

Priority Goal #1: Reduce the rate of water use by 10% throughout the region collectively by 2025. Conservation should be voluntary and encouraged to use incentive based policies and programs.

Action Steps

- ❖ Use average water use for the 10-year period ending 2015 as baseline for water use.
- ❖ Identify research needs to determine if and where water (streamflow or groundwater levels) downtrends are occurring for focusing water conservation efforts.
- ❖ Add streamflow measurements to access changes to in streamflow and baseflow contributions on Elm Creek and other priority locations, preferably continuous monitoring gages.
- ❖ Utilize education/information dissemination as developed for the Vision and region. Should include information on water resources, stresses, conservation tools and water use.
- ❖ Identify barriers to conservation in this region.
- ❖ Work with local, state and federal programs to offer water conservation programs, including cost-share opportunities.
- ❖ Address water use by water use category
 - ◇ Irrigation water use
 - ◆ Use education and informational meetings to inform operators and landowners on techniques to reduce water use such as water saving technologies, lower water use crops and develop Water Conservation Areas (WCA).
 - ◆ Identify barriers hindering operators and landowners from reducing water use.
 - ◆ Promote additional tools and programs for reducing water use including a water technology farm in the region.
 - ◇ Industrial water use
 - ◆ Use Red Hills Goals 3 and 4 to reduce fresh water use in the region.
 - ◆ Goal 3: Reduce the amount of freshwater used in oil and gas completion operations by 4% annually.
 - ◆ Goal 4: Work with oil and gas industry, beginning in 2040, to have 10,000 barrels a day of fresh water to be recycled from oil production for regional use in the Red Hills.
 - ◇ Municipal water use
 - ◆ Gather data municipal water use data such as system sources and levels (status), per capita per day usage, rate structures and conservation plans to identify systems using more than the regional average per capital per day per person.
 - ◆ Educate communities on benefits of water conservation.
 - ◆ Educate decision makers on effective programs to reduce water use or identify water losses and resources available to address losses and upgrade systems.
 - ◆ Encourage development and use of water conservation plans.
 - ◇ Natural/unaccounted for use by eastern red cedar trees and other invasive species
 - ◆ Support and assist efforts to evaluate red cedar effect on water resources in the region through NRCS programs such as EQIP and the Kansas RCPP Native Grazing Lands Protection in the Plains project and other efforts to control invasive species on rangeland and drainages. Include efforts to evaluate red cedar water use after the 2016 Barber County fires.
 - ◆ Gather data on eastern red cedar tree water use in region to establish baseline and need. Such as number of acres affected, number of trees and water consumption data to quantify issue (references needed)
 - ◆ Use information to educate landowners why and how to eliminate red cedars from rangeland.



Red Hills Regional Advisory Committee Priority Goal #2 Action Plan

Priority Regional Goal #2: Increase sources of supply through the use of a multipurpose small lake to meet increased demand in specific growth or need areas by 2035.

Action Steps

Local efforts will be led by Sunflower H2o Coalition and the Sunflower RC&D who will work to:

- ❖ Determine level of support for a reservoir for recreation and future water supply.
- ❖ Gather public input on possible reservoir for recreation and future water supply.
- ❖ Define project and scope of work for detailed engineering study to move ahead, if local support is sufficient.
- ❖ Obtain funding for Engineering Study
- ❖ Initiate Engineering Study.
- ❖ Review Engineering Study and formulate future steps.

Agencies/Organizations

Sunflower H2O Coalition, Sunflower RC&D, local government, local stakeholder groups, Kansas Water Office

Resources Needed

Engineering study funding estimated around \$225,000 in 2008. Updated need will depend on defining interested area.



Red Hills Regional Advisory Committee Priority Goal #3 Action Plan

Priority Regional Goal #3: Reduce the amount of freshwater used in oil and gas completion operations by 4% annually.

Action Steps

- ❖ Develop background/baseline data on the quantity of produced water, water usage and reuse in the region for use in education and development of appropriate actions.
- ❖ Work with industry to use the lowest quality waters possible.
- ❖ Work with industry to recycle/reuse flow back and production waters.
 - ◇ Contact all oil and gas operators in region to request voluntary use of treated production water for fracking when economically sensible.
 - ◇ Provide oil and gas operators with information on use of recycled produced water.
- ❖ Share results of Kansas pilot treatment project and other treatment projects.

Agencies/Organizations

Kansas Water Office, Kansas Department of Health and Environment, Kansas Corporation Commission, Kansas Department of Agriculture, stakeholders and industry groups



Red Hills Regional Advisory Committee Priority Goal #4 Action Plan

Priority Goal #4: Work with oil and gas industry, beginning in 2040, to have 10,000 barrels a day of fresh water to be recycled from oil production for regional use in the Red Hills.

Action Steps

- ❖ Work with industry to reduce produced water underground injection quantities.
- ❖ Initiate a pilot produced water treatment project in the region.
- ❖ Share results of pilot project with industry and citizenry.
- ❖ Identify barriers to reuse, such as limiting factors and water quality parameters.
- ❖ Identify reuse potential in the region.
- ❖ Identify sites for treated (freshwater) water storage for oil and gas industry access for fracking.
- ❖ Develop appropriate policy, programs, data or education to address barriers to reuse.

Agencies/Organizations

Kansas Water Office, Kansas Corporation Commission, Kansas Department of Health and Environment, stakeholder organizations

Resources Needed

Pilot Project funding for operation and evaluation estimated \$300,000 - \$800,000.



Red Hills Regional Advisory Committee Priority Goal #1 Action Plan

- ◆ Identify available programs for landowners to address eastern red cedar tree encroachment in the regional planning area.
- ◆ Educate landowners to encourage cedar tree control.

Agencies/Organizations

Kansas Department of Agriculture, Kansas Water Office, Kansas-State University, county conservation districts, Natural Resource Conservation Service, local stakeholder groups, and the Nature Conservancy

Resources needed

Funds needed to complete data gathering and evaluation such as funds to support additional streamflow measurements as determined needed to access changes in stream reaches contributions to major stream baseflow and effect of red cedar tree eradication on these flows.

Ensure funding for water management and water conservation programs is available in the region.