CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Nebraska	FIELD OFFICE	Any	DATE	10/10/2008
PRACTICE: Irrigation Water Management 449		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 Substantial Improvement	Managing water to maintain surface moisture reduces 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	Slight to Substantial Improvement	Water can be managed in such a manner as to reduce or prevent erosion.
Mass Movement	Not Applicable	Not applicable.
Road, Roadsides, and Construction Sites	Not Applicable	Not applicable.
SOIL – CONDITION		
Organic Matter Depletion	Slight Improvement	The action promotes optimum biomass production.
Rangeland Site Stability	Not Applicable	Not applicable.
Compaction	Not Applicable	Not applicable.
Subsidence	Not Applicable	Not applicable.
Contaminants:		
• Salts and other Chemicals	Slight to Substantial Improvement	Water can be managed to leach salts and chemicals below the root zone
• 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	Not Applicable	Not applicable.
WATER – QUANTITY		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Not Applicable	Not applicable.
Excessive Runoff, Flooding, or Ponding	Not Applicable	Not applicable.
Excessive Subsurface Water	Slight Improvement	Management of irrigation water will help reduce excess subsurface water.
Drifted Snow	Not Applicable	Not applicable.

Inadequate Outlets	Not Applicable	Not applicable.
Inefficient Water use on Irrigated Land	Slight to Substantial Improvement	Managed application of water for irrigation will increase the efficiency of use.
Inefficient Water use on Non-Irrigated Land	Not Applicable	Not applicable.
Reduced Capacity of Conveyances by Sediment Deposition	Slight to Substantial Improvement	Managed irrigation water will reduce the amount of sediment available for deposition.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Substantial Improvement	Managed irrigation water will reduce the amount of sediment available for deposition.
Aquifer Overdraft	Slight to Moderate Improvement	More efficient application of irrigation water reduces aquifer withdrawals.
Insufficient Flows in Water Courses	Slight to Moderate Improvement	More efficient application of irrigation water requires smaller diversion from streams.
WATER – QUALITY		
In Groundwater:		
• Harmful Levels of Pesticides	Slight to Substantial Improvement	Controlling the volume, frequency, and application rate of irrigation water reduces deep percolation.
• Excessive Nutrients and Organics	Slight to Substantial Improvement	Water is applied at rates and times that minimize nutrient transport to ground water.
• Excessive Salinity	Slight to Substantial Improvement	Water is applied at rates that minimize salinity transport to ground water.
• Harmful Levels of Heavy Metals	Slight to Moderate Improvement	Water is applied at rates that minimize heavy metal transport to ground water.
• Harmful Levels of Pathogens	Slight to Moderate Improvement	Water is applied at rates that minimize pathogen transport to ground water.
• Harmful Levels of Petroleum	Slight Improvement	Water is applied at rates that minimize petroleum transport to ground water.
In Surface Water:		
• Harmful Levels of Pesticides	Slight to Substantial Improvement	Controlling the volume, frequency, and application rate of irrigation water reduces runoff and erosion that may carry pesticides into surface water.
• Excessive Nutrients and Organics	Slight to Substantial Improvement	Water is applied at rates that reduce the potential for erosion and detachment, and minimize nutrient transport to surface water.
• Excessive Suspended Sediment and Turbidity	Slight to Substantial Improvement	Water is applied at rates that minimize soil erosion.
• Excessive Salinity	Slight to Moderate Improvement	Water is applied at rates that

		minimize salinity transport to surface water.
• Harmful Levels of Heavy Metals	Slight to Substantial Improvement	Water is applied at rates that minimize heavy metals transport to surface water.
• Harmful Temperatures	Neutral	Conservation irrigation systems minimize affects to surface water quality.
• Harmful Levels of Pathogens	Slight to Substantial Improvement	Water is applied at rates that minimize pathogens transport to surface water
• Harmful Levels of Petroleum	Slight to Substantial Improvement	Water is applied at rates that minimize petroleum transport to surface water
AIR – QUALITY		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Substantial Improvement	Maintaining adequate soil moisture content reduces the potential soil erodibility and increases crop growth and residue production.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Substantial Improvement	Maintaining adequate soil moisture content reduces the potential soil erodibility and increases crop growth and residue production.
Excessive Ozone	Not Applicable	Not applicable.
Excessive Greenhouse Gas:		
• CO_2 (Carbon Dioxide)	Not Applicable	Not applicable.
• N_20 (Nitrous Oxide)	Not Applicable	Not applicable.
• CH_4 (Methane)	Not Applicable	Not applicable.
Ammonia (NH_3)	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	Slight to Moderate Improvement	Timing of water use can decrease temperatures and maintain plant vigor and growth.
PLANTS – SUITABLIITY		
Plants not Adapted or Suited	Not Applicable	Not applicable.
PLANTS - CONDITION		
Productivity, Health, and Vigor	Slight to Substantial Improvement	Managed application of water enhances plant growth, health and vigor.
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	Slight Improvement	Improved irrigation efficiency improves crop health and vigor

		which decreases weed competition.
Forage Quality and Palatability	Slight to Substantial Improvement	Water is managed to optimize forage quality and palatability.
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	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	Not Applicable	Not applicable.
• Declining Species, Species of Concern	Not Applicable	Not applicable.
ANIMALS – DOMESTIC		
Inadequate Quantities and Quality of Feed and Forage	Moderate to Substantial Improvement	Production will be improved with uniform and consistent application of water.
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	Not applicable.	Not applicable.
Land – Land in Production	Not applicable	Not applicable
Capital – Change in Equipment	Slight Increase.	
Capital - Total Investment Cost	Not applicable.	
Capital – Annual Cost	Slight increase	Slight increase, offset by effective and efficient use of irrigation water.
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Slight to moderate increase	Slight to moderate increase to monitor soil moisture and crop condition.
Labor – Change in Management Level	Slight to moderate increase	Slight to moderate increase from timing practices, require above average management skills.
Risk - Yield	Slight to Moderate Decrease	Slight to moderate decrease due to effective management of soil moisture.
Risk - Flexibility	Slight to Moderate Decrease	Slight to moderate decrease due to the effective management of soil moisture.
Risk - Timing	Substantial Increase	Substantial increase - practice must be implemented in a planned and efficient manner.
Risk – Cash Flow	Slight to Moderate Decrease	Slight to moderate decrease from

		higher yields and reduced costs.
Profitability – Change in Profitability	Slight to moderate increase.	
HUMAN - CULTURAL		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	Not applicable.
HUMAN – ENERGY		
Depletion of Fossil Fuel Resources	Slight to Substantial Decrease	Optimizing water use for irrigation reduces energy needs.
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.