

Natural Resource Concern	Description of Concern	State Quality Criteria	Assessment Tools for Quality Criteria Evaluation	Measurement Units
WATER				
Water Quantity – Rangeland Hydrologic Cycle	The capacity to capture, store, and safely release water from rainfall, runoff, and snowmelt (where relevant).	Indicators of Rangeland Health Attribute rating for Hydrologic Cycle is Slight to Moderate or less departure from Ecological Reference Sheet (ESD).	<ul style="list-style-type: none"> Rangeland Health Assessment 	Departure from Ecological Reference Sheet (ESD) categories – amount of departure, by numeric value, from Ecological Reference Sheet for the field or planning area/unit. 1=None to Slight, 2=Slight to Moderate, 3=Moderate, 4=Moderate to Extreme, or 5=Extreme.
Water Quantity - Excessive Seepage	Subsurface water oozing to the surface restricts land use and management.	Subsurface water is managed to limit periods of saturation that are unfavorable to the present or intended land use. Management complies with wetland policies.	<ul style="list-style-type: none"> Visual Assessment (physical presence of water, prevalence of hydrophytic vegetation, etc.) Client interview Area measurements State wetland mapping conventions Part 650 of the engineering field handbook, hydrology tools for wetland determination 	Acres/Year - average annual acres of seep reduced for the field or planning area/unit

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Water Quantity - Excessive Runoff, Flooding, or Ponding	The land becomes inundated restricting land use and management.	Excess water amounts and/or rates of flow are controlled consistent with desired present or intended land use goals and wetland policies.	<ul style="list-style-type: none"> • Visual assessment • Client interview • Stream Visual Assessment Protocol • National Engineering Handbook (EFH – chapter 2 and 3) • Hydrologic models, e.g. HECRAS, TR-20, TR-55 	Non Measurable
Water Quantity - Excessive Subsurface Water	Water saturates upper soil layers restricting land use and management.	Subsurface water is managed to limit periods of saturation compatible with the present or intended land use and wetland policies.	<ul style="list-style-type: none"> • Visual assessment of soil cores and coring holes • Plant quality and quantity measurements • National Engineering Handbook, Part 650 (EFH-Chapter 14) • Soil surveys and permafrost maps • MAPS • State wetland mapping conventions 	Non Measurable
Water Quantity - Drifted Snow	Wind-blown snow deposits and accumulates around and over surface structures restricting ingress, egress and conveyance of humans and animals.	Snowdrifts are reduced or prevented to allow ingress, egress, and conveyance of humans and animals.	<ul style="list-style-type: none"> • Visual assessment • Client interview • Depth and area measurements 	Non Measurable

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Water Quantity - Inadequate Outlets	Natural or constructed outlets too small to remove excess water in a timely manner.	Outlets are designed, installed, upgraded or maintained to adequately convey water for present or intended uses and wetland policies.	<ul style="list-style-type: none"> • Visual assessment • Client interview • National Engineering Handbook, part 650 (EFH – Chapters 2,3,7) • Hydrologic models, e.g. HECRAS, TR-20, TR-55 • State wetland mapping conventions 	Non Measurable
Water Quantity - Inefficient Water Use on Irrigated Land	Limited water supplies are not optimally utilized.	Land and water management is planned and coordinated to provide optimal use of natural and applied moisture.	<ul style="list-style-type: none"> • Visual assessment • National Engineering Handbook, Part 652, Irrigation Guide • Crop quality and quantity measurements • Farm Irrigation Rating Method (FIRM) 	Acre-Inches/ Acre/Year – average annual acre-inches of water per acre used more beneficially for the field or planning area/unit
Water Quantity - Inefficient Water Use on Non-irrigated Land	Natural moisture is not optimally utilized.	Management provides optimum use of natural moisture for the present or intended land use.	<ul style="list-style-type: none"> • Visual assessment • Plant or animal quality and quantity measurements 	Acre Inches /Acre /Year - average annual acre-inches of water per acre used more beneficially for the field or planning area/unit

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Water Quantity - Reduced Capacity of Conveyances by Sediment Deposition	Sediment deposits in ditches, canals, culverts, and other water conveyances reduce the desired flow capacity.	Conveyance structures are upgraded or maintained to adequately convey water for present or intended uses.	<ul style="list-style-type: none"> • Visual assessment • Client interview • National Engineering Handbook, Part 650 (EFH – Chapters 2,3,70) • Hydrologic models, e.g., HECRAS, TR-20, TR-55 	Cubic yards - Volume of sediment in cubic yards removed to maintain water conveyances for the field or planning area/unit.
Water Quantity -Reduced Storage of Water Bodies by Sediment Accumulation	Sediment deposits in water bodies reduce the desired volume capacity.	Water bodies and contributing source areas are treated to allow sufficient water storage for present and intended uses.	<ul style="list-style-type: none"> • Visual assessment • Depth and area measurements • National Engineering Handbook, Part 650 (EFH – Chapters 2,3,7,11) 	Acre-Inches/Year - Average annual reduction in acre-inches in sediment deposition within water bodies for the field or planning area/unit
Water Quantity - Aquifer Overdraft	Water withdrawals exceed recharge rates.	Land and water management are coordinated to conserve aquifer water levels.	<ul style="list-style-type: none"> • Water level measurements 	Acre-Inches/Year - average annual reduction in acre-inches of groundwater overdraft for the field or planning area/unit

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Water Quantity – Insufficient Flows in Water Courses	Water flows are not consistently available in sufficient quantities to support ecological processes and land use and management.	Authorized uses and management of water are coordinated to minimize the impacts on water course flows.	<ul style="list-style-type: none"> • Visual assessment • Water flow records • Gauge Station data • Consumptive use/allocation water rights • Habitat Evaluation Guides • National Biology Handbook • Stream Visual Assessment Protocol 	Non Measurable
Water Quality - Harmful Levels of Pesticides in Groundwater	Residues resulting from the use of pest control chemicals degrade groundwater quality.	Pesticides are applied, stored, handled, disposed of, and managed in compliance with applicable label directions and so that groundwater uses are not adversely affected.	<ul style="list-style-type: none"> • WIN-PST (Windows Pesticide Screening Tool – USDA/NRCS) • NAPRA (National Agricultural Pesticide Risk Analysis – USDA/NRCS) • Vadose zone and groundwater chemical sampling and assay 	Non Measurable
Water Quality - Excessive Nutrients and Organics in Groundwater	Pollution from natural or human induced nutrients such as N, P, and organics (including animal and other wastes) degrades groundwater quality.	Nutrients and organics are stored, handled, disposed of, and applied such that groundwater uses are not adversely affected. Nutrients are not leached below the root zone.	<ul style="list-style-type: none"> • National Engineering Handbook, Part 651, Ag. Waste Mgt. Field Handbook • Leaching Index • Phosphorus Index • Vadose zone and groundwater chemical/particle sampling and assay 	Non Measurable
Water Quality - Excessive Salinity in Groundwater	Pollution from salts such as Ca, Mg, Na, K, HCO ₃ , CO ₃ , Cl, and SO ₄ degrades groundwater quality.	Salts are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	<ul style="list-style-type: none"> • Vadose zone and groundwater salinity sampling (total dissolved solids [TDS] or electrical conductivity) and assay • National Engineering Handbook, Part 652, Irrigation Guide • Soil salinity sampling and assay 	Electrical Conductivity (EC) – average reduction in EC for the field or planning area/unit

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Water Quality - Harmful Levels of Heavy Metals in Groundwater	Natural or human induced metal pollutants present in toxic amounts degrade groundwater quality.	Materials containing heavy metals are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected. If contamination is natural, water uses should be modified.	<ul style="list-style-type: none"> • Vadose zone and groundwater chemical sampling and assay • Chemical sampling and assay of land applied materials • EPA and state water quality standards 	Non Measurable
Water Quality - Harmful Levels of Pathogens in Groundwater	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades groundwater quality.	Materials that harbor pathogens are stored, handled, disposed of, applied, and managed such that groundwater uses are not adversely affected.	<ul style="list-style-type: none"> • Vadose zone and groundwater chemical sampling and assay • FARM-A-SYST • EPA and state water quality standards 	Non Measurable
Water Quality - Harmful Levels of Petroleum in Groundwater	Fuel, oil, gasoline and other hydrocarbons present in toxic amounts degrade groundwater quality.	Petroleum products are used, stored, handled, disposed of, and managed such that groundwater uses are not adversely affected.	<ul style="list-style-type: none"> • Vadose zone and groundwater chemical sampling and assay • EPA and state water quality standards 	Non Measurable
Water Quality - Harmful Levels of Pesticides in Surface Water	Pest control chemicals present in toxic amounts degrade surface water quality.	Pesticides are applied, stored, handled, disposed of, and managed in compliance with applicable label directions and such that surface water uses are not adversely affected.	<ul style="list-style-type: none"> • WIN-PST (Windows Pesticide Screening Tool – USDA/NRCS) • NAPRA (National Agricultural Pesticide Risk Analysis – USDA/NRCS) • Surface water chemical sampling assay • EPA and state water quality standards • WQIG (water quality indicator guide) 	Non Measurable

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Water Quality - Excessive Suspended Sediment and Turbidity in Surface Water	Excessive concentrations of mineral or organic particles, algae, or organic stains degrade surface water quality.	Delivery or suspension of mineral and organic particles, and excessive algae growth or organic stains, is managed such that surface water uses are not adversely affected.	<ul style="list-style-type: none"> • Visual assessment • Client interview • SVAP (Stream Visual Assessment Protocol – USDA/NRCS) • Water Quality Indicators Guide – Surface Waters, Field Sheets IA and 1B (Terrene Institute ©1996) • Surface water chemical/particle sampling and assay • EPA and state water quality standards 	Non Measurable

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Water Quality - Harmful Levels of Heavy Metals in Surface Water	Natural or human induced metal pollutants are present in toxic amounts that degrade surface water quality.	Materials containing heavy metals are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected. If contamination is natural, water uses should be modified.	<ul style="list-style-type: none"> • Surface water chemical sampling and assay • EPA and state water quality standards • Chemical sampling and assay of land applied materials 	Non Measurable
Water Quality - Harmful Temperatures of Surface Water	Undesired thermal conditions degrade surface water quality.	Use and management of land and water are coordinated to minimize impacts on surface water temperatures OR, where pathogens are naturally occurring, water uses are modified.	<ul style="list-style-type: none"> • SVAP (Stream Visual Assessment Protocol – USDA/NRCS) – canopy cover • HSI model for target species (Habitat Suitability Index – USF&WS) • Surface water temperature sampling and assay • SNTMP 	Non Measurable
Water Quality - Harmful Levels of Pathogens in Surface Water	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades surface water quality.	Materials that harbor pathogens are stored, handled, disposed of, applied, and managed such that surface water uses are not adversely affected.	<ul style="list-style-type: none"> • Surface water pathogen sampling and assay • WQIG (water quality indicator guide) • Phosphorus index • EPA and state water quality standards 	Non Measurable

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