change in Equipment	Moderate increase.	
Capital - Total Investment Cost	Substantial.	Substantial.
Capital – Annual Cost	Slight increase.	
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Slight increase.	
Labor – Change in Management Level	Slight increase.	
Risk - Yield	Slight Decrease	Slight decrease due to improved drainage.
Risk - Flexibility	Substantial Decrease	Substantial decrease if allowed according to state law and will not pollute underground waters.
Risk - Timing	Not applicable.	Not applicable.
Risk – Cash Flow	Moderate Increase	Moderate increase due to construction cost.
Profitability – Change in Profitability	Situational	Slight decrease to slight increase.
<b>HUMAN - CULTURAL</b>		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Slight to Substantial Increase	Construction impacts (mechanical).
<b>HUMAN – ENERGY</b>		
Depletion of Fossil Fuel Resources	Not Applicable	Not Applicable
Underutilization of Non-Fossil Energy Resources	Not Applicable	Not Applicable

## Human Considerations Explanation

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